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I

THE ECONOMICS OF SURINAM SLAVERY[1]

by

Gert Oostindie

1. Introduction

The explosive growth of the Caribbean slave colonies from the late seventeenth century onwards, their rise to economic importance out of all proportion to either their size or population, and the nineteenth-century collapse of most of these peripheral centers of production has long fascinated economic historians, and continues to do so. The region's economic history, indeed, has much to thrill the historian inclined to comparative research. There is a series of rises and falls, linking the various colonies in a pattern vaguely reminiscent of a relay race.[2] There are different variants of metropolitan economic policies, initially all inscribed in a mercantilistic framework which was increasingly disrupted, however, and finally abandoned altogether. There are many intriguing questions regarding the predominant type of labour. Why there was slavery may be relatively easily answered. But why, then, the slave trade and slavery itself were abolished is still a question. Others are whether the progressive dismantling of slavery was the cause of the economic decline, or its result, or whether both phenomena were perhaps only indirectly or marginally linked? Moreover, it may be questioned whether slavery and advanced capitalism were really as incompatible as political economists like Smith and Marx have suggested, or necessarily linked, as Wallerstein has it. Yet another field of research is whether slave plantations were really all that mattered in the colonial economies, and – to conclude this incomplete listing of research topics –, how the creeping emergence within slavery of features reminiscent of peasant production, as well as wage-like material incentives, affected the mechanisms of these 'pure' slave economies.

The post-war historiography of the Caribbean has addressed the above questions and raised many more. Scholarly research on the Anglophone Caribbean boasts the longest tradition, reflecting presumptions about its importance to the rise of

British industrial capitalism, the centrality of the British West Indies in the dismantling of 'the peculiar institution', and the cross-fertilization with century-long historiographical debates on North American slavery. The emergence of a significant historiography on other linguistic sub-regions is of later date. The last decades have witnessed a modest boom in innovative studies on Spanish Caribbean history. The study of the French, Danish and Dutch slave colonies still lags behind. Apart from their minor importance in comparison to the British and Spanish colonies, an additional explanation for their exclusion from the mainstream of Caribbean historiography is the apparent invincibility of the extant linguistic barriers.[3]

In this paper, I discuss the major findings, debates and blank spaces in the economic historiography of slavery in the foremost Dutch Caribbean colony, Surinam. I first discuss some long-canonized concepts of the Surinam slave economy.[4] In subsequent paragraphs, I contrast these with recent research on production, trade, capital, and profitability, respectively. I next review some theoretical approaches to the economics of Surinam slave society. A short section on demographic research is then followed by an epilogue. This essay does not aim to be conclusive; elsewhere I have attempted to be more catholic.[5] Moreover, as a participant in this – to use too broad a term – historiographical debate, I cannot claim to provide a fully impartial analysis.

2. *The cliché of rise and fall*

Any analysis of Surinam slave society should start with the seminal study by Rudolf van Lier, *Samenleving in een grensgebied* (1949), translated as *Frontier society* (1971).[6] To put it somewhat bluntly, historians of the Surinam slave economy have long taken this axiom too seriously. For, whereas Van Lier's analysis of the social fabric of Surinam slave society was original and if not flawless, certainly perceptive and forcefully argued, his economic paragraphs did not reach far beyond a summary of contemporary writings. Yet most colonial authors presented only partial accounts, some were simply wrong, and all left many questions open for additional scrutiny. Without further research into archival sources – which Van Lier used very little – one could not hope to broaden our understanding of the puzzling economic development of the Surinam slave economy.

Broadly speaking, contemporary authorship on the colony may be divided into two periods. Up to a fateful crisis in the early 1770s, the typical book or pamphlet on Surinam would eulogize the colony's virtually unlimited natural resources, promising huge profits to be made from an ever-expanding production of tropical staples. Warren (1667) argued that Surinam sugar was of better quality than the produce of the foremost British stronghold, Barbados. Herlein (1718) likened the

colony to paradise. Pistorius (1763) promised new planters fame and riches, as did Hartsinck (1770), who again eulogized the exceptional fertility of the Guianas. Of course, there were drawbacks. In particular, some authors argued that the chronic menace of marronage disrupted the smooth functioning of the plantation economy and undermined the solvency of a colony dependent on metropolitan credit to finance its expansion. Yet such problems could be overcome. Meanwhile, the success in using the famous *polder* technology to transform swampy coastal regions into thriving plantations showed what Dutch ingenuity could forge in this part of the world.[7]

Then came the 1772/73 crash of the British and, hence, Dutch stock exchanges, which translated into an abrupt suspension of credit loans to Surinam and a long series of bankruptcies of major plantations. Soon the former creditors in the Netherlands found out that they had extended far too high loans, based on inflated valuations of the actual worth of the plantations. Some had to cut their losses and, unwillingly, became owners of their mortgaged securities. Others opted for a continuation of the so-called *negotiaties*, a specific form of credit extension.[8] In both cases, the holders of bonds in the mortgages lost much of their investment, and, as subsequent authorship had it, neither the vital credit link nor the colonial economy ever recovered.

Much of the literature from the second period, ranging from the initial crisis to the abolition of slavery in 1863, reflects this pessimistic mood. Certainly, planters' manuals were still produced, suggesting how to run a plantation properly and make a handsome profit. But such books had increasingly bitter overtones of criticism of the conservatism and backwardness of the Surinam planters.[9] Publications meant for the general public were more outspoken, deploring the decline of a once booming colony. Explanations for this reversal of fortunes were manifold, and usually overlapped. Many authors suggested two closely linked vicious circles: first, pre-crisis financial malpractices and overcrediting, and second, withdrawal of investments and recession. Moreover, chronic marronage had demanded a high financial toll and had undermined the colony's solvency.

Allegedly, the situation further deteriorated with the departure of debt-ridden proprietors and the concomitant rise of absenteeism. A range of authors blamed hired overseers and attorneys for the subsequent mismanagement of a once thriving plantation economy. Some also suggested that, even prior to the 1770s, the former frugal and sober colonist had given way to a hedonistic type of planter. Finally, a few late eighteenth-century authors criticized inefficient local rule, the lack of metropolitan support to overcome the crisis and the absence of protectionism in favour of Surinam produce on the Dutch market.[10]

Therefore, even with slavery largely undisputed, Surinam seemed to be in decline. The 1807 abolition of the slave trade - imposed during the British occupation – dramatically confirmed the difference metropolitan policy could make. With apparently none of the other problems solved, the Surinam plantation

economy now faced an abrupt termination of another life-line. As the slave population each year showed staggering rates of natural decrease, it apparently risked dwindling to insignificance within a few decades. Increasingly, and largely in vain, spokesmen for the plantation economy pleaded for metropolitan backing for their languishing industry. In their view, such support should include the continuation of slavery itself; yet by the mid-nineteenth century it was clear that the Dutch government was finally moving towards Emancipation.[11] As for labour, new debates opened up in the 1840s on ways to transform the slave population into a self-reproducing work force and, subsequently, on the substitution of indentured labour for the former slave population.

Nineteenth-century authors disagreed on the issue of slavery. At the same time most parties characterized the Surinam plantation economy as backward and thought of absenteeism and the chronic shortage of capital – generally, *not* the mode of labour per se – as the major explanatory factors. Some of the best-informed writings of the first half of the century addressed the perceived technological stagnation in great detail, thereby creating an image of obsolescence which has lingered ever since.[12] In this period, the association of absenteeism with corruption, incompetence, conservatism and, hence, decline became firmly entrenched. This pessimist view was finally canonized in the voluminous *Geschiedenis van Suriname* (1861), written by the Dutch abolitionist historian Wolbers. On the one hand, Wolbers took the polemical stance that slavery by definition could only produce economic failure and corruption, while on the other, on a more practical level, he blamed absenteeism for wasteful and corrupt management.[13]

When Van Lier published his *Samenleving* some ninety years later, he took up the thread left by Wolbers. His analysis of the economy during slavery leaned heavily on contemporary authorship, and dovetails with Wolbers' analysis. Van Lier marks the crisis of 1772-73 as the turning point from rise to decline. The crisis put an end to the previously lavish flows of credit which had resulted in corruption and incompetence rather than productive investments and stable economic growth. A decline of coffee prices and persistent rumours about new Maroon attacks signalled the definitive end of the capital flow. The crisis was soon translated into bankruptcies and absenteeism. Direct profits rather than a long-term perspective came to dominate plantation management, causing conservatism and technological stagnation in the nineteenth century. Van Lier rightly adds two important observations regarding the sugar industry. First, he reminds the reader of the nineteenth-century come-back of sugar, which for most of the eighteenth century had been bypassed by coffee. Also, he dates the subsequent decline of sugar not in the period of slavery, but immediately after, in a context of rising labour costs, crushing competition from both beet and cane sugar, and increasing Dutch investments in Java, which even in cane sugar production soon outrivalled Surinam.[14]

It took several decades before any serious attempts were made to revise or even substantiate Van Lier's analysis. The economic history by Panday (1959), while providing more systematic economic analysis, still remained fairly close to *Samenleving in een grensgebied.* Adhin (1961) kept suspiciously close to both Van Lier and Panday. Both authors shared a tendency to take decline for granted, and to explain the onset of this decline by the suspension of credit after the 1772-73 crisis. Neither analyzed the internal dynamics of Surinam plantation agriculture at any length.[15] Only the last two decades have witnessed a modest emergence of quantitative research on the colony's economic development. In discussing the results of these studies, I argue for some revisionism and a great deal of problematization in the interpretation of Surinam economic history as postulated by Van Lier.

3. Production

Contemporary authorship on Surinam provided bits and pieces of information on the colony's exports. Reliable official statistics for the colony's production were only provided from 1848 onwards, as part of the published *Koloniale Verslagen* (Colonial Reports). Most of the scattered and very incomplete figures of the previous period were based on export data and usually on elusive units of measure such as oxheads, which raise serious methodological problems.[16] Even so, such data were uncritically accepted by many subsequent scholars.

Figures for the pre-1750 period are virtually unavailable, and so far no scholar has gone much beyond stating that the number of plantations and total plantation output increased dramatically. Recently Van Stipriaan, in *Surinaams contrast* (1993), has presented a first attempt to calculate Surinam plantation production for the period from the mid-eighteenth century up to Emancipation in 1863. The book is based on archival records pertaining to individual plantations, merchant houses' records and government offices. Even if not the definitive study, *Surinaams contrast* deals at last with most of the dynamics of the plantation economy in a longitudinal framework.[17] As Van Stipriaan utilized virtually all of the archival sources uncovered and available at this point, it seems that major revisions of his empirical data will only be done on the possible basis of hitherto ignored archival sources.[18] Short of reproducing Van Stipriaan's findings here, suffice it to summarize the major results regarding production.

First, *Surinaams contrast* documents the geography of plantation production throughout the coastal region, indicating a continuing expansion well beyond the crisis of the 1770s, with stagnation only evident after 1820. Next, Van Stipriaan's information on total plantation produce signals the futility of thinking of Surinam as the typical Caribbean sugar colony. Between 1750 and 1820, the value of total coffee production generally exceeded that of sugar production, with sugar only

regaining its dominance in the 1820s as coffee production collapsed. Even if on a modest scale, the presence of cotton and cacao plantations further undermines the idea of a tropical one-crop economy. Finally, a sectoral breakdown of plantation production indicates that coffee boomed from the 1740s to the 1770s, and subsequently embarked on a downward slope to insignificance by the mid-nineteenth century. Sugar production, in contrast, experienced only a modest decline during the heyday of coffee, and experienced tremendous growth in the half century preceding Emancipation.

There is still the question of productivity. Van Stipriaan calculates for the typical coffee plantation a consistent increase of production per slave up to the 1790s, followed by a rapid decrease thereafter. From the early decades of the nineteenth century onwards, productivity of coffee trees also rapidly deteriorated, indicating serious soil exhaustion caused by deficient rotation. The nineteenth-century cotton sector, too, yielded deteriorating productivity per unit of labour from the mid-1820s.[19] In contrast, the productivity of sugar increased almost consistently, with average production per slave easily doubling from the mid-eighteenth to the mid-nineteenth century, and productivity per unit of land not lagging far behind. In *Roosenburg en Mon Bijou*, a monograph of the Surinam plantations of a Dutch family in the period 1720 to 1870, I reached similar conclusions both for sugar and coffee productivity.

These results, therefore, tend to undermine the general notion of a decline after the 1770s. Geographical expansion proceeded well beyond that periods, and even if coffee did, indeed, come to a grinding halt in the half-century following 1773, sugar certainly did not. Moreover, productivity in the latter sector showed seemingly spectacular growth.

On the other hand, figures on productivity per unit of labour, coffee tree, or cane hectare are relatively meaningless if the performance of competitors in the same market are left out of consideration. Again, the results of such comparisons do not support the notion of undifferentiated decline after the 1770s. Limiting the discussion to the two major products only, we may argue that the typical Surinam sugar plantation was an excellent match for most competitors up to the mid-nineteenth century. Only by that time, the combination of technological sophistication and the abundance of new land and relatively cheap slave labour had propelled productivity of the Cuban and Puerto Rican sugar plantation to unprecedented heights. The average sugar plantation in British Guiana also began to outshine its Surinam rival. Yet even at that point, Surinam productivity continued to compare favourably to that of the majority of Caribbean producers.[20] The productivity record of the Surinam sugar plantation therefore is astonishing. It is reminiscent of the recurrent mention of the colony's proverbial fertility, of an apocryphal project to import Surinam topsoil to give new strength to the exhausted Barbadian sugar plantations – and of that one critic of planter conservatism in the 1820s,

puzzled by the fact that in Surinam 'the fertility of its soils has for more than a century defied the concentrated efforts of man to destroy it'.[21]

The productivity of the coffee sector does not compare as favourably, and here the notion of decline seems more appropriate. Much of this simply stems from the fact that with contemporary technology, coffee production simply could not be expected to hold on as long as its ecologically more amenable 'counterpoint', sugar. Even so, the late-eighteenth-century Surinam coffee plantation was probably in the same category as its rival in Saint-Domingue. Paradoxically, the long life span of some Surinam coffee plantations in the nineteenth century highlights not only the apparent incapacity to switch to other products, but also the astonishing capacity of the same coffee lands, and even the same trees, to continue producing well beyond what would have been considered their lifetimes elsewhere in the Caribbean or in Brazil.

4. Trade, capital, and profitability

From a metropolitan perspective, colonial production and exports were largely interchangeable. In practice, such a perspective was untenable since a small part of the cash crop production was consumed locally and, more importantly, since the reproduction of the slave population was largely the result of the slaves' own food production. Even so, on the export side, we can make a rather secure translation from total production to an only slightly lower export figure, particularly if we allow for local consumption of molasses and the cane-derived liquor, *dram* ('kill-devil'). Most of the exports were traded in consignment to the major Dutch merchant houses that had extended loans and mortgages under such conditions. Only molasses was bought by North American traders. On the import side, and again with the exception of specified items brought in by North Americans, Dutch suppliers had a near-monopoly. A large number of items were imported directly from the metropolis, others through metropolitan ventures. In the second category, the slave trade was paramount. Initially, the Dutch monopoly came with the prevalent mercantilism. The subsequent dismantling of mercantilism was only completed in the nineteenth century. Moreover, it had no major effect, particularly since after the crisis of the 1770s the Surinam plantation sector became completely subordinated to Dutch merchant-cum-finance houses.

Van Stipriaan calculated trade statistics for the four plantations crops. Their growth curves suggest similar curves for production.[22] The volume of annual sugar exports declined from roughly 7,500 metric tonnes in the 1740s to 6,800 tonnes by 1790, but increased to 14-16,000 tonnes in the last three decades before slavery. Starting from scratch in the early 1720s, coffee exports rocketed to 8,000 tonnes in the late 1770s. The subsequent decline was dramatic, to less than 4,000 tonnes in the first decades of the nineteenth century and insignificance by the 1840s.

Cacao exports began in the 1730s, and reached a high 340 tonnes around 1780. Again, a similar collapse followed. Only in the 1850s did cacao exports resume growth, and in the last year before Emancipation they were back at the level of 1780. Cotton exports finally showed wavering growth up to the all-time high of 1,100 tonnes in the first half of the 1820s. Yet downfall was the next stage, with exports below 200 tonnes in the last years of slavery.

Figures for the essential and most fateful item on the import side have been reconstructed by Postma. On the basis of his calculations, the total number of slaves introduced into Surinam between the first Dutch imports in 1668 and the last shipment in 1830 may be put at some 215,000. This is an appreciable correction on the hitherto accepted figure of 300,000 to 350,000.[23] Statistics for other import items have not been uncovered, and neither do we have figures differentiating between the value of imports from the Netherlands as against the U.S, the one outside supplier of long standing that was tolerated. Similarly, the disruptive effects of the various eighteenth-century wars on Surinam have, as yet, been dealt with in general terms only.

The extension of credit loans, a crucial aspect of metropolitan-colonial commerce, has been studied by Van de Voort. His findings relate mostly to the second half of the eighteenth century and underpin much of the post-1773 decline version of Surinam history as proposed by contemporaries and subsequent scholars. According to Van de Voort's calculations, of an estimated 40 million guilders extended in loans to Surinam plantations prior to the crisis, probably no more than a quarter part was recovered. The debacle marked the beginning of the end, for the solvency of Surinam was irrevocably ruined. Bankrupted planters repatriated to Europe, absentee owners had their estates run by the proxy of less reliable overseers – in short, the stage was set for decline.[24] As indicated above, this scenario is too gloomy as far as production figures are concerned, and the analysis of the wider consequences of the 1770s crisis mainly echo Van Lier. Yet Van de Voort's data on the collapse of the *negotiaties* indeed substantiate pessimistic interpretations of Surinam economic history, even if this fiasco did not mark the complete end of credit extension to the colony.[25]

Still the puzzle remains, and so far no author has succeeded in unravelling the total picture. For even if the extension of credit may have been too hazardous, too generous, the question remains whether – and if so, why – the average Surinam plantation, with its relatively high productivity, would not have been able to operate at a profit and to become independent of external debt financing.[26] I will first review the evidence regarding profitability. Calculations of slave plantation profitability are notoriously complicated, and reliable figures are still lacking for all of plantation America. Surinam is no exception to the rule. Instead, what is found is mostly derived evidence, taking variables such as the expansion of the plantation sector, slave imports, documented planters' opulence, etc., as indicators of prosperity. Yet it is difficult to unconditionally conclude that there was

profitability across the line, if we know that, all over the region, plantation expansion was financed by continuous credit flows, and that often creditors lost out or, even more frequently, debtors succumbed under the crushing weight of mortgages.[27]

Ideally, to calculate profitability, net profits should be related to the total of capital invested in a particular slave plantation. An example based on my own research may suffice to illustrate the methodological puzzles involved. The case refers to a sugar plantation, Roosenburg, and a coffee plantation, Mon Bijou, both owned by a Dutch absentee family. Between 1760 and the late 1840s, the estates averaged positive returns, calculated as the difference between expenses and income derived from the selling of plantation produce. Yet such 'profits' were wildly inflated. Like most Surinam plantations, the two estates were burdened with huge mortgages. In much of the eighteenth century the proprietors were able to meet the costs involved in debt servicing. In the nineteenth century, debt servicing was far too heavy a burden to carry. Consequently, the combined burden of the mortgage, debt servicing and current account soared from some 110,000 Dutch guilders in 1760 to over 600,000 at Emancipation in 1863.

Nor is this the whole story. To properly establish profitability, we should also account for appreciation or depreciation of the invested capital, and for income received by the owners as weighed against alternative investments. One yardstick to calculate changes in the value of a slave plantation is to establish occasional appraisals made in certified inventories and documents. In this case, the result is a stunning depreciation from some 350,000 guilders around 1765 to only 55,000 (slaves included) by 1863. An alternative yardstick is to take the number of slaves as an indicator. Again, we see here a dramatic depreciation caused by the consistently negative reproduction rates of the slave populations. The owners did finally derive some income from their plantations up to the 1820s, as against an absence of any income afterwards. However, weighed against alternative investment outlets or even against simply putting the initial capital on a savings account, the actual rewards dwindle to insignificance.[28]

This case highlights some of the methodological complexities in calculating profitability. We may define profitability more precisely as the net income (after deductions for debt servicing and corrections for appreciation/depreciation) related to the total capital stock invested. In order to establish the rate of profit, we would need to have data for longer periods, and we would have to compare the profit rates to prevalent investment or savings opportunities in other sectors of the same economic system (metropolitan or colonial). The sobering fact is that few Surinam – and indeed, Caribbean – plantations have left any better trace of paper work than Roosenburg and Mon Bijou. Yet even in this case, the available data do not even remotely allow for the construction of accurate statistics on profitability.

The few authors attempting to reconstruct profitability for Surinam plantations have all encountered the same methodological pitfalls. Emmer and Van den Boogaart calculated profits of the government-owned sugar plantation Catharina Sophia in the last decades before Emancipation. They point to the discrepancy between profits booked on the positive side, hidden losses caused by depreciation, and the ignored costs of mortgage, debt servicing and government assistance on the negative. Even on this model plantation therefore, the net result was negative.[29] Lamur does present a case of an apparently profitable enterprise, the sugar plantation Vossenburg. For most of the 1705-1863 period, he argues for lengthy periods of favourable profit rates; yet the methodology raises some serious doubts. In any case, Vossenburg is exceptional. Unlike the bulk of Surinam plantations, it was not burdened with a mortgage and therefore did not suffer from prohibitive debt servicing costs.[30]

Again, Van Stipriaan provides the most comprehensive and sophisticated attempt to date to calculate profit rates on the aggregate level, allowing for sectoral and longitudinal comparison. Aware of the impossibility of reconstructing fully reliable ratios, he opts for constructing a measure of profitability by computing net results per slave, and using estimates of the average slave price to arrive at rates of profit. Before reviewing the conclusions based on his sample, we should reflect on a major caveat to his method, which is the choice of the average slave as a proxy to total capital invested. As Van Stipriaan indicates, slave prices fluctuated dramatically over time. This of course is incorporated into his calculations. But no level of sophistication in the computing of real slave values can overcome the broader conundrum, which remains hidden in the computation. Slaves as a major factor of production indeed accounted for 30 % and up to 50 % of the total value of the typical plantation.[31] But even so, the rate of net profits *per slave* overstates the more realistic profit rate calculated over the *total* of invested capital by a factor of 2 to 3. Moreover, because of the inherent methodological obstacles Van Stipriaan explicitly refrains from incorporating appreciations – but more likely depreciations – of the total capital stock. Again, this leads in most cases to overly optimistic assessments of profitability. These observations do not diminish the value of Van Stipriaan's calculations as indicators of trends per sector and in time. The implication is, however, as he rightly points out, that although the results are indicative of trends, they are much less so of real profits.

Even so, the trends are remarkable. Excluding the costs of debt servicing, for most of the 1760-1860 period the average slave on a sugar or coffee plantation usually produced a net benefit. Yet the more realistic calculation, including debt servicing, suggests negative or very low rates of return for coffee, and only slightly better rates for sugar. Allowing, moreover, for the corrections suggested by the above caveats, what remains is a very gloomy picture of the profitability of the Surinam slave plantation. All this dovetails nicely with Van de Voort's analysis of the fiasco of the *negotiatiestelsel*. Ironically though, while Van Stipriaan indeed

suggests the lowest profitability for the last decades of the eighteenth century, he does not reinforce the traditional image of a continuing decline on all accounts since the 1770s. The sugar industry, for one, yielded better results after the 1820s than ever before.[32]

5. The puzzle of perennial decline

The prime aim of any slave plantation was not to produce a tropical crop, but to make a profit. Apparently, Surinam plantations were better producers than has usually been thought, but they mostly failed miserably to achieve their foremost objective. Most of the available figures, both on the *negotiatiestelsel* and on plantation profits, point to almost consistent fiasco. One question is why this should have been the case, and how the continuation of plantation production in a situation which seemed to be doomed to perennial deficits can be accounted for.

Contemporary observers advanced various explanations, but most frequently the blame was put on absenteeism and its allegedly inherent legacy of inefficient, conservative and corrupt management. This interpretation was taken up again by Van Lier and several subsequent authors. Yet by now it has become clear that explanations should go well beyond that. To begin with, in view of the apparent resilience of the Surinam sugar sector, the case for general conservatism and inflexibility of the planter class – whether absentee or resident – seems exaggerated. Van Stipriaan argues that their innovative performance matched their regional competitors' achievements.[33] Also, reconstruction of productivity levels points to a relatively good position.

But this does not explain the unfavourable financial results of the Surinam plantation sector. Let us for a moment simply accept the prevailing opinion that the Caribbean plantation was generally a highly profitable business – a premise perhaps too easily conceded, but which seems to have some ground, at least in comparison to the Surinam experience. The question should then be rephrased as to why Surinam planters produced less profitably than their regional rivals. More specifically, we may ask whether the production costs of the typical Surinam plantation were perhaps higher than elsewhere or conversely, whether Surinam products met with a comparatively unfavourable market. The first part of the question still awaits further scrutiny. On the one hand, perhaps the abundance of possibly unusually fertile land for both cash crop and food production and the efficiency of the *polder* technology gave the Surinam plantation an edge over many competitors. On the other hand, the labour demands of these 'hydraulic' plantations may well have been extreme, as was the environment of disease. Such factors may have translated to higher morbidity and demographic losses, more slave resistance and consequently higher labour costs. The possibility of even a tentative conclusion seems remote, as the groundwork for such complex intrare-

gional comparisons is still lacking. An intercolonial comparison of output per slave would be an acceptable approximation here, adjusting for differential slave prices. Again, this exercise remains on the agenda for future research, but it seems not too far-fetched to suggest that the chronic shortage of new slaves carried by Dutch traders and the colony's location off the main trade routes tended to inflate slave prices in Surinam.

One factor often overlooked in economic history is that slave resistance may also be taken as a possibly significant factor. To cite the most significant case, marronage was substantial, involving up to an astonishing 10 % of the colony's total population during slavery. Apart from this direct loss of labour, there were indirect consequences. Contemporaries blamed marronage for diminishing the solvency of Surinam, and they may well have been right. In addition, the taxes imposed on planters to fight Maroons affected the economics of the Surinam plantation negatively. But again, the significance of this factor may only be established by way of comparison.

The question whether Surinam plantation products met relatively unfavourable market conditions may be answered with more confidence and the answer is probably affirmative. As Van de Voort has indicated, Dutch mercantilism offered the colony the worst of two worlds.[34] Surinam shared with the British West Indies the disadvantage of near complete consignment arrangements, tying the producers to overpowering merchant-cum-finance houses. These arrangements not only precluded bargaining for better prices, but also implied the mandatory ordering of plantation provisions with the same firms. But whereas a united West Indian lobby of British merchant houses and planters secured a protected home market with inflated prices, the Dutch market was unprotected and Surinam produce was sold at a consistently lower price. The French market, like the Dutch, was unprotected, but French West Indian producers usually sold their produce *in loco* to merchants, thus circumventing the costly consignment arrangements.[35]

As long as capital was abundant and investors were searching for investment outlets, as they were in the Netherlands, particularly in the middle decades of the eighteenth century, Surinam apparently succeeded in attracting capital no matter what its comparative disadvantages. Myths regarding the incredible fertility of this tropical paradise created by contemporary authors may have helped to get money flowing. But as soon as crisis hit, the plantation colony lost its solvency. The association of Surinam with the 1770s debacle and the lingering solvency problems of those plantations not bankrupted straightaway may indeed have kept potential future Dutch investors from making a new start in the Guianas. Much of the nineteenth-century expansion in the western region was financed by British planters, as was the rapid development of the former Dutch colonies of Berbice, Demerara and Essequibo. By the 1820s, as the Surinam sugar sector seemed to prepare for a comeback, Java was for the first time being developed as a plantation venture for Dutch colonialism. Soon semi-bonded Netherlands Indian labour was

producing cane sugar in much larger quantities and at lower cost than the Surinam slave.[36] From mid-century onwards, the Netherlands Indies were becoming the obvious target for potential Dutch investors in tropical agriculture.[37]

Much has been made, both by contemporaries and by modern scholarship, of the alleged disastrous effects of absenteeism on plantation management.[38] This argument should not be stretched too far, as absenteeism was also widespread in the French and, particularly, British West Indies. Again, quantitative comparisons are scarce. Even so, it is plausible that the combined effects of absenteeism and the intricacies of the *negotiatiestelsel* had a negative impact on the performance of the Surinam economy. In between the nominal plantation owners and buyers of bonds in the Netherlands and the salaried overseers in Surinam stood two groups of representatives: the metropolitan merchant houses, and the colonial administrators. The financial crisis hit some of the merchant houses hard, even causing some bankruptcies. Most, however, managed to transfer the bulk of their losses to the buyers of bonds, who saw the intrinsic value of these bonds diminish to a fraction of the original price. The main benefits of absenteeism and the *negotiatiestelsel,* however, seem to have accrued to the administrators in Surinam, who in return for their supervision of the work of the overseers and for handling trade and communication with the metropolis received a high 10 % share of all costs made in the colony and in the production made on the plantation. By this arrangement, as long as production continued, administrators made good money regardless of the financial results of the plantations. Recent research tends to confirm some of the harsh judgements of contemporary authors.[39] There is room for further debate on the effects of this management by a covertly interested proxy, particularly as to its effects on long-term versus short-term perspectives and innovative management. Nevertheless it is evident that the direct financial costs were high.

The complexities of the *negotiatiestelsel* may finally go some way towards explaining the puzzle of continuing production at a loss.[40] In many, perhaps even most cases, mounting debts were translated into a plunging fall in bond values. The brunt was born both by the original owners who often found themselves legally or *de facto* expropriated, and by the bond holders who were no less affected. As they grudgingly took their losses, they helped to prevent bankruptcies and to keep the merchant houses and administrators in the eventually unprofitably business of making tropical products and handsome incomes for the proxies only. Under different arrangements, the lack of profitability would have caused more bankruptcies. However, it might also have facilitated a new and unencumbered start for some plantations, leaving more money to spend on maintenance and investments, rather than on the hopeless haemorrhage of debt servicing.

6. Slavery and capitalism

In the vast literature on slavery and capitalism, Surinam is a *quantité négligeable*. The complex debate on the origins and success of British abolitionism and the contribution of the British West Indies to the metropolitan Industrial Revolution has no counterpart in the historiography on Surinam.[41] Abolition of the slave trade was imposed by the British, and to an extent Emancipation itself was the result of international pressure. The limited importance of Surinam slavery to the metropolitan economy, and particularly its dubious profitability, might have set the stage for early abolitionism. That it failed to do so cannot be attributed to a strong Dutch-based proslavery lobby, but might more likely be related – somewhat tautologically - to sheer indifference and lethargy in Dutch politics and mentality.[42] Yet from a planter perspective it was difficult to detect any positive economic logic in these abolitions, as is born out by the consistent planter opposition to abolishing the 'peculiar institution'.[43] The subsequent withdrawal of the freed slaves' labour from the plantation sector corroborates the assessment that even if the economic resilience of the Surinam plantation was weak during slavery, it dramatically deteriorated after Emancipation.[44]

The contribution of Surinam – and the West Indies enterprise in general – to the growth of the Dutch economy diminished over time. Systematic calculations of the West Indian contributions to Dutch Gross Domestic Product are not available. The significance of both the slave trade and, more specifically, the Surinam plantation economy to the Dutch economy stood at its apex in the century preceding the 1770s. Yet even in this period the Netherlands Indies were far more important in colonial trade, and colonial trade as such accounted for only a small proportion of total Gross Domestic Product. After the 1770s, the negative financial balance sheet of its plantation sector probably made Surinam a liability rather than an asset to the metropolis. The contrast with competing Caribbean colonies is evident, and we may safely conclude that the overall contribution of Surinam to Dutch economic growth was modest at the very best. Much less did Surinam slavery contribute to the Dutch Industrial Revolution. The latter breakthrough only occurred in the 1880s and 1890s, postdating the Emancipation of the Surinam slaves by decades. By then, even the industrialization of the Dutch sugar refineries was geared towards Java rather than Surinam cane supplies.[45]

On a more theoretical level, studies by Willemsen and Heilbron have attempted to analyze the economic history of Surinam in a Wallersteinian framework.[46] Wallerstein's model of a world-system linking together different modes of labour in core, periphery and semi-periphery countries has, for good reasons, encountered mounting criticism. Even for the Caribbean, which seemed as close as one could get to the ideal type of metropolitan-made peripheral constructions, several authors have criticized certain mechanistic assumptions or even rejected Wallerstein's theoretical framework altogether.[47] Writing a decade or so ago, Willemsen

and Heilbron still took the wisdom of the world-system for granted. Apart from economist explanations for abolition, which to me seem unjustifiable 'translations' of Wallerstein's analysis of British abolition, they advanced the notion of technological backwardness of the nineteenth-century Surinam sugar plantation, and explained this by reference to the mode of labour.[48] Again, this appears not to be very convincing. The Surinam planter was not as badly conservative as was long thought, and particularly not so in the sugar sector. Van Stipriaan's revisionism, which pairs a very negative assessment of management in the coffee sector to an optimistic view on innovation in the sugar sector, perhaps overstates both the contrasts between the two sectors and the level of innovation in the latter. Even so, it is clear that there is no firm ground for thinking of Surinam as particularly backward. Moreover, it is hard to construe any causal connection between the reliance on slave labour and the level of technological innovation, as several recent studies on the economics of slavery all through the region have suggested. Cuba in the mid-nineteenth century, with its highly innovative *ingenious* and continuing use of slave labour, is a striking case in point.[49]

Surinam does not figure in the ongoing debate on the relationship between capitalism and slavery as a mode of labour. There is no reason to suppose that its inclusion would change the parameters of these often rather scholastic debates. Yet in this context, some interesting topics have emerged which open potentially rewarding avenues for research on Surinam slavery. Many recent studies, following up on Sidney W. Mintz's pioneering work, now portray Caribbean labour relations in the period of slavery as having been far more complex than originally assumed. Specific colonies in specific periods employed various labour arrangements, ranging from slave to semi-bonded to free, at the same time and not necessarily in a unilinear pattern.[50] Moreover, slaves themselves participated not only as bonded labour in the formal economy, but concomitantly as 'proto-peasants' in a largely informal economy.[51]

The first correction on overly schematic interpretations of Caribbean labour relations during slavery is of minor relevance for Surinam. Initially, some Amerindians were employed, and in the last decades of slavery some more use may have been made of free labour; yet none of this undermined the centrality of slavery. In contrast, there is amply evidence and as yet little research on slaves as proto-peasants. From the early colonization onwards, slaves produced part of their own food, ranging from various crops to livestock. In the early eighteenth century, slaves reportedly bartered and sold such products on the Paramaribo market, and this practice continued all through the slavery period of slavery. The marketing of these products remains largely undocumented.[52] Perhaps further study of archival records regarding Paramaribo could provide new insights, both into the links between this informal economy and the formal, as well as into the wider question as to how increasing usage of money and the 'peasant breach' in the

system of slavery influenced the slaves' attitudes towards wage labour, entrepreneurialism, etc.

7. Demography

Surinam slavery had a particularly bad reputation, and even if some of that reputation was beside the point, the demographic performance of the Surinam slave population indeed testifies to the extreme conditions in the colony.[53] In the eighteenth century, an annual natural decrease of 50 per thousand was deemed the norm. This figure improved slightly to 25-30 in the 1820s, but as late as the mid-fifties an annual decrease (of 10 per thousand) remained endemic.[54] Small wonder that critics of Surinam slavery took these sad figures to underscore their position, just as planters had earlier used the same figures to underpin their pleas for an increase in African supplies.

From one perspective, demographic analysis seems to confirm the notion of decline after the 1770s. The slave population reached its highest figure in the early 1770s (ca. 60,000), gradually diminishing to 47,000 around 1835 and only 36,000 at Emancipation. However, the demography of this slave population shows a pattern of consistent, albeit incomplete improvement. As indicated above, the figure of 300,000 to 350,000 slaves imported into Surinam to account for an Afro-Surinam population of barely 50,000 at Emancipation in 1863 has been considerably lowered to 215,000.[55] Both detailed figures for individual plantations and aggregate data show a gradual amelioration of demographic performance. Moreover, analysis by crop type confirm contemporary notions that sugar plantations demanded a higher demographic toll than coffee plantations.[56] At the same time, comparison with other Caribbean colonies continues to keep Surinam at the unfavourable end of a continuum ranging from early self-reproducing colonies to those never attending that stage during slavery.

Future research may help to further substantiate the trends uncovered so far. Perhaps the ecological circumstances in the Guianas account for part of the comparatively poor demographic performance as compared to most of the Caribbean islands. Yet, as is evident from the differential growth rates by crop type, labour regime did make a difference. In this perspective, it may be useful to think of the *polder* technology of this hydraulic society as particularly consuming in terms of human life. The combination of both an adverse disease environment and extreme labour demands may have caused a vicious circle, in which the continuous entry of new Africans, necessary because of high negative growth rates, postponed creolization with its inherently better demographic performance.[57]

Demographic, economic and social history meet in the study of the slave family and kinship. By the early nineteenth century, mainly in response to the abolition of the slave trade, planters had developed more active procreational policies.

Among their explanations for low fertility rates, the alleged lascivious and polygamous life style of the slaves ranked high. In the 1840s Christianization, hitherto neglected altogether, became accepted as a means of imposing the norm of the nuclear family on the slave population, which in turn would contribute to higher fertility rates. At the same time, Christianization meant to help replacing the slaves' unfortunate leisure preference for a work ethic fit for the projected post-Emancipation plantation dominance.[58] Research on the imposition of this package deal of Christianity, family norms and work ethics is still in its infancy. Its significance for a better grasp of both the slavery period and the still mostly obscure transition period towards a free labour economy is evident.

8. Epilogue

As ongoing research enables us to put Surinam more clearly in a Caribbean perspective, we will continue to find similarities with the regional experience. Perhaps Surinam may be thought of as the hydraulic variant of plantation America, with *polder* technology allowing for high productivity levels and possibly helping to shape extreme demographic and labour ordeals.[59] Conceivably it may also be possible to think of the vicissitudes of the *negotiatiestelsel* as a variant on more general patterns. However, in economic as in social history, it will be imperative to think of Surinam in terms of the Caribbean experience *in toto*.

In the various sections of this paper, I have remarked on research needs. I should acknowledge that my listing, to a degree, is partial and particularly neglects rewarding avenues for further research in social history. Suffice it to add two other promising fields of research, if only to demonstrate the incompleteness of the above suggestions. First, the study of the ecological history of Surinam may prove to be rewarding. From the information available so far, it is evident that much of the colony's coastal region was reshaped in a relatively short period. However, more detailed research on this process and its long-term consequences is needed.[60] Second, departing from the recent research findings on the dominant plantation sector, it may now be useful to focus on the significance of the non-plantation sectors to the national economy as well. The role of Paramaribo as a nerve center of both international and national trade is an obvious field of study.[61] More specifically, the economic position of the urban free coloureds might be focused on. Also, it may be worthwhile to reassess the role of the hinterland Maroons and Amerindians, whose seclusion from the national economy may, in reality, have been less absolute than has commonly been thought.[62]

Finally, I have suggested that inclusion of Surinam in the various discussions on the place of slavery within capitalism would not alter the parameters of this debate. Even so, if Dutch colonialism is thought of in the sense of capitalism using different forms of labour simultaneously, Surinam will continue to provide an

intriguing counterpoint to Java. Notions of open and closed resources and capitalist use of bonded labour resound from Nieboer's seminal work through Domar's model to present-day analyses of Caribbean slavery and bonded labour in Java.[63] We may not find it surprising that without slavery, the Surinam plantation sector collapsed, nor that the Dutch managed to introduce the wildly successful *Cultuurstelsel* in Java only in the 1830s, and not earlier. Nevertheless, the last word remains to be said on the reasons why capitalism failed so badly in Surinam – not to exploit slave labor that is, but to do so for a clear gain.

NOTES

1 This paper was written during the Spring 1992 semester at The Johns Hopkins University, Baltimore, Md. I would like to thank the Fulbright Commission for awarding me a research fellowship, and also my colleagues in the Atlantic Program in History, Culture and Society of Johns Hopkins for their hospitality. In the United States, Sidney W. Mintz and Seymour Drescher commented on an earlier version of this paper, as did Alex van Stipriaan and the editors of *Economic and Social History of the Netherlands*. While thanking them all for their criticism, which I have tried to incorporate, I, of course, remain responsible for any remaining errors, omissions and misinterpretations.

2 The analogy does not stand close scrutiny. Of course, there is a sequence of sugar producers in the number one position: Santo Domingo first, followed by Barbados, Jamaica, Saint-Domingue and finally Cuba. Yet the analogy ends there. With the exception of Saint-Domingue/Haiti, all colonies remained in the race from the establishment of plantation production until the twentieth century – or surfaced again after initial collapse, as in the Spanish Caribbean.

3 Actually, the Dutch language was marginal in the Dutch Caribbean colonies. In colonial Surinam, Sranan ('Negro-English') was the *lingua franca*. In the Dutch Leeward Antilles off the Latin American coast, Papiamentu served as the vernacular, as against English in the Dutch Windward Antilles. Even so, the pertinent contemporary literature and archival sources are mainly in Dutch.

4 This essay centers mostly on the 1750-1863 period. Very little research has been done so far on the early economic history of Surinam. The only comprehensive study available, covering the period from the late sixteenth century through the 1940s is: C.C. Goslinga, *The Dutch in the Caribbean and on the Wild Coast 1580-1680* (Assen 1971); *The Dutch in the Caribbean and in the Guaianas 1680-1791* (Assen 1985); *The Dutch in the Caribbean and in Surinam 1791/5-1942* (Assen 1990). Unfortunately, particularly in its chapters on the economic and social history of Surinam, this voluminous trilogy suffers from inconsistency and a lack of rigorous research.

5 G.J. Oostindie, 'Historiography of the Dutch Caribbean since the 1960s: catching up?', *Journal of Caribbean History* 21 (1987) 1-18; G.F. Oostindie, 'Surinam and the Netherlands Antilles', in: B. Higman & J. Casimir, eds, *The UNESCO History of the Caribbean: Historiography* (Paris, forthcoming). In order to avoid a reference section of nauseating length, I mention only a few relevant studies on other parts of plantation America. Both G. Oostindie, *Roosenburg en Mon Bijou. Twee Surinaamse*

plantages 1720-1870 (Dordrecht 1989), and A. van Stipriaan, *Surinaams contrast. Roofbouw en overleven in een Caraïbische plantagekolonie* (Leiden 1993) provide extensive bibliographical references for comparative purposes.

6 R.A.J. van Lier, *Samenleving in een grensgebied. Een sociaal-historische studie van Suriname* (The Hague 1949); R.A.J. van Lier, *Frontier society. A social analysis of the history of Surinam* (The Hague 1971).

7 On mythical fertility, see: G. Warren, *An impartial description of Surinam upon the continent of Guiana in America* (London 1667) 16; J.D. H[erlein], *Beschryvinge van de volk-plantinge Zuriname* (Leeuwarden 1718) 'Voorberigt' n.p.; Th. Pistorius, *Korte en zakelijke beschryvinge van de Colonie van Zuriname* (Amsterdam 1763) 99; J.J. Hartsinck, *Beschryving van Guiana, of de Wilde Kust, in Zuid-America* (Amsterdam 1770) I: 3, II: 867, 931-932. On the threat posed by marronage, governor Mauricius in: *Recueil van egte stukken en bewyzen door Salamon du Plessis [..] en door andere; Tegens Mr. Jan Jacob Mauricius* (s.l. 1754) IV: 86-89. Eulogies on Dutch polder technology in: G.F. Raynal, *Histoire philosophique et politique des établissements et du commerce des Européens dans les deux Indes* (Amsterdam 1774) IV: 336; G.F. Raynal, *Suppléments a l'histoire philosophique et politique des etablissements et du commerce des Européens dans les deux Indes* (The Hague 1781) III: 68. See also: Oostindie, *Roosenburg en Mon Bijou*, 17-26; Van Stipriaan, *Surinaams contrast*, 79-98.

8 The *negotiatiestelsel* was established in 1753 by the Amsterdam mayor Deutz in order to secure massive credit flow to the Suriname plantation sector. Under this system, a merchant house sold bonds in a *negotiatie* fund. Holders of bonds were entitled to annual payment of interest and, after a determined period, repayment of their initial investment, in some cases with an additional bonus. The merchant house, acting as director of the negotiatiefonds, extended credits from this capital to plantation owners against a mortgage on their plantations. The latter were to take care of debt servicing costs according to a fixed schedule. The merchant house, being the sole provider of metropolitan goods to the plantations and receiving plantation produce for sale on the Dutch market, benefitted from consignment arrangements included in the *negotiatie* contract. In addition, it was entitled to a share in financial transactions. The most extensive study on the negotiatiestelsel is: J.P. van de Voort, *De Westindische plantages van 1720 tot 1795. Financiën en handel* (Eindhoven 1973). A summary may be found in: J.P. van de Voort, 'Dutch capital in the West Indies during the eighteenth century', *Low Countries History Yearbook/Acta Historiae Neerlandicae* 14 (1981) 85-105. In theory, all parties involved benefitted. However, as the negotiatiestelsel crashed in the 1770s, the subsequent history of the system centred in large part on the distribution of losses rather than gains.

9 The best manuals are: A. Blom [& F. Visscher Heshuysen], *Verhandeling over den landbouw, in de Colonie Suriname, volgens eene negentien-jaarige ondervinding zamengesteld, door Anthony Blom; en met de noodige ophelderingen en bewijsredenen voorzien, door Floris Visscher Heshuysen* (Haarlem 1786); A. Blom, *Verhandeling van den landbouw in de Colonie Suriname* (Amsterdam 1787); [Eensgezindheid], *Verzameling van uitgezochte verhandelingen, betreffende den landbouw in de kolonie Suriname: Opgesteld door het Landbouwkundig Genootschap: De Eensgezindheid, gevestigd in de devisie Matappika, binnen dezelve Kolonie.* (Amsterdam 1804); M.D. Teenstra, *De landbouw in de kolonie Suriname voorafgegaan door eene geschied- en natuurkundige beschouwing dier kolonie*

(Groningen 1835); C.J. Hering, *De kultuur en bewerking van het suikerriet bevattende de meest volkomene en naauwkeurigste theoretische en practische beschrijving van het suikerriet en deszelfs bewerking [...] ten gebruike der planters in al de Nederlandsche overzeesche bezittingen* (Rotterdam 1858). See also: W.H. Lans, *Proeve over de oorzaken van verval en de middelen tot herstel der Surinaamsche plantaadjen (The Hague/Amsterdam 1829);* W.H. Lans, *Bijdrage tot de kennis der Kolonie Suriname* (The Hague 1842); A.F. Lammens, *Bijdragen tot de kennis van de Kolonie Suriname [...] tijdvak 1816 tot 1822* [G.A. de Bruijne, ed.] (Amsterdam/Leiden 18221, 18462, 19823).

10 For the pre-abolition period, see in particular: Ph. Fermin, *Tableau historique et actuel de la Colonie de Surinam, et des causes de sa décadence* (Maastricht 1778) 291-298, 327-352; *Remarques critiques sur la Tableau historique et Politique de la Colonie de Surinam: Ou lettre d'un inconnu à Monsieur Philippe Fermin* (London 1779) 49-68; *Lettre sur le Gouvernement de Surinam: Sur l'inhumanité des blancs envers les negres [...]; pour servir de suite aux Remarques critiques* (London 1779) 83; Raynal, *Suppléments,* 64-81; E. Luzac, *Hollands rijkdom, behelzende den Oorsprong van den Koophandel, en van dezen Staat* (Leiden 1781-1783) II: 227-228, IV: 465. P.F. Roos, *Redevoering over de oorzaaken van 't verval en middelen tot herstel der volkplanting van Suriname* (Amsterdam 1784); D. de Is, C. Nassy et al., *Geschiedenis der Kolonie van Suriname [...] door een gezelschap van geleerde Joodsche mannen aldaar (Amsterdam* 1791) I: 11, 137-140.

11 The most useful studies from the 1807-1863 period advancing explanations for decline are: Lammens, *Bijdragen*; [G.P.C. van Heeckeren van Waliën], *Aanteekeningen, betrekkelijk de kolonie Suriname* (Arnhem 1826); Lans, *Proeve*; Lans, *Bijdrage*; Teenstra, *Landbouw*; M.D. Teenstra, *De negerslaven in de kolonie Suriname en de uitbreiding van het christendom onder de heidensche bevolking* (Dordrecht 1842); J. van der Smissen, *Beschouwingen over de Kolonie Suriname* (Amsterdam 1849); Hering, *Kultuur*; and particularly: J. Wolbers, *Geschiedenis van Suriname* (Amsterdam 1861). The most detailed study of Dutch Emancipation debates, with particular emphasis on Surinam, is: J.P. Siwpersad, *De Nederlandse regering en de afschaffing van de Surinaamse slavernij* (1833-1863) (Groningen 1979). For a succinct overview, see: P.C. Emmer, 'Anti-slavery and the Dutch: abolition without reform', in: C. Bolt & S. Drescher, eds, *Anti-slavery, religion, and reform* (Folkestone 1980) 80-98.

12 Lammens, *Bijdragen*, 145-149; Van Heeckeren van Waliën, *Aanteekeningen*, 90-98; Lans, *Proeve*, 53-54; Teenstra, *Landbouw*, I: 48, 147, 177; Lans, *Bijdrage*, 37-39, 75, 81, 172, 193; Teenstra, *Negerslaven*, 11-17, 332; W.H. Lans, *Emancipatie door centralisatie. Schets van een ontwerp tot behoud van Suriname* (The Hague 1847) 1-3; Hering, *Kultuur*, I: 86, II: vi, 192, III: v-vi; Wolbers, *Geschiedenis*, 312, 577-578 and *passim*. Negative assessments of the technological level of the Suriname plantation surface again in: A. Kappler, *Holländisch-Guiana. Erlebnisse und Erfahrungen während eines 43 jährigen Aufenthalts in der Kolonie Surinam* (Stuttgart 1881) 17-18; Van Lier, *Samenleving*, 28; R.M.N. Panday, *Agriculture in Surinam 1650-1950. An enquiry into the causes of its decline* (Amsterdam 1959) 47; J.H. Adhin, *Development planning in Surinam in historical perspective (with special reference to the Ten Year Plan)* (Leiden 1961) 32-35; G.F.W. Willemsen, *Koloniale politiek en transformatieprocessen in een plantage-economie*: Suriname 1873-1940 (Amsterdam 1980) 54, 114; W. Heilbron, *Kleine boeren in de schaduw van de plantage:*

De politieke ekonomie van de na-slavernijperiode in Suriname (Amsterdam 1982) 18-21, 27-34; Goslinga, *The Dutch in the Caribbean and in Surinam,* 228-231. Equally so for absenteeism: Van Lier, *Samenleving*, 28 and *passim*; Panday, *Agriculture,* 23-26; Van de Voort, *De Westindische plantages*, 202-203, 216-217; Siwpersad, *Nederlandse regering*, 171-178; Goslinga, *The Dutch in the Caribbean and in the Guianas,* 312.

13 In addition, Wolbers suggested the secondary importance of other factors, particularly the material costs and solvency problems connected with the Maroon wars, the disruptions of production and trade caused by international warfare, and intricacies of the *negotiatie* system. Wolbers, *Geschiedenis*, passim.

14 Van Lier, *Samenleving*, 30, 50, 146-147. Around 1830, sugar production in Suriname and Java were roughly at a par. In 1850, exports from Java exceeded those from Suriname fivefold; in 1860, fourteenfold. J.J. Reesse, *De suikerhandel van Amsterdam van 1813 tot 1894* (Amsterdam 1911) xxxiii, xli.

15 Panday, *Agriculture*; Adhin, *Development planning*. Adhin virtually copies whole paragraphs of Panday's book.

16 Oostindie, *Roosenburg en Mon Bijou*, 433-446; Van Stipriaan, *Surinaams contrast,* 433.

17 Van Stipriaan summarized some preliminary conclusions in: 'The Surinam rat race: Labour and technology on sugar plantations, 1750-1900', *Nieuwe West-Indische Gids/New West Indian Guide* 63 (1989) 94-117.

18 It seems unlikely that substantial new collections will be uncovered in the Netherlands. Perhaps an occasional family or company archive may offer unexpected data, as I discovered while working on *Roosenburg*. Scattered collections in the United States may also provide some more information, as will a closer look at the collections in the Public Record Office dating back from the British occupation of Suriname (1799-1802, 1804-1816). Yet if anywhere, new insights may be gained from the at present largely untapped and inaccessible archival collections in Suriname.

19 Van Stipriaan does not provide figures for the small cacao sector.

20 Oostindie, *Roosenburg en Mon Bijou*, 122-129; Van Stipriaan, *Surinaams contrast*, 139.

21 E. Williams, *From Columbus to Castro. The history of the Caribbean 1492-1969* (London 1970) 124; Lammens, *Bijdragen*, 138. For most of the period, manuring was neglected. The major method for revitalization of the cane fields was alluvial irrigation.

22 Van Stipriaan, *Surinaams contrast*, 429-432.

23 Van Lier, *Samenleving*, 92; J.M. Postma, *The Dutch in the Atlantic slave trade 1600-1815* (Cambridge 1990) 299-301; Van Stipriaan, *Surinaams contrast*, 313-314.

24 Van de Voort, *De Westindische plantages*, in particular 153-203.

25 Van Stipriaan, *Surinaams contrast*, 231-256.

26 This problem is clearly exposed in: J.L. van Zanden, *Arbeid tijdens het handelskapitalisme: Opkomst en neergang van de Hollandse economie 1350-1850* (Bergen 1991), 95-110. This chapter is one of the few serious attempts to discuss the Suriname economy in the context of Dutch merchant capitalism.

27 Research on the role of credit in the American plantation colonies is lacking in many respects. See: J.M. Price, 'Credit in the slave trade and plantation economies', in B.L. Solow, ed., *Slavery and the rise of the Atlantic system* (Cambridge 1991) 293-339.

28 Oostindie, *Roosenburg en Mon Bijou*, 279-304.

29 E. van den Boogaart & P.C. Emmer, 'Plantation slavery in Surinam in the last decade before Emancipation: The case of Catharina Sophia', in: V. Rubin & A. Tuden, eds, *Comparative perspectives on slavery in New World plantation societies* (New York 1977) 205-225.

30 Lamur does not include dividends paid to the shareholders among the expenses, which inflates the positive results. Moreover, his estimates on the total capital invested in the plantation essentially derives from no more than two hall-marks, namely estimates of the plantations' value made in 1705 and 1835, respectively. Lamur utilizes sophisticated computation to reach estimates of the capital invested in each of the in-between years. Nevertheless, with so few even remotely 'hard' figures, the methodology by definition remains problematical. H.E. Lamur, *The production of sugar and the reproduction of slaves at Vossenburg (Suriname) 1705-1863* (Amsterdam 1987) 54-59. The calculations include a second plantation subsequently merged with Vossenburg, Wayampibo.

31 Oostindie, *Roosenburg en Mon Bijou*, 19, 204; Van Stipriaan, *Surinaams contrast*, 125.

32 Van Stipriaan, *Surinaams contrast*, 266-275. His analysis includes figures on the profitability of the late-coming cotton sector, which after a relatively good decade in the 1830s produced at a loss in the 1840s and 1850s.

33 Van Stipriaan, *Surinaams contrast*, 145-202; Van den Boogaart & Emmer, 'Plantation slavery'.

34 Van de Voort, *De Westindische plantages*, 84-90, 210. Compelling as it may be, this argumentation so far has not been substantiated by painstaking longitudinal comparison of price levels, taxes etc.

35 The late eighteenth century emergence of Cuba and the nineteenth century emergence of Puerto Rico proceeded in a framework which had some late 'mercantilist' features. Yet these were more than offset by pragmatic policies allowing for local sugarocracies to emerge and, from the 1820s to the 1860s, the consistent Spanish policy of not keeping in line with European abolitionism.

36 On the cane sugar industry of Java, see: G.R. Knight, 'From plantation to padi-field: the origins of the nineteenth-century transformation of Java's sugar industry', *Modern Asian Studies* 14 (1980) 177-204; J.H. Galloway, *The sugar cane identry. An historical geography from its origins to 1914* (Cambridge 1989) 209-213. On free and (semi) bonded labour in Java, see: P. Boomgaard, 'Why work for wages? Free labour in Java, 1600-1900', *Economic and Social History in the Netherlands 2* (1990) 37-56.

37 In the late 1840s, 24 % of all Dutch imports originated from the Netherlands Indies. Suriname was nowhere near. R.T. Griffiths, *Industrial retardation in the Netherlands 1830-1850* (The Hague 1979) 33.

38 See above and Oostindie, *Roosenburg en Mon Bijou*, 1-5, 396-401.

39 Oostindie, *Roosenburg en Mon Bijou*, 329-341; Van Stipriaan, *Surinaams contrast*, 304-309.

40 To start with, of course, we should be careful not to impose anachronistic criteria. At all times, it was difficult to establish the perspectives of plantation agriculture. Even if the results had been bad in one period, there was no reason why they should not improve in the next. It was to such reasoning that absentee owners and holders of bonds often responded, accepting optimistic calculations of their more experienced representatives (merchant houses, administrators). In due time, bitter disillu-

sion might well shatter the fragile relationship between the interested parties, resulting in distrust and managerial paralysis. Oostindie, *Roosenburg en Mon Bijou*, 371-382.

41 The classical economist explanation of British abolition is: E. Williams, *Capitalism and slavery* (London 19441, 19812). The now authoritative refutation is: S. Drescher, *Econocide: Brit ish slavery in the era of abolition* (Pittsburgh 1977).

42 Emmer, 'Abolition'; G.J. Oostindie, 'The Enlightenment, Christianity, and the Suriname slave', *Journal of Caribbean History 26* (1993) at press. And particularly the provocative interpretation by S. Drescher, 'Capitalism and antislavery. The Dutch slave trade and colonial slavery' (unpublished paper, presented at Leiden University, 1992).

43 Adam Smith-like denouncements of slave labour as inherently inefficient and inferior to free labour were very rare indeed. See however: Van Heeckeren van Waliën, *Aanteekeningen*, 90-91.

44 Sugar output plunged from some 16 millions of metric tonnes on the eve of Emancipation to less than 10 million tonnes two decades later. Within a few decades after Emancipation, the contribution of the former slave population to the plantation work force was eclipsed by that of British Indian and subsequently also Javanese indentured labour.

45 The profitability of the Dutch slave trade was remarkably low, according to Postma, *The Dutch in the Atlantic slave trade,* 276-280. From the above it should be clear that the financial balance of the plantation sector itself was, at best, dubious, allowing for benefits for some but concomitant losses for other actors. On the place of Suriname in Dutch merchant capitalism, see: Van Zanden, *Arbeid tijdens het handelskapitalisme*, 95-110. On the nineteenth-century Dutch sugar industry, see: Griffiths, *Industrial retardation*, 88-92. On the Dutch Industrial Revolution, see: J.A. de Jonge, *De industrialisatie in Nederland tussen 1850 en 1914* (Amsterdam 1968). Drescher strongly argues against the relevance of distinguishing between mercantile and industrial capitalism as a clue to explain the emergence of abolitionism; Drescher, 'Capitalism and antislavery', and personal correspondence.

46 I. Wallerstein, *The modern world-system* (New York 1974-1989).

47 S.W. Mintz, 'The so-called modern world-system: local initiative and local response', *Review* 2 (1978) 253-270; M.-R. Trouillot, 'Motion in the system: coffee, colour, and slavery in eighteenth century Saint-Domingue', *Review 5* (1982) 331-388; S.J. Stern, 'Feudalism, capitalism, and the world-system in the perspective of Latin America and the Caribbean', *American Historical Review 93* (1988) 829-872, and the debate between Wallerstein and Stern, 873-897.

48 Willemsen, *Koloniale politiek*, 50, 54, 87, 114; Heilbron, *Kleine boeren*, 27-34.

49 For a comparative discussion of some of the issues at stake, see: P. Boomgaard & G.J. Oostindie, 'Changing sugar technology and the labour nexus: The Caribbean, 1750-1900', *Nieuwe West-Indische Gids/New West Indian Guide* 63 (1989) 3-22.

50 E.g., the use of Amerindians and African slaves in the early Spanish Caribbean, of indentured white labour and African slaves in the early British and French West Indies or, in mid-nineteenth century Cuba, of slaves, Chinese indentured labourers and free white and coloured labour. Nineteenth-century Cuba provides the spectacular example of a colony at once reviving African slavery and imposing semi-bonded labour on a previously free, both white and coloured population.

51 S.W. Mintz, *Caribbean transformations* (Chicago 1974) 131-224.

52 Herlein, *Beschryvinge*, 95. Also in: Hartsinck, *Beschryving*, II: 915-916; Blom & Heshuysen, *Verhandeling*, 383-384, [Eensgezindheid], *Verzameling,* 14-15; A. von Sack, *Reize naar Surinamen, verblijf aldaar, en terugtogt over Noord-Amerika naar Europa* (Haarlem 1821) 137-138; Lammens, *Bijdragen*, 113; Teenstra, *Landbouw*, II: 430-434; G. van Lennep Coster, *Herinneringen mijner reizen naar onderscheidene werelddeelen* (Amsterdam 1836) 101; G.P.C. van Breugel, *Dagverhaal van eene reis naar Paramaribo en verdere omstreken in de kolonie Suriname* (Amsterdam 1842) 86; H.E. Lamur, 'Het ontstaan van het eigendomsrecht bij slaven in Suriname', *OSO. Tijdschrift voor Surinaamse Taalkunde, Letterkunde en Geschiedenis* 8 (1989) 29-39; Van Stipriaan, *Surinaams contrast,* 403-407.

53 On the reputation of Suriname slavery, see: G.J. Oostindie, 'Voltaire, Stedman, and Suriname slavery', *Slavery & Abolition* 14,2 (1993) 1-34.

54 Blom, *Verhandeling*, 82; J.D. Kuhn, *Beschouwing van den toestand der Surinaamsche plantagie slaven* (Amsterdam 1828) 23; J. van der Smissen, *Over de emancipatie der slaven* (Haarlem 1861) 171.

55 The dramatic decrease of the slave population between the 1830s and 1860s was, to some extent, reflected in a growth of the free coloured population.

56 Lamur, *Production and reproduction*, 27-36; H.E. Lamur, 'Fertility differentials on three plantations in Suriname', *Slavery & Abolition* 8 (1987) 313-335; Oostindie, *Roosenburg en Mon Bijou*, 329-341; Van Stipriaan, *Surinaams contrast*, 318.

57 Studies on virtually all slave societies demonstrate higher births rates and lower death rates for creole as opposed to African slaves. Research on Suriname confirms this rule.

58 See: M. Oomens, 'Veelwijverij en andere losbandige praktijken: Bevolkingspolitiek tegenover Surinaamse plantageslavinnen in de 19e eeuw', *Jaarboek voor Vrouwengeschiedenis* 7 (1982) 152-171; Oostindie, 'Enlightenment'.

59 To a degree, this variant was typical of Berbice, Demerara and Essequibo as well. Unfortunately, the broad study of Caribbean plantation technologies by Watts ignores this Guiana innovation to the West Indian 'Barbados model'; D. Watts, *The West Indies. Patterns of development, culture and environmental change since 1492* (Cambridge 1987).

60 See, however: P. Boomgaard, 'The tropical rain forests of Suriname: Exploitation and management 1600-1975', *New West Indian Guide* 66 (1992) 207-235; Van Stipriaan, *Surinaams contrast*, 46-69. Of course, the resilience of the Guianas to plantation agriculture was far greater than it was in the Caribbean islands, where large territories were virtually deforestated and remodelled with a thoroughness that not only spoiled much of the original beauty, but subsequently posed serious threats of erosion.

61 Useful groundwork is to be found in: G.A. de Bruijne, *Paramaribo, stadsgeografische studies van een ontwikkelingsland* (Bussum 1976).

62 *E.g.*, there is circumstantial evidence of Maroons supplying services and goods (wood) to plantations. Obviously, the other way around, they thought of the supply of certain goods from Paramaribo as crucial. On Maroon subsistence agriculture, see: R. Price, 'Subsistence on the periphery: Crops, cookers, and labour among eighteenth-century Suriname Maroons', *Slavery & Abolition* 12 (1990) 107-127.

63 H.J. Nieboer, *Slavery as an industrial system. Ethnological researches* (The Hague 1910); E.D. Domar, 'The causes of slavery and serfdom: A hypothesis', *Journal of Economic History* 30 (1970) 18-32; J.R. Ward, *Poverty and progress in the Caribbean 1800-1960* (Basingstoke/London 1985) 31-45; Boomgaard, 'Why work for wages?'

II

MARRIAGE PATTERNS OF PATRICIANS IN LEIDEN SIXTEENTH TO NINETEENTH CENTURY

by

Dirk Jaap Noordam

1. Introduction

One of the most splendid weddings in Leiden in the eighteenth century took place on 24 September 1748.[1] The groom was Pieter Allardsz De La Court, son of a very wealthy merchant, and his bride was called Geertruida Jacoba De Bije. Her family was one of the oldest of Leiden and had filled the ranks of the most powerful political body, the Council of Forty, ever since 1548. Even measured by the standards of the rich inhabitants of Leiden, the costs of the wedding day, amounting to more than *f* 6000, were exorbitant. This marriage of wealth and power promised to be a real success but was, in reality, a disaster, at least for De La Court. At first all seemed to go very well, especially when after six years a son was born to the couple. Thanks to the relatives of his wife, De La Court in that same year 1755 became a member of the Council of Forty, a position that all his forbears, especially his great-grandfather Pieter De La Court (1618-1685), a well-known political writer, had pursued in vain. However, when after three years his only child died, the father became mentally depressed, and was put under the guardianship of his wife who did so well that she was able to inherit almost *f* 500 000 after his death in 1775.

De La Court seems to have been somewhat representative of the members of the town council of Leiden in the second half of the eighteenth century. Although mental depressions were probably exceptional among other councillors, several patricians had no sons or other relatives who could succeed them. De La Court and his wife are important in another sense: their age at marriage. He was twenty-six years when he married and she was of almost twenty-three years. Their ages were almost identical with the mean of the (future) members of the Council

of Forty and their wives who were also born in the first and second quarters of the eighteenth century.

These ages at (first) marriage confirm that the Western European marriage pattern was prevalent among the representatives of the political elite of Leiden in the eighteenth century.[2] The most distinctive characteristic is a late marriage because it took place many years after adolescence. A second characteristic is the high proportion of people who never married at all: 10-20 % of the population remained celibate during their lifetime. That was the case with those councillors who were contemporaries of De La Court from whom a tenth did not enter into matrimony.

The question when this Western European marriage pattern became the most important one in the Leiden patriciate is the main one in this article. The prevalence of other patterns of marriage among those patricians is also a subject for investigation. These data are compared with others on elite groups in the United Provinces, as well in other countries. The uniqueness of these patterns is also determined by comparing them with the findings of groups representative of the common people in the Province of Holland.

2. *Leiden and its patriciate*

I collected data on more than 600 men who were members of the Council of Forty between 1510 and 1795, and of their families. I have called these councillors 'the first generation' and their sons and daughters, of course, 'the second generation'. It was possible that a councillor belonged to both generations but, as we will see, the two groups were far from identical.

The Council of Forty developed in the sixteenth century into the most important political body of the city. In principle, the forty patricians filled their ranks by cooption.[3] Only in special circumstances could the Stadhouder of Holland, the Prince of Orange, change the composition of the council. This happened in October 1574 when most councillors who were Roman Catholic lost their seats and were being replaced by Calvinist patricians.[4] Two-thirds of the councillors in the second half of this century practised occupations which were concerned with cloth production and victualling trades.[5] The traditional view is that the patriciate of Leiden was a rather open elite in the sixteenth century. But during the seventeenth century the councillors closed their ranks and newcomers became rare. Although some evidence corroborates this view it remains to be seen if the formation of an oligarchical class in Leiden really took place. Even in the eighteenth century several newcomers obtained a seat in the Council of Forty, as the examples of De La Court and others (to be cited) show. However, by then most councillors were involved in no occupational activities other than politics and government.[6]

The economy of Leiden was based on the production of textiles, and the demographic development of the city reflected the changes in that industry. During the greater part of the sixteenth century it became stagnate and the number of inhabitants fell from 14 250 in 1500 to 12 456 in 1574.[7] After the siege of that year the economy of Leiden began to flourish again, especially after the introduction of the 'new drapery' in 1582. In 1622 no less than 45 000 people lived in the city and by 1670 this number had risen to 70 000. By then Leiden was, after Amsterdam, the second most populated town of the Northern Netherlands, and the second most important centre of textile trade in the whole Western world. After that year, however, a turning-point in the economic and demographic development took place, and in 1748 the number of inhabitants had dropped to 37 200 and, in 1795, even further to 30 955.[8]

3. Celibacy

The difference in numbers and percentages of single men of the first generation and those of single men of the second generation show that both groups were far from being identical (Table 1). Many town councillors were, as was the case with De La Court, *homines novi*. On the other hand the succession of a father by his son was by no means a standard procedure.

The Western European marriage pattern was prominent among men and women in both (generation) groups. Under the daughters of the patricians the percentage remaining single was higher than that of their brothers. This was perhaps because of the cost of the dowry. But the working of the marriage market explains this difference too. The position of a woman depended primarily upon the status of her husband, and it was therefore desirable to marry a man of equal wealth and position.

There was a marked difference between the percentages of those remaining single in the first generation and those in the second generation of patricians. The sons may have had more opportunity of finding their own way, with or without marriage. Economic factors also played a role, as the fate of the sons born between 1650 and 1724 shows. They were the first generations to be faced with the economic depression that began around 1670 and many of them were unable to contract a marriage. The opportunities and goals of the first generation were quite different. These men were mostly heads of a whole family and their purpose was to further the interests of their group. Marriage seemed almost essential to reach that goal. The marriage behaviour of some councillors shows that they were well aware of the demographic implications of their position. Several of the newly appointed members in the Council of Forty who were single at the time of their appointment, married afterwards. In 1699 Gerard Fransz Meerman, already 40

Table 1. *Percentage and number of single Leiden councillors and their children 1500-1824*

(By cohort of birth)

	Percentage first generation	Percentage second generation		Number first generation	second	
	men	men	women	men	men	women
1500-1524	8.7	0.0	0.0	23	8	6
1525-1549	6.9	12.2	0.0	58	41	22
1550-1574	9.5	4.8	5.4	53	63	37
1575-1599	3.0	14.3	13.2	33	42	53
1600-1624	8.6	6.7	14.8	35	30	27
1625-1649	15.4	16.0	0.0	65	50	47
1650-1674	19.1	31.6	14.1	47	57	64
1675-1699	12.5	21.6	19.6	48	51	56
1700-1724	10.5	30.0	26.5	38	30	49
1725-1749	11.6	12.5	13.3	43	40	45
1750-1774	28.5	16.0	16.7	21	25	30
1775-1799		23.8	36.8	21		19
1500-1824	11.6	15.0	11.6	654	532	596

years old, became a councillor and contracted a (first) marriage nine months after his appointment.[9] Sixty years later Barthoud Adriaan Van Assendelft quite unexpectedly entered the ranks of the councillors. He was the last member of his family and probably spent most of his time not in the council chamber but at parties at the homes of other patricians. Anyhow, Barthoud Adriaan married five months after his appointment. Several other examples of councillors marrying after being appointed in the town council can be cited, mostly of old established families.

On the other hand some newcomers seemed to become councillors just because of the fact that they were single. In 1651 and 1652 three new members were unmarried, in 1669 six newly-appointed councillors were single, of whom two contracted a marriage shortly afterwards. At the beginning of the eighteenth century one of every five new councillors was (and stayed) unmarried.[10] In 1788 no fewer than nine out of sixteen councillors appointed had neither wife nor children. This policy made it possible to fill the ranks without creating new dynasties, and allowed the established families to hold their share of power. This

development began in the second half of the seventeenth century, as the percentage of unmarried councillors in first generation of the cohort 1625-1649 shows. However, the policy did not always work as planned. In 1705, a newcomer, Van Panhuis, who was 42, was made a councillor. Sixteen months later he married and afterwards fathered no fewer than six children.

Two other developments, one at the beginning of the sixteenth century and the other at the end of the eighteenth still need to be explained. For the first cohort, no sons remained single and for the first two cohorts no daughters of patricians remained single. The numbers concerned are not great and the chance that I missed some of the unmarried ones because they led a quiet life in a convent is, of course, possible. However, there is another explanation for none of them remaining single. Van Zanden recently studied the marriage behaviour of a small number of men and women who lived near Leiden in 1540.[11] All the women of 40 years and older were married or had once contracted a marriage. This means that at the beginning of the sixteenth century one characteristic of the Western European marriage pattern, a high percentage of people who remained single, was still not present in the immediate surroundings of the city. That was the prevalent behaviour in the famous village of Montaillou, where all women eventually married.[12] However, bearing in mind the smallness of the numbers concerned, further study is needed to confirm this view. The last cohort, consisting of those born from 1775 onwards, shows quite another development. The very high percentages of those remaining single perhaps reflects the economic depression during the period 1795-1813. However, it is also possible that these Leiden patricians adopted a pattern that by then was normal among elite groups in the United Provinces. In the first half of the eighteenth century no less than a third of the Frisian nobles and even half of the patricians in Zierikzee did not marry at all.[13] In the sixteenth century, half of the adult members of the patriciate of this city in Zealand, were not married. The celibacy among noble women in Holland in the period 1500-1650 was also high and amounted probably to one in three.[14]

The pattern of celibacy in Leiden corresponded well with that of the English nobility. Of the males and females born in the families of English peers between 1600 and 1800, a fifth never married.[15] The English gentry resembled the Leiden pattern even more: before 1650 no more than 5% of men remained single, but of those born between 1650 and 1800 this was 15%.[16] The high percentages of the other elite groups in the United Provinces corresponded more to the patriciate of Geneva, where 30% never contracted a marriage.[17] Nevertheless the data for the patriciate of Zierikzee are exceptional, even when compared with those of the ruling families of Europe from the sixteenth to the eighteenth centuries.[18]

4. Marriage and remarriage

Most of the councillors who married did so only once (Table 2). The differences in the percentage of councillors who married only once seem large. The effect of the demographic crises in the sixteenth century probably caused many remarriages of the patricians born between 1525 and 1574. It seemed imperative for a councillor to father one or more sons who could succeed him in the town council. The high percentages of remarriages in the cohort 1625-1649 were possibly caused by the malaria epidemic in 1669 and 1670. One of the victims was the first wife of the well-known lawyer Simon Van Leeuwen. She was buried in January 1670, eleven days before the widower became a member of the Council of Forty. As this was the last epidemic in the history of early modern Leiden, the high percentages of remarrying patricians born between 1725 en 1749 remain a mystery.

Table 2. *Distribution of marriages among Leiden councillors 1500-1774.*

(By cohort of birth)

	1	2	3	4	Number
1500-1524	71.4	19.0	9.5		21
1525-1549	64.8	33.3	1.9		54
1550-1574	66.7	31.3	2.1		48
1575-1599	75.0	21.9	3.1		32
1600-1624	81.3	18.8			32
1625-1649	58.2	30.9	10.9		55
1650-1674	86.8	10.5		2.6	38
1675-1699	78.6	19.0	2.4		42
1700-1724	73.5	23.5	2.9		34
1725-1749	60.5	39.5			38
1750-1774	93.3	6.7			15
1500-1774	72.1	24.2	3.5	0.2	409

Other groups of the elite in the United Provinces and elsewhere contracted fewer second and following marriages. No more than 26 % of the patricians of Zierikzee remarried.[19] Among the Frisian nobles and in the other countries this was less than 15 %.[20]

5. Age at marriage

The period in which the Western European marriage pattern became the most important in the Leiden patriciate, can be seen in Table 3. The Western European marriage pattern is already visible for the first cohort of men born between 1500 and 1524. However, as this first group consists of only six councillors, it is too small to come to a conclusion. This is also true for the women of whom no more than two data are known. Only with the second cohort, born in the second quarter of the sixteenth century, are enough data available to draw that conclusion.

Table 3. *Mean age at first marriage of Leiden councillors and their wives 1500-1774.*

(By cohort of birth)

	Mean age		Number	
	men	women	men	women
1500-1524	28.8	19.5	6	2
1525-1549	27.4	25.6	25	10
1550-1574	26.1	25.1	46	17
1575-1599	27.2	23.7	32	20
1600-1624	28.4	24.1	32	16
1625-1649	25.8	22.4	54	44
1650-1674	29.8	23.4	38	37
1675-1699	28.5	25.6	41	37
1700-1724	26.3	22.6	34	32
1725-1749	28.0	23.0	38	33
1750-1774	29.1	24.3	15	21
1500-1774	27.5	23.7	361	269

Table 4. *Mean age at first marriage of the children of Leiden councillors 1500-1824.*

(By cohort of birth)

	Mean age		Number	
	men	women	men	women
1500-1524	24.6	21.7	5	6
1525-1549	25.2	23.5	32	20
1550-1574	28.7	27.5	57	33
1575-1599	27.5	25.6	36	46
1600-1624	26.7	24.8	27	23
1625-1649	26.5	22.9	42	47
1650-1674	26.5	23.1	38	55
1675-1699	27.9	25.1	40	41
1700-1724	29.4	24.9	19	34
1725-1749	31.5	24.7	34	38
1750-1774	26.1	25.3	19	25
1775-1799	26.7	26.8	15	10
1800-1824	24.0	23.0	3	2
1500-1824	27.5	24.6	367	380

In general there were two reasons for marrying late, in the early modern period. The first one lies in the necessity of having enough money or opportunities for raising a family. This factor, as is shown by some of the examples already given, was sometimes present among the patriciate of Leiden. For others, appointment to the Council of Forty seemed to settle the date of their wedding. In 1669 Daniel (II) Van Alphen had the banns published six weeks after he became a councillor. His namesake Daniel (VII) Van Alphen did the same (in 1742), but this time it was only 19 days after the appointment. In the eighteenth century, however, many future councillors to be did not wait so long, because with the almost obligatory degree in law they could practise as a solicitor.

As was customary the age of women at marriage was lower than that of their husbands. Demographic factors can explain the timing of their marriages. A rather low age generally meant a large number of children. It seems probable, however, that the wives of councillors employed some form of birth control. Several of them gave birth to their last child well before their fortieth birthday, the 'normal' point at which fertility of women stopped. The ages at which men married fluctuated more than those of women.[21] Perhaps economic changes were primarily responsible for the marriage behaviour of the councillors. Men born in the second

quarter of the seventeenth century grew up during the most prosperous period in Leiden in the early modern period. They married at a younger age than any of the councillors before or after them. The depression and stagnation from 1670 onwards can easily explain why the members of the Council of Forty married so late. The changes in the ages at first marriages of men correspond with those found among the male inhabitants of Amsterdam and of the village of Maasland, also not far from Leiden.[22] However, there exists no resemblance of patterns between women. Here the ages and the changes are quite different.

The difference in ages between the Leiden councillors and their wives was 3.8 years and therefore not great. That points to the fact that the position of women in the marriage market was not bad. In his book on the patriciate of Leiden in the eighteenth century Prak gave some examples of rather independent girls.[23] In 1740, against the wishes of her father, Elisabeth De Raet married Nicolaas Van Den Boetzelaer, at the age of 19. It was, in the opinion of others, also a misalliance, despite the fact that Elisabeth became a baroness by marrying Nicolaas.

Some men and women in the Leiden patriciate who born after 1525 showed a marriage pattern deviating from the prevailing Western European one. It was, however, not so pronounced as the one displayed by men and women in the surroundings of Leiden in 1540. These villagers generally married around the age of 20.[24] That pattern was the normal one in the ruling families of Europe before 1500. Later on it was also found among the Princes of Orange, for instance at the age of 18, William I married a girl of his own age in 1551. In Leiden Jacob Thomasz Van Swieten, a brewer and future councillor, who was born in 1539, became the father of his first child when he was only 19 years old. In 1539, at that same age Willem Willemsz Van Warmond married a girl who was 18. These marriages between people in their teens were most prominent in families who remained Roman Catholic (and therefore disappeared from the ranks of the patricians in 1574).[25] There is another marriage pattern that was found among the Leiden councillors. This was that of an alliance between a rather old man with a teenage girl. This sort of marriage was the most important one in Florence in 1427 and prevailed afterwards in the patrician families of that city.[26] Jan Pietersz De Bije displayed this 'Florentine' pattern when he married Beatrix Van Warmond in 1606, when he was 37 and the bride only 19. It was, however his second marriage, his first one had followed the normal Western European pattern.

The age at which councillors contracted a marriage depended sometimes on their position. This was not the case with the behaviour of their sons and daughters. They had, if they were not their fathers successors, more freedom to follow their own wishes. Sons of the councillors married at precisely the same age of 27.5 years as the first generation did. Daughters were slightly older than the wives of the members of the Council of Forty. However, there was some difference among the cohorts of the children and those of the first generation. In the sixteenth and the eighteenth centuries the councillors were older than their sons, in the seven-


Figure 1. Age at 1st marriage, males
35
30
25
20
1500-1549
1600-1649
1700-1749
Leiden patriciate
Zierikzee patriciate
Holland nobility
Frisian nobility


Figure 2. Age at 1st marriage, females
35
30
25
20
1500-1549
1600-1649
1700-1749
Leiden patriciate
Zierikzee patriciate
Holland nobility
Frisian nobility

teenth century the opposite was the case. It is possible that the stagnation influenced the marriage pattern of the first generation whose members not only bore the burden of their own nuclear family but also of the clan which they headed. The behaviour of the sons was more consistent throughout time. The economic opportunities had more influence on their chance of marrying, as I have already pointed out.

From the first cohort onwards, the second generation displayed, the Western European marriage pattern. Sometimes the children married at a younger age, especially if their fathers were already dead. The daughters of Claas De Munt, one of the victims of the epidemic of malaria in 1669, contracted a marriage at the ages of seventeen and eighteen. The Florentine pattern was not only found among the children of councillors who, like the Van Der Graft and Van Der Hall families, had remained Roman Catholic. It was also found in families with aristocratic aspirations, for instance the Van Leijdens and the Van Lanschots. Pieter van Leijden, a baron and later a count of the Roman Empire, in 1712 married his 15-year old daughter to a baron of 26.

Figures 1 and 2 compare the marriage patterns of the second generations in Leiden with those of other groups in the United Provinces. Elite groups elsewhere in the United Provinces were much older when they married than the sons and the daughters of the councillors of Leiden. The marriage ages of the patricians of Zierikzee and of the nobles of Holland and Friesland bore some resemblance to the French nobility, and also to the patricians in Florence and Geneva.[27] As was the case with their fathers, the second generation in Leiden corresponded with the patterns found in the English peerage.[28]

6. Conclusion

The most common marriage pattern among the male and the female patricians in Leiden was, even at the beginning of the sixteenth century, the Western European pattern. The high percentages of those remaining single and the relatively late age at which first marriages toke place show the prevalence of that behaviour. From time to time in Leiden patriciate marriages the couple were still under 20. This was especially true of families that remained Roman Catholic after 1574. Another minority pattern was found, that between young girls and much older men. These marriages were concluded in the same families that stayed true to the old church but also in families with aristocratic tendencies. However, these marriages of the Florentine type were rare, just as those between the teenagers in the Leiden patriciate.

The Leiden patricians differed greatly from other elite groups in the United Provinces. The patterns found among the councillors corresponded more with

those found among the common men in Amsterdam or Maasland, than with the behaviour of the nobility of Holland and Friesland or the patriciate of Zierikzee.

There were two distinct marriage patterns in the political elite of Northern Netherlands between the sixteenth and the nineteenth centuries. There was the Leiden type that bore close resemblance to the behaviour pattern of the English gentry and peerage, and the more aristocratic type found elsewhere in the elite of the United Provinces that resembled the patterns in the French nobility and other elites in the regions with a Roman culture.

NOTES

1 M. Prak, *Gezeten burgers. De elite in een Hollandse stad, Leiden 1700-1780* (The Hague 1985) gives a very lively picture of this wedding and of its participants.
2 See for a description the classical article by J. Hajnal, 'European marriage patterns in perspective', in: D.V. Glass & D.E.C. Eversley, eds, *Population in history. Essays in historical demography* (London 1965) 101-143.
3 P.J. Blok, *Geschiedenis eener Hollandsche stad* (The Hague 1916) III: 142-144.
4 Blok, *Geschiedenis*, 71-72. The same happened in 1618, 1672 and 1788.
5 S.A. Lamet, *Men in government: The patriciate of Leiden, 1550-1600* (Amherst 1979) 184-186, 473-475; Prak, *Gezeten burgers*, 128.
6 Prak, *Gezeten burgers*, 128-129.
7 D.E.H. de Boer, 'Leiden in de middeleeuwen', in: J.K.S. Moes & B.M.A. de Vries, eds, *Stof uit het Leidse verleden. Zeven eeuwen textielnijverheid* (Utrecht 1991) 39; A.J. Brand, 'Crisis, beleid en differentiatie uit de laat-middeleeuwse Leidse lakennijverheid', in: Moes & De Vries, *Stof uit het verleden*, 53-65.
8 H.A. Diederiks, D.J. Noordam & H.D. Tjalsma, eds, *Armoede en sociale spanning. Sociaal-historische studies over Leiden in de achttiende eeuw* (Hilversum 1985).
9 Several of the examples cited are borrowed from the genealogical appendix in: Prak, *Gezeten burgers*, 368-422.
10 Prak, *Gezeten burgers*, 186.
11 J.L. van Zanden, *Arbeid tijdens het handelskapitalisme. Opkomst en neergang van de Hollandse economie 1350-1850* (Bergen 1991) 41.
12 F. & J. Gies, *Marriage and the family in the Middle Ages* (New York 1987) 183.
13 Y. Kuiper, 'Uitsterven of uithuwelijken? Een analyse van het demografisch gedrag van de adel in Friesland in de 18de en 19de eeuw', *Tijdschrift voor Sociale Geschiedenis* 12 (1986) 279; Y. Kuiper, *Adel in Friesland 1780-1880* (Groningen 1993) 107-108; H. van Dijk & D.J. Roorda, *Het patriciaat in Zierikzee tijdens de Republiek* (Middelburg 1980) 40.
14 H.F.K. van Nierop, *Van ridders tot regenten. De Hollandse adel in de zestiende en de eerste helft van de zeventiende eeuw* (The Hagaue 1984) 63, 65.
15 T.H. Hollingsworth, 'The demography of the British peerage', *Population Studies* 18 (1965) II: Supplement, 20.
16 L. Stone & J.C. Fawtier Stone, *An open elite? England 1540-1880* (Oxford 1984) 87-88, Table 3.2.

17 L. Henry, *Anciennes familles genevoises. Etude démographique: XVIe-XXe siècles* (Paris 1956) 52.
18 S. Peller, 'Births and deaths among Europe's ruling families since 1500', in: Glass & Eversley, *Population in history*, 88-89.
19 Van Dijk & Roorda, *Het patriciaat in Zierikzee*, 39.
20 Kuiper, 'Uitsterven', 280; Kuiper, *Adel in Friesland*, 110-112.
21 D.J. Noordam, *Leven in Maasland. Een hoogontwikkelde plattelandssamenleving in de achttiende en het begin van de negentiende eeuw* (Hilversum 1986) 106-107.
22 *Ibidem*, 106, 232.
23 Prak, *Gezeten burgers*, 177-179.
24 Van Zanden, *Arbeid tijdens het handelskapitalisme*, 40.
25 The pattern was to be seen in the Van Leeuwen family, and in some branches of the Van Swanenburg and Van Nierop families.
26 D. Herlihy & C. Klapisch-Zuber, *Les Toscans et leur familles. Une étude sur le 'catasto' florentin de 1427* (Paris 1978) 205, 207; L. Burr Litchfield, 'Demographic characteristics of Florentine patrician families, sixteenth to nineteenth centuries', *Journal of Economic History* 29 (1969) 199.
27 J. Houdaille, 'La noblesse française avant 1600', *Population* 45 (1990) 1071; J. Houdaille, 'La noblesse française 1600-1900', *Population* 44 (1989) 507-508; Litchfield, 'Demographic characteristics', 198-200; Henry, *Anciennes familles*, 55.
28 Hollingsworth, 'The demography', 25-27.

III

THE PRE-MODERN CITY IN INDONESIA AND ITS FALL FROM GRACE WITH THE GODS

by

Luc Nagtegaal

1. Introduction

Some people do not believe that Indonesia has cities, or has ever had them. Hans-Dieter Evers wrote that modern Jakarta is "a very large settlement but, nevertheless, not a city.[1] His argument is that Jakarta and other Indonesian 'large settlements' are not ritually defined as entities. Braudel and Chaudhuri claimed, however, that urbanism is a universal and abstract historical category. 'A town is a town wherever it is'.[2] Many visitors of contemporary Jakarta with its high-rise buildings and eternal traffic jams would agree that it surely looks urban. Debates such as these on the nature of cities often deal with both their present and their past. Even for modern mega-cities an understanding of their history is useful. To comprehend the general changes and developments of urbanization it is important to know the starting point. Planners in the Third World are increasingly aware that they must not disregard indigenous urban traditions. If they adopt inappropriate western norms of urban planning the financial costs will be huge and the plans will often meet with resistance from the population.

In recent years there has been an upsurge of studies on the nature of the pre-modern cities in Indonesia. This can be explained by the tremendous growth of cities in Southeast Asia in the last three decades, which has provided a strong stimulus for urban studies. There are theoretical reasons as well. In the wake especially of Max Weber, many historians have made a comparison with Europe, where capitalism and economic modernization are purportedly urban phenomena. In explaining why Indonesia remained underdeveloped they have made a link with the fact that until recently Southeast Asia was one of the least urbanized areas in

the world. The answer to the question of what went wrong with Indonesia was looked for in the history of the city.

A reaction to this positive approach to capitalism came with the Dependencia School. Writers like Wallerstein stressed that colonialism incorporated the Third World into a world system in which the surplus of those countries was drained to the West. The cities were a key element in this world system. They are described as foreign bodies, meant to facilitate the drain of surplus, and maintaining themselves on the expense of the periphery. Again this has led to a flow of studies on mainly embryonic primate cities.

The discussion on pre-modern cities in Indonesia generally has two objectives: to mutually classify them according to their dominant features, and to compare the Indonesian cities with cities in Western Europe. Although the element of comparison is often present, urban historians who focus on Indonesia only seldom tie their ideas in directly with theoretical debates on European cities. The discussion on Indonesian cities has usually been inwardly oriented. An unwanted result is that many contributors seem unaware of the origins and theoretical implications of their concepts.

In this article I try, in a tentative way, to identify and delineate a number of concepts around which the literature revolves. I have done this according to the dominant function that the concepts attribute. I have labelled them the Sacred Centre, the Market City, the Islamic City, the Colonial City, the Bourgeois City, the Incomplete City, and the Mental City. Most names are entirely mine, and they are not common in the literature. In each case I give a survey of the essential characteristics as they can be found in the literature, followed by my own ideas on that concept. The comments that I make are on those concepts only, and they should not be mistaken for criticism on the value of individual studies. At the end of the article, I confront the concepts with some of the findings of my own research on the cities of Java in the seventeenth and eighteenth centuries. From that follows my conclusion that the differences between the various pre-modern cities have often been overstated.

2. *The City as a Sacred Centre*

The most common theory on the nature of cities in pre-modern Indonesia is that there were essentially two types: the Sacred Centres and the Market Cities. Sacred Cities were the centre of inland agrarian empires and had strong religious functions, whereas Market Cities were coastal and trade-oriented.[3]

Sacred Centres were supposed to be organized morphologically according to a cosmological master plan. The city represented the cosmo-magical thought and symbolism of the Southeast Asians that presupposed a strong parallelism between heaven and earth, macrocosm and microcosm. Urban order and moral order were

closely related. The morphology of the Southeast Asian Sacred Centre followed closely those of sacred cities in India, which were understood to be at the centre of the world. The residence of the rulers duplicated Mt Meru, the holy mountain for both the Hindus and Buddhists. Around it, the city was laid out in series of concentric circles, *mandala*, that symbolized the concentric circles of power in the cosmos. Besides expressing cosmological order the city also condensed and expressed the order of this world. A king was one charged with bringing the reign of moral law into harmony with the principles of cosmic law that were expressed in his capital. The order of the ceremonial centre helped to insure the order of the kingdom.[4]

In the literature on pre-modern cities in Southeast Asia other phrases are sometimes used to describe what is essentially a Sacred Centre. Geertz called them Exemplary Centres, because the rituals and ceremonies celebrated there, the style of life and the forms of social organization that obtained there functioned as mirrors for the larger community.[5] Redfield and Singer called them *orthogenetic* cities, that is cities that created and sustained the ethos and order of a whole culture.[6]

This image of the city as a Sacred Centre is closely connected to a theory of society that is often called the concept of *devaraja*, or the god-king. It describes the societies of Southeast Asia as being completely centred on the ruler: he was the only source of power. Relations with the subjects and, therefore, the functioning of the state were based on religion. Everybody shared the same beliefs and participated in the same moral order. Ceremonies and rituals were essential to the state, and their pivot was the person of the ruler. This *devaraja* theory claims that the normal situation in the pre-colonial states of Southeast Asia was one of harmony.[7]

The origins of the concept of the Sacred Centre and the *devaraja* state lie with philologists and archaeologists like Heine-Geldern and Coedès, who published their main works from the 1940s onwards.[8] The concept was strongly influenced by the then recent studies of the remains of Angkor in Cambodia. In the literature this city still functions as the example *par excellence* of a Sacred Centre. A second source was the Southeast Asian court chronicles which became increasingly available in philological editions at that time. The roots of the concept, however, are much older, and go back to old European images of the Orient. Montesquieu had already written that the oriental states were based on religion.[9]

In recent years this *devaraja* theory has increasingly come under attack for being too focused on an ideal that was promoted by the royal courts, rather than on the actual situation.[10] Surprisingly enough, the twin theory of the city as a Sacred Centre has escaped serious theoretical debate until lately. Yet there are sufficient reasons for casting doubt on it. If, in reality, power was much more diffuse than the *devaraja* theory says, then the Sacred City may well have not been an exemplary centre and *orthogenetic* after all. In actual fact, relations between the

city and its hinterland seem more complicated than just being based on religion, and include economic and social aspects just as much.

A telling example of the traps hidden in the sources is a manuscript from the end of the fifteenth century. It contains a map of the city later to be known as Hanoi. Both the map and the text give many details on the palace and temples, but the existence of quarters for merchants and artisans is totally concealed. Yet we know now that those quarters did exist. The manuscript clearly presents a mandarin view of the city, and probably a map drawn by a merchant would not have left out the trading quarter.[11] Unfortunately, in Southeast Asia almost all remaining documents were written in court circles. If historians do not realize the biases in their sources it is all too easy to fall victim to them.

A very essential question that adherents of the concept do not ask themselves seriously enough is whether the cosmological master plan of the cities really had such a tremendous impact. It should be asked whether the fact that Southeast Asian cities imitated the morphology of Indian holy centres meant that everybody lived by the ideology that it was supposed to reflect, or whether this Indian morphology merely was an architectural fashion, of which most Southeast Asians did not realize the deeper meaning. It can be argued that many philologists and historians have literally transposed Indian concepts like the Sacred Centre, *mandala* and *devaraja* to Southeast Asia, without much evidence that such concepts were just as meaningful there as they presumably were in India. Moreover, the concept is basically static: although it is frequently claimed that the Sacred Centres flourished during the 'Classical Period' of Southeast Asia, it is unclear when cities transformed into something else and ceased to be Sacred Centres.

3. The Market City

In the existing literature on pre-modern cities in Southeast Asia it is clear that, for some ports, trade was extremely important, and that these ports were inhabited by merchants from many ethnic backgrounds. This makes it difficult to describe such cities as Sacred Centres, because obviously trade and multi-ethnicity imply a different moral order. The search for profit is fundamentally different from a quest for harmony and proper ritual behaviour. The solution to this conceptual dilemma has been to distinguish a second type of urban settlement, the Market City.[12] Whereas Angkor is the archetype of a Sacred Centre, fifteenth century Malaka is always mentioned as the perfect example of a Market City. Almost at the same time as Karl Polanyi was laying most of the groundwork for this concept, the writings of Tomé Pires, a Portuguese traveller to Malaka in the sixteenth century, became available in a modern edition.[13]

According to Reed there were several differences between the Market and the Sacred Cities.

1) The economy of the Market Cities was based almost exclusively on trade, rather than on agrarian taxes.
2) The culture of the inhabitants of the Market Cities was not *orthogenetic*, but *heterogenetic*. The cities were cosmopolitan and did not dictate undifferentiated religious and moral norms to the rest of society.
3) The buildings were constructed with perishable materials. The Sacred Centres, on the other hand, had many buildings made of stone.
4) In their morphology the Market Cities did not have much planning, whereas the Sacred Cities had a cosmological structure.[14]

It has to be asked how such Market Cities were able to co-exist with a society that was supposedly based on subsistence. Logically historians had to come up with the idea that the Market Cities were enclaves, to a large extent separated from the rest of society. Market cities are often referred to as *emporia*, a Greek word for special secluded market zones in Antiquity. The separation was, of course, only possible if it could be argued that the trade was unimportant for the wider society. Indeed, within the concepts of the Sacred Centre and the market city this trade has always been described as strictly limited to luxury items.

The concept of the Market City reflects the cultural pessimism of the late 1930s and early 1940s, when many people were questioning the wisdom of pursuing modernization. A tranquil oriental society based on age-old rituals seemed much more preferable than a modern world that had plunged into the barbarism of the Second World War. Karl Polanyi argued that in traditional societies the 'capitalist' values were constricted to special enclaves to prevent the spread of dehumanising behaviour that could undermine the prevailing moral order.[15] Others, however, have appreciated the potential of Market Cities for spreading new ideas and innovations.

However, the concept of the Market City runs into serious problems when it is confronted with data from historical sources. Trade in Southeast Asia was never limited to luxury items, but contained many important bulk commodities like salt and rice. Therefore it cannot be maintained that the Market Cities were strictly separated from the rest of society, for such commodities had to be purchased from and sold to the rural population. Other aspects of Southeast Asian cities also demonstrate that they were not strictly separated from the hinterland; for instance, many cities were not surrounded by walls, and the inhabitants did not have any special legal status.

4. The Islamic City

Until recently most historians accepted the dual typology of the Sacred Centre and the Market City, and presumed them to be eclipsed by the Colonial City, even though they seldom explained when and how. It can have happened in the

eighteenth century, but Selosoemardjan even described twentieth century Yogyakarta in terms of Hindu-Buddhist concepts.[16] Yet, even in the eighteenth century most parts of Indonesia had already been islamicized for centuries, and even in Javanese court circles Islam was practised quite seriously.[17] Problems like these led Kathirithamby-Wells to propose a new concept, that of the Islamic City.[18] Although a firm believer in the basic dual division of agrarian versus maritime cities, she viewed them as having undergone a transition from a Hindu-Buddhist into an Islamic phase. She described several differences.

1) Emphasis shifted from court rituals to an egalitarian religion that centred on the mosque and the market place. Since trade was now acceptable to society, the cities became more secular.
2) Cities in Southeast Asia became links between the world of international Islam and the local Muslim community. Cities now were more internationally oriented and open to change.
3) Because of the strong religious networks that radiated from the cities, the urban centres became much more integrated into their hinterlands. This made it possible for isolated city-states to transform themselves into large territorial states.

The great advantage of this new concept is that it has finally focused attention on Islam, whereas in the traditional historiography there has always been a tendency to minimize its influence and even to deny that Indonesians were real Muslims. This is probably a legacy of colonial rule, which perceived Islam as a threat and tried to present it as un-Indonesian.

There are some logical problems with the concept of the Islamic City, however. Kathirithamby-Wells presented it as a particular type of the Sacred Centre and the Market City, and not as their successor. According to her, even during the Islamic period this dichotomy was very characteristic of the Indonesian cities. However, in describing the changes that Islam is supposed to have brought, Kathirithamby-Wells pulled the rug from under the very reasons why there should have been a dichotomy. On the one hand, when the Sacred Centres became Islamic the *devaraja*-cult was abandoned, rulers became interested in trade, and communities of foreign merchants moved in. This made their culture heterogeneous, cosmopolitan and open to change: in short, the things that only Market Centres were supposed to be. On the other hand, Market Centres became more like Sacred Centres because they were no longer isolated from the rest of society. Sacred Centres and Market Centres began to share the same characteristics, and there seems to be no reason any more why they should still be sharply distinguished.

Kathirithamby-Wells tried to save the idea of the dichotomy by introducing a new element: ecology. Agrarian cities were fundamentally distinct from maritime cities because they adapted to different ecological settings. This explains, for instance, why inland cities had stone buildings and maritime cities not. They had much better access to stone quarries and corvée labour, traditionally extracted

within agrarian communities. Kathirithamby-Wells suggested that the total symbiosis with the rural environment set the Southeast Asian cities apart from the cities of Medieval Christendom.[19]

In a later article she seems to have adapted her views suggesting that 'the distinction between agrarian and maritime as separate historical categories should (...) be less sharply drawn'.[20]

5. The Colonial City

When the Europeans arrived in Southeast Asia they settled pre-dominantly in cities. Many scholars have made the Colonial City a distinct category of urban settlement, on the assumption that the cities ruled by Europeans were quite distinct. Unfortunately, for most historians this assumption seemed so evident, that they have not bothered to explain what the differences with cities not ruled by Europeans were. Telkamp and King tried to index the common characteristics of Colonial Cities around the world. They put forward features such as a sharp distinction between European and indigenous spheres, pluralistic structure, the importance of race, relative absence of females, dominance of the tertiary sector, and a grid-iron planning.[21] My main objection to this methodology is that it is highly self-affirmative. No attempt has been made to compare the cities that are labelled as Colonial Cities (apparently on the basis of European political rule only) with others. Thus it never becomes clear whether the indexed characteristics are unique to cities that are ruled by Europeans, or not.

Although seldom phrased as a separate concept, most writers on Colonial Cities in Indonesia attach certain characteristics to those settlements, which are supposed to make them unique. I have listed several features that are mentioned in the historical literature on early Malaka, Makassar, Ambon, and especially Batavia: places which are presumably Colonial Cities. In such places, it is written, Europeans imposed their own urban concepts, with the result that, for instance, Batavia looked like a typical Dutch town, complete with canals and drawbridges. The central place in the cities was occupied by the European fortress or castle. There were several other common features of the Colonial Cities.

1) Political control was absolutely in the hands of the Europeans.
2) Most inhabitants were migrants from other islands or other parts of the world.
3) A large part of the population consisted of slaves.
4) Cities were poorly integrated into the hinterland.[22]

The Colonial City is perceived as a special kind of *emporium*, because just like the traditional Market Cities, it was a place full of foreigners engaged in trade, largely isolated from the surrounding society.

If these can be taken for characteristics of the early Indonesian Colonial City, this concept has some flaws too. European aspects of such cities have been

frequently exaggerated. Even in Batavia, Makassar and Ambon the Europeans were just a small minority, although relatively powerful. Only the European parts of these cities looked western, whereas the rest looked Chinese or Indonesian. Of all the ethnic groups the Europeans were the ones who were least permanent, because most of them were usually replaced every few years. Europeans could not create a city at will, but had to adjust themselves to the settings of Southeast Asia. In order to populate Batavia, for instance, the Dutch had to entice Chinese merchants to settle there. Without Chinese trade there would not have been much income for the Dutch. As a reaction to the European bias in many studies on Colonial Cities, Blussé argued that Batavia was more Chinese than European.[23]

This still leaves the impression that the Colonial Cities were unique because they were populated by migrants. Looking at the ethnic composition of Colonial Cities, however, it is neither the Chinese, nor the Europeans who made up the majority of inhabitants. Most of the population *intramuros* originated from other parts of Southeast Asia, such as Bali and South Sulawesi.[24] Moreover, it is important to realize that almost in every city a large number of natives lived just outside the area that the Dutch East India Company defined as urban, outnumbering the people living within. Thus the major group living in Batavia and Ommelanden was Javanese. As many of these people were totally linked to the city it is merely a matter of definition whether they should be included or not. Admittedly, Colonial Cities were, to a large extent, populated by migrants, but so were indigenous cities like Semarang and Surabaya.

If the migrant character of the Colonial City was not as absolute or as distinct as literature suggests, the morphology of the cities was also not overwhelmingly European. It may well be argued that the division of the Colonial City in a castle, town and *kampung* was not unique, but that it resembled the situation in other Indonesian cities, with the Castle merely being a substitute for the Kraton. Thus colonial Makassar had basically the same physical structure as the pre-colonial city that had been destroyed by the Dutch, with Castle Rotterdam as a nucleus instead of the indigenous fort Somba Opu.[25]

The isolation of Colonial Cities seems to have been overstated as well. Batavia was totally dependent on imports of timber, rice and other food from the northern coastal plains of Java. If in the past historians concluded that Batavia was isolated, they made the mistake of overlooking those plains, focusing only on relations with the mountainous Priangan.[26] Also, part of the population of the Colonial Cities were engaged in agricultural activities such as working the land and fishing. This means that there was no strict separation between the city and the rural areas. The imperfect integration between Colonial Cities and their hinterland seems to have been true for the initial phase only. As Blussé admitted, Batavia began to resemble a traditional Javanese city more and more as time went by.[27]

If we compare the Colonial Cities with other new settlements in Southeast Asia, like Pontianak, the differences are not all that great. When an Arab with his

followers founded Pontianak on the West coast of Borneo in 1772, almost all the inhabitants were also migrants from other parts of Southeast Asia. Consequently, in the beginning integration with the hinterland was limited.[28] In Pontianak the necessary labour was provided by slaves, just as in the Colonial Cities. Therefore, it seems more justified to consider Colonial Cities as examples of *externally induced* settlements in their early stages. This means that the cities had not developed organically within the society itself, but that they were imposed by outside forces who needed a point of entry.[29] In the eighteenth century, it was still possible in Southeast Asia for a leader with a group of followers to start an entirely new settlement at a well-situated location, and to redirect existing trade routes to it. Whether that leader was European, Arab or Buginese was only to a limited extent relevant to the nature of such a city.

6. The Bourgeois City

So far all the concepts that I have discussed lack any explanation of how and when the type of cities they describe developed into something else. One of the first to introduce an explicit evolution of city-types was Reid.[30] He came with an explanation of why cities in Southeast Asia have never generated full-blown capitalism. Reid's views can be seen as a reaction to the old concept of the Market City with its implication that it was the inherent structure of Southeast Asian society that had impeded progress. According to him, in the fifteenth and sixteenth centuries Southeast Asia was on a course that could have also led to modernization.

In Reid's view, before the coming of the Europeans cities in Southeast Asia were not isolated from rural society but were, on the contrary, essential to the functioning of that society. Trade was not limited to luxury items but rather consisted largely of bulk. In the fifteenth and sixteenth centuries the societies of Southeast Asia were dominated by port cities, which made that part of the world one of the most urbanized. In them capitalism was clearly on its way, a development that Reid seemed to associate with progress. A group of politically independent big merchants was developing into a native bourgeoisie.

Reid argued that pre-modern cities in Southeast Asia between the fifteenth and seventeenth centuries were fundamentally different from those in Western Europe. When compared to Western European cities four important differences stand out.

1) Rather than being isolated from the rest of society, the port cities were extremely well integrated. The cities were themselves semi-rural. Houses were surrounded by fruit-trees and hedges, while chickens and goats were kept in the yards. Cities had no surrounding walls, which meant that there was a continuum between town and country. The peasants were involved in trade and therefore economically needed the cities.

2) Cities were extremely important to society at large. Cities in Southeast Asia were generally larger than those in Europe: within Indonesia itself, Demak, Aceh, Makassar, Surabaya and Banten all had populations of about 50 000 to 100 000. Since Southeast Asia overall was sparsely populated, the degree of urbanization was extremely high. In the main states more than 10 % of the population lived in cities. [31]
3) Labour was much more important than land or capital. Since the population was sparse, control over labour was of the utmost importance. When the elite invested, it was in slaves and followers rather than in capital assets. There was no free labour market in Indonesia before the nineteenth century. The implication of this is that slavery was a hindrance to modernization there. The elite did not invest capital in buildings, which, except for a few warehouses, were all made of wood. This made it possible to abandon cities quite frequently and move to new locations. This lack of permanency made sustained growth difficult.
4) Cities did not have a military function. As already mentioned, cities had no surrounding walls. Since not a great deal of capital was invested in fixed assets, there was no necessity to defend cities. Moreover, they could be situated in positions that were commercially most advantageous; in river deltas. Elsewhere in the world the military function of cities usually dictated that they were situated on hilltops.

Other elements were almost the same as in Western Europe, however. Most important among them were political pluralism and inherent dynamics. As wealthy merchants became politically important and merged with the aristocracy a nascent bourgeoisie developed. Known as *orang kaya* (= rich men) they formed the dominant class and derived most of their wealth from international trade. Politically they opposed the centralism of the rulers. Every important *orang kaya* lived in his own compound, that mirrored the palace of the ruler in design. As a result cities became segmented and the population was far from homogeneous.

Although the cities in Southeast Asia were different from those in Western Europe, they could still provide innovation and a booming trade. In the seventeenth century, however, development towards modernization was brutally arrested, according to Reid. The rulers of the agrarian inland states perceived these port cities as a threat, as did the European trading companies that had arrived on the scene. Jointly they truncated the Capitalist Cities, so that in the end those cities did indeed become segregated from the rest of society. Reid's argument is that if the Colonial Cities were secluded places where a handful of foreigners conducted marginal trade, it was a historical creation, rather than a logical consequence of the nature of society.[32]

However, some aspects of Reid's view do not seem to stand up to the historical data available. It is becoming increasingly clear that the volume of trade waslarger in the eighteenth century than in the sixteenth. As cities were essential to this trade,

it is extremely unlikely that their impact was reduced. Reid's assessment of the high degree of urbanization in the sixteenth century is doubtful. As Wisseman Christie has pointed out there was a huge difference between the estimates of the Portuguese traveller Tomé Pires that were based on observation and those that were based on hearsay. The figures based upon direct observation reveal that the ports of the Javanese north coast were quite small. Tuban, for instance, had only some 1 000 inhabitants within its walls.[33] Foreign travellers often made wild estimates of the population that had no relation to the actual size of the cities. In the early modern world such estimates were often a metaphor for indicating that a city was large or not, rather than an attempt to make a correct assessment. The first reliable population figures for Indonesia were those of censuses held by the Dutch in some cities at the end of the seventeenth century. These show that Malaka, Ambon and Makassar all had about 5 000 inhabitants. Only Batavia was considerably larger, with a population of approximately 27 000 people.[34]

7. Incomplete Cities

Boomgaard and Wisseman Christie reacted separately to Reid's hypothesis about Southeast Asia being dominated by large cities in which a merchant-aristocracy provided for dynamics.[35] Just like Reid, they also implicitly tried to answer the question why cities in Indonesia did not generate modernization in the same way that cities in West Europe did, and in doing so, they also sketched an evolution of cities. Yet, their answers are different from Reid's. Instead of a high degree of urbanization, Boomgaard and Wisseman Christie claimed that in the pre-modern period Indonesia only had a few real cities. Most settlements that Reid described as cities were, in reality, just small trading towns or palace settlements. Wisseman Christie claimed that until the nineteenth century Java had only small towns, most having fewer than 2 000 inhabitants. Peter Boomgaard estimated that in 1400 only 1 % of the population of Java was urbanized, and in 1600 only 3 % or 4 %.[36] Such rates make Southeast Asia one of the least urbanized areas in the world, a conclusion that is totally opposite to that of Reid. The implication is that cities could not act as motors for economic modernization as well as they could in Europe.

According to this concept, cities in Java developed in a fundamentally different way from the ones in Europe. Before the fourteenth century there were no real cities at all, which was remarkable since the volume of trade and other economic factors were large enough to have supported urbanization. It was only in the sixteenth century that a considerable number of cities developed, but most remained small and insignificant. Moreover, after a time many lost their urban qualities and became sleepy towns once more. This minimal urban development can be explained by the absence of a hierarchy of markets, unlike many other parts

of the world where cities functioned as Central Places. This was a result of the relative efficiency of the existing market system that revolved around large numbers of small traders who visited rural markets. This efficiency was reinforced by the Javanese tax system that benefitted small traders and small markets, and heavily taxed large ones.

According to Boomgaard, what made the Javanese settlements fundamentally different from cities elsewhere was the lack of integration of functions. They did not have a military function and most port settlements did not have a religious function either as in medieval Java the temples were usually situated in the country. The palace settlements lacked a commercial function. When a city lost its most important function, like being a court town or a port-of-trade, it could not rely on the presence of two or three other functions for survival. The result was that Javanese cities lacked permanency. Whereas in the rest of the world a settlement that had developed into a city usually remained so for centuries, in Java settlements were often abandoned. Again, this lack of permanency meant that Javanese settlements could not act as motors for sustained economic growth.

8. The Mental City

The previous concepts were based on implicit comparisons with cities in West Europe. Other writers have felt that the use of concepts that are derived from European history should be abandoned as a matter of principle. They allow indigenous concepts only. The argument is that as 'urban reality' was largely a mental construction it is absolutely essential to focus on the indigenous mental image of the city.

This view was put forward by O'Connor[37], who mentioned the 'market model' as the most important example of a western concept that has been inappropriately applied to cities in Southeast Asia. By this he meant the notion that the functioning of the market is the central element in the structure of a city. O'Connor claimed that cultural elements have always been more important to Southeast Asians than the market. He stressed two: community and hierarchy. Societies introduced hierarchy to avoid the constant feuding and fission of the communities. This meant that communities became organized around a centre in such a way that they were complementary to one another. The reason it took such a long time for the first cities to appear in Southeast Asia was the relative strength of the communities and the lack of a suitable idiom of hierarchy.

The idiom that was finally introduced was indianization. Only then did cities spring up, consisting of separate ethnic communities, held together by a common Indic idiom. According to O'Connor, the advent of colonialism basically changed nothing except that Indianization was replaced by the new idiom of modernization. O'Connor even claimed that Singapore was a real Southeast Asian city

and not a transplant because it shared the basic structure of communities which were joined by a collective concept of hierarchy.

In his actual description of Southeast Asian cities that were based on the Indic idiom O'Connor fell back on the concept of the Sacred Centre.[38] This means that his 'theory of indigenous urbanism' had most of the conceptual problems of the Sacred Centre as well. He had, for instance, difficulty in explaining the introduction of Islam, which in theory was definitely less hierarchical than the Indic idiom.

A fundamental problem with a consequent use of 'indigenous' concepts is that it limits the types of questions that can be asked. It makes research of things that were not perceived by the indigenous population at that time impossible. Yet macro-economics, for instance, was often extremely relevant to the growth of cities. A limitation to indigenous concepts also virtually precludes systematic comparisons with cities in other cultures. On top of that, even the concepts that are based on indigenous perceptions cannot eliminate subjectivity. Just as other concepts, 'indigenous' concepts are usually described by twentieth century Western academics as well, making them modern Western interpretations of a historical Southeast Asian perception at best. As no one can escape subjectivity, it is better to be aware of it, limit it, and pose meaningful questions anyway.

9. Cities in Java, 1600-1800

Years ago McGee wrote that it was a pity that more thorough accounts of the towns of Northeast Java did not exist because they were important centres of political and maritime power.[39] My own research is on those cities in the seventeenth and eighteenth centuries. At this point the findings are only preliminary.

In this section I want to develop two arguments: that existing concepts often do not fit the available historical data, and that the value of any fixed concept that does not provide room for dynamic change is questionable.

On the first point, historical data on the Javanese cities of the seventeenth and eighteenth centuries make the popular dichotomy between Sacred Centres and Market Cities highly questionable. Inland cities like Plered, Kartasura, Surakarta and Yogyakarta did not fit many of the characteristics that are associated with Sacred Centres, and in reality they were not radically different from the coastal cities. From studies of historical maps and from reports by travellers it becomes clear that only their palaces and walled compounds were based on cosmological patterns. Even there sacred principles do not seem to have been observed too closely. The various palaces, both in the interior and along the coast, showed considerable differences.[40] The geometrical pattern of the palace in Jepara could not be detected at all, because the buildings were placed in an extremely disorderly way, making it resemble a labyrinth.[41]

If the palace compounds were meant to follow a cosmological pattern, this was not true for the rest of the settlement. There was not much cosmological planning about these kampungs, nor about the streets that connected them. At the beginning of the nineteenth century, Crawfurd described the cities in Central Java as an aggregate of rural villages.[42] The streets were often crooked, narrow, and muddy, and stone buildings were as rare in the interior as they were on the coast. Besides Javanese kampungs every city had special quarters for foreigners, which were also not built according to an Indic master plan. Migrants tended to build along morphological patterns that were common in their place of origin. In the cities of the interior, rulers and other aristocrats employed large numbers of Balinese and Makassarese mercenaries who lived in kampungs close to the palace. More telling is that all these cities had considerable Chinese quarters, especially in the eighteenth century. These quarters were usually located north of the *alun-alun* or city square and next to the main market place. The Chinese kampungs were often built in the shape of a long street surrounded by palisades.[43] This was patterned on the morphology of Chinese cities which were crosscut by two straight commercial streets that intersected at right angles.

The presence of groups of foreigners, all placed under their own autonomous chiefs, makes clear that in the seventeenth and eighteenth centuries all cities had a heterogeneous population. This raises the question of whether the ruler really was the absolute centre of the entire society, for not only were these foreigners placed under autonomous chiefs, but so was a large part of the Javanese population. Rather than being submerged in the ritual pomp and glory around the ruler, those Javanese aristocrats were usually extremely active in court intrigues, from which the king was not excepted. Conflicts were so common that Adas called Java a "contest state".[44] In reality, power was much more diffuse than the twin theories of *devaraja* and the Sacred Centre presuppose. In a sense this was reflected by the morphology of the Javanese cities. Many important aristocrats did not live in the palace but in walled compounds of their own, thereby morphologically stating their autonomy from the ruler as well. Usually the pious Muslims also had their own quarters.

The importance of trade for the inland cities is usually underestimated. Long before Surakarta became a palace city in 1746, it was already, under the name of Solo, a main centre for trade in Central Java. Every year merchants from this town sent large numbers of barges along the river Solo to the coastal cities of Sidayu and Gresik, where they traded mainly rice, cotton and pepper for salt and imported commodities.[45]

Another reason why the difference between inland and maritime cities in Java was only gradual was because coastal cities depended much more on agriculture than the concept of the Market City indicates. Agriculture was an important activity within every city, where the yards of the houses were used to produce vegetables and fruit. Reid was absolutely right in his claim that the cities consisted

of separate kampungs in which the Javanese lived under conditions that were similar to those in the rural areas. All houses were made of bamboo with thatched roofs, and were surrounded by fruit-trees and yards. To Europeans those kampungs looked like forests with houses in between. Both the coastal and the inland cities were surrounded by wet-rice fields that were worked by its inhabitants. In the beginning of the eighteenth century Valentijn listed fishery and the cultivation of rice as the most important economic activities in Semarang, while trade and the timber and textile industries were of lesser importance.[46]

Economically the Javanese maritime cities were perfectly integrated into the hinterland, and therefore it would be nonsense to describe them as isolated *emporia*. Urban markets were visited by peasants from quite some distance away. Trade in imported luxury items, such as Indian textiles and opium, was totally linked to the trade in local agricultural products. When, in 1678, trade in locally produced fish and salt in Semarang was interrupted because of political turmoil, the trade in luxury items also came to a halt, for lack of customers.[47] The cities in Java linked the rural markets to the markets in Batavia and the rest of Southeast Asia.

The conclusion has to be that a sharp dichotomy between inland and maritime cities is untenable. Of course, there were distinctions of scale, such as the fact that the palaces in the interior were larger than the ones in the port cities, but these were gradual rather than fundamental.

Anthony Reid's description fits the Javanese cities much better. They were, indeed, semi-rural, politically pluralistic, and dynamic. But it must be questioned whether the Javanese maritime cities in the seventeenth and eighteenth centuries were really Bourgeois Cities that had been dismantled by the rulers from the interior and by the Dutch East India Company. Many of the characteristics that Reid placed in the fifteenth and sixteenth centuries were still present in the later period. I cannot see much evidence for a structural dislocation of the cities. As the volume of trade grew from the middle of the seventeenth century onwards it is likely that the economic function of the cities became more important.

One factor that was certainly much different from the Bourgeois Cities as described by Reid was the size of the Javanese cities in the seventeenth and eighteenth centuries. By far the largest was Semarang, which had approximately 1 000 armed men in 1670, and exactly 1 691 armed men in 1704.[48] This suggests a size of 10 000 people at the most. Recently Lombard published an interesting description of Semarang around 1812, from which it appears that by then the population of Semarang had risen to 22 000.[49] Reid's claim that Surabaya had a population of between 50 000 and 60 000 in the sixteenth century is in deep contrast to the fact that in 1705 the number of armed men in Surabaya was only about 1 000.

Boomgaard and Wisseman Christie therefore seem justified in their conclusion that Java was not highly urbanized. I agree that the reasons for this must be sought

in the functions that the cities performed for the rural areas. What the Javanese cities in the seventeenth and eighteenth centuries seem to have lacked most of all was sizeable industry and a significant wholesale function. Most of the handicraft was produced in the rural areas by peasants who devoted their spare time to it. There was specialization, but it was on the level of certain villages that were specialized in, for instance, the making of mats. Important industries like shipbuilding, salt-production and sawing mills were decentralized and located in rural areas. Even the sugar mills, which involved relatively much capital, labour and skill, were situated in the country. Semarang was a centre of textile production, but most textiles were made in villages close to the city, in a sort of putting-out system. The only exception was complex metallurgy, such as the casting of guns and gongs. These industries seem to have been concentrated in cities like Kartasura, Semarang and Gresik. Economically, though, this sector was relatively unimportant. The bottom line is that although the cities did contain various industries, these urban industries were responsible for only a minor part of the total industrial production of Java.[50]

Cities also did not have a very dominant wholesale function. Most trade in Java was extremely small-scale: a large mass of small traders made small transactions with each other. Most commodities were not imported in bulk by wholesalers and then broken down in volume until the quantities became small enough for retailers. The trade was small-scale almost from the outset. Many maritime traders sailed along the coast stopping at various ports. They pulled their tiny ships onto the beach and sold to small peddlers and even directly to consumers. Even the Dutch East India Company sometimes had to send its soldiers to the markets to peddle textiles, for lack of wholesalers. There were some important Chinese merchants, but compared with Western Europe they were not very numerous.

One question that should be asked is why the cities did not have a competitive edge over rural areas. Bray claimed that it is in the nature of wet-rice economies to be small-scale. In contrast to Western grain-farming, Asian wet-rice cultivation could be improved by scale-neutral and relatively cheap capital inputs, but mainly by inputs of manual labour. The economy of scale did not apply here.[51]

Many aspects of the concepts on pre-modern cities in Indonesia do not fit the historical data. The sharp dichotomy between the Sacred Centre and the Market City seems especially untenable. A line of defence that is sometimes used is that the concepts are only *Idealtypen*, heuristic devices that should not be taken for factual descriptions of reality. However, surely a concept that does not mirror reality has little or no value. And if they are really just heuristic devices, logic seems to dictate that whenever they are used in history books, their formulation should be followed by a warning that reality was different. However, the differences between the concept and the historical reality are almost never pointed out. And if it is realized that there are many differences, then the concept should be replaced by a better one that does apply.

However, I do not want to leave it there, or suggest that the concepts should be replaced by other but similar ones. I seriously question the value of fixed concepts that only offer a set of static characteristics. These concepts do not explain how their particular type of city grew out of something else, nor how, in the end, the city was transformed into a new type again. The only way such static concepts can explain change is by referring to sudden intervention from outside forces. Colonialism is the textbook example here. According to these concepts, pre-modern cities did not change because they had inherent dynamics, but only because Europeans forced them to.

It is especially the twins of the Sacred Centre and the Market City that cannot cope with inherent dynamics. Yet, in the Javanese cities of the seventeenth and eighteenth centuries their dynamic was extremely clear. The cities changed constantly and, for instance, the Surabaya of 1800 was a very different city from the Surabaya of 1600. The cities changed in their ethnic composition and in the way ethnic groups defined themselves. This had important consequences for the morphology. One of the most important developments in this period was the influx of Chinese migrants after 1680. There had already been Chinese in Java for a long time, but immigration accelerated considerably after the end of the civil war in China and the lifting of the imperial ban on foreign trade. The consequence for the coastal cities in Java was that the newcomers formed large communities of their own. In places like Pekalongan it was only after 1680 that a separate Chinese kampung was established. In Jepara the Chinese community expelled Javanese from their quarters in 1679, after a fire had destroyed most houses. The Chinese blamed the Javanese for this, claiming that Javanese thieves deliberately started fires in order to benefit from the resulting confusion.[52] These Chinese kampungs soon reflected aspects of the morphology of the cities in the homeland. Rather than living in houses that were placed criss-cross amidst yards and groups of fruit-trees, as the Javanese did, the Chinese preferred living in homes along the streets, with shops at the front.

In the eighteenth century segregation of the Chinese quarters became even more marked. In many cities along the north coast of Java the Chinese community had become almost as large as the Javanese population, and they had their own social and administrative hierarchies, separated from the Javanese ones. Minor conflicts between the Chinese and the Javanese happened frequently, and they blamed each other for the ever recurrent fires. In 1727 both in Surabaya and in Semarang the Chinese surrounded their quarters with walls and moats.[53] By then the Chinese kampungs contained many brick buildings in Chinese style.

Javanese cities not only gained an important Chinese element, but also a European one. At the same time as the large-scale Chinese immigration began, that is around 1680, the Dutch East India Company built forts in the most important port cities. Those forts were consistently situated in the northern part of the towns, reflecting the close connection between the VOC and the sea.

Initially all Europeans lived within these forts, but soon the more permanent part of the staff occupied houses in town, leaving only the common soldiers in the fort. In time a small community of European mestizos and civilians grew, their houses situated close to the fort. In the eighteenth century parts of the cities were already beginning to look European. By 1740 Semarang, Jepara and Surabaya had become cities with canals, bridges and wide straight roads suitable for carriages.[54]

Other important dynamic changes that occurred in the Javanese cities in the seventeenth and eighteenth centuries were ecological. Gradually many swamps close to the cities were drained and brought into cultivation. This reduced the malaria that was endemic to lowland Java, and which was probably an additional reason why no large urban centres had developed along the coast. Any useful analysis of the pre-modern cities in Indonesia should deal with these and other dynamic changes, and not with fixed lists of supposed common characteristics.

10. Conclusion

Each of the concepts I have discussed has produced individual studies that have greatly enhanced our understanding of the pre-modern cities in Indonesia. Yet I believe that the various concepts put too much stress on their mutual differences. This is partly a consequence of placing the cities in dichotomies: Sacred Centres versus Market Cities, Colonial Cities versus indigenous cities, and so on. In reality coastal cities had a strong agricultural base as well, and cities in the interior a commercial function. The religious function was present both in the interior and on the coast, but in a more haphazard way than is usually presumed. It is true enough that cities in Southeast Asia frequently had important religious or commercial functions, but many additional characteristics that are often ascribed to Sacred Centres and Market Cities seem questionable.

Also the contrast between the Colonial City and the 'indigenous Indonesian city' looks gradual at best. The difference between Batavia at the beginning of the seventeenth century and other cities on the north coast of Java was real, but this seems to have been a result of the fact that Batavia was a new settlement. Historians should first answer the question why Batavia had so much more in common with other 'Colonial Cities' like Makassar than with 'indigenous cities' like Pontianak or Semarang, before they accept the use of the concept of the Colonial City as a separate category.

A deconstruction of the current concepts appears valuable, since it will force historians to have a closer look at the available historical data again. Too often the concepts mentioned have become static and non-historical constructions that are taken for historical reality. Reality has always been more complex and dynamic. I suggest that research of pre-modern cities should be initiated with that complexity and dynamism in mind. In this article I have given examples of themes that I

think are important, such as the creation of ethnicity as a social category in the cities, the role of shipbuilding and other industries, and the ecological impact of urbanization. Other examples are changes in the commercial relations with rural areas, and urbanization in the context of migration in general.

I have written this article in the hope that it will stimulate discussion and that it will help others in defining their concepts. I am well aware that writing a meaningful urban history is much harder than criticizing other peoples' views. Bachelor's wives and maiden's children are well trained.

NOTES

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IV

RECONSTRUCTING THE DEMOGRAPHIC REGIME OF AMSTERDAM 1681-1920

by

Marco H.D. van Leeuwen and James E. Oeppen[1]

'The human condition is so miraculous and intertwined, that this human knot will not so easily be undone.'[2]

'It is a most difficult task, the one we are about to undertake, and no one, unless he has done some research into the matter, can realize how difficult it is, and what caution is demanded in making exact calculations of the mortality of a town.'[3]

1. Introduction

'Engines of innovation', 'safety valves', 'graveyards': these images testify to the wide interest in population processes in cities of the past. Unfortunately, classic measurement techniques have only been able to open up this area of research to a limited extent. This article describes a new method - Generalized Inverse Projection or GIP - for deriving population estimates from data sources that are typically available for European cities in the past, and applies the method to data for Amsterdam, 1681-1920. Data quality is discussed and the robustness of the results is investigated by looking at the effects of different model assumptions. This article thus has a methodological orientation when assessing the potential of GIP for urban demography in the past, and a basic twist when discussing data quality and when offering estimates of Amsterdam population totals, mortality, migration and fertility from the late seventeenth to the early twentieth century. It opens the way for later substantive interpretations of Amsterdam demography.

2. *Some methods in urban historical demography*

Knowledge of the demographic regimes of cities in the past is of basic importance, not only for the demographic, economic and social history of those cities but, in a broader sense, for the societies of which they were a part. Large metropolises had a vast influence on their hinterlands.[4] Demographic patterns, economic developments and social relations in countries like England and the Netherlands were strongly influenced by London and Amsterdam. However, population processes within cities in the past are still largely *terrae incognitae*, as is evident from classic studies by Mols and De Vries.[5]

Parish registers of baptisms, marriages and burials established in Europe in the sixteenth and seventeenth centuries provide a rich source of demographic data for urban historians. For short term changes, a great deal of information can be derived directly from these series, given certain assumptions. For example, the fact that the number of burials in a town at any particular time was twice as high as in the periods immediately before or after, leads one to suppose that there must have been a mortality crisis. It is assumed that if the mortality rate remained constant the number of inhabitants in the city could not have risen rapidly enough to have created the illusion of a mortality crisis. Similar assumptions about the slow evolution of the base population are made when de- trending numbers of baptisms, marriages and burials in more sophisticated statistical analyses of demographic time-series and the relationships between them.

Understanding the longer term population dynamics of a city presents a much greater problem. Most demographic measures, whether concerning the individual or the aggregate, require a knowledge of the population exposed to the process ('the population at risk'). Often this information is simply not available when studying developments in a city over a long period of time. This is especially so if age at death is not recorded, or unreliably stated in the registers. Since, in most cases, migration is also unrecorded and since there may have been only sporadic or partial population counts in the early years of the data, the balance between baptisms and burials may be a poor guide to the evolution of the population and still less of a guide to the pure measures of fertility and mortality that demographers have developed to understand the forces of population change.

One of the strongest and most accurate methods for studying both long and short term developments of demographic regimes in the past using parochial registration data is family reconstitution, originally developed by Henry.[6] Basically, it is a set of precise rules for establishing the population at risk and the number of demographic events in a period, by linking information usually from parochial registration, and specifying which data can be used. Family reconstitution, however, has not often been applied to cities. Since its origin - about thirty years ago - it has been used mainly for the study of villages and the nobility.[7] This is because the method is extremely time-consuming, and because the particular sources

needed, namely baptism, marriage and burial registers, must be of outstanding quality.[8]

There is another class of measurement techniques which is less time consuming for applying in an urban context, and less demanding with regard to data. Some twenty years ago Lee devised a method which, in the absence of migration, could be used for estimating age distributions over a long period of time, using baptisms, burials and an age distribution at the beginning of the period.[9] This method - Inverse Projection - has subsequently been refined for application to open populations, provided an assumption on migration is made. Standard software is now available.[10]

Inverse Projection works as follows. Firstly, the migration rates have to be specified. This specification, given a later census as an end-point, automatically determines the population total in each period, since the balance of births and deaths is known. Secondly, an age distribution is assumed for the earliest population total. This is usually done by assuming a growth rate and a level of mortality sufficient to define the age-structure of a population closed to migration. Given these two conditions, an age-specific mortality table is selected from a family of such tables with exactly the right level of mortality to match the first observed total of deaths, and the initial 'census' is projected one time period. The process is then repeated for each period to build up a series of estimated 'censuses'. If it is assumed that age-specific fertility can be described adequately by a family of fertility tables in the same way as mortality, then the dynamics of a population can be defined in standard demographic terms. Inverse Projection has been a major innovation in historical demography. A drawback of the method, however, is that it needs a population total at the beginning of the period, and an initial age distribution, although the effect of wrongly specifying the latter decreases with time.

In 1981 Wrigley, Schofield and Oeppen devised a method - Back Projection - for estimating the same kind of information without *a priori* information on migration, and using a terminal instead of an initial census. This method was applied in a highly innovative study on the population history of England, 1541-1871.[11] Recently Oeppen showed that both Inverse Projection and Back Projection can be incorporated into the same framework, Generalized Inverse Projection.

3. Generalized Inverse Projection (GIP)

GIP acts as a sophisticated demographic interpolation algorithm. It constructs a series of censuses which form the smoothest population trajectory consistent with the known data and the assumptions. Estimates are dependent on assumptions as well as on data. GIP can operate in the spirit of Back Projection and, if information

on initial population size, age distribution and an assumed migration rate are supplied, in the spirit of Inverse Projection.[12] Broad outlines of the method are sketched below.

The data used are numbers of births and deaths (without age distribution) for the whole period studied, and the age distribution of the population in the final year. GIP also requires the following: a family of net migration schedules, a family of life tables and an optimization procedure. The life table describes the mortality of a population, giving the probability of dying in each age group. The net migration schedule gives the probability of migrating per age group. A life table and a net migration schedule specify the age specific form of the mortality and migration curves only. The core of GIP is formed by simultaneous estimation of the level of mortality and net migration in one optimization. It is achieved by using an optimization procedure to minimise an 'objective' or 'penalty' function.

The optimization procedure selects a demographic system - that is age structure of a population, its mortality and migration level - which generates as closely as possible the observed data, *i.e.* the recorded number of deaths, the numbers per age group in the final census and, if available, other information such as population totals. These data function as 'targets'. The optimization procedure selects the demographic system which is most consistent with the observed data and the assumptions by minimizing the sum of squared errors (SSE) in the objective function, that is with as little difference as possible between estimated and recorded values of the targets. The optimization procedure used is a standard non-linear least- squares algorithm. The procedure allows the user to examine the sensitivity of the results to individual parameters and to discover which data points contribute most to the SSE. Its specification allows any assumption or piece of data to be incorporated and used to influence the estimation process. For example, a particular age-group in a census may be given less weight than the others because it is assumed to be less accurate, or an early census may be a target even though it only counted the population over a certain age.

To avoid specifying an initial census, GIP assumes that the population to be estimated was growing or declining at a fixed rate r before the beginning of the series of birth and deaths. This is to allow for the fact that the sizes of the original birth cohorts are unknown for some of the age-groups in the early estimated censuses. The value for r can be specified *a priori* or approximated from the early years of the series of births totals.

When a region is studied over T periods, GIP estimates 2T parameters; that is T for migration and T for mortality. The number of targets is T for observed deaths and, if a final census is used, there are also K targets for the age groups in the census. For C additional population counts in the period studied, this makes T+K+C targets. The demographic regime can be estimated using conventional projection methods if the number of targets is equal to, or higher than, the number of parameters to be estimated. If T+K+C is less than 2T then additional targets are

needed. These may be life expectancies from family reconstitution or life annuities or other measurable features of the demographic system. If such information is not available, one option is to specify extra smoothness targets for migration. This means that migration levels should fluctuate as little as possible. Such a smoothness constraint on migration has a pragmatic rather than a theoretical justification. It selects a smooth population surface from the infinity of surfaces that are implied by the data. Smooth reconstructions have had wide application in statistical methods and underly the stationary (zero growth) and stable (fixed growth) models of demography. Of course, other targets are also possible. In the Amsterdam case, for example, there is information on migration from marriage registers, and this may be converted into targets.

GIP has a high 'yield': a large part of the demographic past, in terms of basic demographic measures over long periods and for many regions, can potentially be reconstructed with minimal data and without the heroic efforts involved with *e.g.* family reconstitution. This high yield comes at a price however. The results are not only dependent on the quality of 'raw data', but also on the 'truthfulness' of the model assumptions. The use of one family of migration schedules and one family of life tables means that the age-specific form of migration and mortality are supposed not to have changed over time. These are unrealistic assumptions.[13] The selection of extra targets is somewhat arbitrary, which is in part a virtue since it allows a researcher to use whatever is available, but it also makes the estimates dependent on these extra targets. If no initial population size is available, the same applies to the specification of the initial growth rate r, and Lee has recently criticized the use of GIP in these situations.[14]

Reliability of GIP-results can be studied in two ways. Results can be compared with other independently acquired data, *e.g.* mortality levels compared with life expectancies based on life annuities. In addition to this kind of 'external checking', 'sensitivity testing' is possible, where the robustness of the results to changes in data and model assumptions is studied. If the results are highly dependent on an assumption which cannot be made with accuracy, proper sensitivity testing will show this.

4. Data

The available series of births, deaths and censuses and their quality are reviewed *in extenso* below. Such a review may in itself be useful for those interested in urban historical demography in general and in Amsterdam in particular. Furthermore, the review sets out to identify known or presumed data flaws and to give some indication of their direction, magnitude and timing. This information can then be used to construct an alternative data set. The effect of data imperfections

on GIP-estimates becomes clear when using the alternative data set in a GIP-experiment.

Numbers of births for the years 1681-1810 were taken from Nusteling who had used counts made by Hart from baptism registers for the period 1681-1700 and from a contemporary list published by the Amsterdam Municipal Bureau of Statistics for the period 1701-1810.[15] For the period 1811-1920 we used tabulations by the Bureau of Statistics, based on civil registration data.[16]

Nusteling corrected Hart's counts for the years 1681-1700 for gaps in the registers, for underregistration of unbaptized children and for missing numbers of Jewish births.[17] He also applied the last two corrections for data for the years 1701-1810. Numbers of births in the period 1681-1700 are not known to be problematic, neither are those after 1815[18].

There are four problems, however, for the period from the beginning of the eighteenth to the second decade of the nineteenth century. First, the contemporary list used by the Amsterdam Municipal Bureau of Statistics and subsequently by Nusteling is not accurate. A count made by Hart for the years 1776 and 1777 of the numbers of baptisms in the baptism registers (augmented by the number of Jewish births) showed differences between numbers counted and those in the contemporary list. Hart's count is 5.5 % lower in 1776 and 12.4 % higher in 1777; for both years together the difference is 3.8 %.[19] Nusteling argued that the contemporary list does not include Jewish births and that Hart's comparison is thus flawed. He went on to compare this list with counts by Hart, now excluding Jewish births. Hart's numbers are then 9.0 % lower for 1776 and 10.2 % higher for 1777; for both years together, Hart's count is only 1.0 % higher.[20] Next, Nusteling compared the contemporary list with another count, this time of births in 1739 and 1740 (excluding Jewish births), published by Struijck. Struijck's number is 2.9 % higher for 1739 and 1.5 % lower for 1740 and for both years 0.7 % higher.[21] This led Nusteling to conclude that the contemporary list used by the Municipal Bureau of Statistics is, by and large, reliable - for example in periods of five years.[22]

Using available material it was possible to investigate this question further. Three short series of baptisms exist:

(1) Struijck's tabulations of numbers of baptisms in two churches, the Nieuwe Kerk and the Amstel Kerk, 1700-1740;
(2) Peter Jansen's count of numbers of baptisms in Dutch Reformed churches and Lutheran churches, as published in the 'Amsterdamsche Courant', 1750-1790;
(3) Nieuwenhuijs' tabulation of numbers of baptisms in Dutch, Walloon and English Reformed churches and in Lutheran churches, 1771-1799.

These series of (uncorrected) numbers of baptisms were compared to the series of uncorrected baptisms in the contemporary list used by Nusteling and the Bureau of Statistics. As the three series relate to a part and not to all baptisms, their absolute numbers are lower but, if consistent, should show a more or less similar

development. The ratios of the three series to the contemporary list are shown in Table 1.

Table 1. *Ratio between the total number of births in Amsterdam 1701-1800 according to a contemporary list and the number in certain churches according to three studies.*

	Struijck	Jansen	Nieuwenhuijs
1701-1710	0.11		
1711-1720	0.09		
1721-1730	0.10		
1731-1740	0.10		
1741-1750			
1751-1760		0.64	
1761-1770		0.73	
1771-1780		0.73	0.73
1781-1790		0.79	0.79
1791-1800			0.79

Note: Missing numbers for 1763, 1773 and 1799 have been estimated by multiplying the decennial totals by 10/9.

Sources: N. Struijck, *Vervolg van de beschryving der staartsterren en nader ontdekkingen omtrent den staat van 't menslijk geslagt* (Amsterdam 1753) 126-127; unpublished material collected by Peter Jansen; C.J. Nieuwenhuijs, *Proeve eener geneeskundige plaatsbeschrijving (topographie) der stad Amsterdam* (Amsterdam 1816) Table M (after page 268).

Correspondence with the series of Struijck and Nieuwenhuijs is reasonably good, although differences do exist. The same applies to correspondence with Jansen's numbers, except for the decade 1751-1760.

The second problem is that the number of missing Jewish births has to be taken into account. Around 1622, the percentage of Jewish inhabitants was very low and less than 1 %.[23] Also at the end of the seventeenth century few Jews lived in Amsterdam but they grew considerably in number during the eighteenth century, and were up to 7.9 % of the population in 1795.[24] So it was clear that the number of Jewish births was not negligible and needed to be estimated. Surviving Jewish birth registers are incomplete and suffer from considerable underregistration. Nusteling estimated the number of Jewish births on the basis of numbers of Jewish

marriages as a percentage of the total number of marriages in Amsterdam.[25] This assumes that the ratio between crude birth rate and crude marriage rate for Jews and non-Jews are alike. There were three ways to test this. The first was to begin with circumcision registers.[26] These registers relate to Jewish boys (excluding those who died before circumcision) and so must be corrected for the non-registration of Jewish girls. The latter can easily be done by using a fixed sex ratio at birth of 105 boys to every 100 girls. A second possibility was to estimate the number of Jewish inhabitants on the basis of linear interpolation between the known numbers in 1622 and 1795, and the third was to assume a constant crude birth rate. Although a comparison between these two estimates (not shown here) and that of Nusteling showed differences, all series generally show an identical trend in the eighteenth century, namely a doubling. Hart also gave numbers of Jewish deaths. When expressed as a percentage of total deaths, they too showed a doubling.[27]

The third problem is that of underregistration of infants who died before being baptized. This is a potentially large problem, which can be made clear by a simple example.[28] An infant mortality rate under the age of one of 250 per thousand, with half dying in the first month, and with once again half being registered in the baptism registers and half being unregistered, produces an underregistration of ca 6 %. Nusteling assumed a fixed level of underregistration of 1.5 %.[29] It is based on two sources, both giving a higher number. Nusteling referred to data given by Struijck for the small Dutch village of Broek in Waterland in the middle of the eighteenth century.[30] Underregistration in this village amounted to 2.5 %. The assumption of a lower level for Amsterdam is potentially problematical, because it is likely that underregistration in a small village was lower than in a large city. The second source is data on 'stillbirths' in 1789, collected by the 'Collegium Medicum'.[31] These are not included in the birth registers but, at least partially, in the burial registers and amounted to 2.5 % of all burials (slightly less in baptism percentages). In addition to the problematically low level of assumed underregistration for Amsterdam over the whole period, there was another problem for part of the period. Taking a fixed rate does not take into account the rise of delayed baptism in the Netherlands after the end of the eighteenth century. Mentink and Van der Woude have shown that the period between birth and baptism in Rotterdam increased after 1790.[32] This increase did not, however, lead to an increase in the percentage of early deceased and unbaptized children in the city. This was 2.2 % for the period 1775-1784 and 2.1 % for 1800-1809. A possible solution to this paradox is that parents had weak children baptized quickly. Possibly lay baptism was practised. If this holds true for Amsterdam too, the phenomenon of delayed baptism in itself does not invalidate Nusteling's correction, but the assumed level of underregistration might be too low.

The fourth (and last) problem relates to the possible failure of birth registration in the first years of civil registration, introduced while the country was still under

French rule. The existence of such a failure was claimed by the Amsterdam physician C.J. Nieuwenhuijs in his topography.[33] According to him, the inhabitants of Amsterdam did not feel at home in the new system of civil registration and feared that the French government would use it for purposes of conscription. This is not as nonsensical as may be thought as the French armies were always hungry for soldiers. The 1795 census committee also mentioned distrust of the French government as a cause of underregistration. It was feared that the census would serve as a basis for a poll-tax.[34] It thus remains possible that birth registration in the first years of its existence was imperfect.

For 1811 onwards we used data from civil registration, as published by the Municipal Bureau of Statistics. They were purged of a small error for the years 1811-1840.[35] When expanding the birth series to 1920, annexation of bordering municipalities in 1896 has to be taken into account. The total population in the annexed area is known for the years 1899, 1901, and 1920 but not numbers of births separately.[36] These were estimated by using the total number of births, and the ratio between total population size and that of the annexed area. For years between censuses, linear interpolation was used. This assumed that crude birth rates in the annexed area were similar to those of the rest of the town. Although undoubtedly not altogether correct, it seemed acceptable, especially given the fact that the number of inhabitants of the annexed area formed only 9 % of the total number of inhabitants of Amsterdam.

Nusteling also presented birth data for the period 1586-1680 (corresponding death totals are not available).[37] Although, these early birth data might have been useful for a calculation of the growth rate (r) of the pre-1680 cohorts, we did not use them. One problem we faced was that there are no data for Roman Catholic baptisms until 1628 and after that date they show a considerable and varying degree of underregistration.[38] This is illustrated by the fact that the percentage of Roman Catholic baptisms stood at around 1 % in the third decade of the seventeenth century, rising in the ninth decade to ca 18 % without such a marked increase in the percentages of Roman Catholic inhabitants.[39] Nusteling argued that this underregistration is, in fact, a case of 'optical illusion' for he assumed that all Roman Catholics had their children baptized in the Dutch Reformed church until 1628, thereafter moving gradually towards their own church. This would mean that all children of all Roman Catholic parents, missing in the Roman Catholic baptism registers, are registered after all, but in the books of the Reformed churches.[40] This view seems unlikely for two reasons. First this practice must have had its heyday at the end of the sixteenth century and at the beginning of the seventeenth, that is just after the Alteration (from Catholic to Protestant city government) with its religious disputes. Second, it has not been substantiated. It may be the case that some Roman Catholic parents had their children baptized in a Reformed Church, but it is unlikely that they all did so. It seemed better to adhere to Hart's view: missing is missing.

All in all, it is clear that the available birth series can be used from 1680 onwards. Table 2 presents the numbers of births. They may not be perfect, and as an alternative the number of births may be raised by 5 % before 1790 and by 10 % in the years 1790-1820.

Table 2. Births and deaths in Amsterdam 1681-1920.

	Births	Deaths
1681-1685	31 969	38 955
1686-1690	36 674	36 561
1691-1695	35 993	38 886
1696-1700	39 052	35 812
1701-1705	34 351	37 399
1706-1710	34 370	33 666
1711-1715	35 105	35 799
1716-1720	33 893	39 700
1721-1725	35 731	36 641
1726-1730	36 795	51 406
1731-1735	36 494	39 682
1736-1740	38 268	42 726
1741-1745	37 062	39 264
1746-1750	35 456	41 894
1751-1755	36 883	34 864
1756-1760	37 597	36 816
1761-1765	35 139	38 783
1766-1770	37 295	38 461
1771-1775	36 048	40 205
1776-1780	36 837	44 622
1781-1785	36 777	44 740
1786-1790	34 551	41 497
1791-1795	36 019	40 980
1796-1800	36 832	41 653
1801-1805	36 542	35 939
1806-1810	35 912	37 042
1811-1815	32 855	38 524
1816-1820	34 547	32 393
1821-1825	37 336	31 853
1826-1830	36 245	36 731
1831-1835	34 363	36 287
1836-1840	37 544	34 381
1841-1845	38 542	33 912
1846-1850	37 447	42 025
1851-1855	40 815	34 734
1856-1860	39 857	36 891
1861-1865	43 697	31 724
1866-1870	44 003	34 856
1871-1875	48 294	38 688
1876-1880	55 636	38 451
1881-1885	65 503	44 360
1886-1890	70 256	44 090

Table 2 continued

	Births	Deaths
1891-1895	71 435	41 787
1896-1900	69 558	38 238
1901-1905	69 586	36 608
1906-1910	64 642	34 419
1911-1915	62 851	31 789
1916-1920	64 047	37 511

Sources:
1681-1810: H.P.H. Nusteling, *Welvaart en werkgelegenheid in Amsterdam 1540-1860. Een relaas over demografie, economie en sociale politiek van een wereldstad* (Amsterdam 1985) 242-43;
1811-1920: *Statistische Mededeelingen van het bureau van Statistiek der Gemeente Amsterdam* 67 [= Statistiek der bevolking van Amsterdam tot 1921] (Amsterdam 1924) 136-139, 179-181, with corrections for stillbirths in the years 1811-1840 and for annexation in the years 1896-1920.

Deaths

Numbers of deaths for the period 1681-1810 were taken from Nusteling, and based on counts by Hart from burial registers until 1700, and on a contemporary list thereafter. For the period 1811-1920 civil registration data were used, as tabulated by the Municipal Bureau of Statistics of Amsterdam.[41]

In general, burial registers were of good quality in Amsterdam and for the years 1681-1700 most of them have been preserved.[42] Nusteling made small corrections to Hart's tables to correct for missing data for certain years and for some churchyards.[43] For the years after 1700, Nusteling used contemporary reports on the numbers of deaths as collected yearly and published in the 'Amsterdamsche Courant' and other newspapers. Numbers of deaths for the period 1774-1810 were also known from a different source. They were counted for a medical board, the 'Collegium Medicum', and published by Nieuwenhuijs.[44] A comparison of these numbers with those presented by Nusteling demonstrated that both series are much the same. Nusteling's series concerning the period 1774-1810 had, on average, only slightly (1 %) lower numbers than the Collegium Medicum reports.[45] However, one subperiod stood out. For the years 1803-1810 Nusteling's series is 10 % lower than the 'Collegium Medicum' reports; in 1807 the difference even amounts to 32 %. After 1811, data come from civil registration and are generally considered reliable. When extending the series beyond 1896 to 1920, a correction for annexation of border-municipalities was made similar to the one for the birth series.

One conclusion is that, as far as can be ascertained at present, the available series of deaths can be used. Table 2 presents the numbers of deaths. The quality of the church-data, however, is not beyond suspicion. One possible flaw concerns the years 1801-1810 and as an alternative, the number of deaths in this decade may be raised by 10 %.

Census data

The age distribution of the total Amsterdam population in 1920 has been used by GIP. It was recorded in the census for that year but had to be corrected to exclude the population of the area annexed in 1896, to which the birth and death series do not relate. The total number of citizens of this area is known, but their age distribution is not. We assumed that this age-distribution was similar to that of the town as a whole. Although undoubtedly not altogether correct, it was deemed acceptable because only 9 % of the total town population lived in the annexed area in 1920. Tables 3 and 4 present census material.

Table 3. *Census totals in Amsterdam 1795-1920.*

Date	Raw	Corrections			Result	Sex	ratio
		1	2	3		4	5
14/10/1795*	217 024	221 000		222 458	222 458	123.4a	-
16/03/1809	201 714b	205 426			205 423	127.2b	-
/04/1811*	200 430c	204 118			204 118	122.0c	-
/03/1812	194 196	197 769			197 769	125.6	-
01/02/1815*	1801 79	183 494			183 494	125.6	-
/09/1821*	1914 60	194 983			194 983	-	-
05/10/1826*	2007 84	204 478			204 478	-	-
29/01/1828	200 190	203 873			203 873	-	-
10/02/1829	202 769	206 500			206 500	-	-
31/12/1829*	202 175	205 895			205 895	123.9	137.3
31/12/1839*	211 349	215 238			215 238	121.7	130.8
19/11/1849*	224 035	228 157			228 157	120.0	125.7
31/12/1859*	243 304				243 304	118.6	123.7
01/12/1869*	264 694				264 694	116.9	122.4
31/12/1879*	317 011				317 011	113.8	116.7
31/12/1889*	408 061				408 061	112.6	116.2
31/12/1899*	510 853		467 793		467 793	111.7	116.5
31/12/1909*	566 131		525 585		525 585	109.9	114.3
31/12/1920	647 427		589 573		589 573	107.1	109.2

Notes:
*) Used as targets in GIP-experiments.
1) Increased for underregistration with 1.84 %
2) Excluding the area annexed in 1886.
3) Including *transitoire vreemdelingen*.
4) Number of women per 100 men.
5) Ibidem, for age groups 20-49.
a) Excluding 1958 *transitoire vreemdelingen*, whose sex is unknown.
b) Including 2242 male soldiers. Excluding these the sex ratio is 125.1.
c) Including 1441 male soldiers. Excluding these the sex ratio is 122.7.

Sources:
1795: J.P. Farret, A.G. Verster & J.H. van Swinden, *Rapport over de telling van het volk van Amsterdam* (Amsterdam 1795) 4- 6;
1809: Gemeente Archief Amsterdam [GAA]: Vol. 5053 (N.St.B.): 252, appendix 284;
1811: GAA: Particulier Archief [PA] 349 (HZH): Vol. 322, appendix 12;
1812: GAA: PA 349 (HZH): Vol. 323a, appendix 19;
1815: GAA: PA 349 (HZH): Vol. 323b, appendix 11;
1821: GAA: Vol. 5181 (AZ) 1821: 2575;
1826: GAA: Vol. 5186 (AZ) 1826: 3979;
1828: GAA: Vol. 5186 (AZ) 1828: 688;
1829: GAA: Vol. 5186 (AZ) 1829: 954;
1829-1889: *Statistische Mededeelingen van het Bureau van Statistiek der gemeente Amsterdam* 100 (1934) 7-11;
1899-1920: *Statistische Mededeelingen van het Bureau van Statistiek der gemeente Amsterdam* 72 (1924) Table 5.

The first census in the period studied dates from 1795.[46] Some attempts were made to estimate the total number of inhabitants in earlier years on the basis of total numbers of marriages and an assumed constant marriage rate, but the appendix to this article shows that this is not a reliable method. The 1795 census is a local count, generally considered reliable. It was carried out by men familiar with the situation in their districts. They were given written instructions on how to count by a coordinating committee presided over by the mathematician J.H. van Swinden. Despite these precautions, counting was not perfect. The committee itself explicitly paid attention to the problem of underregistration: 217,024 inhabitants of Amsterdam and 1958 travellers (*transitoire vreemdelingen*) were counted, but an estimated 4000 people had escaped the counters' attention. This amounts to an underregistration of 1.84 %.

Between 1795 and 1829 local censuses were held at irregular intervals.[47] Nationally organized censuses have been held since 1829. In the first half of the nineteenth century, censuses possibly suffered from a varying degree of underregistration; only the 1859 census is generally considered relible.[48] The level of underregistration is unknown, and various opinions about it exist. Van Tijn argued that the counts of 1811, 1812, and 1815 saw a greater underregistration than those

Table 4. *Age distribution of the Amsterdam population according to censuses 1829-1920.*

Age	1829	1839	1849	1859	1869	1879	1889	1899	1909	1920
0-4	23 906	25 793	24 027	27 576	31 672	41 992	54 838	57 806	56 551	57 065
5-9	22 632	20 972	23 622	24 668	26 914	31 686	43 438	52 575	54 001	53 965
10-14	18 505	20 763	21 168	21 714	23 273	29 017	39 673	48 907	53 067	52 830
15-19	16 438	20 959	19 467	22 405	23 469	28 258	36 698	43 591	51 320	53 839
20-24	16 966	18 560	21 355	21 085	21 416	26 520	36 500	42 343	48 707	56 421
25-29	17 193	17 248	21 213	19 280	21 444	25 803	33 587	36 911	43 300	54 383
30-34	15 871	15 791	18 039	19 534	19 398	22 165	28 503	33 878	39 891	47 350
35-39	14 560	15 776	15 653	19 058	17 695	21 254	26 557	30 348	34 052	41 527
40-44	13 243	13 014	13 870	15 596	17 323	18 701	22 006	25 121	30 981	37 627
45-49	9 904	11 775	12 788	13 045	16 477	16 118	20 570	23 397	27 719	32 409
50-54	9 776	10 366	10 781	10 941	13 165	15 250	17 420	18 803	22 228	27 312
55-59	7 981	7 194	8 605	9 667	10 322	13 983	14 058	16 658	20 092	24 210
60-64	7 013	6 023	7 242	7 394	7 856	10 182	12 539	13 064	14 772	17 454
65-69	5 187	4 727	4 478	5 406	6 399	7 104	10 229	9 683	12 125	14 116
70-74	3 473	3 299	2 931	3 422	4 028	4 538	6 184	7 320	8 275	9 266
75-79	2 033	1 752	1 749	1 605	2 334	2 779	3 305	4 795	4 869	5 812
80-84	806	813	812	609	983	1 160	1 326	1 922	2 522	2 892
85-89	306	316	251	212	284	403	476	553	924	865
90-94	79	63	78	32	51	66	92	99	162	202
95-99	20	35	18	4	11	9	10	18	17	25
100+	2	0	0	0	2	3	0	0	1	3
?	0	0	11	51	178	20	52	2	9	1
TOTAL	205 895	215 238	228 157	243 304	264 694	317 011	408 061	467 793	525 585	589 573

Notes:
1) Numbers for 1829 and 1839 were increased by 1.84% for underregistration.
2) In the 1829 and 1839 census some age groups were regrouped (pro rata) to fit the age-groups used here.
3) Numbers for 1899, 1909 and 1920 were corrected to exclude the area annexed in 1896.

Source: See Table 3.

of 1795, 1809, 1829, 1839, and 1849, but he considered the latter group not very reliable either.[49] For the 1849 count no less that 10 % of the urban population is believed to have been ignored.[50] However, Knotter argued that underregistration was in fact smaller.[51] Nevertheless, he also regarded the counts from the first half of the nineteenth century as too low. Nusteling, in contrast, stated that the 1809, 1811, and 1812 counts were overregistered.[52] He believed later counts to be reasonably reliable. Finally, Diederiks considered the 1810, 1811, and 1815 counts as unreliable as that of 1795.[53] It is clear that different opinions exist, but at present it is not possible to determine which is most plausible. A practical solution is to apply the estimated degree of underregistration of the 1795 census to all censuses prior to that of 1859. This is not entirely satisfactory, for it is still possible that the correction is too low for a number of counts.

Although the 1859 census showed less underregistration, a new problem arose. Censuses for the period 1795-1849 were concerned with all people actually (*feitelijk*) staying in Amsterdam.[54] Censuses for 1859 and the following years were concerned with all those permanently (*werkelijk*) living in Amsterdam. Unfortunately, there is a difference between the two. In 1859 and the following years, those who happened to be in town at the time of the census but otherwise lived elsewhere were not taken into account. Instead, those who lived in Amsterdam but happened to be out of town during census days were included. For 1859 therefore there is thus a flaw in the series of population numbers. Differences between *feitelijk* and *werkelijk* population were, however, not large. The (poorly kept) population register states that the *feitelijk* population in 1859 was 2.2 % higher than the *werkelijk*.[55] So more inhabitants of Amsterdam were temporarily out of town than non-inhabitants temporarily in town. For other years no data on *feitelijk* population size are available. There are also series of *feitelijk* and *werkelijk* births and deaths.[56] Differences between the two did not appear to be large over the period 1850-1920. However, they changed in the course of time and, in addition, were different for births and for deaths. The *feitelijk* numbers of births at the beginning of the period were 0.6 % higher, but decreased until the difference was 0.2 %, rising again to a 0.6 % difference at the end of the period. The *feitelijk* numbers of deaths around the middle of the nineteenth century were 3.5 % lower than the *werkelijk* but rose until they were 2.2 % higher.

In conclusion, it is clear that a probably very minor but unrepairable flaw exists in the series of censuses for 1859. More important, we conclude that the censuses for 1795, 1859 and later are reliable but those in the first half of the nineteenth century and especially those for the years 1811-1821 may suffer from a higher degree of underregistration than is allowed for. As an alternative, population totals in those years may be increased by 10 %.

A review of the available data identified several potential flaws and these resulted in the construction of an alternative data set for use in one of the GIP-experiments. The alternative data set raises the number of births by 5 % for the years 1681-1790 and by 10 % for the years 1791-1820, allowing for a higher level of underregistration of infants who died before being baptized and for possible flaws in birth registration in the first years of civil registration. It raises the number of deaths in the years 1801-1810 by 10 % to cope with underregistration in a period of high mortality. It is generally agreed that the censuses for 1795, 1859 and later are reliable, but that the counts for the years 1811-1821 may be too low, even after correcting for underregistration. The alternative data set therefore increases the latter by 10 %.

5. Model assumptions and results

A two stage research design was employed. First, GIP was used in the spirit of Back Projection, that is without an initial census or equivalent information. Secondly, GIP operated in the vein of Inverse Projection. In the Amsterdam case this did not mean the incorporation of an initial census, since such data are unknown. Nevertheless, two sets of information for the period before 1795 were available for us. The first relates to life expectancies calculated by Alter from life annuities in the years 1673-1737,[57] the second relates to migration streams as found in the Amsterdam marriage registers before 1811. These registers, which contain information on places of birth of bride and bridegroom, made it possible for us to calculate the percentage of migrants at marriage.

GIP-results are not data but estimates. Both when GIP operates as Back Projection and when it operates as Inverse Projection, assumptions have to be made. The use of one family of migration schedules or one family of lifetables, for example, is necessary but simplistic. The resulting GIP-estimates can not be expected to fully capture the rich detail of historical reality over more than two centuries. As it is very important to determine the sensitivity of the estimates to reasonable changes in assumptions - or data -, several sensitivity tests had to be run. In the

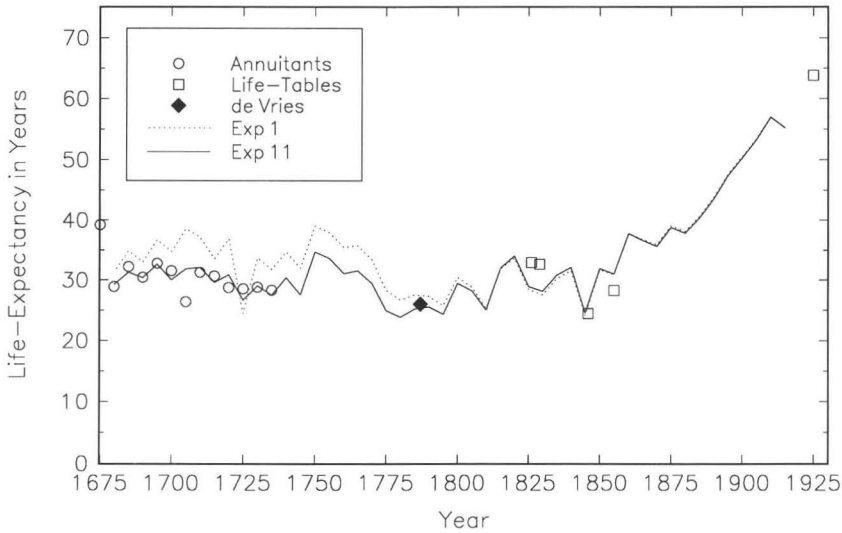

Figure 1: *Life-expectancy in Amsterdam 1681-1920 acoording to GIP and other estimates.*

Table 5. *Design of GIP-experiments.*

No	Name
	Without incorporating pre-1795 external information
1	Births and deaths from Table 2; 14 census totals from Table 3; age groups at the final census from Table 4; Swedish migration schedule, Amsterdam 1921-30 life Table and fertility schedule from Table 6; smoothing migration rate with lambda= 0.1; initial annual growth rate from births (r = 0.058 %).
2	As Experiment 1 but with 1850-59 Amsterdam life table (Table 6).
3	As Experiment 1 but with Amsterdam 1974 migration schedule (Table 6).
4	As Experiment 1 but with high lambda (= 0.5).
5	As Experiment 1 but with low lambda (= 0.05).
6	As Experiment 1 but with very high r (on average 1.5255 %)
7	As Experiment 1 but with high r (on average 0.4209 %).
8	As Experiment 1 but with alternative dataset.
	Incorporating pre 1795 external information
9	As Experiment 1 but with life expectancies from annuities (Table 7) as targets.
10	As Experiment 1 but with migration before 1795 modelled after information in marriage registers (Table 8).
11	Combining Experiments 9 and 10.
12	As Experiment 11 but with high lambda (= 0.5).
13	As Experiment 11 but with low lambda (= 0.05)
14	As Experiment 11 but with very high r (on average 1.5255 %)
15	As Experiment 11 but with high r (on average 0.4209 %)

first stage of the research attention was focussed on Experiment 1 (but variations on this theme were also investigated in Experiments 2-8). In the second stage of the research attention was focussed on Experiment 11 (but alternatives were investigated in Experiments 12-15). An overview of all experiments is given in Table 5.

First stage

For the first experiment we used births, deaths, fourteen census totals and twenty age groups from the final census of 1920. We used a family of life tables based on the Amsterdam life table for the years 1921-1930, a family of migration

Table 6. *Life tables, migration and fertility schedules.*

Age group	Life tables Amsterdam 1921-30	Amsterdam 1850-59	Migr. schedule Swed.cities 1891-1900	Amsterdam 1974	Fert. schedule
0-4	0.95103	0.67072	0.0338	-0.0634	0.0000
5-9	0.97723	0.79800	0.0409	-0.0615	0.0000
10-14	0.99315	0.95972	0.0441	-0.0561	0.0000
15-19	0.99216	0.97021	0.2266	0.0033	0.0250
20-24	0.98852	0.96018	0.2434	0.2677	0.1275
25-29	0.98706	0.94781	0.1568	0.1256	0.2525
30-34	0.98660	0.93704	0.0901	0.0219	0.2650
35-39	0.98467	0.92861	0.0533	-0.0167	0.2000
40-44	0.97921	0.91656	0.0297	-0.0313	0.1075
45-49	0.97302	0.90414	0.0221	-0.0370	0.0225
50-54	0.96157	0.88215	0.0159	-0.0393	0.0000
55-59	0.93849	0.84203	0.0143	-0.0399	0.0000
60-64	0.90719	0.81114	0.0117	-0.0394	0.0000
65-69	0.85979	0.74354	0.0094	-0.0375	0.0000
70-74	0.78352	0.63056	0.0035	-0.0337	0.0000
75-79	0.68010	0.51082	0.0018	-0.0271	0.0000
80-84	0.55293	0.35859	0.0009	-0.0166	0.0000
85-89	0.39821	0.23146	0.0018	-0.0005	0.0000
90-94	0.19803	0.15469	0.0000	0.0000	0.0000
95-99	0.04229	0.12475	0.0000	0.0000	0.0000

Notes:
The life table gives an intercensal survival rate, that is the probability of surviving from age group A at time T to age group A+5 at T+5.
The migration schedule gives the probability of migrating per age group, in a stylized version.
The fertility schedule gives the distribution of births over the age groups.

Sources:
Life tables: *Statistisch Jaarboek voor het Koninkrijk der Nederlanden.* (1867) 346-349; *Statistische Mededeelingen van het Bureau van Statistiek der gemeente Amsterdam* 100 (1934) 51.
Migration schedules: *Emigrationsutredningen. Bilaga V, Bygdestatistik* (Stockholm 1908-1913) for Swedish cities; Amsterdam model parameters from: A. Rogers & L.J. Castro, *Model migration schedules* (Laxenburg 1981).
Fertility Schedules: A.J. Coale, P. Demeny & B. Vaughan, *Regional model life tables and stable populations* (New York 1983) 30.

schedules based on data for Swedish cities in the period 1891-1900 and a model fertility schedule by Coale and Demeney. The use of such model tables or schedules is required in population projections studies in general and GIP in particular. The effect of potentially not having chosen an optimal model, could be, and was, studied by looking at the effect of using an alternative model. Migration rates over the whole period were smoothed with lambda equal to 0.1 (the meaning of lambda is discussed below). The initial growth rate for the incomplete cohorts was estimated by regressing the births over time and amounted to 0.058% (compound annual rate). As well as Experiment 1, fourteen alternative experiments were made: seven without incorporating the external pre-1795 information on mortality and migration and seven with incorporation.

We carried out four independent checks on the results in Experiment 1. First, mortality levels according to GIP were compared with those estimated by Alter using life annuities, with an estimate by De Vries and with those based on population registration (Table 7). Small differences between GIP-estimates and the latter are likely if only because GIP works with one life table for the whole period, and therefore cannot capture short term fluctuations in the age pattern of mortality *e.g.* caused by mortality crises (leaving aside errors in the population registration with regard to ages at death). Small differences between GIP-estimates and those based on life annuities are also likely to occur. They are, like the ones produced by GIP, only estimates. Life expectancies derived from annuities are particularly dependent on assumptions concerning the mortality of contracting parties in age groups for which no data are available. Furthermore, they concern only a fraction of the Amsterdam population as only those from higher socio-economic groups entered into these contracts.[58] This selection effect may be thought to imply that annuitants had a lower mortality rate than the population at large to which GIP-estimates relate. Available information suggests, however, that such a selection effect may be small. Houston recently reviewed evidence on the mortality level of elite groups compared to the population of which they were a part.[59] He concluded that the Scottish advocates whom he studied in detail were even likely to have had a lower adult life expectancy - that is a higher mortality level - than the mass of the Scottish population until some point in the eighteenth century when they changed to a position of advantage. Livi-Bacci saw the existence of a general pattern of early parity with regard to mortality and the later improvement for European elites.[60] An explanation may be that the mortality levels for both elite and non-elite were largely determined by environmental factors beyond their control and not so much by nutritional factors favouring the well to do. Figure 1 shows mortality levels according to life annuities (circles), the estimate by De Vries (diamond), population registration (boxes) and GIP-experiment 1 (dotted line). The graph shows life expectancies at birth, *i.e.* the average number of years a person will live. Correspondence between the GIP-estimates and the independent mortality material is good: both level and trend are captured.

Table 7. *Life expectancy in Amsterdam 1678-1930, according to life annuities and population registration.*

	Life Annuities	Pop. Registration	De Vries
1678-1682	28.87		
1683-1687	32.23		
1688-1692	30.44		
1693-1697	32.77		
1698-1702	31.53		
1703-1707	26.37		
1708-1712	31.26		
1713-1717	30.65		
1718-1722	28.75		
1723-1727	28.53		
1728-1732	28.80		
1733-1737	28.31		
1777-1797			26
1816-1825		32.93	
1827-1831		33.45	
1840-1851		24.47	
1850-1859		29.01	
1921-1930		64.38	

Notes:
1) Life expectancies of both sexes have been combined using a weighted mean of 105 men to 100 women.
2) The estimate of De Vries is based on a list of deaths of Christians in Amsterdam by age.

Sources:
Life annuities: G. Alter, 'Plague and the Amsterdam annuitants: A new look at life annuities as a source for historical demography', *Population Studies* 37 (1983) 23-41, in particular 30.
Population registration: M. van Haaften, 'De Amsterdamsche bevolkingssterftetafels', *Levensverzekering* 12 (1935) 1-18, in particular 14-15; J. de Vries, *European urbanization 1500-1800* (London 1984) 358-359, n. 45.

This greatly supports the reliability of the GIP-estimates, especially for the early period. Correspondence, however, is not perfect. The level of the GIP-estimates of life-expectancy is somewhat higher than that of the annuities, and differs markedly for one time-point. This graph and later ones also provide information

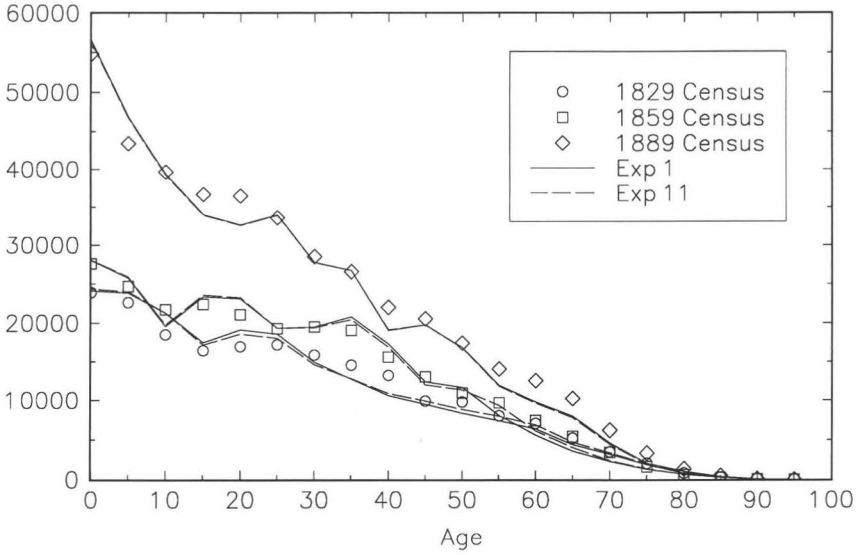

Figure 2: *Age structures in Amsterdam 1829, 1859 and 1889, according to GIP and censuses.*

on GIP-Experiment 11, which incorporates pre-1795 information on mortality and migration, but this information is discussed later.

Second, the age distribution of the population from the censuses (Table 4) was compared with the GIP-distribution. Some differences are likely, because of the model character of GIP-estimates with, for example, one mortality and migration schedule for the whole period or because of the fact that age registration in nineteenth century censuses can be flawed, as Lam and Lee have demonstrated for England.[61] Figure 2 presents the results of this test. It compares the number of inhabitants per age group according to the census with those estimated by GIP. If the GIP-line hits all the symbols, the match is perfect. Here, too, it is clear that GIP does a good job in estimating age structures and this supports the reliability of the results for the nineteenth century. Correspondence between GIP-estimates of population size and the census totals is also good, but this tells us nothing about the reliability of the estimates since most census totals were used as GIP-targets.

Third, the estimated net-migration rates were compared with residual migration rates, calculated from census totals and numbers of births and deaths from 1795 onwards. Differences are expected, if only because GIP works with one age specific migration schedule over the whole period and because migration rates are smoothed. In addition, residual migration rates are not exact since errors in census

totals or numbers of births and deaths influence these rates. Also, some of the early census totals may have been too low because of underregistration. Furthermore, there is a small flaw in the census series around the middle of the nineteenth century caused by a transition from actual population numbers to those relating to permanent inhabitants. Numbers for the latter exclude visitors in Amsterdam but include men and women who happened to be outside the city on the census day. Figure 3 presents the 'stepped' residual migration rates and the smoother GIP-ones. A negative rate means that more men and women entered the city than left it. A positive rate indicates net-emigration. The graph illustrates that GIP is not able to capture short term fluctuations in migration rates as neither the sharp emigration wave in the beginning of the nineteenth century nor the pronounced immigration wave in the seventies and eighties were captured. The GIP-estimates of migration only give a general, long term approximation of true migration rates.

Fourth, GIP-estimates of fertility could be compared with Ig-values in a general way and only from 1850 onwards. GIP-estimates of the mean number of daughters per mother (the Gross Reproduction Rate, in short GRR) are not shown here for Experiment 1, but are shown in the similar GRR's from Experiment 11 in Table 9. They show stability in the fifties and sixties, followed by an increase with a marked peak in the early eighties and a decrease afterwards. This fertility pattern is also indicated by external material in the form of Ig-values - another measure of fertility -calculated by Van Poppel.[62] These peaked in 1880-1881 and decreased rapidly in the 1890s. GIP-estimates of the GRR, however, can be slightly biased if based on combined-sex data, as was the case for Amsterdam. GIP related numbers of births per decade to estimated numbers in the female fertile age span 20-49. If the sex-ratio shifts in favour of men, for instance by a positive net-migration with more men than women coming to town, then the real number of women was lower than is assumed by GIP. GIP, then, estimated the number of women too high and as a result, the GRR too low. The sex-ratio in Amsterdam in the first quarter of the nineteenth century remained fairly constant but decreased afterwards (Table 3). GIP's GRR estimates since 1831-1840 are therefore somewhat too low and the graph should in fact rise more, with 1831-1840 functioning as an inflexion. However, the sex-ratio in the decade 1881-1890 (containing a high residual immigration, higher than estimated by GIP) did not change very much, so that the high GRR for that decade cannot have been caused by this bias.

The reliability of GIP-results was studied via external checking as presented above, but also via sensitivity checking. For this, model assumptions were changed systematically and the effect was studied by comparing ensuing results with those of the base experiment (no 1). For Experiment 2 we changed the life table. The base life table relates to Amsterdam in the period 1921-30 and is a reliable table based on excellent population registration. For our purposes it had one disadvantage, namely that it relates to a modern mortality situation and it is possible that the age specific form of the mortality curve changed markedly over

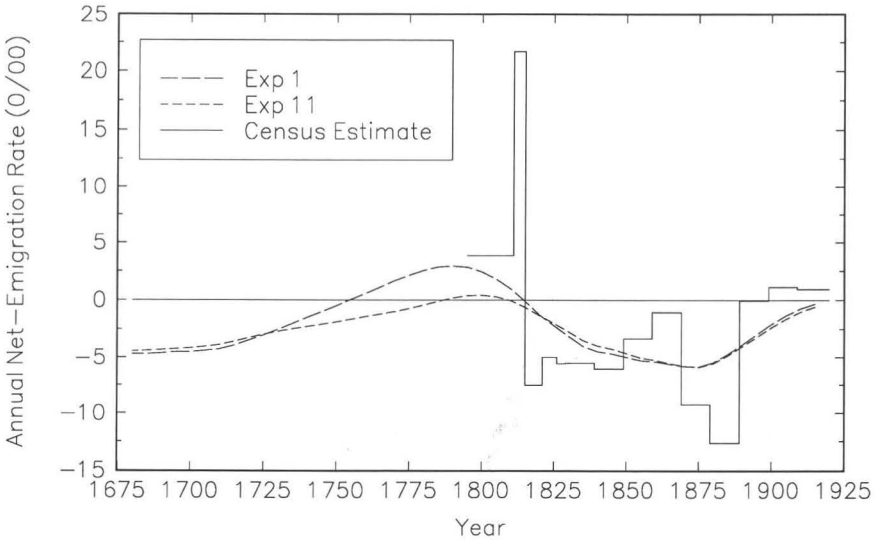

Figure 3: *Migration in Amsterdam 1681-1920, GIP and pop. adminstration.*

the centuries. So for this experiment we took an Amsterdam life table from the mid-nineteenth century (Table 6) which might have been more valid, although also less reliable as it is based on poorer registration. Experiment 3 tested the importance of the migration schedule by reverting from the Swedish data to data for Amsterdam in 1974. Amsterdam migration data were also available for the years 1900-1920 but we could not use them because the age grouping was incompatible with the one used here. Experiments 4 and 5 were used to test the effect of alternative values of lambda. Lambda is a coefficient specifying the weights given by the objective function for minimizing errors in data targets - *i.e.* minimizing the difference between estimated and known values for death totals, census totals and numbers of inhabitants in each age group in the 1920 census. It is also used for minimizing other errors - in this case for smoothing the migration rates. In the first experiment lambda equals 0.1. In Experiment 4, lambda was higher (0.5), and this means more weight was given to the data, whereas in Experiment 5 lambda was lower (0.05) and the reverse is true.

The next two Experiments (6 and 7) focused on the importance of a true value for *r*. This coefficient is important because it defines the growth rate of the 'incomplete cohorts', that is those people whose births were before 1680 and therefore unknown to us. As Lee has shown GIP-estimates can be very sensitive to values of *r*.[63] Unfortunately, there was no easy way to arrive at a true value of *r*. One way, applied in Experiment 1, was to calculate *r* by regressing the births in the period 1681-1780 over time. This would give the true value of *r* if the

population growth in the period 1580-1780 was stable, that is constant over time and across age groups. While this may seem a reasonable way for estimating *r*, its true value may be different. Therefore two other estimates were made. The first was based on the view held by Van Der Woude that the city grew rapidly in the late sixteenth and early seventeenth centuries (with a population total of 104,932 according to the census of 1622), but entered a phase of stagnation after 1670 or 1680 which lasted until the time of the first census in 1795.[64] Experiment 6 reflected this view. The average growth rate was calculated from the known population total of 1622 and an assumed population total in 1680 equal to the known one in 1795. Furthermore, this experiment assumed that the growth rate was highest in the late sixteenth century and levelled off to the value derived from regressing the birth series. The five year growth rate thus fell from 0.1544 in 1580 to 0.0029 in 1680 and on average amounted to 0.0786.

Experiment 7 also assumed a falling growth rate but a lower one on average. The average was taken by assuming a constant growth rate between the census years of 1622 and 1795. Thus, this experiment stipulated that *r* fell from 0.0395 in 1580 to 0.0029 in 1680 with an average value of 0.0213.

Demographic data for the distant past are often flawed in one way or another. Some of these flaws may be remedied, others are likely to remain with us. Even then, much can be done if some knowledge of the direction, timing and magnitude of the data imperfections is known. Not all flaws are equally important. If alternative datasets are constructed to capture these imperfections, albeit only in a global way, then projection methods such as GIP will enable us to evaluate their importance. In Experiment 8 we looked at the effect of errors in the data set, and used the alternative data set discussed in the previous section.

Results are shown in Figure 4 which gives population totals for Amsterdam from 1680 to 1920 according to the various experiments and indexed with the values of Experiment 1 as a base. In this way the effect on the results of changing assumptions or data are visible. One overall conclusion is clear: all tests for data after 1775 are in agreement; that is, they give the same population total give or take 10%. This is not surprising, given the existence of censuses from 1795 onwards and given the influence of the 1920 age groups, both of which were used as targets. Test results for the data from before 1775 begin to diverge, with the one extreme increasing the population total for 1680 by a modest 10 % and the other extreme decreasing it by 25 %. In detail, it is clear that specifying a lower lambda (Experiment 5), changing the life table (Experiment 2), using the alternative dataset (Experiment 8) and stipulating a very high *r* (Experiment 7) do not have any great effect. In these cases the population totals in 1680 are within a 10 % band of the total according to Experiment 1. A low value of lambda (Experiment 4) lowers the population total and, using a very high *r* or a modern migration schedule do so *a fortiori*. This gives an idea of the sensitivity of the results when no material prior to 1795 is incorporated.

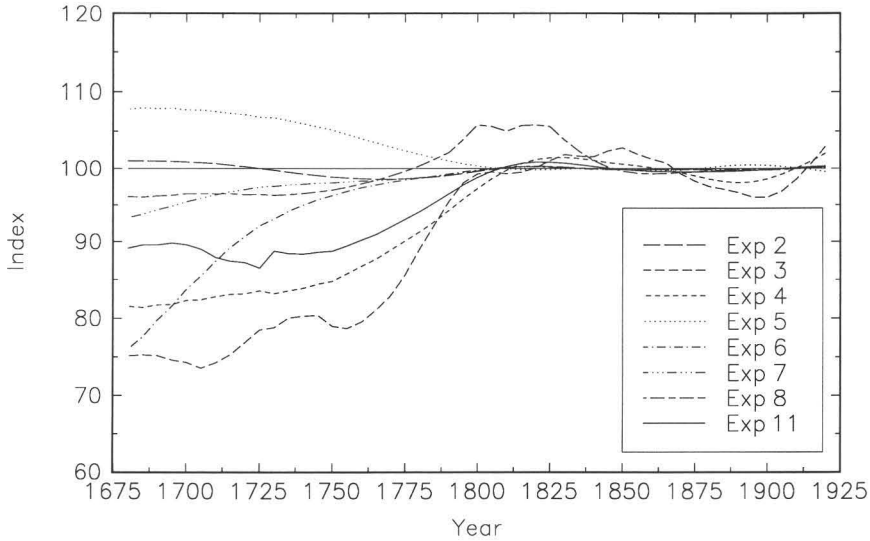

Figure 4: ***Population totals in Amsterdam 1680-1920, indexed with GIP exp. 1 as base.***

All in all, the conclusion is that GIP-estimates without - incorporating the pre-1795 material are supported by external material relating to mortality for the whole period, age distributions from 1829 onwards, residual migration rates since 1795 and a fertility indicator after the middle of the nineteenth century. Sensitivity tests reveal that results are insensitive to reasonable changes in model assumptions or data after 1775. For the first hunderd years, the results are sensitive to an accurate specification of migration schedule, lambda and *r*. If these cannot be accurately specified, the experiments suggest a margin of error in 1680 of 10% upwards or 25 % downwards.

Second stage

The second stage of the research design incorporated external information on mortality and migration. Experiment 9 incorporated life expectancies based on annuities as GIP-targets. For the tenth experiment we did not incorporate external mortality information but used external migration data taken from the marriage registers.[65] They refer to the share of migrants (those not born in the city) of all brides and bridegrooms (see table 8). It was unlikely that this series would reflect migration flows perfectly because not all migrants married and those that did so, must, on average, have done so some time after entering the city. It may nevertheless be seen as a 'best guess'. In this respect it was encouraging to see that

another migration indicator - the net-number of migrating members of the Dutch Reformed Church - generally displayed the same temporal development with a fairly constant level from 1751 to 1790 and a large drop for the years 1791-1820. This indicator also showed an increase in the next decade, and this, as well as the large drop was confirmed by residual migration rates calculated from census totals, birth and death series.[66]

Table 8. *Marriage banns in Amsterdam 1681-1810.*

Period	Number	% mig
1681-1685	12 796	52.07
1686-1690	10 964	51.23
1691-1695	11 692	48.40
1696-1700	11 114	48.43
1701-1705	10 395	48.21
1706-1710	11 258	45.66
1711-1715	10 565	43.94
1716-1720	11 122	42.85
1721-1725	12 843	43.61
1726-1730	13 289	45.79
1731-1735	13 326	48.43
1736-1740	12 577	51.90
1741-1745	11 116	52.63
1746-1750	11 467	51.81
1751-1755	11 220	50.24
1756-1760	11 787	50.00
1761-1765	13 046	49.07
1766-1770	12 457	51.08
1771-1775	11 690	52.40
1776-1780	12 770	53.23
1781-1785	13 718	53.75
1786-1790	12 144	53.54
1791-1795	11 385	51.70
1796-1800	10 268	47.39
1801-1805	10 115	41.56
1806-1810	10 071	38.23

Note:
% mig is the number of people marrying in Amsterdam but not born there as a percentage of the total number marrying.

Source: S. Hart, 'Bronnen voor de historische demografie van Amsterdam in de 17de en 18de eeuw' (typescript Municipal Archive of Amsterdam, 1965) appendix 7.

Table 9. *The demographic regime of Amsterdam 1681-1920, estimated while incorporating pre-1795 external information (GIP-experiment 11).*

	Pop. total	Growth rate	GRR	NRR	E0	NMR in 0/00
1681-1685	219 098	0.0000	1.84	0.81	29.22	-4.43
1686-1690	219 120	0.0048	2.10	0.99	31.28	-4.41
1691-1695	224 393	0.0029	2.04	0.93	30.37	-4.33
1696-1700	227 649	0.0065	2.20	1.08	32.63	-4.23
1701-1705	235 224	0.0008	1.92	0.87	30.04	-4.17
1706-1710	236 217	0.0025	1.90	0.91	31.85	-4.03
1711-1715	239 149	0.0026	1.87	0.91	32.10	-3.87
1716-1720	242 326	-0.0007	1.74	0.78	29.59	-3.57
1721-1725	241 447	0.0012	1.79	0.83	30.85	-3.25
1726-1730	242 862	-0.0025	1.84	0.74	26.65	-2.97
1731-1735	239 866	-0.0006	1.88	0.82	29.05	-2.70
1736-1740	239 193	-0.0014	2.03	0.84	27.48	-2.48
1741-1745	237 582	0.0004	2.03	0.93	30.39	-2.28
1746-1750	238 012	-0.0034	1.99	0.83	27.57	-2.08
1751-1755	233 952	0.0036	2.10	1.10	34.70	-1.87
1756-1760	238 148	0.0023	2.13	1.08	33.61	-1.65
1761-1765	240 862	-0.0017	1.98	0.93	31.08	-1.42
1766-1770	238 851	0.0002	2.10	1.00	31.54	-1.21
1771-1775	239 056	-0.0026	2.02	0.89	29.41	-0.99
1776-1780	235 985	-0.0061	2.05	0.77	24.94	-0.72
1781-1785	228 938	-0.0067	2.06	0.74	23.87	-0.42
1786-1790	221 367	-0.0063	1.96	0.74	25.22	-0.11
1791-1795	214 473	-0.0049	2.12	0.81	25.56	0.18
1796-1800	209 249	-0.0056	2.28	0.83	24.36	0.38
1801-1805	203 485	-0.0003	2.41	1.07	29.44	0.43
1806-1810	203 229	-0.0019	2.52	1.07	28.22	0.29
1811-1815	201 347	-0.0063	2.42	0.91	25.06	-0.04
1816-1820	195 108	0.0028	2.57	1.24	31.95	-0.61
1821-1825	197 831	0.0069	2.68	1.38	34.02	-1.33
1826-1830	204 727	0.0016	2.46	1.07	28.94	-1.99
1831-1835	206 383	0.0010	2.22	0.94	28.14	-2.72
1836-1840	207 405	0.0066	2.32	1.08	30.80	-3.49
1841-1845	214 367	0.0083	2.25	1.09	32.09	-3.98
1846-1850	223 416	0.0003	2.06	0.76	24.54	-4.26
1851-1855	223 700	0.0099	2.15	1.03	31.92	-4.65
1856-1860	235 074	0.0075	2.04	0.95	31.00	-5.05
1861-1865	244 050	0.0147	2.17	1.23	37.78	-5.24
1866-1870	262 612	0.0123	2.10	1.16	36.63	-5.56
1871-1875	279 221	0.0126	2.21	1.19	35.68	-5.79
1876-1880	297 324	0.0171	2.40	1.40	38.79	-5.89
1881-1885	323 784	0.0181	2.60	1.48	37.85	-5.54
1886-1890	354 526	0.0190	2.56	1.55	40.39	-4.84
1891-1895	389 892	0.0185	2.38	1.55	43.56	-4.02
1896-1900	427 667	0.0172	2.14	1.50	47.47	-3.19
1901-1905	466 037	0.0159	1.96	1.45	50.27	-2.37
1906-1910	504 622	0.0132	1.65	1.28	53.30	-1.63
1911-1915	538 969	0.0122	1.45	1.19	56.96	-1.02
1916-1920	572 806	0.0096	1.36	1.08	55.22	-0.58

Note: Population total refers to start of the period, *e.g.* the total for the period 1681-85 refers to 31 December 1680.

Table 10. *Age structure of the population in Amsterdam 1680-1920, estimated while incorporating pre-1795 external information (GIP-experiment 11).*

	Age groups									
	0-4	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1680	21 928	19 244	18 703	18 953	18 872	18 256	17 390	16 342	15 011	13 542
1685	21 625	19 162	18 703	19 002	18 997	18 404	17 510	16 424	15 038	13 530
1690	25 807	19 114	18 677	19 060	19 124	18 602	17 720	16 603	15 184	13 623
1695	24 873	22 674	18 607	19 008	19 148	18 693	17 880	16 772	15 318	13 724
1700	28 114	22 100	22 116	18 999	19 181	18 801	18 042	16 997	15 553	13 922
1705	23 558	24 617	21 460	22 369	19 075	18 735	18 060	17 067	15 670	14 046
1710	24 377	20 819	23 946	21 662	22 400	18 699	18 058	17 142	15 798	14 214
1715	24 997	21 557	20 244	24 085	21 594	21 884	18 031	17 148	15 876	14 340
1720	23 005	21 791	20 874	20 215	23 790	20 923	20 957	17 042	15 793	14 323
1725	24 850	20 186	21 124	20 807	19 943	23 047	20 046	19 828	15 740	14 291
1730	23 403	21 279	19 442	20 851	20 274	19 109	21 874	18 796	18 130	14 100
1735	24 468	20 317	20 561	19 218	20 341	19 472	18 193	20 584	17 267	16 325
1740	24 785	21 034	19 577	20 245	18 643	19 429	18 458	17 056	18 834	15 482
1745	25 501	21 651	20 339	19 318	19 725	17 884	18 491	17 384	15 699	17 000
1750	22 988	21 908	20 837	19 910	18 667	18 795	16 917	17 309	15 894	14 070
1755	27 335	20 515	21 279	20 543	19 435	18 012	18 002	16 040	16 072	14 490
1760	27 366	24 249	19 887	20 881	19 938	18 665	17 203	17 029	14 853	14 608
1765	24 447	23 942	23 413	19 387	20 100	19 010	17 719	16 187	15 677	13 412
1770	26 152	21 426	23 117	22 773	18 620	19 140	18 037	16 673	14 912	14 170
1775	24 236	22 632	20 609	22 339	21 711	17 619	18 066	16 891	15 280	13 406
1780	22 314	20 397	21 604	19 695	21 025	20 315	16 473	16 763	15 321	13 586
1785	21 629	18 632	19 417	20 506	18 411	19 583	18 932	15 243	15 164	13 585
1790	21 075	18 209	17 756	18 366	19 121	17 147	18 273	17 552	13 824	13 483
1795	22 178	17 783	17 351	16 716	17 035	17 760	15 984	16 938	15 924	12 298
1800	22 009	18 588	16 917	16 252	15 378	15 721	16 484	14 768	15 319	14 122
1805	24 658	19 057	17 836	15 989	15 059	14 289	14 698	15 359	13 500	13 747
1810	23 660	21 248	18 287	16 915	14 794	13 928	13 302	13 646	13 993	12 074
1815	20 111	20 043	20 343	17 422	15 636	13 602	12 873	12 260	12 336	12 415
1820	24 574	17 767	19 428	19 832	16 501	14 633	12 739	12 011	11 247	11 122
1825	27 535	21 975	17 304	19 229	19 112	15 609	13 785	11 936	11 065	10 187
1830	24 358	23 986	21 289	17 180	18 589	18 052	14 623	12 809	10 873	9 895
1835	22 715	21 138	23 238	21 291	16 770	17 678	16 970	13 598	11 655	9 705
1840	26 220	20 021	20 573	23 466	21 086	16 151	16 783	15 906	12 463	10 477
1845	27 584	23 291	19 532	20 905	23 442	20 479	15 434	15 814	14 644	11 248
1850	22 753	23 472	22 494	19 675	20 661	22 509	19 361	14 373	14 341	12 995
1855	29 177	20 241	22 941	23 031	19 802	20 200	21 625	18 319	13 267	12 969
1860	28 024	25 852	19 785	23 597	23 260	19 364	19 408	20 453	16 893	11 983
1865	34 221	25 687	25 517	20 688	24 291	23 122	18 854	18 608	19 164	15 532
1870	33 866	31 183	25 328	26 777	21 413	24 194	22 512	18 051	17 400	17 578
1875	36 585	30 672	30 691	26 597	27 821	21 394	23 571	21 540	16 850	15 929
1880	43 902	33 526	30 248	32 247	27 845	28 055	21 016	22 714	20 260	15 552
1885	50 941	39 955	32 941	31 456	33 579	28 070	27 571	20 251	21 336	18 663
1890	56 324	46 750	39 256	33 912	32 581	33 923	27 727	26 721	19 147	19 793
1895	59 258	52 229	45 960	39 950	34 807	32 888	33 640	27 035	25 458	17 918
1900	59 843	55 633	51 421	46 295	40 577	35 034	32 696	32 991	25 979	24 070
1905	61 233	56 633	54 816	51 303	46 477	40 584	34 791	32 143	31 871	24 737
1910	58 124	58 429	55 882	54 362	51 026	46 217	40 229	34 254	31 200	30 558
1915	57 793	55 971	57 777	55 293	53 794	50 547	45 765	39 673	33 419	30 140
1920	58 282	55 398	55 263	56 925	54 295	52 850	49 698	44 870	38 505	32 114

(Table 10 continued)

	Age groups									
	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-99
1680	11 823	9 709	7 475	5 317	3 380	1 884	888	318	60	2
1685	11 784	9 668	7 444	5 300	3 374	1 884	889	319	60	2
1690	11 843	9 704	7 467	5 315	3 385	1 890	892	320	60	3
1695	11 893	9 722	7 470	5 314	3 385	1 891	893	321	60	3
1700	12 059	9 840	7 546	5 360	3 409	1 902	898	322	60	3
1705	12 143	9 888	7 566	5 365	3 410	1 904	899	323	61	3
1710	12 314	10 019	7 653	5 413	3 432	1 912	902	324	61	3
1715	12 471	10 170	7 762	5 480	3 466	1 926	907	325	61	3
1720	12 492	10 210	7 807	5 510	3 482	1 934	910	326	61	3
1725	12 521	10 271	7 874	5 565	3 514	1 948	915	327	61	3
1730	12 349	10 153	7 807	5 537	3 507	1 948	916	328	62	3
1735	12 264	10 092	7 780	5 532	3 512	1 954	919	329	62	3
1740	14 132	9 971	7 692	5 485	3 494	1 950	920	330	62	3
1745	13 507	11 598	7 676	5 475	3 493	1 953	922	331	62	3
1750	14 712	10 978	8 840	5 413	3 459	1 940	919	331	62	3
1755	12 422	12 253	8 585	6 391	3 498	1 955	924	332	62	3
1760	12 749	10 303	9 540	6 179	4 113	1 971	929	333	63	3
1765	12 756	10 477	7 944	6 802	3 943	2 302	933	334	63	3
1770	11 726	10 497	8 091	5 673	4 347	2 210	1 090	336	63	3
1775	12 313	9 578	8 043	5 734	3 601	2 424	1 043	392	63	3
1780	11 507	9 913	7 231	5 622	3 597	1 990	1 137	373	74	3
1785	11 626	9 232	7 458	5 038	3 517	1 983	932	407	70	3
1790	11 663	9 364	6 974	5 216	3 162	1 944	931	334	76	3
1795	11 584	9 401	7 080	4 882	3 276	1 749	913	333	63	3
1800	10 530	9 301	7 081	4 938	3 057	1 808	820	327	63	3
1805	12 256	8 593	7 121	5 015	3 134	1 704	853	294	61	3
1810	11 887	9 959	6 550	5 023	3 172	1 743	803	306	55	3
1815	10 349	9 560	7 513	4 576	3 151	1 752	818	287	58	2
1820	10 842	8 513	7 382	5 366	2 927	1 767	830	294	54	2
1825	9 768	8 982	6 624	5 313	3 456	1 650	840	300	56	2
1830	8 814	7 947	6 858	4 681	3 366	1 924	778	302	56	2
1835	8 541	7 149	6 050	4 833	2 959	1 871	906	279	57	2
1840	8 440	6 989	5 492	4 300	3 079	1 655	885	326	53	2
1845	9 148	6 938	5 393	3 920	2 750	1 727	784	319	61	2
1850	9 626	7 337	5 219	3 757	2 455	1 518	810	281	60	3
1855	11 359	7 915	5 660	3 723	2 402	1 376	719	291	53	3
1860	11 316	9 318	6 089	4 026	2 373	1 343	651	259	55	2
1865	10 675	9 525	7 367	4 448	2 629	1 353	644	236	49	2
1870	13 797	8 951	7 499	5 359	2 892	1 494	647	233	45	2
1875	15 576	11 534	7 024	5 436	3 472	1 638	713	234	44	2
1880	14 253	13 183	9 174	5 162	3 567	1 987	787	259	44	2
1885	13 878	12 022	10 446	6 717	3 375	2 035	953	285	49	2
1890	16 791	11 826	9 636	7 739	4 440	1 943	982	347	54	2
1895	17 993	14 500	9 622	7 252	5 195	2 589	946	359	66	2
1900	16 499	15 803	12 035	7 400	4 976	3 087	1 278	349	68	3
1905	22 368	14 676	13 318	9 415	5 168	3 005	1 542	475	67	3
1910	23 210	20 170	12 580	10 627	6 718	3 184	1 525	579	91	3
1915	28 984	21 270	17 659	10 301	7 810	4 260	1 654	581	112	4
1920	28 420	26 355	18 439	14 285	7 462	4 882	2 187	626	112	5

Note: Numbers relate to the last day of the year, *e.g.* 1680 refers to 31 December 1680.

For Experiment 11 we used both the external migration and external mortality data. This experiment forms the centre of the second stage of the research design. The use of available 'extra' information for this experiment probably brings it as close to historical reality as is possible with a projection method such as GIP, given the basic data - birth, deaths and census totals - at our disposal and under the assumption that the extra information is trustworthy. Ironically, the very fact that external information was used limited the options for testing the reliability of the results.

For the next four experiments we took Experiment 11 as a base and then went on to look at the effects of changing the value of lambda (Experiments 12 and 13) and the initial growth rate r (Experiments 14 and 15). The results of Experiment 11 can be seen in Tables 9 and 10. Sensitivity tests are displayed in Figure 5. Incorporation of pre-1795 external information made GIP-estimates for Amsterdam insensitive to reasonable changes in assumptions: all come within a 10 % band. The mortality information from annuities 'fixed' the demographic regime at the beginning of the period. Figure 4 shows how Experiments 1 (no external material) and 11 (incorporting external mortality and migration information) differ by about 10% in population totals for the first seventy five years. This gap closes thereafter and from 1795 onwards differences between both experiments are invisible.

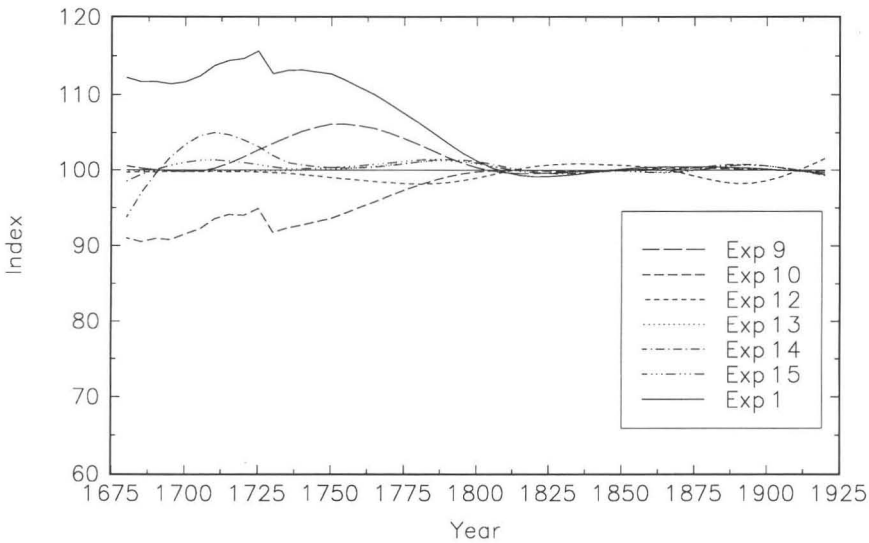

Figure 5: *Population in Amsterdam 1680-1920, indexed with GIP exp. 11 as base.*

External material for checking GIP-estimate 11 was by now sparser, because some of it had already been used in the GIP-estimates. The estimate for mortality by De Vries and the values from the population registers were still available. Figure 1 shows that correspondence is still good, as it also was before in Experiment 1. As correspondence with Alter's mortality data was programmed it is no indication of the reliability of GIP-estimates. The similarity between age-distributions according to GIP and as observed in the censuses, however, does testify to that (Figure 2). Fertility estimates still display the pattern observed independently by Van Poppel and Fokkema. Figure 3 illustrates that, whatever the model assumptions, GIP remains unable to estimate short term fluctuations in migration.

Table 11 shows the value of the Sum of Squared Errors (SSE) - a measure of the discrepancy between observed and estimated values. The table also shows a disaggregation of the SSE into two components, RMSE-data and RMSE-smooth, the one relating to data targets and the other to smooth migration targets. In principle, a low SSE means a better fit between obervations and estimates than a high SSE, but there is one problem. Unlike regression by ordinary least squares, where the suitability of different model specifications can be directly compared, GIP-experiments may include data on different scales as targets in the objective function and this makes direct comparisons between SSE's impossible. This inclusion may be deliberate, as in the changing of the value of lambda, or unavoidable as in the replacement of migration targets with life-expectancy data. In Table 11, Experiments 1, 2, 3, 6, 7 and 8 are directly comparable as a group, as are the set of Experiments 11, 14 and 15, since each group shares one form of objective function, although they represent different forms of the data. Within each group, Experiments 1 and 11 show a relatively high degree of consistency with the data and the assumptions (*i.e.* they have a relatively low SSE) which supports their *a priori* selection as base experiments.

The conclusion has to be drawn that incorporating pre-1795 information makes GIP-estimates very stable, *i.e.* insensitive to model changes. Of course, it also makes the result dependent on the pre-1795 information. What independent information there remains after incorporation still indicates that GIP-results are reliable.

Table 11. *Error sums in GIP-experiments.*

No	SSE	RMSE data	RMSE smooth
	Without pre-1795 external information		
1	0.01990	1.2554	3.8102
2	0.01996	1.3143	3.4601
3	0.05050	2.0882	5.5176
4	0.03087	1.6857	1.7612
5	0.01609	1.1793	4.3985
6	0.02188	1.2993	4.0927
7	0.02011	1.3037	3.5747
8	0.02304	1.4082	3.7420
	With pre-1795 external information		
9	0.08476	2.8951	3.5633
10	0.02533	1.3706	3.2141
11	0.08994	2.6752	2.9399
12	0.09907	2.7733	1.6980
13	0.08679	2.6294	4.0332
14	0.12796	3.1844	5.1676
15	0.09359	2.7287	4.2503

6. Conclusion

In this article we have reviewed the availability and quality of series of births, deaths and population totals for Amsterdam, 1681-1920, and shown how we used them to obtain estimates of demographic key variables. A two stage research design was employed. In the first stage no external information prior to 1795 was taken into account. The ensuing estimates (in Experiment 1) are reliable according to comparisons with independently acquired material. For the first hundred years, however, they are sensitive to some model specifications (but insensitive to known or presumed data flaws). The general level and long term direction of migation can be reconstructed with the use GIP, but short term fluctuations in migration rates cannot. In the second stage, external information was incorporated in the estimation procedure in the form of mortality levels for the early period based on life annuities and migration information from marriage registers. Ensuing GIP-estimates (in Experiment 11) then become insensitive to reasonable changes in

model specifications and are still compatible with unincorporated external material. Reconstructing short term fluctuations in migration rates still proves too difficult a task.

Differences between estimates from Experiment 1 and 11 are modest for the first hundred years and negligible thereafter. Both give a consistent set of estimates, supported by available external information, and are generally in agreement. By using the available 'extra' information, Experiment 11 probably comes as close to historical reality as is possible with a projection method, if it is assumed that the extra information is trustworthy. Even Experiment 11 does not present data, but only estimates. There is a margin of error, and external checking and sensitivity testing (presented in Figure 5) go some way in evaluating the extent of this margin. It appears that the margin of error is greatest during the first hundred years, though nevertheless modest (all alternative results in Figure 5 are within a 10 % band) and negligible thereafter.

To sum up, this article serves two purposes. On a basic level it provides estimates of key-variables of the Amsterdam demographic regime which are open to further substantive interpretation; a series of experiments demonstrated the reliability of these estimates. Methodologically speaking, the article demonstrates the use of Generalized Inverse Projection in historical demography. GIP needs only a minimal set of data (but additional information may be incorporated) and quantifiable objections to model assumptions or data can be tested. External checking and sensitivity testing give insight in the reliability and margin of error of the estimates. It seems, therefore, that GIP is a useful method for historical demography in general and that of cities in particular.

Appendix. *Other estimates of Amsterdam population totals.*

This appendix reviews other estimates of Amsterdam population totals, in particular a recent attempt to infer such totals from numbers of marriages. The appendix demonstrates that if such an attempt is carried through consistently, it can be shown empirically to be unreliable.

Between 1630 and 1795 no censuses were held, but estimates of the size of the population were made at the time.[67] These guesses were very dissimilar. Several historians have tried to estimate population sizes for the sixteenth, seventeenth and eighteenth centuries with the help of numbers of marriages or births and an assumed constant crude marriage rate or birth rate.[68] These estimates give only a very general insight into the development of population size. Recently, Nusteling estimated the size of the population of Amsterdam.[69] In general, he did so with the help of numbers of first marriages and a correction factor dating from 1622. Both numbers of marriages and a census with a population total exist for that year. For marriage totals Nusteling used a weighted twenty-year moving average number of marriages.[70] The formula he used is:

$Pt = 200/c * (Mt + 1.86Mt\text{-}1 + 1.15Mt\text{-}2 + 0.36Mt\text{-}3)/4.37$

with:

t = a five-year time period,

Pt = population size at period t,

M_t = number of first marriages in period t,

c = a correction factor from 1622 with a value of 8.53.[71]

Nusteling's estimates can be compared to census totals of 1795 and later. The correspondence between his estimates and the 1795 census total is very good, with a difference of only 2%.[72] Correspondence with the next censuses, as presented by Nusteling for the years 1806-1860, is generally very good too.[73] Unfortunately, this agreement cannot be easily interpreted as a sign of the reliability of the method of estimation because of a number of modifications in the method. At times all marriages, not just first marriages, were used. Sometimes a constant from 1829 with a value of 8.575 was taken instead of that from 1622. For some, but not all, years an extra correction factor based on the percentage of illegitimate births was used. Prior to 1811 the number of marriage banns was used and after 1811 the number of marriages was used. The latter was slightly higher as some banns did not lead to wedlock. To correct for this another factor was introduced. The various modifications are outlined below.[74] Formally, they result in four different methods of calculating. (see table 12).

Nusteling was forced to adopt these modifications because no numbers of first marriages were tabulated by the Bureau of Statistics. In order to arrive at a population total he had to resort to the number of all marriages and a corresponding correction factor. From a heuristic point of view these modifications are, however, unfortunate. The method of estimation for the nineteenth century was

Table 12. *Variations in Nusteling's method.*

Period	A	B	C	D
1581-1795	1622	1st banns	no	1
1796-1810	1622	1st banns	yes	2
1811-1825	1829	1st banns/marr.	yes	3
1826-1865	1829	all marr.	yes	4

Legend:
A. Constant used to convert numbers of marriages or marriage banns to population totals dating from this year.
B. Using numbers of marriages or marriage banns, 1st or all.
C. Using a correction factor based on illegitimacy levels.
D. Ensuing method used by Nusteling.

different from that for the sixteenth, seventeenth and eighteenth centuries. This means that a correspondence between the modified estimates and census totals in the nineteenth century is no longer an indication of the reliability of the original method of estimation in the sixteenth to eighteenth centuries. The reliability of the agreement of the estimates in the nineteenth century could be a result of the various modifications in that period and not a virtue of the method. In order to test this, we made new calculations using various methods used by Nusteling, including the unaltered one. The following table presents results and also shows where he derived his estimates from.

Some of these estimated population totals can be compared to census totals, including quite reliable ones from the second half of the century.

These test results are disappointing. The unaltered method of estimation, used for the sixteenth, seventeenth and eighteenth centuries, leads to poor results for the nineteenth century, which differ widely from census totals, including quite reliable ones. The conclusion must be that it is very difficult to estimate population totals accurately in this way. Of course, this result does not disqualify Nusteling's series of births and deaths prior to 1811 which are the best available at present.

For the sake of comparison, a graph is presented below showing population totals according to GIP-experiments 1 and 11, Nusteling's unaltered method, his modified one, and census totals. Figure 6 shows that Nusteling's original method underestimates true population totals in the middle of the nineteenth century by a wide margin. Furthermore, it shows that population totals in the first hundred years are estimated higher by GIP than by Nusteling's method and fluctuate less. In reality this may simply mean that the marriage rate fluctuated more than allowed for by a method with a constant twenty-year moving average marriage rate.

Table 13. *Consequences of variations in Nusteling's method for Amsterdam population totals.*

Period	Marr.(banns) 20 tr. mov. a.		Population totals x 1000 Methods			
	1st.	all	1	2	3	4
1776-1780	9 751	12 770	**222**	-	-	-
1781-1785	10 488	13 718	**228**	-	-	-
1786-1790	9 428	12 144	**233**	-	-	-
1791-1795	8 842	11 385	**225**	-	-	-
1796-1800	7 852	10 268	209	**209**	-	269
1801-1805	7 778	10 115	193	**193**	-	250
1806-1810	7 745	10 071	185	**186**	-	241
1811-1815	6 199	7 245	174	175	**181**	223
1816-1820	7 128	8 274	163	166	**182**	201
1821-1825	8 034	9 163	168	174	**198**	202
1826-1830	-	8 700	-	-	-	**202**
1831-1835	-	8 272	-	-	-	**202**
1836-1840	-	9 755	-	-	-	**206**
1841-1845	-	9 196	-	-	-	**217**
1846-1850	-	9 842	-	-	-	**223**
1851-1855	8 901	10 263	-	-	-	**230**
1856-1860	8 488	10 171	-	-	-	**235**
1861-1865	9 233	10 832	-	-	-	**242**
1866-1870	9 353	10 942	212	-	-	-
1871-1875	10 479	12 213	223	-	-	-
1876-1880	11 090	12 611	240	-	-	-

Note:
Numbers tabulated by Nusteling in bold.

Table 14. *Amsterdam population size according to the censuses compared to that of Nustelings modified and his unaltered method.*

Period	Population in thousands			
	Nusteling		Census	
	modified	unaltered	total (year)	
1806-10	186	185	202	(1809)
1811-15	181	174	200	(1811)
			180	(1815)
1816-20	182	163	-	-
1821-25	198	168	191	(1821)
1866-70	-	212	264	(1869)
1871-75	-	223	-	-
1876-80	-	240	313	(1879)

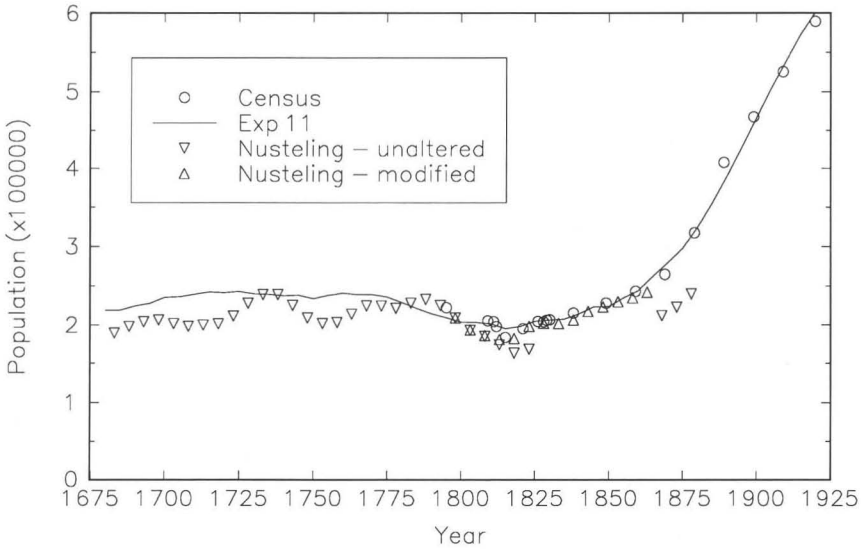

Figure 6: *Population totals in Amsterdam 1680-1920, according to GIP, Nusteling and censuses.*

NOTES

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22 Nusteling, *Welvaart en werkgelegenheid*, 21.

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24 J.P. Farret, A.G. Verster & J.H. van Swinden, *Rapport over de telling van het volk van Amsterdam* (Amsterdam 1795) 5.
25 Nusteling, *Welvaart en werkgelgenheid*, 239.
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30 Struijck, *Vervolg*, 121.
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33 Nieuwenhuijs, *Proeve*, 267.
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39 Calculated from data by Hart, 'Bronnen', appendix 3.
40 Nusteling, *Welvaart en werkgelegenheid*, 16-20.
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44 J.J. Haver Droeze, *Het Collegium Medicum Amstelaedamense 1637-1798* (Amsterdam 1921) 95-96; Nieuwenhuijs, *Proeve*, 278, 283.
45 Nieuwenhuijs, *Proeve*, Table VIII (opposite page 306). Numbers according to the contemporary list correspond almost exactly to those for the period 1701-1752 in: Struijck, *Vervolg*, 143.
46 Farret, Verster & Van Swinden, *Rapport*.
47 Located in: Nusteling, *Welvaart en werkgelegenheid*, 249-251.
48 See in particular: Th. van Tijn, *Twintig jaren Amsterdam. De maatschappelijke ontwikkeling van de hoofdstad van de jaren '50 der vorige eeuw tot 1876* (Amsterdam 1965) 104-107; A. Fokkema, 'Sociaal-economische verandering en demografische structuur te Amsterdam in de 19de eeuw' (unpublished M.A. thesis, University of Utrecht, 1981) 23-26.
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50 Van Tijn, *Twintig jaren Amsterdam*, 106.
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65 Experiment 10 was implemented in the following fashion. Percentages in Table 8, covering the period 1681-1810, were first converted into z-scores to standardize level and variance and leave temporal fluctuations. The GIP-programme was modified to estimate the mean and standard deviation of the net-migration over the period 1681-1810, while requiring that the estimated pattern of short-run changes in net-migration matched the z-score fluctuations as closely as possible, consistent with the other targets in the objective function.

66 Reformed Church numbers can be found in: S. Hart, 'Historisch demografische notities. De Amsterdamse bevolking in de 17de en 18de eeuw' (typescript Municipal Archive of Amsterdam 1968) 24.

67 Survey in: Nusteling, *Welvaart en werkgelegenheid*, 234-236.

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Friesland in de periode 1665-1794', *It Beaken* 46 (1984) 105-138 [Friesland]; H.P.H. Nusteling, 'Periods and caesurae in the demographic and economic history of the Netherlands, 1600-1900', *Economic and Social History in the Netherlands* 1 (1989) 87-117 [Netherlands]; H.P.H. Nusteling, 'Strijd om de commerciële suprematie in de zeventiende en achttiende eeuw', *NEHA-Bulletin* 6 (1992) 5-23 [Britain].

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71 Calculated from: Nusteling, *Welvaart en werkgelegenheid*, 200, n. 1, 240.

72 *Ibidem*, 31.

73 *Ibidem*, 24.

74 *Ibidem*, 200, n. 85, 241, Table B, n. 4 and 7. The correction for illegitimacy in Nusteling, *Welvaart en werkgelegenheid* is different from that in Nusteling, 'La population'. Cf. Nusteling, *Welvaart en werkgelegenheid*, 241, n. 4. Information on the correction factor relating to marriages and marriage banns kindly comes from a personal communication by Nusteling.

V

TRANSPORTATION NETWORKS IN THE DUTCH PROVINCE OF GRONINGEN IN THE NINETEENTH CENTURY[1]

by

Marcel Clement

1. Introduction

Transportation networks are the physical expression of the flows of people, goods and information which bind an economic system together. Therefore, these networks can provide valuable information about the spatial pattern of human behaviour. The structure of the networks and the position of the various places in it can be examined, and structural changes in these characteristics during the process of economic modernization can be looked at. The relationship between the transport system, the location of economic activities and the spatial distribution of population has long been of interest to geographers, economists and economic historians. Several empirical studies have demonstrated that transport networks can be used to study the structure of the urban system and the hierarchy of places.[2] To integrate these related approaches an analysis on a limited, regional scale seems to be the most appropriate. This article focuses on the Dutch province of Groningen.

It is not an easy task to give a solid historical analysis of the relationship between transport networks and the spatial pattern of human activities. Even relatively small networks tend to be very complex and are therefore difficult to study. However, the technique of *graph analysis* offers several good opportunities for studying the characteristics of networks in a formal and quantitative way. Graph analysis was developed in geography during the 1960s for the study of the structure of complex transportation networks.[3] Nowadays it is applied in several fields of research, such as geography, social sciences, marketing or organizational sciences in order to obtain a better insight into complex relationships between actors.[4] It has also been used in historical disciplines such as transport history, urban history and social history.[5] The method can be used to obtain an insight into

the structure of relations between places, people or firms and to measure their relative positions in the networks they form. It is also possible to identify structural changes in time by taking measurements for several moments.

Nevertheless, sine the method is based on a simplified reflection of reality, the scientific significance of the results is limited, but when used in combination with other approaches, network analysis can lead to very interesting results. In my thesis on the relationship between transport development and economic development I have used this method in combination with studies on the spatial and temporal development of infrastructure, the volume and structure of traffic flows and trade flows, and the evolution of public transport services.

This article begins with an analysis of the spatial characteristics of the nineteenth century transport system in the Dutch province of Groningen. First, I show general characteristics of the various transportation networks (roads, waterways, railways, tramways), such as their density, their degree of connectivity and the spatial pattern of traffic flows. Second, I measure the accessibility hierarchy of cities and villages in the province. Finally, I relate the results to the distribution of population and the location of industrial activities.

2. *A regional graph analysis*

The province of Groningen is situated in the utmost northeast of the Netherlands. In the east it borders on Germany and in the north on the North Sea. In 1900 the province had almost 300 000 inhabitants, about 6% of the national population. The region can roughly be divided into three areas: the *city of Groningen*, the *Clay District* in the north and the *Peat Colonies* in the southeast. Before analyzing the regional transport system I briefly describe these areas.[6]

The province of Groningen is a classic example of a city region.[7] In 1900 its capital, the city of Groningen, had 65 000 inhabitants and was the fifth largest city in the Netherlands. It was the only large city in the region and contained about 22% of the provincial population. Its sphere of influence covered the whole of the province and small parts of the neighbouring provinces of Friesland and Drenthe. The city was the regional staple market for agricultural products, and it was a centre for trade, other services, and manufacturing. The Clay District in the northern and utmost eastern part of the province was a flourishing agricultural area. In the numerous villages there were some services and handicrafts for local needs. However, compared to the other two areas, population growth stagnated in the second half of the nineteenth century, there was no urbanization process and the district remained agrarian. The Peat Colonies, in contrast, experienced high population growth, urbanization and large scale industrialization. In the second half of the nineteenth century this part of the province even became one of the leading industrial areas in the Netherlands. In general, the 'great spurt' in econ-

omic modernization in the city of Groningen and the Peat Colonies took place in the 1890s. It is an interesting question wether this dramatic shift in the spatial distribution of economic activity was reflected in a changing structure of the transport system.

Graph analysis gives a formal simulation of transport networks, where transport connections are converted into links or lines and places into points or nodes. For the present analysis of the regional transport system in the province of Groningen, the networks of each subsystem (roads, waterways, railways, sea shipping) were converted into graphs, which could then be described by means of a matrix. With such a matrix two important characteristics of a network can be measured: the *connectivity* of the network as a whole and the relative *accessibility* of places within the network. For measuring the accessibility of places I constructed an integrated graph of the whole transport system in 1900, because the subsystems did not function independently.

Selection of the places and routes, and choices about the boundaries of the graph are important and deserve attention. De Vries argued correctly that 'the results of a graph analysis can be sensitively affected by small changes in these identifications'.[8] However, a certain arbitrariness is inevitable. For the present study the regional transport system was considered as an open system. All connections between places within the region, and the main connections with places elsewhere were taken into account up to the first step. I did not measure the position of the region in a national or international context because that had already been studied by other scholars.[9] Another important point is the selection of the nodes. In most national studies only cities above a certain population size are selected, but that is too crude for a regional analysis. I decided therefore to consider all crossings as nodes. Where important places were not precisely situated at such crossings they were clustered with the nearest crossing.

3. Transportation Networks

A first indication of the size of networks and their development in time can be drawn from their density. This also gives an opportunity for comparisons with other regions or countries. Table 1 shows the density of the networks of roads, waterways, railways and tramways (separate and combined) in the province of Groningen from 1800 up to 1915. A low value corresponds with a high density.

In 1800 the province of Groningen possessed a very dense network of narrow canals (*trekvaarten*) which had been constructed from the seventeenth century onwards, and a few natural waterways. The region was connected with the Dutch trekvaart system that covered the western and northern coastal provinces. This traditional waterway network was very important before the railway era since, except for local traffic, almost all intraregional and interregional flows of goods

and passengers went by boat. During the nineteenth century the existing waterway network was improved and its density increased further. Except for some towpaths along the main canals, paved roads were a purely nineteenth century phenomenon. From the 1820s onwards a dense network of paved roads was constructed within a short period. First main routes were built and after about 1850 the numerous villages were connected to them. After 1870 this was the densest network in the transport system. In 1866 the first railway came into operation. Within four years the three main interregional connections in western, southern, and eastern directions came into operation. From 1880 onwards a complementary tramway network was developed. Since these two modes of transport were highly interconnected, their functions can only be understood if they are analyzed together. However, even that shows that their density was lower than that of waterways or roads.

Table 1. *Density of transport networks in the province of Groningen, 1800-1915.*

(km^2 area/km infrastructure)

	Waterways	Roads	Railway	Tramway	Rail+tram
1800	4.0	-	-	-	-
1830	3.9	127.8	-	-	-
1840	3.9	46.9	-	-	-
1850	3.9	9.6	-	-	-
1860	3.7	4.4	-	-	-
1870	3.4	2.5	28.4	-	28.4
1880	3.3	1.7	28.0	135.3	23.2
1890	3.3	1.6	19.2	31.5	11.9
1900	3.3	1.6	15.6	14.7	7.6
1910	3.2	1.4	12.2	14.6	6.6
1915	3.1	1.4	12.2	9.3	5.3

Sources:
Inland waterways: *Overzicht der scheepvaartkanalen in Nederland* (1879, 1909). Changes over time in roads or waterways are drawn from *Verslag aan den Koning over de openbare werken (1850-1914).*
Roads: G.A. Venema, 'Kunstwegen in de provincie Groningen', *Staatkundig en Staathuishoudkundig Jaarboek* (1861); J.W. Sips, *Overzicht der gesubsidieerde kunstwegen in de provincie Groningen* (Groningen 1904). Railways and tramways: J.W. Sluiter, *Beknopt overzicht van de Nederlandse spoor- en tramwegbedrijven* (Leiden 1961).

The density of the networks corresponds well with their penetrative power. Dense networks with a lot of places of entrance have a high permeability. In this respect road traffic came first, because the road network was very dense and allowed for door-to-door transport. Second was the dense waterway network with its numerous loading and discharging berths. Traffic on tramways and railways was limited to the stations and therefore this network had the lowest permeability.

It is important to see wether the province of Groningen had a well-developed and relatively modern transport system or wether it was only modernized with delay and at a modest level. Table 2 makes a comparison with data available for the Netherlands as a whole and for highly industrialized Northern England. This confirms that the waterway network of Groningen was very dense indeed, which points to the fact that the region had a well-developed infrastructure at its disposal before the railway era. Groningen's road network of 1860 corresponds well with the British turnpike or toll road network between 1770 and 1821. In 1860 only main roads with toll duties in Groningen were in operation, and later the only roads to be added were secondary roads without toll duties. Pawson has demonstrated that the network of turnpike roads in England and Wales developed mainly between 1750 and 1770. This means that Groningen's road network developed in a similar way though a century later. The network of all paved roads (toll roads and secondary roads) in Groningen after 1860 can only be compared to the total Dutch network, which also includes all paved roads. Although Groningen's network in 1900 was a little denser, the process of road-construction in Groningen seems to be characteristic for the country as a whole.

Compared to the railway network of Northern England, which developed rapidly in the middle of the nineteenth century, Groningen's network developed rather late and remained small. Compared to the Netherlands, Groningen started in the second phase of construction and its network remained small as well. However, the low density of the railway network was compensated by a dense network of tramways. Because of its lower fixed costs, the tramway was more efficient than the railway for relatively small traffic flows. The combination of the railway and tramway networks in Groningen had roughly the same density as the British railway network in 1920, but of course with a much lower capacity and speed. The density of railways and tramways together was roughly the same as in the Netherlands as a whole. Although traffic by rail developed much later than in England and a little later than in the Netherlands as a whole, Groningen had a well-developed network, but with a relatively low transport capacity.

The density of transportation networks is a good indicator of their length and development over time, but it tells us nothing about their efficiency and how well they connect places. A formal graph analysis provides a useful method for investigating these aspects. The first step is to convert the actual networks into graphs. In this formal simulation of reality, nodes (places) are interconnected by links (roads, waterways or railways). An interesting characteristic of a network is

Table 2. *Comparison between the density of transportation networks in Groningen and some data for the Netherlands and Northern England, 1830-1910.*

(km^2 area/km infrastructure)

	England	Netherlands	Groningen
Inland waterways			
1830	27	9.3	3.9
1876		7.8	3.4
1906		7.5	3.3
Paved roads			
1750	28		-
1770	6.3		-
1821	4.6	49	-
1836	4.2	27	128
1873		2.7	2.5
1905		2.1	1.6
Railways			
1840	57	1949	-
1850	14	188	-
1860	9	99	-
1870		23.4	28.4
1880		18.0	28.0
1890		12.7	19.2
1900		12.0	15.6
1910	6	10.4	12.2
Railways & tramways			
1910		6.0	6.6

Sources: The data on British railways and waterways concern Northern England: B. Fullerton, *The development of British transport networks* (Oxford 1975) 26. The data on paved roads concern England and Wales: E. Pawson, *Transport and economy. The turnpike roads of eighteenth century Britain* (London 1977) 115. I wish to thank my colleague Peter Groote for providing me with his estimates for Dutch inland waterways and roads. Some other studies with information about Dutch infrastructure are: *Verslag van den landbouw* (1877). R.T. Griffiths, 'The creation of a national Dutch economy, 1795-1909', *Tijdschrift voor Geschiedenis* 95 (1982) 518-521. Tramways 1910: *Statistiek van het vervoer op de spoor- en tramwegen.*
I calculated with the following areas: England and Wales 151.207 km^2, the Netherlands 33.136 km^2, Groningen 2.300 km^2. Data for Northern England were already expressed in area/km track.

its degree of *connectivity*, which indicates the ease with which parts of a graph can be reached from any other part of the graph. For example, in a graph with a tree structure, connectivity will be low, but in a graph where all nodes are interconnected with many other nodes, connectivity will be high.

Most authors work with the indices alpha and gamma.[10] To allow comparison I have followed their method. The *alpha* index measures the ratio between the actual number of circuits and the maximum possible number of circuits (a circuit is an area enclosed by links). This is an indicator for connectivity since the more circuits there are, the better areas are interconnected. The *gamma* index measures the ratio between the actual number of links and the maximum possible number of links. The indices can be calculated with the following formulas:

$$\alpha = (L-N+1) / (2N-5)$$
$$\gamma = L / 3(N-2)$$

L = number of links; N = number of nodes

In the formula for α the actual number of circuits (the cyclomatic number) is obtained by subtracting from the number of links the number of nodes and adding the number of graphs: L-N+1. The maximum number of links minus the minimum number of links gives the maximum number of circuits: 3(N-2)-(N-1) = 2N-5. In the formula for a the maximum number of links is expressed by 3(N-2) because the addition of each successive node increases the maximum number of links by three.

Values for both indices are always between 0 and 1. In graphs with a low connectivity the values will be closer to 0 and in highly interconnected graphs closer to 1. For example, in a network where 10 nodes are interconnected by the minimum number of 9 links α is 0 and α is 0,38. However, in a graph where these 10 nodes are interconnected by the maximum number of 24 links both α and γ are equal to 1. Lepetit worked with the following categories: α : 0-0.5 is an elementary network with a minimum of connections, 0.5-1 a more integrated network; γ: 0.33-0.50 is an elementary network, 0.50-0.66 a network with a raster structure, and 0.66-1 a highly integrated network.[11]

It seems reasonable to hypothesize that connectivity of transport networks in regions with one dominant central place will be lower than in networks with more central places.[12] Dominant central places often try to prohibit the construction of important cross-links between other places in their hinterland. Therefore, the higher the dominance of the central place in a region, the lower the number of alternative connections may be. Kooij has stressed that from the seventeenth century onwards central places such as Groningen were highly concerned with obtaining a large sphere of influence.[13] For infrastructure, which was an important tool for achieving this, the city of Groningen sat like a spider in its web. In regions

with more central places like, for example, the neighbouring province of Friesland, a glance at the map teaches us that the transport system must have had a higher connectivity.

Table 3. *Comparisons between the connectivity of transport networks in the province of Groningen and some other measurements.*

(Indices α and γ)

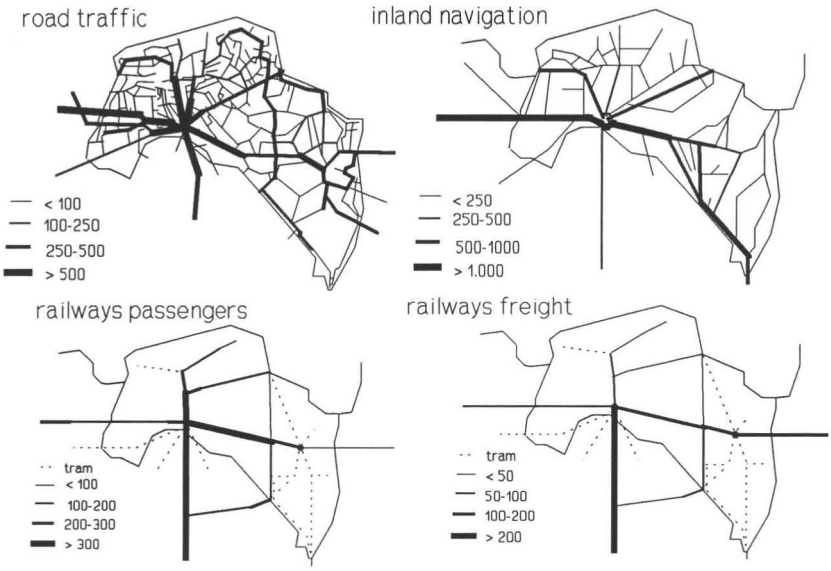
	period	α	γ
Inland waterways:			
Groningen	1800	0	0.35
Northern Netherlands	1665-1800	0	0.37
Holland	1665-1800	0.23	0.50
Northern France	1835	0.34	0.57
Southern France	1835	0	0.29
England	1730	0.07	0.38
England	1830	0.18	0.45
Northern England	1830	0.05	0.37
Inland waterways and coast connections:			
Groningen	1900	0.21	0.48
Northern France	1835	0.55	0.71
Southern France	1835	0	0.35
Paved roads:			
Groningen	1850	0.06	0.38
Groningen	1870	0.22	0.49
Valencia region	1850	0.26	0.53
Northern France	1820	0.37	0.58
Southern France	1820	0.27	0.52
Railways:			
Groningen	1915	0.13	0.46
Groningen (incl. tramways)	1915	0.16	0.46
Northern England	1840	0.04	0.38
Northern England	1850	0.35	0.56
Northern England	1920	0.36	0.57

Table 3 makes a comparison between the connectivity of the transport networks in Groningen and data available for other regional and national networks. Groningen's waterway network in 1800 had a very low connectivity, just like most of the waterway networks elsewhere. According to De Vries, the *trekvaart* network in the north of the Netherlands was a minimum solution for connecting the most important places.[14] The networks in Holland, Northern France and England in 1830 had a higher connectivity. If port connections are also included, the index for Groningen increases, but remains lower than the highly connected network in Northern France in 1830. The road network in Groningen in 1850, which only consisted of the main connections at that time, had a very low connectivity too. Twenty years later, when the network was almost finished, this had increased, but it was still lower than elsewhere.[15] Finally, the railway network had an elementary structure with a low number of alternative links as well. Even in combination with the tramways, connectivity remained low.

In short, compared to other regions and countries, all networks in Groningen had a low connectivity, which means that the number of alternative connections between places was limited. Of course, it would have been better to compare the province of Groningen to other small regions, but unfortunately such data are not available. Therefore, it was necessary to investigate the regional transport system in more detail and to see wether connectivity was really low because of the high dominance of the regional capital or wether it was only because I compared a small region to large areas or countries. This had to be analyzed by means of the spatial pattern of traffic flows.

For inland waterways and railways it is rather easy to construct maps showing the spatial pattern of traffic flows, because statistics are available for each route.[16] Road transport was not registered during the nineteenth century, but toll revenues can be used as an indicator for the traffic intensity. In the province of Groningen the provincial authorities owned many important roads. On these roads toll duties were uniform and remained unchanged until their abolishment in 1906. Toll duties on provincial or national roads did not differ substantially.

Map 1 shows the pattern of traffic flows in the regional transport system.[17] This clearly confirms the dominance of the city of Groningen. Traffic flows within the region were strongly directed towards the regional capital and it was the traffic junction for almost all interregional traffic flows. Though the three transport subsystems had different functions within the system, the networks show a similar pattern. Firstly, in road traffic the city had a very dominant position, and traffic was especially heavy on the roads close to the city. In interregional traffic all links with important destinations outside the region (Leeuwarden, Amsterdam, Zwolle, Germany) began in Groningen. However, in the eastern part of the province there were some cross-links at right angles to the main roads. These were directed towards railway stations. Secondly, the waterway network shows a similar pattern. There were no important cross-links between the main waterways outside the



Map 1: *Pattern of road traffic, inland navigation and railway traffic (passengers and freight) in the province of Groningen.*

centre and interregional connections were directed towards the Dutch cities and seaports in the north of the country. Thirdly, the pattern of railway traffic also shows a centripetal pattern. There was only one cross-link in the eastern part of the province, which gave the Peat-Colonies their own connection with the port of Delfzijl. In the tramway network we can distinguish two clusters: a large one around Groningen and a small one in eastern Groningen around Winschoten.

These findings correspond with the low values for connectivity which were found for all networks. Most intraregional traffic was directed towards the city of Groningen, and cross-links outside the centre were scarce. The region was connected with other regions via its main traffic junction, the city of Groningen. Presumably the province of Groningen was the only province in the Netherlands with a transport system that was dominated so much by one central place.

4. Accessibility of places

All places in the region had access to one or more of the networks, but some had a more strategic position than others. Of course, a good entrance to all networks and good connections with important places was most favourable. The construction of new links could offer good opportunities for some places, but it could also

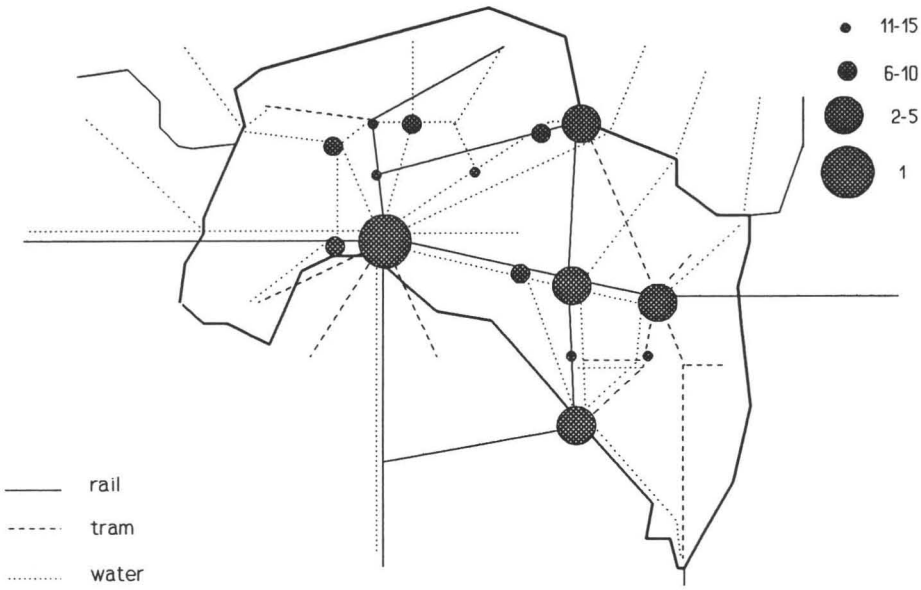
have negative effects for others. The position of places in the transport system can be measured in terms of their *accessibility*. A place is highly accessible if it can easily be reached from other places in the network. Isolated places with a minimum of connections with the central places have the lowest accessibility. It is possible to construct a hierarchy of places according to accessibility. This offers an opportunity for investigating the relationship between transport facilities on the one hand and the spread of population and industries on the other.

In order to measure the accessibility of places in the transport system, I constructed an integrated graph of the networks of waterways (including port connections), railways and tramways.[18] It was important to consider the separate networks as an integrated system because the networks were highly interrelated (competitive or complementary). Roads were neglected for practical reasons. It appeared to be very difficult to translate the extremely dense road network into this integrated graph. This does not seriously influence the results, because the main roads almost completely overlapped the waterway network and secondary roads were only of local importance.

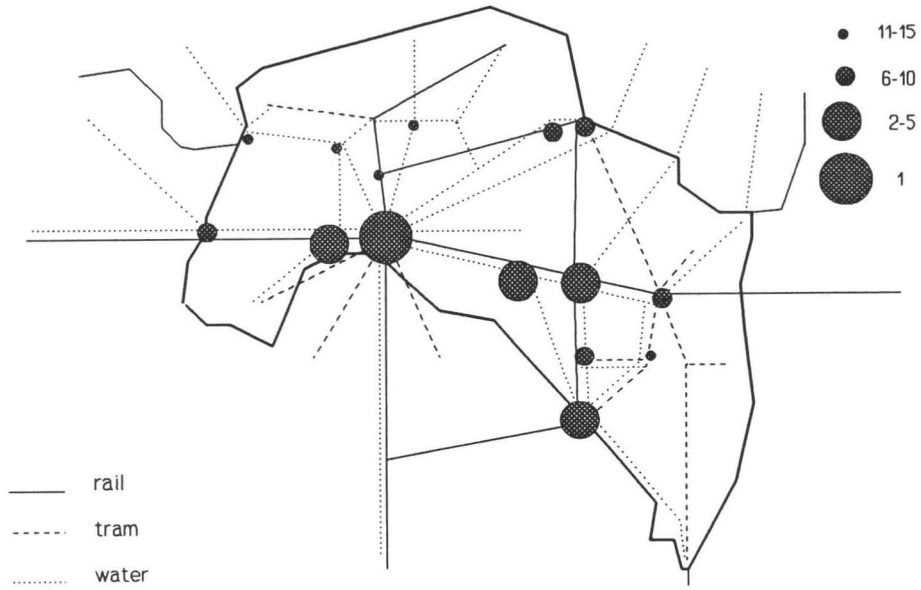
The accessibility of places was calculated by means of a computer programme based on network analysis (GRADAP).[19] The Hubbell point centrality index was based on the shortest path matrix, where the cells of the matrix contained information about the relationship between each pair of places. The relative accessibility of a place was determined by the row sum of the content of the cells.

A problem with unweighted measures is that the graph gives an oversimplified simulation of reality. All places, regardless of size, and all routes, regardless of importance, are treated equally. This is an important shortcoming, because direct access to the main transport connections was more important than access to secondary links and a one step connection with a large city was more valuable than a connection with a small village. In order to approximate reality as well as possible it was necessary to work with a model that contains information about the relative importance of places and connections.[20] The Hubbell index provided a way for including weight factors for the importance of points (population) and lines (traffic flows). In the weighted procedure the point-weights or line-weights influenced the content of the cells. Line-weights for railways were based on the capacity of the connection, those for waterways on the volume of traffic flows; point-weights were based on the population density of places.[21] Maps 2 and 3 show the ranking of the most accessible places according to the unweighted and the line-weighted procedure (see Appendix for scores).

According to all measures the city of Groningen had by far the highest accessibility. For most other places ranking largely depended on the way of measuring. According to the unweighted measure the most accessible places were the junctions in the centre of the transport system, regardless of the importance of transport routes and places (Map 2). These were more evenly spread over the province. According to the line-weighted measurement, places on the dominant west-east



Map 2: *Hierarchy of accessibility of places in the province of Groningen in 1915 (unweighted).*



Map 3: *Hierarchy of accessibility of places in the province of Groningen in 1915 (line-weighted)*

railway and waterway axes in the north of the Netherlands (Northern Germany - Winschoten - Peat Colonies - Groningen - Leeuwarden - Harlingen) had the highest accessibility, followed by several places in the Peat Colonies and the seaport Delfzijl (Map 3). The list only contained a few places in the Clay District. The ranking according to the point-weighted procedure showed some important differences. Small places with a favourable position on the main traffic lines, like Zuidbroek, Hoogkerk, Grijpskerk/Stroobos, a junction at the canal Reitdiep, Sauwerd and Zoutkamp had a lower ranking on the list or disappeared and were replaced by larger places.

Results clearly showed differences in ranking. The unweighted measure overvalued small places with a position on a junction of minor connections. Two examples of this were a junction on the waterway Reitdiep (Garnwerd) and Sauwerd, an insignificant junction for light railways. The weighted measures corresponded better with the real accessibility of places. The ranking according to the point-weighted measure showed differences in the accessibility of the largest places.[22] The hierarchy according to the line-weighted measure gave the places most accessible by main transport connections.

The graph analytical approach has demonstrated that it is possible to reduce complex networks to a model and that specific variables can be integrated in the procedure. This makes it possible to give a formal analysis of complex networks at a certain moment in time. It is also possible to study structural temporal changes. I give one example of this by means of the traditional trekvaart network that had been constructed from the seventeenth century onwards. The accessibility hierarchy of places shows some remarkable differences with the situation around 1900 (see Appendix 4). The better position of the large villages in the northern Clay District, which were very prosperous in those days, is especially striking. The villages of Bedum and Onderdendam, located at the important trekvaart Boterdiep even had the second best position after the city of Groningen itself. In the second half of the nineteenth century these villages lost their central position in the transport system in favour of places in the south-eastern part of the province. That area also faced an enormous increase in population and economic activities.

One question to be asked is wether all important places were located at favourable positions in the transport system and wether the transport system determined growth opportunities of places. Within the region an obvious shift in the density of population took place in the nineteenth century. After a flourishing period, places in the northern Clay District faced a relative decline in population size by the end of the nineteenth century. Simultaneously, population growth was high in the city of Groningen and in the Peat Colonies. Perhaps this process can be related to the structure of the transport system.

Map 4 gives the fifteen most densely populated municipalities in the province (see also Appendix 4).[23] Of course, the regional capital had by far the highest density of population. Almost all other centres were situated in the south eastern

Map 4: *Hierarchy of municipalities in the province of Groningen according to their density of population in 1909.*

part of the province, most of them in the Peat Colonies. Only three places belonged to the Clay District: the small town of Appingedam, the seaport of Delfzijl and the industrialized village of Hoogkerk, which borders the city of Groningen.

The hierarchy of places according to their density of population demonstrates that there was a high correlation between the importance of places and their accessibility. Almost all major centres of population possessed strategic positions in the transport system. There were only three centres without a high accessibility score (Nieuwe Schans, Muntendam and Scheemda), but these places were not situated on crossings in the networks and were therefore not regarded as nodes. However, they all had easy access to the important east-west axes in the region. It is difficult to separate cause and effect in the relationship between transport facilities and concentrations of population. On the one hand better transport connections offered growth opportunities, but on the other hand important places could also exert more influence on modifications of the transport system themselves.

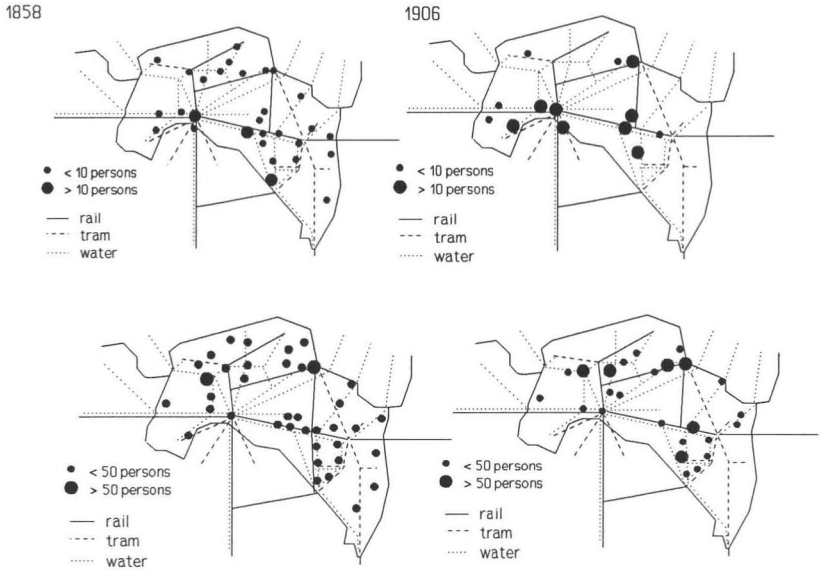
In the earliest economic theories of industrial location, the location of manufacturing industry was largely determined by transport facilities (Weber, Lösch, Von Thünen, Christaller).[24] This relationship is a complex one for at least two reasons. First, the location of an industrial firm is determined by a range of economic, social, historical, geographical and political variables and therefore the transport

system can only give a partial explanation. Second, the relationship is a two-way one. On the one hand the existence of economic activities creates a demand for transport, but on the other the availability of transport facilities affects land use patterns. Several studies have shownthat, for the Netherlands as a whole, spectacular structural changes took place in the spatial distribution of industrial activities in the second half of the nineteenth century.[25] In several industries there was a process of an increasing scale of production and spatial concentration in specific cities or regions, especially at favourable locations in the transport system. As a result of a higher mobility of factors of production, Knippenberg and De Pater observed a process of scaling up in production and, for some industries, concentration in specific cities or regions. For example, in 1858 textile production was to be found all over the country, but by 1906 it was highly concentrated in Twente and Noord Brabant.

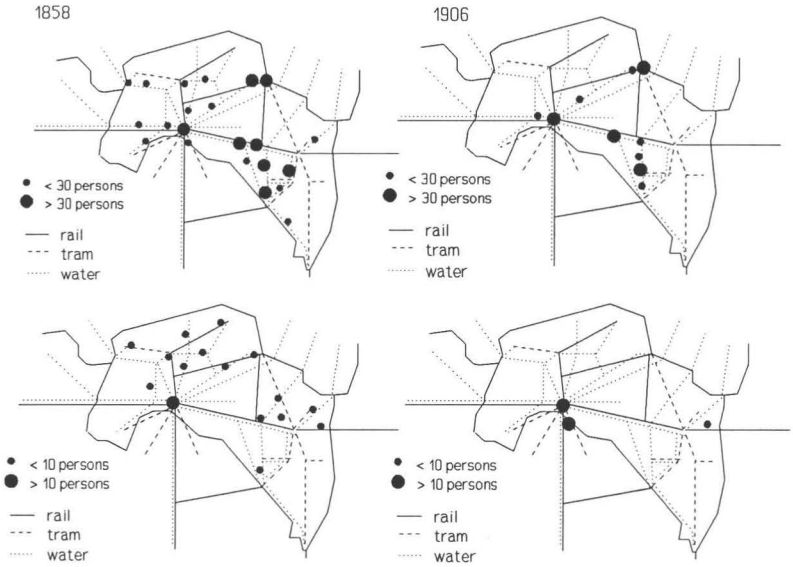
In asking what happened to the spatial distribution of the main industries in the region we might, theoretically, expect a process of concentration and a general shift to the most favourable locations in the transport system. The modernization of the transport system increased the mobility of people and goods. Important forward linkage effects were the integration of markets, an increase in scale of production and regional specialization. Around 1850 numerous small industrial firms were widely scattered over the province, but around 1900 they were more spatially concentrated. A more efficient transport system not only increases growth potentials, but also exposes local firms or markets to more competition from elsewhere. Therefore, it is also possible that some industries disappeared because of intensified competition. Such phenomena are examples of what Myrdal and Voigt called *backwash effect* and *Entleerungseffekt* respectively.[26] They stressed that better transport facilities could induce a general drain in unfavourable areas. One example of this process is the disappearance of local markets and growth of the main markets. In industries with high transportation costs we may expect a high correlation between the disappearance of firms and the survival of others on the one hand and the provision of good transport connections on the other.

An interesting question is what consequences the improving transport facilities had for the distribution of industries within the region. A useful way to investigate the geographical distribution of some industries are maps showing the main centres of production for some branches of industry.[27] These are available on the municipal level for 1858 and 1906. For this study I selected four industries in the region: vegetable oil production, bricks and lime industry, shipbuilding and beer production. The maps show the distribution of these industries measured by the number of workers in each municipality. These locations are drawn in the map of the transport system for 1915.

Map 5 shows that in 1858 vegetable oil production was scattered all over the region, but the situation in 1906 clearly shows that a structural process of spatial



Map 5: *Distribution of vegetable oil production (above) and brick and lime production (below) in Groningen in 1858 and 1906 (numbers of workers per municipality).*



Map 6: *Distribution of shipbuilding (above) and beer production (below) in Groningen in 1858 and 1906 (number of workers per municipality).*

concentration at favourable positions in the transport system had taken place. This process was even stronger in brick and lime production, where a lot of the firms at relatively unattractive locations had disappeared and production was increasingly concentrated along the main waterways. Because this branch had high transportation costs it is probable that an optimal location between resources and markets became decisive when competition increased.

Map 6 shows a similar process of concentration in shipbuilding. Halfway through the nineteenth century this activity was to be found in many municipalities widely scattered over the province. In the next decades the industry faced fell into decline, with many small centres disappearing and only a few centres surviving. A very interesting development is the almost complete disappearance of beer breweries in the province. This is a good example of the short term negative effects of market integration for specific industries. Regional production was no longer competitive with beer supplies from the west of the country and Germany. In the Netherlands as a whole, beer production became increasingly concentrated in Amsterdam and Rotterdam and in the southern provinces.

The distribution of agricultural industries and dairy factories has already been studied by other scholars. In the second half of the nineteenth century numerous strawboard and potato flour factories were established in the province. These were largely concentrated at the main waterways in the Peat Colonies.[28] This was not so for dairy factories, which were located close to their inputs, in the middle of stock farming areas.[29] These factories were often established at locations with a high local accessibility.

In general, the location of industrial activities was largely determined by the waterway network and, to a lesser extent, by the railway network. In the province of Groningen most industries were located on one of the main waterways. Pieces of land between a waterway and a railway or a tramway proved to be extremely attractive as locations for industrial enterprises. Examples of this are the sugar factories in Groningen and Hoogkerk, potato flour factories in Veendam and Scheemda and strawboard factories in Pekela.[30] The most important industries in the province of Groningen used agricultural products like potato, straw and sugar beet as their inputs. Around 1900 inland navigation still had comparative advantages in transporting such cheap bulk cargo, but in some cases rail transport was preferred. The strawboard factories in Pekela, for example, frequently used the tramway to get the straw from the farms. A location near a railway or tramway station could also be important for the supply of the labour force, imports of coal, and the export of final products.

In short, we can clearly observe a connection between industrial activity and transport facilities available.[31] The enormous improvements in the transport system had important forward linkage effects for other sectors. For many products, markets were widened, the scale of production increased and specialization in production became possible. This not only offered new opportunities for the

regional economy but also exposed firms to more competition. For some industries the region offered no comparative advantages and such activities gradually disappeared. Other industries were able to profit from the better mobility of factors of production. In such industries a process of concentration can be observed at the end of the nineteenth century. The number of firms decreased and those that survived were often concentrated at positions with a high accessibility. This process cannot be explained by the development of the transport system only, because other variables like population density changed as well. Therefore, it is better to attribute this process of concentration to *economies of agglomeration*, which were highly influenced by transport facilities.[32]

5. Conclusion

My analysis of the regional transportation system has shown its development in time, its spatial characteristics, and the accessibility of places. The regional infrastructure was modernized completely after the middle of the nineteenth century. The dense seventeenth century waterway network was improved, a dense network of paved roads was constructed and a wider integrated network of railways and tramways was developed. Connectivity of all separate networks was low, because of the high dominance of the regional capital the city of Groningen. All connections were centripetally directed towards this capital and secondary places were hardly interconnected among themselves. Only Winschoten and the main towns in the Peat Colonies developed some connections of their own, but they remained subordinated to the city of Groningen. All important connections with places outside the province began in the capital.

In order to measure the accessibility of places I constructed an integrated graph of the whole transport system. The various calculations of accessibility of places (line-weighted, point-weighted and unweighted) gave different results. This demonstrated that it is not sufficient to work with unweighted measures only, because this over-estimates meaningless connections or minor places. The weighted measures provided the best indication of locations with favourable transport facilities. The hierarchy of accessibility of places according to the weighted measures highly corresponded with spatial concentrations of population and industrial activity. All important places had easy access to the main transport connections. The opposite process of the relative stagnation of economy and population in the Clay District on the one hand and the fast growing Peat Colonies on the other was coupled with a shift in transport facilities in favour of the last. The east-west axes in the north of the Netherlands (Germany - Winschoten - Peat Colonies - Groningen -Leeuwarden - Harlingen) became more and more important. We can clearly observe concentration of industries at strategic positions along

the main transportation routes during the process of increasing specialization and large scale production in the second half of the nineteenth century.

APPENDICES

Appendix 1. Line-weights and point-weights used for the accessibility calculations.

Line weights:		
Railway		3
Light railway		2
Tramway		1
Navigation	> 500 000 tonnes	3
	250 000-500 000 tonnes	2
	< 250 000 tonnes	1
Seaport Delfzijl		4
Seaport Zoutkamp		2
Termunterzijl and Statenzijl		1
Point weights:		
> 1 000 inhabitants/km^2		4
Important nodes outside the province		4
200 ≤ 1 000	inhabitants/km^2	3
100 ≤ 200	inhabitants/km^2	2
< 100	inhabitants/km^2	1

Appendix 2. *Hierarchy of accessibility of places in the transport system in the province of Groningen in 1915.*

(Hubbel score, line-weighted according to traffic flows, point-weighted according to the density of population, and unweighted)

	Line-weighted	Score	Point-weighted	Score	Unweighted	Score
1	Groningen	1.36	Groningen	6.45	Groningen	2.28
2	Zuidbroek	1.22	Winschoten	4.79	Winschoten	1.79
3	Hoogezand/Sappemeer	1.22	Stadskanaal	4.65	Zuidbroek	1.61
4	Stadskanaal	1.22	Hoogezand/Sappemeer	4.21	Delfzijl	1.59
5	Hoogkerk	1.17	Pekela	4.12	Stadskanaal	1.57
6	Winschoten	1.17	Veendam/Wildervank	4.02	Hoogkerk	1.53
7	Grijpskerk/Stroobos	1.16	Delfzijl	3.58	Bedum/Onderdendam	1.51
8	Veendam/Wildervank	1.14	Zuidbroek	3.47	Appingedam	1.51
9	Delfzijl	1.14	Hoogkerk	3.09	Hoogezand/Sappemeer	1.46
10	Appingedam	1.11	Appingedam	2.91	junction Reitdiep	1.43
11	Sauwerd	1.10	Bedum/Onderdendam	2.91	Sauwerd	1.43
12	Pekela	1.09	Grijpskerk/Stroobos	2.80	Ten Boer	1.43
13	junction Reitdiep	1.08	Zoutkamp	2.77	Pekela	1.40
14	Bedum/Onderdendam	1.07	Ter Apel	2.53	Veendam/Wildervank	1.38
15	Zoutkamp	1.07	Beerta/Finsterwolde	2.40	Winsum	1.35

Appendix 3. *Hierarchy of accessibility of places in the waterway network in the province of Groningen in 1800.*

(Unweighted Hubbell score)

1	Groningen	2.12
2	Bedum/Onderdendam	1.43
3	Hoogezand/Sappemeer	1.35
4	Zuidbroek	1.29
5	Veendam/Wildervank	1.26
7	Grijpskerk/Stroobos	1.24
8	Appingedam/Delfzijl	1.24
9	Middelstum	1.19
10	Winsum	1.19

Appendix 4. *Hierarchy of municipalities in the province of Groningen by population density in 1909.*

(Number of inhabitants/km^2)

	Municipality	Population density
1	Groningen	4,098
2	Winschoten	515
3	Sappemeer	493
4	Oude Pekela	362
5	Veendam	248
6	Nieuwe Schans	238
7	Wildervank	228
8	Appingedam	119
9	Hoogezand	190
10	Delfzijl	190
11	Muntendam	175
12	Nieuwe Pekela	169
13	Zuidbroek	163
14	Hoogkerk	149
15	Scheemda	136

Appendix 5. *Main locations of industrial activity in the province of Groningen around 1900.*

(Measured by numbers of workers)

Oil mills:
Groningen, Sappemeer, Zuidbroek, Winschoten, Veendam, Appingedam, Loppersum, Leens, Hoogkerk, Grijpskerk, Haren, Leek, Grootegast

Bricks and lime:
Groningen, Sappemeer, Veendam, Pekela's, Winschoten, Scheemda, Beerta, Midwolda, Nieuwe Schans, Termunten, Noorddijk, Ten Boer, Loppersum, Appingedam, Delfzijl, Bierum, Winsum, Bedum, Middelstum, Kantens, Ezinge, Grijpskerk, Hoogkerk

Potato flour:
Veendam, Hoogezand/Sappemeer, Zuidbroek, Kiel, Stadskanaal, Pekela's, Ter Apel.

Strawboard:
Pekela's, Hoogezand/Sappemeer, Zuidbroek, Scheemda, Nieuwe Schans, Stadskanaal, Hoogkerk, Appingedam, Ulrum

Shipbuilding:
Groningen, Hoogezand/Sappemeer, Zuidbroek, Veendam, Hoogkerk, Appingedam, Delfzijl

Metallurgical industry:
Groningen, Hoogezand, Veendam/Wildervank, Winschoten, Midwolda, Slochteren, Appingedam, Delfzijl, Uithuizen

Cigars and tobacco:
Groningen, Zuidhorn, Appingedam, Winschoten, Nieuwe Schans, Pekela's

Sugar:
Groningen, Hoogkerk

Dairy factories:
Groningen, Leek, Marum, Grijpskerk, Hoogkerk, Haren, Slochteren, Ezinge, Winsum, Middelstum, Loppersum, Bierum, Ten Boer.

Sources: J.C.A. Everwijn, *Beschrijving van handel en nijverheid in Nederland* (The Hague 1912). Municipalities with dairy factories are taken from P. Priester, *De economische ontwikkeling van de landbouw in Groningen, 1800-1910* (Groningen 1991) 442. Only factories with an output of more than 2 240 000 litres of milk have been selected.

NOTES

1 This article is an elaborated version of a paper presented at the International Urban History Conference on 'European Cities and Their People', section 'Urban Networks and Hierarchies', Amsterdam, September 1992. It forms part of my Ph.D. thesis *Transport and economic development. An analysis of the modernization of the transport system in the province of Groningen, 1800-1914*, which will be finished at the end of 1993. I would like to thank my colleagues Pim Kooij, Rainer Fremdling, Maarten Duijvendak, Adrian Clemens, Peter Groote and Jan Dekker for their useful comments on earlier versions of this article.

2 J. de Vries, *Barges and capitalism. Passenger transportation in the Dutch economy, 1632-1839* (Utrecht 1981); B. Lepetit, *Chemins de terre & voies d'eau. Réseaux de transports. Organisation de l'espace en France 1740-1840* (Paris 1984). G.A. van der Knaap, *A spatial analysis of an urban system: The case of the Netherlands* (Utrecht 1978).

3 P. Hagget, *Geography. A modern synthesis* (New York 1979) ch. 18; P. Hagget & R. Chorley, *Network analysis in geography* (London 1969).

4 Examples of studies which use graph analysis to analyze social networks are: M.G.J. Duijvendak, *Rooms, rijk of regentesk. Elitevorming en machtsverhoudingen in oostelijk Noord-Brabant, circa 1810-1914* ('s-Hertogenbosch 1990) ch. 5; W. Jansen & G.L.H. Wittenboer, eds, *Sociale netwerken en hun invloed* (Meppel 1992). An important study about the application of network analysis in marketing is: H. Hakanson, ed., *Industrial technological development. A network approach* (London 1987). A main example in organizational sciences is: N. Nohria & R.G. Eccles, eds, *Networks and organizations: Structure, form, and action* (Boston 1992).

5 De Vries, *Barges and capitalism*; Van der Knaap, *Spatial analysis*; Lepetit, *Chemins de terre*; B. Fullerton, *The development of British transport networks* (Oxford 1975); T.R.B. Dicks, 'Network analysis and historical geography', *Area* 4 (1972) 4-9; I. Schickhoff, 'Matriztheoretische Verfahren zur Bestimmung der Zugänglichkeit von Knotenpunkten eines Verkehrsnetzes, aufgezeigt am Beispiel 'Eisenbahnnetz Randstad Holland', *Tijdschrift voor Economische en Sociale Geografie* 68 (1977) 152-167; K.J. Kansky, *Structure of transport networks: relationship between network geometry and regional characteristics* (Chicago 1963); J. Vidal, *Transportes y mercado en el pais Valenciano* (Valencia 1991).

6 The most important studies on the economic history of the region are: P. Kooij, *Groningen 1870-1914. Sociale verandering en economische ontwikkeling in een regionaal centrum* (Groningen 1986); P. Kooij, 'De eerste industrialisatie- en urbanisatiefase in de Groninger Veenkoloniën', in: *Van het verleden naar de toekomst. De Groninger Veenkoloniën in historisch, geografisch en economisch opzicht* (Noordbroek 1989); R.F.J. Paping, 'De nijverheid op het Groninger platteland 1800-1860. Bedrijfsstructuur en loonontwikkeling', *Economisch- en Sociaal-Historisch Jaarboek* 53 (1990) 80-116; P. Priester, *De economische ontwikkeling van de landbouw in Groningen 1800-1910. Een kwalitatieve en kwantitatieve analyse* (Groningen 1991); H.J. Keuning, *De Groninger Veenkoloniën. Een sociaal geografische studie* (Groningen 1989^2); G. Minderhoud, *Ontwikkeling en beteekenis der landbouwindustrie in Groningen* (Groningen 1925); H.J. Keuning, *De regio Groningen. De geografisch-economische geschiedenis van een regionale centrum-stad en haar ommeland* (Groningen 1974).

7 P. Kooij, 'Peripheral cities and their regions in the Dutch urban system until 1900', *Journal of Economic History* 48 (1988) 357-371.
8 De Vries, *Barges and capitalism*, 36.
9 De Vries, *Barges and capitalism*; Van der Knaap, *Spatial analysis*; Schickhoff, 'Matriztheoretische Verfahren'.
10 Lepetit, *Chemins de terre*, 66; De Vries, *Barges and capitalism*; Fullerton, 'Transport networks', 13; Vidal, *Valenciano*; Kansky, 'Transport networks', 13.
11 In networks with a tree structure there is no fundamental difference between the two indices because an increase of links will also result in an increase of circuits.
12 International networks, which often have a limited number of border-crossing links, will presumably also have a low connectivity. However, studies on international networks are not available.
13 Kooij, 'Peripheral cities', 360.
14 De Vries, *Barges and capitalism*, 39.
15 Lepetit also measured the index for France with isolated areas excluded (like mountainous areas which were difficult to cross). This caused a decrease in connectivity. For roads in 1820 he found the following results for α and γ: France 0.15 and 0.43; Bretagne 0,14 and 0,44; Paris and Nord 0,19 and 0,47; Eastern France: 0,20 and 0,47; Southern France: 0,05 and 0,37; Lepetit, Chemins de terre, 71.
16 Data for inland navigation are drawn from: *Statistiek der scheepvaartbeweging op de rivieren en kanalen in Nederland.* Data for road traffic are derived from toll revenues, which are available for each section of 5 kilometres. Rijks Archif Groningen [National Archives of Groningen]: Provinciaal Bestuur, Provinciale Rekeningen, Serie K. The railway data are from: *Verslag der Maatschappij tot Exploitatie van Staatsspoorwegen.*
17 Road traffic is measured in annual toll revenues in 1900 (guilders); inland navigation in 1 000 tonnes loading capacity in 1910; railways in 1 000 passengers and 1 000 tonnes freight in 1910.
18 Lepetit constructed a combined network of roads and waterways, including port connections; Lepetit, *Chemins de terre*, 103. Van der Knaap adds up the accessibility of places in the separate networks; Van der Knaap, *Spatial analysis*, 100.
19 This programme is constructed for analyzing the ranking of people within social networks, but this universal method can also be applied to the ranking of places in spatial networks. For a detailed explanation of the procedures see: C.J.A. Sprenger & F.N. Stokman, *GRADAP. Graph definition and analysis package* (Groningen 1989).
20 Lepetit, *Chemins de terre*, 98; De Vries, *Barges and capitalism*, 36.
21 The weights for lines and points are mentioned in Appendix 1.
22 It is not very meaningful to relate this ranking to population distribution since it is not an independent variable.
23 The province consisted of 57 municipalities. The importance of places is derived from their population density, and not their population size. Both measures have the problem that they over-estimate small and large municipalities respectively. Source: *Regeeringsalmanak Groningen 1910.*
24 K.J. Button, *Transport economics* (London 1982) ch. 3; H.P. White & M.L. Senior, *Transport geography* (Hong Kong 1989) ch. 8.
25 There are some studies which have shown some very interesting results at the national level, *e.g.*: H. Knippenberg & B. de Pater, *De eenwording van Nederland. Schaal-*

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26 G. Myrdal, *Economic theory and underdeveloped regions* (London 1972[2]); F. Voigt, *Verkehr. Die Entwicklung des Verkehrssystems* (Berlin 1965) II: 1157.

27 These are based on the maps constructed by Everwijn; Everwijn, *Handel en nijverheid.*

28 Keuning, *Veenkoloniën*, ch. 9 and fig. 16, 17.

29 Priester, *Landbouw*, 442, gives a map with the locations of dairy factories.

30 Keuning, *Veenkoloniën*, 316; R. Dijksterhuis, *Spoorwegtracering en stedebouw. Historische analyse van een wisselwerking. De eerste eeuw 1840-1940* (Delft 1984) 99.

31 A detailed analysis of the level and nature of this relationship is beyond the scope of this paper.

32 P.E. Lloyd & P. Dicken, *Location in space. A theoretical approach to economic geography* (London 1977) 286.

VI

CIVILIZING THE RESIDENTIAL WORKING-CLASS BY REGULATIONS AND LEASE RULES FOR TENANTS, 1850 - 1980

by

Leon Deben

1. Introduction

In the past decade there has been a number of social-scientific publications about the 'bourgeois civilization offensive'. It is, for example, a key concept in the work of the Amsterdam historian Bernard Kruithof.[1] The Amsterdam sociologist De Regt offered a detailed account of how the civilization activities of bourgeois groups sought to shift the family relationships of urban industrial workers towards a more domestic, orderly and regular pattern of family life whereas Van Daalen, on the basis of an analysis of the letters of complaint from Amsterdam citizens to the City authorities, demonstrated how individuals, mostly from the middle class, sought to civilize their fellow citizens.[2]

All of these studies owe their inspiration to the works of Norbert Elias. Elias ascribed a central role in the civilization process in Western Europe to the adoption by the lower classes of the models of behaviour and social intercourse of the higher classes: the imitation process. The higher classes then reacted to this imitation process by controlling their own behaviour more stringently and further refining their forms of social intercourse: the distinction process. The bourgeois class saw itself both as an example for others to emulate and as a group which might, consciously and intentionally, seek to mould the behaviour of the working-class in the direction it chose. It tried to achieve this latter aim by founding schools, building houses, and taking care of the poor, the sick, prisoners, neglected children and 'fallen women'.[3]

In the mid-nineteenth century members of the bourgeoisie began to take an interest in the life-style of the working-class. They tried to instil in the working-class an awareness of domesticity, decency and hygiene. The pressure to change

'housing behaviour' developed gradually over several generations, but its main themes remained constant. These included the requirement for ever more external control, supervision and regulation, and also encompassed the encouragement of self-control and the need for the working-class to internalize the desired norms of behaviour. Housing civilization, it is clear, did not emerge spontaneously. A large number of institutions became involved in the drafting of house rules, planning working-class housing and undertaking related investigations. By the beginning of the twentieth century the need for civilized housing behaviour was widely regarded as self evident.

The German sociologist Peter Gleichmann is currently conducting research into the component parts of the domestication process. He has written about the development of sleeping, eating and other human habits in terms of the application of hygienic concepts to houses. In a study of housing management in the nineteenth century he explains how powerful German bourgeois landlords went about educating their tenants: 'The ever increasing insistence on rules of socially correct behaviour based on time and space is the most important distinguishing mark of the domestication process'.[4] His contribution to the study of domestic civilization is also inspired by conceptions and ideas derived from the historical sociology of Norbert Elias and his circle.

This study focuses on a number of questions. On the basis of my investigation of the content of leases, I want to identify the aspects of residential conduct which were the main targets of the civilization process and also which values it was thought most important for the workers to adopt. I ask, for instance, how much importance was placed on domesticity, on the proper upbringing of children, and the control of the emotions and how important, for example, pride in the neatness and cleanliness of houses was. I also examine whether it is possible, on the basis of the changing tone and content of leases, to detect any evidence that the civilization process worked, and that the desired middle class norms of housing behaviour did, in fact, become internalized by working-class tenants. The article offers examples, drawn from various historical periods, of rules and regulations about housing behaviour formulated by a wide range of housing associations.

First I give information about the Dutch housing market and the housing organizations involved in it. I then move on to observations about the desired residential conduct of tenants derived from tenancy regulation. Here I describe the process of the housing civilization offensive through rules in leases stretching from 1850 to the present day. The study essentially confines itself to the period from 1900 to 1945, beginning with the passing of the Housing Act of 1901. However, in order to gain a wider perspective on the changes in tone and phrasing of rental agreements, examples drawn from both earlier and later periods are also considered.[5] Even in the present day it is still possible to find leases which enshrine the desire of the landlord to educate the tenant.

The application of the lease regulations is beyond the scope of this study. There is no attempt here to address the questions of how strictly the clauses were adhered to, what sanctions were applied in the event of violation, nor whether such sanctions were carried out. In this second part of the article I examine the phraseology and subjects of the rules and regulations. In the final section I offer an interpretation of the changes as they were written down in tenant regulations. Here the concern is with the regulations that were specifically designed to civilize workers by means of their residential conduct.

2. *Housing market and the rise of social housing organizations*

Attempts to exert regulatory influence over the behaviour of tenants was not confined to the public housing sector. One of the aims of the *Vereniging van Grond en Huiseigenaren* (Rights of Ownership Society; an organization of private landlords) founded between 1894 and 1896, was the achievement of a degree of legal control, though naturally its motivations were different from those of the housing reformers.[6] Section 3 of its Articles of Association stipulated that activities were to be undertaken for the purpose of 'bringing about better legislation in the field of rapid and cheap legal transactions in matters of rented premises and the effects of such transactions'.[7] This society soon drew up a model lease and repeatedly urged its members to make use of it.

The widespread private ownership of housing which was an important element of the housing market in England and Germany was not found in the Netherlands. In the nineteenth century private rental was almost entirely in the hands of small landlords and a specific class of land and house owners never developed.[8] Dutch landlords had relatively small numbers of properties and were sometimes connected with industrial governors (and sometimes with social housing reformers). These small landlords also made lease contracts and formulated house rules to control their tenants. In the Netherlands these - mostly very compact - contracts were derived from the model contracts of the social housing organizations. This was precisely the opposite situation to that which pertained in other European countries where house rules were developed by big private landlords and their associations.

The influence of the social housing organizations in the Netherlands, even in Amsterdam, was relatively slight in quantitative terms, and their contribution must be evaluated in terms of quality. In the period 1851-1870 these organizations built only 2 681 houses.[9] Of these, 927 were in Amsterdam and 541 in the Hague. Until 1901 the fourteen Amsterdam housing organizations had only managed to build around 4 500 houses, representing 7 % to 8 % of the city's housing stock. Most of these were built after 1875, when the period of industrial growth in the economy began.[10]

The first boom in social housing organizations took place in the period 1916-1925 when the increase was very rapid. Whereas between 1902 and 1914 around 300 organizations recognized by the central government were established, there were 1 341 organizations in existence by 1922. Their position is reflected in the house building statistics for the first decades of the century. (see appendix; p. 144).

It is possible to conclude that the production of social housing was only important in quantitative terms for a relatively short period, but that the general influence of social housing organizations on the wider housing market was much more extensive. This qualitative influence can be detected in a number of areas. Firstly, it can be seen in the rules and regulations which the boards of these organizations formulated in order to educate their tenants and to improve their residential behaviour. Secondly, it can be found in the new ways they issued instructions to architects. They were building houses for occupiers who were only identified as a category and it was necessary to instruct architects to develop good, inexpensive housing for the needs of the anonymous worker. Thirdly, they contributed to the debate as to what a suitable house for a worker should consisted of. These organizations were not only interested in specifying minimum standards but also in the formulation of rules of occupancy. They looked abroad for good examples of how tenants might be disciplined under the guidance of supervisors and special functionaries. Life in the properties belonging to the social organizations was still regulated and controlled. In a sense the rules were less rigid and strict than in the houses of the poor in the first half of the nineteenth century, but they were nonetheless elaborately formulated.

Most social housing organizations began with the intention of building houses for different categories of workers, and some even wanted to build for the poorest among these workers. In practice this last proved impossible and it was only the more well-to-do workers who could afford the rents of newly built properties. These workers were the ones who would be most likely to behave in a disciplined way and conform to the norms of behaviour as understood by the board members. Thus the high rent level served at the same time as a means of excluding those who were most likely to behave in an unsuitable manner. The Social Democrat housing associations, connected with the trade unions, which appeared later, also emphasized the need for disciplined behaviour. Drunkenness, causing annoyance, public fornication and the wearing of shabby clothes were forbidden by these organizations on the penalty of eviction on the expiry of the lease. Social housing organizations in general brought working-class housing out of the field of poor relief. The rents they charged were higher than for slum housing and they were carefully calculated in order that they should bring in some return on the initial investment. Working-class housing thus became a new field in which it was possible for sections of the bourgeoisie to impose their opinions on the lower orders.

The battle against the pub as a threat to the domestic virtues also illustrates this quest to establish discipline. The first licensing law against public drunkenness was passed in the 1883 and it was also during this period that laws were enacted against urinating in public and against cruelty to animals. Education and the dissemination of knowledge also came to be seen as something very important, as the bourgeoisie transformed their initial hostility and antagonistic attitudes towards working people into an strategy of imposing their views on the less powerful. The domain of working-class housing proved to be eminently suitable for this purpose.

3. Leases and tenancy rules and regulations

This section looks at the content and tone of the various leases. I want focus especially focus on the question of which aspects of residential conduct are prescribed in the leases in the periods considered.

Regulations for tenants are an excellent source for studying the aims of the bourgeoisie. In contrast to countries such as Germany, during the first decades of the twentieth century many leases in the Netherlands, were derived from the model lease included in the *Handleiding voor woningbouwverenigingen* (Manual for Housing Associations). This Manual had been written by Hudig, a lawyer who was the Director of the Social Advisory Office, an umbrella organization of the housing reformers founded in 1889, and H.C.A. Henny, the Director of the Amsterdam Building Fund. The editors of the manual did not confine themselves to such formal matters as articles of association and rules and regulations, but also included a chapter 'Wenken aangaande gezond wonen' ('Helpful Hints for Healthy Living'). On the basis of a whole host of anxieties concerning health and hygiene, the working-classes were urged to revise their attitudes towards housing. 'Let the sun come into your home ... The sun exerts a great deal of influence on the development of the human body ... If the sun does not enter a home the doctor will ... Do not cover your windows with unnecessary curtains ... Do not rent a railway apartment where the bedrooms never see the light of day ... Light and air are always the first requirements for good health ... Keep your home clean and tidy, and keep the hallways and landings clean too'.[11] This manual was just one in a long series of publications advising tenants how to behave.

The phraseology of the older rules and regulations is strikingly straightforward. The prohibitions, demands and threats of punishment give an all too transparent picture of the power of the landlords. The nineteenth- century rules seem to have been just as crude as the conduct they were designed to contain.[12] Matters that might have appeared to be negotiable were really one-sided; in essence the landlord made the rules and the tenant abided by them. This was also the case in neighbouring countries. The potential strength and scope of such regulations can

be illustrated by the example of a *Hausordnung* that hung on a wall in the hall of a housing complex in the Karl Marxhof in Vienna as recently as 1986. Polishing shoes in the corridor was forbidden. If there were laundries in the block, the tenants were not allowed to do the washing in their apartments. It was forbidden to play in the inner court after sunset or to play music or sing after ten at night. The tenant was even instructed on how he was to fill his bath; he should fill it to a depth of ten centimetres from the cold tap before adding the hot water. In a house regulation from 1872, described by Gleichmann, the tenant was told what to do at certain times and in certain places.[13]

From the perspective of the present day, the rules of the first housing associations were intrusive and dictatorial. The Boards were obviously not content to confine themselves to the provision of accommodation but were determined to improve the moral standards of their tenants and instil in them the rudiments of residential civility. The articles of one nineteenth-century housing association were quite explicit about this. The association defined its duty as 'the taking of any measures within its power to promote the health and cleanliness of the tenants, particularly by urging the government or other owners to bring about improvements in this respect'. Another article outlined the intention of the association 'to improve the moral standard of the tenants by any means that experience proves to be effective'.[14] In the *Verordening op Gebouwen, Getimmerten en Kleine Woningen* (ordinances on buildings, structures and residential premises) of Deventer, passed in 1876, one of the rules stated: These homes are to be kept clean and tidy at all times. If they are found to be dirty, the police will require the tenants to mop, sweep and scrub them within a fixed period of time. If the request is not complied with, the tenant will be punishable by law'.[15] Evidence of similar efforts to instil a greater sense of cleanliness and tidiness, to restrict the consumption of alcohol and to elevate the moral level of the working-classes can be found in many of the rules, regulations, stipulations and bye-laws of the nineteenth and early twentieth centuries.[16] Sometimes it is possible to detect the ideology of a particular association, as in the Articles of the *Amsterdamse Coöperatieve Bouwvereniging Rochdale* (Rochdale Amsterdam Cooperative Building Association). The aim of this housing association was to build accommodation that 'met with the requirements of hygiene and comfort that can be made by a family in modest financial circumstances'.[17] It is unclear what exactly was meant by 'comfort'. There was not a single reference to comfort in any of the earlier nineteenth century rental agreements.

What the older rental agreements did make very clear, however, was that the tenants had to comply in every respect with the standards set down by the landlords. These landlords included members of the boards of the first housing associations and factory owners who built housing for their workers. They were later joined by Social Democrat leaders, who also placed themselves in the vanguard of the campaign for homes that were neat, clean and well designed.

Leaders of the Roman Catholic Church, most notably in mining areas, were also active in the field of housing.

The fact that it was mainly 'excellent' tenants who moved into the developments of the housing associations was the result of a process of careful selection based on evidence of their behaviour, a continuous education of the 'chosen few' and the maintenance of a strict surveillance of their behaviour. The rules drawn up in advance effectively preselected an elite group of artisans, civil servants and office clerks. In addition to paying their rent punctually, tenants were also expected to be neat and tidy and to behave in a respectable manner. Helene Mercier referred to the tenants of the *Amsterdamse Vereniging ten behoeve van de Arbeidersklasse* (Amsterdam Association on behalf of the Working-Class) as 'the cream of the crop'.[18] The Association hand picked an elite to live in its buildings. Moreover, this elite was willing to abide by the strict rules and to set an example to others; an elite which had willingly and consciously chosen to take on the role of model tenant. The effects of this relationship can be found in such stipulations as: 'It is forbidden to put flower pots on the window sills except in accordance with the instructions of the Board of Management'.[19] The street in front of the house had to be scrubbed once a week. Apart from a bird cage, nothing could be suspended from the windows that would be visible from the street. In some leases the tenants were 'obliged to see to it that the gardens were well cared for'. In others it was forbidden to hang laundry or anything else in the gardens in front of the houses.[20] In the event of irregularities, a tenant would be 'dismissed' rather than 'victed'.[21]

The behaviour of the stragglers and unadapted, those who were unable to go along with the transformation of the old working-class into the new industrial class, became less and less acceptable. In 1922 the term 'unadmitted' was used for this category. Later on the Amsterdam City Council softened this to the 'so-called unadmitted'. The housing of such people in slum houses, sheds, old school buildings and other empty properties was not thought of as being in any sense a satisfactory solution. Social reformers were not, however, primarily motivated by the need of such people for shelter, but rather by the desire to re-educate them. In the 1920s officials of the housing services in Utrecht, Amsterdam and the Hague developed plans to build housing complexes of an institutional character specifically for these kinds of people. The organization and the management of these 'housing schools' show how far the housing reformers were prepared to go in order to inculcate in people what they thought were the rules of proper residential behaviour. The intention was to provide an education which would persuade them to 'form neat families' and turn them into 'regular ratepayers and quiet and calm residents'.[22]

I now intend to analyze in some detail the phrasing of a number of rules which appeared in most of the regulations, particularly those pertaining to rental and tenancy, and the extent to which the tenant could exercise control over the premises and sub-let them. Rules about disturbing the peace, causing a nuisance,

and the maintenance of cleanliness and hygiene are also be examined, as are rules about the tenants' right of access to members of the board or the superintendent.

Rent and terms of notice

A lease usually began with rules about how the rent should be paid and how the rental agreement might be terminated; for example: 'The tenant as well as the landlord can terminate the lease at any time with one week's notice'.[23]

When the new neighbourhoods with housing for workers were built at the end of the nineteenth century and the renting of such properties was beginning to take place on a large scale, one of the first and most important questions that needed to be settled was the level of the rents. Average rents of the time ranged from *f* 1.70 to *f* 2.50 a week. It was clear, therefore, that families who were partially or entirely dependent on the dole and were accustomed to living in rooms and tenements where the weekly rent was *f* 0.80 to *f* 1.00 could never afford the rents that were charged in the new neighbourhoods. What is more, they were not the kind of tenants that the housing associations were interested in. Housing, they felt, must not degenerate into a matter of charity. In their articles of association many of the housing associations had special stipulations excluding tenants who were in receipt of poor relief. It was up to the churches and the city authorities to look after paupers. The housing associations wanted to rent their properties to 'good, orderly, well-behaved working people who can pay the rent on time'.[24] Rochdale expressly stated in its Articles of Association that the premises were to be let 'for the normal rent that these premises are valued at'.[25] Immediately after the turn of the century, a great deal of attention was focused on the question of how high rents should be. Other housing associations did little more than specify that the Board was to stipulate the rent. The housing associations implemented an economic rent policy in the sense that philanthropic consideration seldom had any influence. Charity was out of the question. The whole concept eventually disappeared from the rules and regulations to be replaced, in the nineteen twenties, by references to tenants' inability to pay the rent.

Sub-tenancy, lodgers and sub-letting

Sub-tenancy and over-crowding were major causes of concern for the housing reformers. In the Explanatory Memorandum of the Housing Act, over-crowding was viewed as one of the most serious problems. It was explicitly specified in the Housing Act as a ground for eviction. In order to deal with the problem, registration and inspection were called for. Nineteenth and early twentieth century rental agreements stipulated that anyone who was not a member of the 'official' family

could not spend more than a week on the premises without the permission of the Board. Nor was it permitted to reside alone or remain alone on the premises, for example, after the death of one's spouse. The clause prohibiting tenants from having anyone stay with them for more than a week was removed around the turn of the century but these regulations were later restored, often in a more strict form. By 1930 Rochdale was insisting that 'if the composition of the family is not properly proportionate to the number of bedrooms, or if inspection has shown that tenants cannot be expected to comply with reasonable requirements of residential conduct, the Board can refuse allocation'.[26] For the most part, the tenor of this section of the regulations remained intact from the middle of the nineteenth century: no sub-letting and no lodgers without the written permission of the board of the housing association.

Disturbing the peace and causing a nuisance

The older rules and regulations usually included a general section dealing with disturbing the peace and stipulations along the lines of 'causing a nuisance and irregular conduct that disturbs the neighbours may lead to eviction'. In general, leases after 1900 contained less extensive descriptions of this kind of disturbance or nuisance. In later years, one general section on misbehaviour was thought to be sufficient. Sections dealing with the chopping of wood, the beating of linen upstairs, and wallpapering and whitewashing were eliminated. New types of domestic fuel and new standards of domestic comfort were responsible for the change.

In the nineteenth and early twentieth centuries, associations were very concerned about drunkenness and immoral conduct. Section 10 of the Rochdale house rules, drawn up in 1903, actually went so far as to prohibit drunken, immoral and wanton conduct inside the home. Up until the 1920s, the house rules still permitted the sale of alcoholic beverages on the premises. Around the turn of the century widespread drinking among the lower classes was associated with a whole range of problems. Workers would simply fail to show up for work 'the day after the night before' and this led to large losses in productivity. The discipline required for industrial labour was largely lacking at that time. 'Filthy rubbish, drunkards and public houses are not allowed'?[27] After 1945 the sections on disturbances of the peace came to be formulated in more general terms. For example, the tenant was required to refrain from conduct 'which according to generally accepted standards is viewed as causing damage to the premises or to the adjacent premises or as disturbing to the tenants of the adjacent premises'.[28]

Business and trade

By prohibiting tenants from being involved in 'business and trade' on the premises, as virtually all the older rental agreements did, the housing reformers were trying to stimulate domestic living by excluding all commercial activities. Business and trade were also seen as potential sources of inconvenience to other tenants and of damage to property. The premises were meant to be lived in, not worked in. Work was something that should be undertaken at some other place and at some other time. The same intention was behind the rule that attics were to be used exclusively as storage space and not for work (or sleep). The more modern regulations specified that 'the rented premises should not be used for any purpose other than the purpose for which they have been let out' and sometimes added that the premises should not be used 'for the sale and storage of merchandise'.[29] More recent lease agreements can be found which are even more specific about the sort of work that was to be forbidden. They sometimes even prohibited piano and singing lessons.[30]

Laundry

Even after the nineteenth century beetle (a machine to beat the washing) was no longer in use, house rules still included regulations about drying laundry, beating rugs and so forth. To an extent these were motivated by such practical considerations as hygiene, and the desire to maintain ventilation and avoid excessive humidity, but the management boards were apparently also concerned to avoid what they regarded as the embarrassment of laundry being visible from the street. Hanging laundry in such a way that it was exposed to public view was regarded as non-respectable behaviour. Some housing associations went about this in a somewhat oblique way, requiring that nothing should be done to mar the exterior of the buildings. Others expressly prohibited the hanging of laundry in the front of buildings and some of them emphasized that this would be particularly reprehensible if it were done on a Sunday. The 1983 lease of Patrimonium, still contained the stipulation that 'no linen should be visible on a Sunday'.[31]

Animals

One nineteenth-century rental agreement explicitly forbad tenants to keep 'pigeons and chickens and four-footed animals, with the exception of cats, without permission'.[32] As has been noted above, tenants were sometimes allowed to have a cage with a bird in it outside their window though quite a few of the older rental agreements specified that the keeping of rabbits was forbidden. Around the turn

of the century rabbits often provided a welcome supplement to the meagre diet of the working-classes. The rabbit was useful in that it could be bred and slaughtered at home. Chickens could serve the same purpose but in 1928, the *Bouwmaatschappij tot Verkrijging van eigen Woningen* (Building Society for the Promotion of Family Housing) ruled that chicken and other coops would only be permitted if both the permission of superintendent and the approval of the board had been granted. It even specified the permitted dimensions: 'the chicken coop is to be one metre high and the night coop one metre and twenty centimetres'.[33] The more modern lease agreements were less specific, stating that no animals were to be kept in the home that caused 'discomfort and disturbances of any kind' and that written permission was required. The phrasing had thus become more lenient but the intention to avoid all possible disturbances remained the same.

Noise

During the 1930s the first references to radios, and the fact that some people turned up the volume too loud, began to appear in lease agreements. Rochdale specified that it was forbidden 'to turn loudspeakers on in front of open windows or doors, on porches or in the back or front garden' or to 'turn the volume up to the extent that, in the judgment of the Board, it can or does disturb the neighbours'.[34]

Cleanliness

Together with the rules about the payment of rent, rules about cleanliness were the basic components of rental contracts and agreements. 'Tenants are to keep all parts of the interior and exterior of their homes clean at all times and are to ventilate the premises as thoroughly as possible every day'.[35] 'the tenant is under an obligation to keep the property neat and clean'.[36] 'It is the duty of the lessee to keep the premises neat and clean and to be responsible for the costs of the following repairs, which are to be done by the lessor'. The repairs in question were broken windows, damage to locks and latches, plumbing, and any damage caused by negligence or wrongful acts.[37]

In modern contracts, in this case the lease of the *Stichting Lieven de Key* (Lieven de Key Foundation), one of the stipulations was similar to the phrasing that had been common several decades earlier, whereby the tenant promised to reside in the premises 'in the manner of a good upstanding citizen'. Section 5, part 2 now stated that 'The tenant will reside in and keep the premises in a respectable manner'.[38] Stipulations about being 'proper' and 'respectable' and keeping the premises 'clean' and 'ventilated' disappeared over time. The ventilation clause was the first to be dropped; there was no mention of it after 1900. Being 'clean'

became increasingly synonymous with being 'respectable'. In post-war leases the specific stipulations were replaced by the more general notion that tenants had to live in the premises in the manner of 'respectable' persons. Apparently everyone understood exactly what was meant by this. It was no longer necessary to specify that the floors had to be scrubbed. The modern leases did, however, specifically require that the premises should be carpeted and furnished. In the nineteenth century leases mentioned the necessity of having beds in the home which, if need be, could be rented. The guiding principle then seemed to be to make sure that all the most fundamental rules were specified in the regulations. By the twentieth century, and certainly after the Second World War, regulations became increasingly focused on the interior as an expression of social status.[39]

Nonetheless even some of the more recent leases could include stipulations which sound rather old fashioned. Section 3 of the Patrimonium lease, [of 1983], stipulated that the lessee would only be given the key after he has presented to the lessor 'proof of the fact that all the possessions to be placed in the premises have been cleansed and decontaminated by a person or persons to be appointed by the lessor and that the costs, to be fixed by the lessor, have been paid by the lessee'.[40]

Third party access

Newer rental agreements had restrictions on the access of third parties to the premises. In the nineteenth century, the *Vereniging tot Verbetering der Woningen van de arbeidende klasse te 's-Gravenhage* (Society for the Improvement of the Homes of the Working-Class in The Hague) was still able to specify that the superintendents and members of the Board had the right to enter the premises 'as often as was required in the interests of the Society'. Half a century later, Rochdale stipulated that, 'the Board and officials appointed by the Board are authorized to enter the premises at all times, with the exception of the hours between sunset and sunrise, in order to ensure that all the rules stipulated in the previous sections and in the Articles of Association are being adhered to'.[41] Here, at least, the rights of access of third parties were restricted to certain parts of the day, but other housing associations had different ideas about this. Section 23, part 2 of the Rules and Regulations of the *Bouwmaatschappij tot Verkrijging van Eigen Woningen* (Building Society for the Promotion of Family Housing), as formulated in 1914, obliged every tenant 'to allow an investigatory committee of no fewer than two persons, to be appointed by the joint meeting of the Board and Council of Representation, to enter the premises at any time'. In 1928 they added the requirement that the tenant should 'allow the manager appointed by the Board to enter the premises at any time'.[42] The notion that the tenant had a right to privacy in his own home was still not widespread in housing association circles.

Strangely enough, Hudig and Henny's Manual, which served as the example for many housing associations, did not contain any regulation about third party access. The matter was left to the individual housing associations. In the Rules and Regulations of the Haarlem housing association Rosehaghe, the phrasing was as follows: 'In order to enable the Board to keep a check on the manner in which the residents maintain the premises and to see whether there are any repairs that need to be done, upon prior notice, the tenant is obliged to allow the Board or any person or persons appointed by the Board for this purpose to enter the premises'.[43] More recent tenancy agreements expressed the idea that, in so far as it was necessary to carry out its functions as lessor, the housing association should have access to the premises. If the lessee denied the housing association access he would be held liable for any damage that ensued. Access could only be requested on the basis of a prior and precise indication of when the work was to be done, or when the premises were to be viewed by new prospective tenants. Stipulations of this kind fell under the heading of 'compulsory admission'. The term clearly no longer carried the same meaning which it had in the nineteenth century, when the tenant had been required to provide complete access at any time of day or night. After 1945, Patrimonium tenancy agreements restricted compulsory admission to the room which contained the hoisting apparatus, used for moving furniture in and out of upstairs windows where staircases were too narrow. In order to avoid differences of opinion as to who might legitimately be defined as a removal man, it also specified that 'persons who are not of the staff of the housing association' should be granted admission.

4. Conclusion

The first question raised in this article concerned the theme of civilized residential behaviour. I shall now try to identify the most significant issues which arise from the study of tenancy agreements: the items of residential conduct that were the main targets of the civilization process; the values that were thought to be of greatest importance; wether it is possible to deduce anything of consequence from the changing tone and content of the leases.

Many sets of regulations opened with lists of the uses the tenant was permitted to make of the premises and which he was not. This might include rules about sub-tenancy, lodgers, sub-letting, business and trade, and sometimes the explicit prohibition of the sale of alcohol on the premises. There were also prohibitions on activities which could be performed in the property, which were designed to prevent tenants causing a public nuisance or disturbing other tenants. Some of these prohibitions seem to relate less to actual residential behaviour than to more general standards of good conduct, for example the rules against drunkenness and immoral acts. Residential behaviour, in the sense that was directly related to

residing in a specific property, was dealt with in sections pertaining to hygiene and maintenance. It was forbidden, for example, to discard refuse in streets, alleyways, bleaching fields, entrances or passages. It was forbidden to leave garbage outside except on the day appointed for its collection. All leases contained stipulations about the rights of access of third parties to the premises. In some cases, members of the board or superintendents could only gain access to the property after the tenant had given his permission. At the other extreme, as in the nineteenth-century agreement cited above, they could come and go as they pleased. In more recent leases (post-1945) the euphemistic term 'compulsory admission' came to be used. The final category of rules and regulations pertain to supervision. Without supervision by members of the Board, the superintendents appointed by them, or, as later became the common practice in the Social Democrat housing associations, committees of tenants, there was no way the other rules and regulations could be put into effect. This, however, is beyond the scope of this study which is only concerned with developing a picture of the relationship between lessees and lessors and the way in which this changed over time.

Civilized residential behaviour was thought to include tenants not being permitted to sub-let any part of their premises. The property could only be used as a home. The purpose of this type of regulation was clearly to promote domesticity. Notions of civilized domestic behaviour were also translated into regulations about hygiene the proper maintenance of the interior and exterior of the premises, and rules about conduct towards neighbours. The aim of the latter was to prevent nuisances or disturbances of the peace, matters often intrinsically linked to the kind of socially desirable conduct associated with being 'respectable'. In general, leases were concerned with specifying undesirable conduct rather than defining proper residential behaviour. Most of the injunctions were along the lines of what could and could not be done at a particular time or in a particular place. The concept of respectable behaviour clearly had a great deal to do with very specific notions of time and space. The home was firmly defined as a place of residence and not of work. One of the central aims of the civilization offensive of the housing reformers was the regulation of the behaviour of the working-classes outside the place of work.[44] To this end they precisely defined the rules of domesticity: the family must play the central role; there were not to be any lodgers on the premises; the tenant was required to exercise self-control in everything he did or said; the premises were to be kept clean and tidy; no laundry was to be hung to dry where it might be visible to outsiders; the front yards were to be well cared for; the staircases to be swept and scrubbed regularly. Wether, no animals were to be kept in the home and there was to be no drunkenness or public immorality.

We can now pose the question as to whether such regulations proved effective and whether the working-class did acquire a sense of inner discipline in respect of housing behaviour. Points can be made both for and against. Although the content and subjects of rental agreements largely remained constant there were

considerable changes in their tone and the phrasing. Over time the paternalistic and imperious character of the rules diminished. This was not only an indication of the changing relationship between lessor and lessee, but might also suggest that some internalization of the rules of civilized residential behaviour had taken place. The phrasing of the earlier rules and regulations make it clear that the lessor was in a 'command' relationship with the lessee; the one led and the other followed. In the nineteenth-century agreements there is scarcely any acknowledgement of the autonomy and right to privacy of the tenant.[45] Over time this relationship changed. The standardization of rental contracts helped reduce the high handed arbitrariness which had defined and accentuated the inequality in the lessor/lessee relationship. The change in tone became particularly noticeable after 1920. The tenant was no longer simply informed that 'this is forbidden' or 'that is prohibited' but was approached more as an equal. The lessor had certain rights but so did the lessee. The phrasing of agreements became less authoritarian and brusque.

The effects of the civilization process seem to be most clearly evident in the prohibitions specified in the rental agreements. Some rules suddenly disappeared. This clearly did not mean that activity was no longer forbidden, but rather that it was thought to have become unnecessary to mention it explicitly. Perhaps the rule had become superfluous because the tenant had come to comply with it automatically. An analysis of modern leases would seem to indicate that the working-classes did come to value domesticity and to look upon their house as an environment for the proper upbringing of children, and that they had learned to control their expressions of emotion and to take a pride in maintaining a neat and hygienic home. Support for this view can be found in the work of De Regt.[46] Whereas in the nineteenth century it was the bourgeoisie which had provided the example of civilized behaviour for others to follow, by the beginning of the twentieth century this function had been taken over by the progressive sectors of the working-class.

Appendix. *Houses build by private persons, cities and organizations, 1905-1930.*

	(1)	(2)		(3)	(4)	(5)	
	Total number of houses	Number of build houses by private persons		Number of *social* houses: build by social housing organi-sations	build by cities	total social houses	
		abs	%			abs	%
	(2+5)					(3+4)	
1905-1910	124,000	121,461	98.0	2,287	252	2,539	2.0
1911-1915	98,000	85,887	87.6	11,459	654	12,113	12.4
1916-1920	66,500	16,981	25.5	36,877	12,642	49,519	74.5
1921-1925	221,886	131,525	61.5	59,784	25,577	85,361	38.5
1926-1930	244,887	208,037	85.0	25,363	11,437	36,800	15.0

Source: W.C. Dijkhuizen *et al.,Documentatie Woningbouwcorporaties (The Hague, no year).*

NOTES

1 B. Kruithof, 'De deugdzame natie. Het burgerlijk beschavingsoffensief van de Maatschappij tot Nut van 't Algemeen tussen 1784 en 1860', *Symposion* 1 (1980) II: 22-37. See also: P. de Rooy, *Werklozenzorg en werkloosheidsbestrijding 1917-1940. Landelijk en Amsterdams beleid* (Amsterdam 1979) 9-10; W. van Kranendonk, *Figurational sociology* (Amsterdam 1990).

2 A. de Regt, *Arbeidersgezinnen en beschavingsarbeid. Ontwikkelingen in Nederland, 1970-1940* (Meppel 1984); R. van Daalen, *Klaagbrieven en gemeentelijk ingrijpen. Amsterdam 1865-1920* (Amsterdam 1987).

3 De Regt, *Arbeidersgezinnen en beschavingsarbeid*, 136-137.

4 P.R. Gleichmann, 'Wandlungen im Verwalten von Wohnhäusern', in: L. Niethammer, *Wohnen im Wandel. Beiträge zur Geschichte des Alltags in der bürgerlichen Gesellschaft* (Wuppertal 1979) 69: 'Die im Verlauf engerer Verflechtungen immer präzisere raumzeitliche soziale Verortung des richtigen Benehmens ist ein Hauptkennzeichen des Verhäuslichungsprozesses'.

5 The rules and regulations, leases and rental agreements used in this study are:

1) The rental code of the *Vereniging tot Verbetering der Woningen van de arbeidende klasse te 's-Gravenhage* (Society for the Improvement of the Homes of the Working Class of The Hague), drawn up in 1854. The amended Code drawn up on 1 May 1904 was also consulted. This is the oldest set of rules and regulations examined in this study. This society was founded by several of the Hague's most prominent citizens.

2) Rental regulations and house rules of the *Amsterdamse Coöperatieve Bouwvereniging Rochdale* (Rochdale Amsterdam Cooperative Building Association), drawn up in 1903. Specific attention was given to sections 6-15 of the House rules. The 1930 House rules were also consulted. This Social Democratic housing association was founded in 1903 and was recognized in 1906 as an 'admitted institution' according to the criteria formulated in the Housing Act. The members of its managing board included A. Keppler, an engineer who was the director of the Amsterdam Municipal Housing Department founded in 1915, and H. C.A. Henny, the chairman of the National Housing Council founded in 1912. Both these men were pioneers in the field of public housing.

3) Sections 12-19 of the tenancy rules of the *Amsterdamse Coöperatieve Vereniging 'De Samenwerking'* (Amsterdam Co-operative Association 'Co-operation'), drawn up in 1908 and revised in 1958. These tenancy rules were included in the membership booklet and share certificate. It was a social housing organization which focused its attention on the housing needs of the new middle classes. It was founded by a group of higher Amsterdam civil servants and teachers who wanted to look after their own housing needs.

4) Parts of the 1913 lease of the *Amsterdamse Woningstichting Patrimonium* (Patrimonium Amsterdam Housing Foundation). These were similar to the rules referred to under 3 and 4. Sections 4, 5, 6, 10 and 15 were referred to. Leases dated 1961 and 1983 were also consulted. The Patrimonium Housing Foundation in Amsterdam is a social housing organization with denominational affiliations. The Foundation, which was founded in 1911, was the result of a 1910 initiative on the part of Douwes, the chairman of the Protestant Workers' Association (Protestant Trade Union). Just

as the Social Democrat trade union was linked to Rochdale, so the Christian workers trade union was closely associated with Patrimonium.

5) Lease included in the *Handleiding voor Woningbouwverenigingen* (Manual for Housing Organizations) by D. Hudig and H.C.A. Henny, written in 1914.

6) Sections 4 and 5 of the 1986 Rental Contract of *Stichting Lieven de Key* (Lieven de Key Foundation) in Amsterdam.

7) Articles of association, tenancy rules and regulations, of the *Bouwmaatschappij tot Verkrijging van Eigen Woningen* (Building Society for the Promotion of Family Housing), drawn up in 1914, 1920 and 1928. This housing association was founded in 1868 by a number of leading Amsterdam citizens, who became members of the Committee of Supervisors. One of them was D.P.D. Fabius, a fervent member of the Dutch temperance movement. Later, J.W. Tellegen, an engineer and the director of the Building and Housing Supervisory Department which was founded in 1901, joined the Board of Directors, as did A. Keppler, who became its municipal commissioner. The individuals who held the executive positions illustrated the association's ties with the pioneers in the field of public housing as well as their middle class origins.

9) Articles of association and rental regulations of the *Woningbouwvereniging Rosehaghe* (Housing Corporation Rosehaghe) in Haarlem, drawn up in 1934, 1951 and 1978. This housing association was founded in 1918. Its aim was to provide 'hygienically designed homes that meet the needs of the families of civil servants and other persons of similar status' (from the rules and regulations included in the 1934 Articles of association). Its tenants were the vanguard of the working classes.

6 All translations of rules and regulations or names of housing associations are my own.

7 Vereniging van Grond- en Huiseigenaars 'Het Eigendomsrecht', *Articles of association* (Amsterdam 1902).

8 F. Barnhoorn, *et al.*, *Kleine huisbazen* (Amsterdam 1986) 70.

9 S. Stratingh Tresling, *Het bouwen van arbeiderswoningen* (Haarlem 1870) see list Boissevin.

10 C. Schade, *Woningbouw voor arbeiders in het 19e-eeuwse Amsterdam*, (Amsterdam 1981) 199-200.

11 D. Hudig & H.C.A. Henny, *Handleiding voor woningbouwvereenigingen* (Zwolle 1914) 9, 211-212.

12 P.R. Gleichmann, 'Veranderingen in het beheer van woonhuizen', in: L. Deben & J. van der Weiden, eds, *Sociologie en gebouwde omgeving* (Deventer 1982) 32.

13 Gleichmann, 'Veranderingen in het beheer', 57-61 and 61: 'Übrigens is alles Zanken, Musiciren, Singen, alles unnütze Geraüsch des Gesindes, Thürenwerfen, starkes Treppenlaufen, Kindergeschrei u.s.w. im Hause und im Hofe untersagt. Das Gehen mit Holzpantoffeln oder Pantinen sowohl in der Wohnung als auf den Treppen und Treppenfluren ist unter keinen Umstände gestattet' (article 17).

14 Vereniging tot Verbetering der Woningen van de arbeidende klasse te 's-Gravenhage, *Rental code* (1854).

15 J.W. Jenny Weijerman, *Overzicht van de door verschillende woningverenigingen op aanvrage der tentoonstellingscommissie verstrekte statistische gegevens* (Amsterdam 1899) 113, n. 40.

16 F. Bakker Schut, *Industrie en woningbouw* (Assen 1933) 41.

17 Amsterdamse Coöperatieve Bouwvereniging Rochdale, *Rental regulations, House rules, Articles of association* (Amsterdam 1903) section 2.
18 L. Delfgaauw & D. Overwater, *Van Concordia tot Lucky Luyk* (Amsterdam 1985) 16. See also: M.J.A. Moltzer, 'De Nutsrapporten betreffende het woningvraagstuk', in: *Gedenkboek van het Maatschappij tot Nut van het Algemeen, 1784-1934* (Amsterdam 1934) 210-220.
19 Vereniging tot Verbetering der woningen van de arbeidende klasse te 's-Gravenhage, *Rental code* (1854-1904) section 9.
20 Woningbouwvereniging Rosehaghe, *Articles of association and rental regulations* (Haarlem 1934) section 5.
21 See also: N.L. Prak, 'Klein behuisd. De wooncultuur van arbeiders in de 19e eeuw', in: P.M.M. Klep *et al.*, eds, *Wonen in het verleden, 17e - 20e eeuw* (Amsterdam 1987) 249-258.
22 Gemeentelijke Woningdienst, *De huisvesting van a-sociale gezinnen te Amsterdam* (Amsterdam 1929) 5.
23 Hudig & Henny, *Handleiding*, Appendix, lease, section 1.
24 L.M. Hermans, *Krotten en sloppen. Een onderzoek naar de woningtoestand in Amsterdam* (Amsterdam 1901, 1976[2]) 89.
25 Rochdale, *Articles of association represent 1903*, section 2.
26 Rochdale, *House rules* (1930) section 7.
27 Hermans, *Krotten en sloppen*, 89.
28 Stichting Lieven de Key, *Rental contract* (Amsterdam 1986) sections 4-5.
29 Amsterdamse Woningstichting Patrimonium, *Lease* (Amsterdam 1983) sections 3-4.
30 Amsterdamse Coöperatieve Vereniging 'De Samenwerking', *Tenancy rules* (Amsterdam 1958) sections 12-19.
31 Patrimonium, *Lease* (1983) section 13, part 14.
32 Vereniging tot Verbetering der woningen van de arbeidende klasse te 's-Gravenhage, *Rental code* (1854/1904) section 8.
33 Bouwmaatschappij tot Verkrijging van Eigen Woningen [from 1911: Maatschappij ter Verbetering der Volkshuisvesting], *Articles of association, Tenancy rules and regulations* (Amsterdam 1928) section 31, part 7.
34 Rochdale, *Rental regulations and House rules* (1930) section 10.
35 Vereniging tot Verbetering der woningen van de arbeidende klasse te 's-Gravenhage, *Rental code* (1854/1904) section 11.
36 Rochdale, *Rental regulations and House rules* (1903) section 9.
37 Hudig & Henny, *Handleiding*, Appendix, lease, section 12.
38 Lieven de Key, *Rental contract*, section 5, part 2.
39 L. Deben, *Van onderkomen tot woning: Een studie over woonbeschaving in Nederland 1850-1969* (Amsterdam 1988).
40 Patrimonium, *Lease* (1983) section 3.
41 Rochdale, *Rental regulations and House rules* (1903) section 5.
42 Vereniging tot Verbetering der woningen van de arbeidende klasse te 's-Gravenhage, *Articles of association, Tenancy rules and regulations*, section 31, part 8.
43 Woningbouw Vereniging Rosehaghe, *Articles of association*, section 7.
44 See also: De Regt, *Arbeidersgezinnen en beschavingsarbeid*; Van Daalen, *Klaagbrieven en gemeentelijk ingrijpen*, Deben, *Van onderkomen tot woning*, and especially Gleichmann, 'Wandlungen im Verwalten'.

45 See also: A. de Swaan, *Uitgaansbeperking en uitgaansangst* (Amsterdam 1979) 15.
46 De Regt, *Arbeidersgezinnen en beschavingsarbeid.*

VII

DUTCH INTERNATIONAL ECONOMIC RELATIONS DURING THE DEPRESSION OF THE 1930S

by

Hein A.M. Klemann

1. Introduction

It is common opinion that the economic depression in the neighbouring countries pulled the Dutch economy down in the early 1930s.[1] While in Britain and Germany a strong recovery had begun as early as 1933, in the Netherlands recovery did not become established before 1936. It was in this year that the guilder was devalued. This paper attempts to answer the question why the Dutch economy did not recover before the end of 1936 while the economies of Britain and Germany began to grow again from 1933 on. In the 1920s the Dutch economy had grown quickly. In the 1930s it could not even recover from the depressed position it fell into during the years of international depression. It is clear that something must have fundamentally changed between the 1920s and the 1930s. Monetary instability and protectionism in the outside world proved disastrous for the Dutch economy; sterling was depreciated and the *Reichsmark* became inconvertible. This can explain the prolonged depression, but it cannot explain the recovery after 1936. After all monetary instability and protectionism were also characteristic for the last years of the interbellum period. The monetary policy of the Dutch government is often seen as a cause of the prolonged depression.[2] This paper not only examines the Dutch gold standard policy but also the consequences of the inconvertibility of the German *Reichsmark* for the Dutch economy. It will be made clear that the Dutch economy suffered from the monetary development in Britain and Germany and from the reaction of the Dutch government to this development.

The 1920s are known in the Netherlands as 'the good years that preceded the depression'. The Dutch economy increased at an annual rate of 5 % and industrial

growth was even as high as 8 %.[3] The government did not stimulate this development but it merely tried to balance its budget and lower the tax level, a policy that was rather successful. From 1925 until 1929 the budget was more than balanced. A great advantage for the Dutch economy in the 1920s was the fact that the country had remained neutral during the First World War. It was then that several important industries began their production in order to substitute necessary imports that were no longer available. The war gave the economy a broader base.[4] It also strengthened the financial foundation of the economy to such an extent that even the most conservative economist could wish no better. Profits were high and, more important, a number of foreign banks and financial institutions took shelter in the neutral Netherlands during the war and the period of postwar inflation. The gold stock of *De Nederlandsche Bank*, the Bank of the Netherlands, became enormous and Amsterdam became an international financial centre once again. It was the loss of the Central Powers' contacts with London in 1914 and the post-war German inflation that made this renaissance of Amsterdam as an international financial centre possible.[5]

The 1920s saw a period of growth and diversification of the economy. The Dutch no longer principally earned their living with trade, colonial investments and agriculture. Industry had already become important during the last decennia before the First World War, and this industrialization process continued during the 1920s.[6] Although the economy became more diversified, this did not mean that the country became more self-sufficient. Agriculture was still an important export sector, but this was only true for horticulture and for the dairy and meat industry; exports included butter, eggs, cheese, meat and vegetables. However, Dutch agriculture could not feed the country's population or its cattle, and corn had to be imported on a large scale. Although Dutch industry became more important and more diversified, many products were not produced domestically. The mines in Limburg, in the extreme south, were better located for the Belgian or Luxembourg markets than for the Dutch market. Before the canalization of the Maas River in the 1930s it was cheaper to use German Ruhr coal. Dutch coal was not of the rich quality often used in industry anyway. Dutch iron and steel production, the machine industry and even the consumption goods industry also increased and diversified during the 1920s, but could not produce all types and qualities the Dutch economy needed. Large imports were also necessary because the country had limited natural resources. At the same time foreign markets were a fountain of life for the specialized production. The development of international trade and thus the economic development in the neighbouring countries, were of the highest importance for the Dutch economy. In 1929 almost 50 % of GNP was used to buy imported products while visible and invisible exports were more than 40 % of GNP.[7]

In the years of economic growth during the interbellum period labour productivity grew by more than 1.5 % annually.[8] Until the 1960s the birth rate in the

Netherlands was high. During the interbellum period the labour force increased annually by 1.0 - 1.5 %.[9] Drukker thinks it strange that the exceptional Dutch demographic development has hardly been mentioned in the debate on the prolonged depression. He believes that the lasting high unemployment was a result of this high population growth.[10] However, he fails to clarify why this demographic development and the high labour supply became a problem in the 1930s and not in the 1920s. During the interbellum years in the Netherlands an annual growth of at least 2.5-3.0 % was necessary to avoid unemployment. During the second half of the 1920s this proved possible. In 1928 unemployment reached its lowest level for this period, 4.5 %. During the following years unemployment grew and by 1936 had reached 19.0 %.[11] From 1929 on the depressed economy could no longer absorb the growing number of people. This was not only a problem in the years of international depression until 1933, but also in years of international recovery from 1933. A strong recovery only began in the last quarter of 1936. The open economy suffered from the international depression in the early 1930s but could not benefit from the recovery in Germany and Britain after 1933. Real national income fell by 4 % as late as 1934 (Table 1) Only in 1935 was there a small recovery, but it was too small (only 1.4 %) to keep employment at the depressed 1934 level.[12] One question is therefore how it was possible for the economies of the neighbouring countries to pull the Dutch economy down into depression in the early 1930s and yet not be able to pull it out when recovery began.

During the 1930s the Netherlands was confronted with fundamental changes in the economy and policy of the surrounding countries. A depression in Germany or Britain is always a setback for the Dutch economy, but the total monetary debacle in these countries proved disastrous. Stable exchange rates are of the utmost importance. In 1931 not only was the pound sterling devalued, but the currency of the most important Dutch economic relation, Germany, also lost its value in the international markets. In July 1931 the *Reichsmark* became inconvertible. Germany was not only important for Dutch agricultural exports, but the German economy was also the basis of the port of Rotterdam and of the transit traffic along the Rhine. The depression in the surrounding countries pulled the Dutch economy down. Real exports of goods and services fell by more than 30 % between 1929 and 1933. In the same period the export prices in guilders also fell down by more than 30 %.[13] The only force strong enough to restore prosperity was the export of goods and services, but the export trade was in depression until the last quarter of 1936.[14] The question why the depression in the Netherlands continued after 1933 can therefore be extended into the question why the Netherlands could not restore contact with the international economy, in other words, what went wrong in the contacts with Germany, Britain and other important trading partners and would another policy have solved these problems.

Table 1. *The Dutch economy in the 1930s.*

Year	Unemployment in %	Real national income 1929=100	Real exports (incl. invisibbles) 1929=100	Real imports 1929=100	Real exchange rate of 1929=100
1929	5.7	100	100	100	100
1930	5.5	99	92	95	98
1931	9.7	94	85	90	107
1932	16.2	93	70	78	116
1933	17.7	94	69	82	123
1934	17.1	91	75	79	121
1935	19.1	92	77	76	125
1936	19.0	96	80	78	101
1937	16.5	102	94	88	105

* The real exchange rate of the gulden is the average of the exchange rate of the gulden with the Reichsmark, pound sterling, US dollar, the French and Belgian franc and the Dutch-Indian gulden, weighted by the proportion of these countries in Dutch exports in 1929 and corrected for the cost of living in these countries and in the Netherlands. In 1936 the gulden was devalued.

Sources: *CBS, Macro-economische ontwikkelingen, 1929-1939 en 1969-1985. Een vergelijking op basis van herziene gegevens voor het interbellum* (The Hague 1987); G.P. den Bakker & W. van Sorge, 'Het onbenut arbeidsvolume in het Interbellum', *Economisch- en Sociaal-Historisch Jaarboek* 54 (1991) 212-240; H.A.M. Klemann, *Tussen Reich en Empire. De economische betrekkingen van Nederland met zijn belangrijkste handelspartners: Duitsland, Groot-Brittannië en België en de Nederlandse handelspolitiek, 1929-1936* (Amsterdam 1990) 103.

2. *Monetary collapse of 1931*

In 1929 the Federal Reserve System reacted to Wall Street speculation by introducing a stringent money supply. It did not end speculation, but it was a setback for the credits to Europe and created enormous financial problems there.[15] The financial crisis of 1929 had great influence on the German economy and was even a threat to the stability of sterling. To the Dutch economy it was only a small matter.[16] One of the consequences of the policy of the FED was that the liquidity the United States received from the outside world through its active current account no longer returned to the debtor countries. Germany was the country most

severely affected.[17] Its economy was based on foreign credits, it had to pay reparations to the victors of the First World War and it had a passive current account.[18] To pay for the reparations and the deficit Germany had to borrow on a large scale from foreign countries, especially short-term loans from the United States.[19] Any uncertainty about the German economy or a more interesting opportunity for investing money elsewhere could result in a financial crisis. In 1929 the credits from the United States slackened just at the moment when the German reparation payments reached a climax. In June 1929 the issue of a German Treasury Loan became a failure.[20] Internal savings were scarce and external credits were no longer available. The Brüning government had to balance its budget as there was no alternative source of money, after the Reichsbank refused credits to the government to avoid inflation. The only way to pay the reparations was by a cut in government expenditures.[21] The German prosperity based on foreign credits collapsed, and the social and political instability of the early 1920s returned. To foreign creditors this was a reason for withdrawing their credits, which credits never again became as important as they had been before 1929. Every economic or political incident, and there were many in these dramatic years of German history, resulted in new foreign withdrawals. Every new gulf of withdrawals extended the economic, social and political problems.[22] In the summer of 1931 withdrawals and speculation resulted in bank failures that threatened the weak position of the *Reichsbank*. The Central bank was not in a position to save the private banks, neither could the Government help them.[23] The only solution for this crisis was a depreciation, but the German population feared the inflationary impact of such a policy as they remembered the inflation of the early 1920s as a period of depreciations. Another objection to a depreciation was that as most credits were in foreign currency, depreciation would extend the problem of the foreign credits.[24] Germany proved to be *zahlungsunfähig*. A total currency control was the only solution. In July 1931 the *Reichsmark* became inconvertible.[25] The financial uncertainty after the collapse of the *Reichsmark* prompted the destruction of the second weak link in the monetary chain.[26] The pound sterling, overvalued since 1925,[27] faced grave problems in 1929. American speculation became a threat, but an even greater one was the French decision to change its gold exchange standard for a real gold standard. Before 1928 the *Banque de France* had accepted payment in sterling and kept bank accounts in London. French capital was used in London as a foundation for the international credits that flowed from this financial market all over the Empire and South America.[28] In 1928 France claimed gold for its active current account,[29] a policy that threatened British monetary stability. This year was the first year that the British Empire had a deficit current account,[30] Britain had to use its gold stocks. The President of the Bank of England, Norman, had feared for the British gold standard during the Wall Street speculation.[31] After the great Wall Street crash of September 1929 and the relaxation of American monetary policy that followed, the danger seemed over. However, the

stream of gold from London to Paris continued. According to the theory of the gold standard this could not go on. Gold losses should result in a smaller money circulation and thus in a fall of the domestic price level. The position of the country in international competition would be strengthened by these lower prices, and this would balance the current account and end the gold flow. The British authorities, however, feared the consequences of monetary deflation at a time when the economy was already depressed. The Bank of England used the open market to stabilize circulation, and from 1929 Britain had a fixed circulation based on a diminishing gold reserve. This could only end in disaster.[32]

The flow of gold to Paris was not the only British problem. Sterling was still the most important international currency and bankers from all over the world kept sterling accounts in London. When these banks feared for their liquidity, the easiest way to strengthen it was by liquidating their sterling accounts.[33] In the summer of 1931 there were financial problems all over Europe and the United States.[34] An important number of European banks, that lost liquid assets when the German credits were blocked, began to liquidate sterling accounts to restore liquidity.[35] The flow of gold from London took on a dangerous shape. On 10 September, 1931, the Chancellor of the Exchequer, Snowden, presented a balanced budget, which seemed to check the immediate threat.[36] In fact, the British government could not check the flow of hot money from London as long as bankers anywhere needed their money at home. The last blow came from bankers in Amsterdam. In the Netherlands the Third Tuesday of September is traditionally the day the Queen opens Parliament and the Government presents its budget for the next year. Rumours had it that the 1932 budget was unbalanced. This resulted in speculation on the Amsterdam stock exchange. For the banks this was an incentive to liquidate more sterling accounts and the flow of gold from London to the continent began once again.[37] The uncertain position of the Bank of England stimulated French banks to participate in this scramble for gold. On September 23 the Bank of England failed. The British Ambassador in Brussels told the Dutch Minister that the Netherlands were to blame.[38] In fact the British monetary policy, the enormous economic problems of Britain during the interbellum period and the monetary and financial instability were to be blamed. Nevertheless, it is a fact that in the third quarter of 1931 82 % of the flow of gold from London went to only two countries, France (49 %) and the Netherlands (33 %).[39]

3. The Netherlands and the gold standard

For the Netherlands the depreciation of sterling and the fall of the *Reichsmark* were disastrous. The stability of the exchange rates was lost, the authorities had no idea how to react on this, the banks reacted by liquidating their foreign accounts, the flow of gold from London went on without slackening until the end of the year and gold smuggling from Germany kept the stream from Berlin going. During 1931 the already large gold stock of *the Bank of the Netherlands* doubled from 426 to 899 million guilders.[40] Technically there was no reason to depreciate. The idea the British authorities had already expressed a few months after the collapse of sterling - to stabilize its currency without any link to gold - was considered nonsense in the conservative Dutch financial world.[41] Experience with currencies without a metal base was limited to the Great War and the first few years afterwards. The German experience made clear what would happen with paper money; uncontrolled inflation would be the end of it. After the depreciation of sterling the prime minister, Ruijs de Beerenbrouck, invited politicians, top civil servants, trade union leaders and the leaders of industrial organizations to discuss what to do. Everyone agreed to do nothing. [42]The depreciation of sterling made competition for the Dutch difficult, but by sitting out British inflation and hoping for a little deflation, the economy would soon become competitive again. There was no reason to follow the dangerous British experiment.

Table 2. *The development of prices in the Netherlands (1929 = 100).*

Year	International prices import	export	Sterling rate	Cost of living	GNP deflator
1929	100	100	100	100	100
1930	91	91	100	93	98
1931	74	75	69	86	94
1932	59	59	67	83	86
1933	53	53	67	85	82
1934	49	51	60	84	82
1935	48	49	60	81	78
1936	50	52	74	80	75
1937	68	65	74	83	78

Sources: CBS, *Macro-economische ontwikkelingen; CBS, 75 jaar statistiek van Nederland* (The Hague 1975); 'Wisselkoersen in Nederland', *Economisch-Statistische Berichten* 14-22 (1929-1937); Klemann, *Tussen Reich en Empire.*

Sterling had been the main currency in the international markets since the nineteenth century. The 1931 depreciation of sterling did not result in any change of the sterling prices on these markets. For the countries that did not depreciate, it resulted therefore in a deep fall of the international price level (Table 2).[43] There had been a downward trend in international prices since the late 1920s, but from the last quarter of 1931 the fall of export and import prices was almost a reflection of the sterling rate. Before the depreciation of sterling, the downward pressure on the international price level was no insurmountable problem for the Dutch economy. The internal prices were flexible enough to realize even a small fall in the real exchange rate of the guilder in 1930 (Table 1). It was only in Germany, where the lack of foreign credits pressed the Brüning government to follow a systematic deflationary policy, that prices fell faster.[44] After the depreciation of sterling the situation changed. The international price level in guilders fell with Sterling by 35 % (Table 2). Both export and import prices fell at this rate, but the cost of living in 1931 and 1932 fell only by 6 and 7 % and wages only by 2 and 7 % respectively.[45] Dutch companies operating on international markets were confronted with rigid costs, and with falling yields caused by the downward trend in (international) prices. Against all expectations prices in Britain and other countries with a depreciated currency were stable until 1935. The overvaluation of the guilder was in 1935 as high as 25 % (Table 1). There was some speculation against the guilder, but the gold stocks of the *Nederlandsche Bank* were so enormous that this could not become a serious threat. In the United States and Belgium, it became necessary to depreciate because of lack of liquidity of the private banks,[46] but in the Netherlands the position of the banks was sound. The only way of restoring international equilibrium again was by a political decision to depreciate or by a fall in domestic prices.

An overvalued currency and a slow adaptation of the domestic price level (Table 2) has to result in an economic setback. Companies operating on the world market have to choose between bringing production for international markets to a standstill and defending these markets and accepting their losses. They will try to lower costs, for instance by lowering wages. As the alternative is unemployment, the unions will accept a cut in wages as long as this does not result in a cut in real wages. In the cost of living index, prices of non-tradeables, like rents, public utilities and retail margins, are of great influence. Since the prices of these services are hardly influenced by developments on international markets, they will not fall when the international price level falls. Adaptation to the international price level by a fall in the domestic price level is therefore hard to achieve. This becomes even more difficult when a government is obliged to take protectionist measures to defend important industries. Immediately after the depreciation of sterling and the monetary collapse in Germany some industries claimed protection. The government had to give in to some of these demands. In 1933 a systematic protection of agriculture was introduced, as a result of which the costs of living

in this year even increased (Table 2).[47] Since the cost of living was rigid, wages were also rigid compared to international prices.

Because of the rigidity of the internal prices and the absence of inflation in the countries that depreciated, the idea to depreciate the guilder as well was discussed more and more in the Netherlands. However, no serious political party or powerful pressure group openly demanded a depreciation.[48] The depreciation of the US dollar and deep fall of sterling in March 1933 worsened the problem of discrepancy between internal and external prices. Now the first voices were heard in favour of a devaluation.[49] The US government tried to restore the relation between domestic and international prices by devaluation, but in Dutch government circles there was a fear of the inflation that was a consequence of Roosevelt's policy.[50] In May 1933, when a new five party centre-right cabinet under the inspiring leadership of H. Colijn came into office, it was confronted by some speculation against the guilder as a reaction to the depreciation of the US-dollar.[51] In Dutch historiography Colijn is still known as the strong leader that firmly chose for a gold standard policy. He kept the guilder on its gold level until 1936, when it became no longer possible.[52] Nevertheless, in his first speech as prime minister to Parliament, Colijn remained unclear about the governement's monetary policy.[53] It was only at the London Economic Conference in the summer of 1933, some months after the cabinet came into office, that the Dutch position on these questions became plain clear, when the Netherlands accepted the invitation to become a member of the gold block.[54] From then on Colijn defended the gold standard until there was nothing left to defend. This policy is often seen as typical for this conservative, military man who cultivated the image of strong leader who would guide his country through the depression and save the gold value of its currency. In fact, there are some reasons for doubting whether his belief in the gold standard was as strong as most historians and most contemporaries thought.

Just before the new cabinet was formed, the Hitler government took over in Germany. It was not clear what the economic policy of that government would be. Dr. Hjalmar Schacht, the famous Nazi-economist, wanted to keep the official exchange rate of the inconvertible *Reichsmark* at a par, but another important economic advisor of Hitler, Dr. Wilhelm Keppler, wanted to devalue. A few years afterwards Schacht was to use the artificial high exchange rate to manipulate the foreign economic relations, but in 1933 this was not the target of his policy. As far as is known, Schacht feared unrest from a depreciation of the *Reichsmark*, because of the remembrance of the 1923 inflation. It was not until after Keppler lost in the discussion with Schacht that the position of the Dutch cabinet on the issue of monetary policy became clear. [55]It seems that Colijn did not want to defend the guilder if the *Reichsmark* was to be devalued. Colijn was not a friend of Germany - as a former Director of the Anglo-Dutch Royal-Dutch/Shell group he was an Anglophile - but he knew quite well that the Dutch economy needed good

relations with its most important partner. Only after the German decision to keep the *Reichsmark* at its value did Colijn become the champion of the gold standard.[56]

During the London Conference of 1933 the British government promised to support the gold standard in the gold block. This was not an empty promise.[57] Sterling did not follow the deep fall of the dollar in the late summer of 1933. In January 1934, when the dollar gained a new parity of $35 per troy ounce, its devaluation since the start of the monetary problems in 1931 was deeper than the fall of sterling.[58] London did not depreciate any further because such a policy could become dangerous for continental gold currencies. A devaluation in the gold countries would strengthen the industry on the continent in its competition with Britain. The British government therefore thought it better to accept a high exchange rate against the dollar.[59]

In the Netherlands discussion on the gold standard began around 1933. No serious political party nor any strong pressure group openly advocated a devaluation. The only important politician who declared himself an advocate of devaluation, and this only in 1935, was M.P.L. Steenberghe, the Minister of Economic Affairs, a member of the Roman Catholic Party.[60] After he had expressed these feelings, he lost all support in the cabinet and had to resign. The prime minister was quite obstinate on the question of the gold standard. In almost every book and article on the 1930s Colijn is described as the man who was responsible for the gold standard policy.[61] He feared that the only stable point in international monetary relations would be lost if the Netherlands left the gold standard. High moral principles against a devaluation were expressed by him and the president of *Nederlandsche Bank*, L.J.A. Trip.[62] In fact, there are a number of reasons for thinking that Colijn wanted to abandon the gold standard as early as 1935, after the devaluation in Belgium, but that he was already too much associated with the gold standard policy to alter it without undermining his own position. Colijn became a prisoner of his own reputation.

In 1935 the only minister to plead openly for a devaluation, Steenberghe, had to resign, but Colijn chose as his successor another advocate of devaluation, Gelissen.[63] According to him in 1935 Colijn believed that devaluation was inevitable.[64] It was also in 1935 that Colijn expressed the opinion to the British Minister in The Hague, sir Hubert Montgomery, that a depreciation in 1931 would have been better.[65] It is known that Colijn thought there was at that time no alternative for his government. After the government fell, new elections were the only alternative to his return, but no political party wanted elections.[66] Early in 1935 the elections for the Provincial States (County Councils) brought the only important victory for the Dutch National-Socialistic Party (NSB), which gained 8 % of the votes.[67] A fall of the government could therefore only result in a restored and stronger position for Colijn, and he knew it.[68] Of course, a fall of the government and, something not uncommon in the Netherlands, a long period of trying to form a new one, would have ended the stability of the guilder. The gold

stock, three and a half years after the depreciation of sterling was not all that large any more. A speculation of a week would do the job, it was thought. If Colijn wanted to get rid of the gold standard without being blamed for it, a political crisis was easy to arrange and would create the speculation necessary to end it. If he thought the gold standard to really be the cornerstone of Dutch economic policy then he had everything to fear from a political crisis. Colijn did not fear a crisis. On the contrary, he created one.

In 1935 there were strong tensions between Colijn and the Roman Catholic Political Party. Colijn dropped the popular Roman Catholic Minister of Economic Affairs, Steenberghe, and appointed H. Gelissen as his successor, without consulting the leader of the Roman Catholic Party.[69] A few months before, the Liberal Minister of Education had to resign because he had become a Roman Catholic.[70] Now Colijn openly quarrelled in Parliament with the Roman Catholic Party (RKSP), the largest party with members in the coalition. It was demanding a more systematic deflationary policy. In fact the RKSP monetary specialists wanted a devaluation, but it was impossible to express these feelings publicly.[71] To propagate a devaluation was thought to be unpatriotic, a charge the Roman Catholics were especially sensitive to because more conservative Calvinists of Colijn's party still thought that a real Dutchman was a Calvinist. After his quarrel with the parliamentary leader of the RKSP, Colijn asked in the Second Chamber for an unprecedented Motion of Confidence.[72] P.J.M. Aalberse promised not to support any motion against the government, but refused to vote for a Motion of Confidence. For Colijn this was enough. He went to the Queen, and so created a useless crisis.[73] After the fall of the government on Tuesday 23 July, the *Nederlandsche Bank* lost gold worth 62 million guilders in one day. If the speculation continued on this scale, a few days would have been enough.[74] But the Queen was determined to act without delay. After only consulting the chairmen of both Chambers of the States General, she gave Aalberse the task of forming a new coalition. In the Dutch tradition, the party responsible for the resignation of the outgoing government has to be given the opportunity of forming a new one. After only one day it became clear to Aalberse that it would be impossible to form a government in a short period of time and that he would be blamed for a depreciation of the guilder as well as for the fall of the government if he took more time. He resigned. On Monday 29 July the Queen assigned Colijn the task. By the next day he had accomplished the task. Almost every minister of his former government was given his old position again. Colijn had won. It was clear to everybody that without new elections it was impossible to do anything without Colijn. Criticism from the RKSP was silenced.[75] A fall of the guilder was not realized, as speculation did not go fast enough. The economy had to struggle on under the heavy weight of the gold standard until the French devaluation in September 1936. Nobody had the nerve and the power to take a decision on the monetary question.

4. Inconvertibility of the Reichsmark

International prices fell with sterling. An exception was the prices on the German market. The inconvertibility of the *Reichsmark* isolated the economy from the outside world. An inconvertible currency is an overvalued currency in a country where a devaluation is impossible for some reason or another. The current account is passive and the gold and currency stocks of the central bank are too small to keep normal monetary relations going. The only solution in such a situation is currency control. Under currency control foreign currency, foreign bank accounts or gold must be sold to the central bank against the official exchange rate. Since the official reserves of the central bank are almost empty, the country can only import as much as it exports but exports are difficult to realize with an overvalued currency. Germany had a deficit trade balance before 1931.[76] After the introduction of currency control it was unacceptable for any trade relation not to be paid in hard currency immediately. To realize this, Germany had to reduce its imports until these were below the depressed exports. The German economy was an industrial economy and Britain was an important competitor. Therefore, the depreciation of sterling was an enormous blow to German exports. Not only export prices fell rapidly, but also real exports became deeply depressed. In 1932 real exports fell by 33 %, while nominal exports, the source of foreign currency, even decreased by more than 40 %.[77]

The depressed condition of German foreign trade was a great blow to the Netherlands. In 1931 and 1932, German imports, and therefore Dutch exports, were in depression. This was a simple reflection of the economic depression in Germany. A recovery began in Germany in 1933, but this was not reflected in imports or in Dutch exports. In 1936 real imports in Germany were actually 4.3 % lower than in 1932.[78] Germany isolated itself by its currency control. Hard currency was only available for goods and services that were absolutely necessary in the eyes of the National-Socialist regime. The limitation of imports not only made a recovery more difficult to organize, but it also made the influence of fiscal policy more strongly felt. A stimulus could not leak out of the country. For the Netherlands, Germany's most important trade relation, the only way of escape from the depression was by a recovery of its foreign markets. However, while the German economy recovered, its international economic relations remained depressed.

Until 1933 Germany had hardly used its currency control as an instrument of trade policy. The Dutch feared nothing so much as a selection of German imports according to their importance for the German economy.[79] Dutch exports to Germany consisted for more than 60 % of agricultural products, mostly luxury products: vegetables, dairy products, eggs, meat and flowers.[80] A German decision to spend hard currency only on products that were essential for German recovery could become disastrous for Dutch agriculture. As long as the German depression

was as deep as in 1932, this danger was not very high. The effective demand in Germany was so low that the hard currency Germany received was hardly spent.[81] In that period Dutch agriculture was more afraid of the German agricultural lobby for protecting the home market against foreign imports. Dutch farmers reacted to German protectionist measures with well-organized boycott actions against German products.[82] The German industry considered these actions threatening and this made it possible for Dutch diplomacy to mobilize the German industrial lobby against agricultural lobby in Germany. Because during this period the Dutch cooperated with the Scandinavian countries and Belgium, German industry feared that agricultural protection would destroy enormous export markets. This quarrel between agricultural and industrial interests worsened the relations between the members of the German government, especially between the State Chancellor Brüning and the State President von Hindenburg. The Dutch policy to use the German industrial interests as a weapon against German agricultural protectionism was in the end hardly effective, but it worsened the political situation of the Weimar Republic.[83]

In the end of 1932 the German government wanted to improve relations with the Dutch who were given a *Sonderkonto* as a concession.[84] This was nothing but an account the *Nederlandsche Bank* opened with the *Reichsbank*. German importers who no longer had hard currency, could pay their debts to Dutch exporters into this account in *Reichsmark*. The Dutch central bank had permission to sell the balances a little below the official exchange rate. The guilders gained by selling this balances were used to pay the Dutch exporters. Thus the trade between the two countries could continue even if a German had no hard currency. Dutch merchants found it worthwhile to export to Germany because it was one of the few markets with an interesting price level. The *Sonderkonto* opened on 1 January 1933. At the end of that month Adolf Hitler became German Chancellor. The new German regime strongly stimulated the economy. This resulted in a growing demand and a rising price level.[85] Exporting became even more difficult for the German industry, just at the moment the economy needed more imported goods and thus more exports to earn hard currency. To improve the position of German products on the international market during the late Weimar Republic a programme of subsidizing exports was started. In 1933 low priced, subsidized German products became a threat to the stability on the Dutch market, according to some Dutch producers. In negotiations for a new trade agreement it was therefore agreed that the Germans should only subsidize exports to the Netherlands if this was no threat to Dutch industry or to the Dutch price level. Because of this the German position on the Dutch market became much weaker.[86] Competition from Britain and from other countries that had devaluated became too strong for German industry. As long as this only had consequences for German exports, it was of little importance to the Dutch, but currency control often ends in bilateral trade relations. The first year after the beginning of the depression that

Germany had a passive current account was 1934.[87] In the summer the Board of the *Reichsbank* was already afraid of losing the last bit of gold.[88] The stimulating policy had a positive effect on imports. Although this was checked by the limited amount of hard currency, the scarcity of hard currency did not check imports from the Netherlands. If a German importer needed more imported goods than he could buy with his ration of hard currency, he could buy the extras in the Netherlands and pay for them in *Reichsmark* in the *Sonderkonto*. By importing from or through the Netherlands it was possible to import as much as necessary. The *Sonderkonto* became an important Dutch export credit for Germany. Not only could Dutch goods and services be paid for in this account, but goods bought through the Dutch transit trade were also settled by paying into this account.[89] Early in 1934 the German currency rations became smaller and smaller while the need for imported products in the recovering German economy grew rapidly. The *Sonderkonto* seemed to be miracle for solving this discrepancy. Because the Dutch government was responsible for this account, payment into the account was regarded as perfectly safe. Exporting to Germany was of interest to the Dutch economy because of the high prices, and the recovery in that country was so strong that it seemed possible to sell everything. The *Reichsmark* balances on the account became higher and higher.[90] The German economy was strong enough to pay the bills, but the transfer in hard currency became a growing problem. It proved impossible to sell the *Reichsmarks* in the *Sonderkonto* even below the official exchange rate. There was, in this period, a substantial supply of smuggled German banknotes at the Amsterdam currency market. The actual exchange rate of the *Reichsmark* was even lower than the rate at which the *Nederlandsche Bank* was allowed to sell the *Sonderkonto* balances.[91] In the summer of 1934 these balances were so high that the Dutch government asked the Germans to negotiate a bilateral clearing agreement to guarantee the payment of exports. The Germans were not interested in negotiations at that time, which was just before Schacht introduced his New Plan.[92]

The New Plan subordinated all international trade to bureaucracy. Under it imports were exactly limited by the amount of hard currency the *Reich* had at its disposal. For every transaction a governmental department took a decision on whether this import was necessary. There were 27 of these departments. The Dutch refused to wait until the Germans completed their plan. On 14 August, 1934 the Netherlands introduced a unilateral clearing against Germany. The balances on the *Sonderkonto* amounted to 75 million guilders at that time which was more than the whole gold stock of the *Reichsbank*.[93] In 1934 real Dutch exports increased for the first time since 1928 (Table 1). This export growth was not a sign of recovery as the C.B.S. thought in a recent publication.[94] It was only an effect of the *Sonderkonto*. Over 10 % of the total Dutch export in that year was paid for through this account and could not be transferred into Dutch guilders. It was only in 1937 that the last exporter got his money from the *Sonderkonto*. For

him and for many other exporters who had to wait for their money, the *Sonderkonto* turned out to be a disaster.[95]

By introducing unilateral clearing the Dutch government was able to prohibit all payments to Germany. The hard currency Germany normally received for its exports was paid into a Dutch Clearing Account and was used to pay the Dutch exporters. Money to settle German bills was not allowed to leave the country. For Germany this arrangement was very disadvantageous. It could not even have free disposal of the small amount of hard currency it earned. At this stage both parties wanted a bilateral clearing agreement. According to the agreement of the autumn of 1934 only a small part of German exports to the Netherlands was paid in hard currency. Most of the balances on the clearing account had to be used to pay for Dutch products or for the payment of debts, including the redemption of the *Sonderkonto*.[96] This solution did not stimulate Germany to export to the Netherlands; Germany needed imports in exchange for its exports, and was not interested in redeeming its debts. The part of the clearing balance Germany could spend on imports from the Netherlands was, however, very important in German eyes. In the first place the Germans could use these balances as much as it wanted in order to acquire Dutch services. The port of Rotterdam, the Rhine trade and shipping were all important in this respect. Every three months a German-Dutch Committee decided how much of the clearing balances Germany would be allowed to spend on imports. It had to spend 39.5 % of this payment on agricultural products, 24.2 % on industrial products, 12.1 % on tropical products from the Netherlands East Indies (coffee, tea, sugar) and 24.2 % on Netherlands-Indian raw materials.[97] Dutch industrial products and Netherlands-Indian raw materials made these imports very important to Germany, especially as some of them were of great strategic value.

The introduction of bilateral clearing means that normal trade relations disappear; exports become dependent on imports. Since a country with an inconvertible currency has an overvalued currency, it is almost certain that the exports of that country will be smaller than the exports of its partner. In the 1930s not only the *Reichsmark* but also the guilder was overvalued, but because the Dutch economy stayed depressed, imports were small. The German economy was recovering and imports only remained at a low level because of a lack of hard currency. On foreign markets, German industry could hardly compete with countries with devalued currencies. The export subsidies, the *Zusatzausfuhrverfahren*, enabled German industry to defend its position in the world market at the depressed level of 1933. In 1934 German exports fell, but in 1935 and 1936 there was a recovery. In 1936 exports were at same the level as in 1932.[98] After 1934 on Germany concluded an important number of bilateral clearing agreements. The country had just as many isolated foreign markets. Before the German authorities decided what subsidies they were ready to pay to stimulate the export to a certain market, they examined the importance of the imports they received from that country in exchange. This

had nothing to do with the demand for the products of a certain country on the German market. For instance, Dutch vegetables were easy to sell in Germany, but the German government did not consider these products as *volkswirtschaftlich notwendig*, *i.e.* as necessary for the economy of the German people. The authorities preferred payment in hard currency and were equally interested in certain raw materials. Colonial raw materials - tin, rubber, petroleum etc. - several products of Dutch industry, and the transport facilities of the Dutch ports and Rhine fleet made Dutch trade important in the eyes of the German government.[99] In 1937, when the Germany systematized its export stimulating activities, the Netherlands were put into the second of five categories. Only countries that paid their imports from Germany in had currency were put into the first category.[100] This system was not invented in 1937. In 1934 Germany had already diversified its export subsidies. The more important the imports it received in exchange for its exports, the higher the subsidies. It was not private trading firms that decided where imports came from or exports went to, but the German authorities. The only criterion was: how important the imports were to the political goals of the regime.

Germany was ready to pay subsidies to promote its exports to the Netherlands. However, one problem was the agreement not to use these subsidies if this threatened Dutch prices. The German government was therefore reserved in using its export stimulating instruments.[101] Year after year imports from Germany declined. In 1936 the real imports from Germany were only 55 % of those in 1929. The total real imports in that period fell by only 27 %. After 1933 Dutch total real imports were almost stable, but the imports from Germany fell by about a third.[102] The Hague accepted that the imports from the only important trade relation it had bilateral trade relations with had declined sharply. A new trade agreement without any limitation to the German export subsidies would have been a solution for both parties. Both German and Dutch diplomats knew quite well that the agreement that Germany should only use its exports subsidies if this did not threaten Dutch prices was a disadvantage, but a system of bilateral trade relations was, and is, rather difficult to explain to non-experts. Since the cheap German imports in 1933 were felt as a threat by a number of industries, and because of anti-German feelings, the export subsidies became a subject loaded with emotions. Until September 1936 the subject was only mentioned when the Minister of Economics defended his budget in Parliament. There seems to have been little serious discussion on the subject.[103] After the devaluation of the guilder, a top civil servant, Hirschfeld, feared that this development would destroy the German position on the Dutch market, and therefore - because of the bilateral relation - the Dutch position on the German market. The only way to save this market was by giving the German government the freedom to use its export stimulating methods.[104] After that, imports from Germany increased by 38 %. Corrected for prices it was not much, but it created the space in the clearing account that Dutch export needed.[105]

5. Trade policy and protectionism

In the Netherlands a number of industries, agriculture, transport and trade, were so large that access to world markets was a necessity. The prolonged gold standard policy made access for the industry to these markets not only more difficult, but also less interesting. The price level on these markets was too low and export prices fell faster than internal prices. This was disastrous for firms with external markets and internal costs. Nevertheless, the industry tried to defend its share in foreign markets. To defend the home market, protectionist measures were necessary.[106] The situation was worse for agriculture. In 1931 the price level was so low that a well-known agricultural specialist feared that production would stop.[107] Industry, services and agriculture were also confronted with a strict limitation of access to the German market. Currency control made it impossible for Germany's relations to benefit from the recovery. The German market was and remained limited. Nonetheless, it was still a very important market. Every merchant that was given permission to export to Germany gained access to a profitable market. This single market with high prices, sometimes together with a protected home market, gave companies the opportunity to defend other markets.[108]

During a depression the tendency to protect one's markets is great. Even in the Netherlands protectionism struck root after the depression proved strong and lasting. Traditionally, the Netherlands was a free trade country. It levied some tariffs, but only as a source of tax income.[109] During the 1920s and early 1930s, the Hague tried to defend the free trade tradition in the League of Nations, but this policy was not very successful. The larger countries became protectionist because they considered it necessary to defend their national economies. However, it was not protectionism that caused the depression in the Netherlands to be deep and lasting. It was monetary policy that obstructed the recovery after 1933 that was to blame. The small Northern European countries that did devalue their currencies with sterling in 1931 were able to enlarge their share of the British import market from 5 % before 1931 to 9 % after 1934. After 1933 these countries were able to benefit from the recovery in Britain. The gold standard countries of Western Europe had a share of 14 % of the British import market before 1931. After that year their share fell to 9 % in 1932 and to only 8 % in the following years.[110] Of course, Britain is only an example, but the situation was not fundamentally different on other important markets. Because of its gold standard policy and its objection against German export stimulation, the Dutch government had to protect some of the industries that were suffering from the monetary policy and from the setback on the German market.

After the monetary collapse of 1931 measures were taken to defend the most threatened industries. The Dutch government decided on a quota system. In a period with rapidly falling prices, tariffs are a weak form of protection, but this was not the only reason why the government decided against them. Protectionist

measures were thought to be temporary. After an equilibrium with the international price level was restored, all quotas were to be abolished. The politicians feared that tariffs would be permanent.[111] Import quotas were no solution for the specialized agricultural production. The scale of production was too large to sell the products on the Dutch market but the Dutch government supported these branches in another way. Dairy production received a premium per kilogram milk, paid from charges on the consumption of creams and fats.[112] In the same year, 1932, a similar system was introduced to protect the production of pigs.[113] In this year, just after the British devaluation and the fall of the Dutch export prices that resulted from this monetary disaster, the decrease in internal prices was even less than in 1930 or 1931, because of the protection of agriculture.

The central problem for agriculture was the fall in exports. The German market, before 1930 the most important one, was deeply depressed. More than 50 % of agricultural export to Germany was lost forever, according to a top civil servant in 1932.[114] He was right. Only during the German occupation, when the monetary problems were solved by the German authorities through the linking of the guilder to the *Reichsmark*, would it have been possible for this export to recover, but for the fact that almost all food was distributed at that time.[115] If there were no alternative markets for agriculture with a reasonable price level, the only alternative for lasting support would be a total reorganization of the industry. The only market comparable in size with Germany was Britain. On the British market, however, the price level was low and since the summer of 1932 the dominions had imperial preference.[116] Dutch agriculture was superfluous, not because of the overvalued guilder, but primarily because the traditional market no longer existed and there was hardly any alternative. All important economic advisers of the government thought it better to reduce agricultural production.[117] The parties of the coalition, however, feared a reorganization of agriculture. Both Calvinist parties as well as the Roman Catholic Party relied for an important part of their votes on the countryside.[118] In 1933 the Agricultural Crisis Policy was therefore further developed and systematized. The heart of the new system was the Agricultural Crisis Fund, filled by charges on the prices of all agricultural products or by the profits made on the trade in some agricultural products that were monopolized by the government. From this fund premiums were paid to farmers. As late as 1938, the total cost of this policy was 200 million guilders, or 4 % of GNP. The cost of food consumption was raised by 8 % for the well-to-do and 11 % for the working class in that year.[119] Before the devaluation of September 1936 the costs were, of course, higher. The British attache for Agriculture in the Hague, Laming, a good friend of Hirschfeld, thought that in 1935 subsidizing agriculture in 1935 cost the Dutch working class 10 to 20 % of its earnings.[120] In spite of the deflationary policy, in 1933 the cost of living rose by 2.5 %. The protection of agriculture became the most important characteristic of the Dutch trade policy in this period.

The Dutch market was not large enough to fill the Agricultural Crisis Fund. The export of agricultural products to Germany was therefore most important for the government. The price level on this market was high, but access to it was strictly limited by the clearing balances. By exploiting its right to monopolize the trade in agricultural products and by selling licences to export, the government reaped considerable profits.[121] Thus it became possible to use the profits on Dutch exports of agricultural products to Germany to further Dutch agriculture. The government reserved a high share for agricultural products in the clearing quotas (39.5 %), and referred to accept German proposals to lower this share. The profits made through these exports and through the high internal food prices made it possible to create a fund large enough to dump the remaining Dutch agricultural production on foreign markets. The British market was the most suitable for this.[122] A good example is the export of butter. Although the British government gave imperial preference to butter from the dominions, Dutch export grew from 4 to 22 million guilders between 1933 and 1936 or from 8.2 to 41.0 million kilogram. Of course other products were dumped as well on both British and other foreign markets.[123]

In the first half of the 1930s there was no reason to be optimistic about the future of Dutch agriculture. The most important market, Germany, had a profitable price level, but access to that market was strictly limited by the clearing balances. The only alternative market large enough to absorb a substantial part of Dutch agricultural production was the British, but there the price level made any profitable sales impossible. Anyway, the British government adopted a policy of imperial preference that could only result in a limitation of the Dutch export of dairy products and meat. It was possible, however, to sell as many agricultural products as the Dutch wanted to get rid off at a low price in Britain. The protection of agriculture kept the internal food prices high. By this and by reserving almost 40 % of total Dutch access on the German market to agricultural products, the government was able to fill the Agricultural Crisis Fund which was used to pay premiums to farmers and to subsidize exports to foreign markets with a low price level. The financial burden of the Agricultural Crisis Policy was carried by the rest of the economy (industry and trade). In a period of growing unemployment the government chose to subsidize a sector of the economy that could not generate new jobs. Since the nineteenth century the share of the working force active in agriculture had only decreased. New jobs were created in industry.[124] In the 1920s and in the 1950s industry proved to be the dynamic element in the Dutch economy. In the 1930s this sector had to carry the burden of the agricultural policy. The only positive interpretation of the Agricultural Crisis Policy is that during the two World Wars it was important that the agricultural sector could feed the people. It is a fact that during the German occupation the considerable size of Dutch agriculture was an advantage. That this sector was still so important was a result of the Agricultural Crisis Policy, but this was never an argument for implementing this policy. The idea that it was necessary to take economic measures in prepara-

tion for a possible war did not arise before 1937.[125] The government supported the sector of the economy that - as far as could possibly be predicted at that time - had no future, and it did this during a period of rapidly growing unemployment by keeping the cost of living, and thus the wages, high.

6. Conclusion

The Dutch economy suffered in the early 1930s from the setback in the surrounding countries, but could not benefit from the recovery that took place in these countries after 1933. The international economic contacts became weaker. The gold standard policy was partly to blame, but it was not the only cause. Of course protectionism in the surrounding countries was also a disadvantage, but that was of secondary importance. Of primary importance was the fact that normal economic relations with Germany, traditionally the most important economic partner, were lost because of the German currency control. The German recovery that began in 1933 was strong, but was totally isolated. The inconvertibility of the *Reichsmark* was to blame for this. In fact, the effects of the stimulating policy of the National-Socialist regime could be as strong as it was because the effects were only felt inside Germany. It was impossible for the neighbouring countries to benefit from it. German imports even fell during the years of recovery. From the second half of 1934 clearing agreements bilateralized all important German trade relations. It was not the fault of the Dutch government that the German economy became isolated, but it was a mistake not to use the rules of bilateral trade in advantage of Dutch export. By almost prohibiting Germany from using its export subsidies on the Dutch market, the government limited access for Dutch export to the most profitable market of Europe.

Table 3 shows that after a recovery in 1934 as a result of the *Sonderkonto*, Dutch real export to Germany remained depressed until the end of the period. In 1936 real exports to this country were less than 50 % of the 1929 export. The real exports to the rest of the world remained depressed until 1934. The small recovery in total real exports in that year can only be explained by the *Sonderkonto*. From 1935 the export trade to the rest of the world started to recover, however slightly. The 1936 level of the Dutch export to all countries, excluding Germany, was still almost 25 % below the 1929 level, but this was already a recovery with 20 % against the trough of 1935. Dutch trade remained depressed as long as the guilder was not devalued, but Dutch exporters could have had a small share of the worldwide recovery, but for Germany. In its 1987 publication on the Dutch economy in the interbellum years and in the 1970s and 1980s, the CBS (Central Bureau of Statistics) tried to prove that the Dutch guilder had been no longer overvalued from 1935, that the trade-balance and the balance of invisibles recovered, and from 1935 that the current amount was active again.

Table 3. Dutch international trade (visibles) in the 1930s.

Year	Total trade in guilders		Real trade 1929 = 100		Real trade with Germany 1929 = 100		Real trade excl. Germany 1929 = 100	
	imp.	exp.	imp.	exp.	imp.	exp.	imp.	exp.
1929	2.951	2.187	100	100	100	100	100	100
1930	2.552	1.830	95	92	99	88	94	93
1931	1.974	1.374	91	84	99	75	88	87
1932	1.354	879	78	69	81	66	77	69
1933	1.256	755	81	65	84	64	79	65
1934	1.081	737	74	66	71	75	76	63
1935	991	711	71	67	59	58	76	69
1936	1.086	755	73	70	56	49	80	76

Sources: See table I

The traditional opinion is that the guilder was overvalued until September 1936. From Table 1 it seems clear that this view is right. The Dutch current account was no longer passive since imports stayed depressed, and there was a small recovery of exports because of foreign recovery and dumping. The gold standard policy was to blame, not because exports did not recover a little after 1934, but because the international price level in guilders stayed depressed. It was almost impossible to export without loss after 1931. External prices fell between 1929 and 1935 by 51 % (export prices), while internal prices fell only by 19 % (cost of living). Exporting companies were confronted by falling prices and fixed costs and the gold standard policy undermined the competitiveness of the Dutch economy. The fact that Dutch export did recover a little after 1934, as far as it did not go to Germany, was partly a result of the dumping of agricultural products. It also goes some way to prove that the Dutch economy would have been competitive enough to defend its position on the international markets, but for the political decision not to depreciate.

The government had to take protectionist measures to compensate the consequences of the monetary policy. Protection is easy when the home market is larger than the home production, but the government chose to protect agriculture, a sector with a much larger production than the home market. This sector could only be rescued by dumping on foreign markets. From the early 1930s access to the German market was limited. There was no alternative market, but it was a political necessity to assist the countryside. This was done by keeping the internal price level high and by reserving almost 40 % of the profitable German market for

agricultural products. The profits of this policy were put into a fund to pay premiums to the farmers and to dump the agricultural remainder on foreign markets, especially in Britain. It was decided in 1932 and 1933 to protect agriculture in this way. Not until 1937 was it considered an advantage that the agricultural sector was still large enough to feed the Dutch population during a then feared war. In 1932 or 1933 this argument was not heard. Agriculture was protected for internal reasons. The internal price level, and therefore also the wages, were kept high by this policy. Industry and trade, the sectors that generated new jobs in the 1920s, were confronted by high wages in a period of growing unemployment.

NOTES

Abbreviations to archival sources

ARA	Algemeen Rijksarchief, The Hague, including:
- BEB	Archief Directie voor Buitenlandse Economische Betrekkingen van het Ministerie van Economische zaken.
- Financiën.	
NBvB	Archief van de Nationale Bank van België, Brussels.
AA	Archiv des Auswärtigen Amtes, Bonn.
BA	Bundes-Archiv, Koblenz including:
- R2	Reichswirtschaftsministerium.
- R7	Reichsfinanzministerium.
- R9	Reichsstelle für den Außenhandel.
- R43	Reichskanzlei [I, II].
BZ	Ministerie van Buitenlandse Zaken, The Hague, with:
- DEZ	Archief Directie voor Economische Zaken, 1924-1940.
EZ	Ministerie van Economische Zaken, The Hague, with:
- Hirschfeld.	
- H&N	Archief Directoraat-Generaal van Handel en Nijverheid,
PRO	Public Record Office, London (Kew), including:
- BT	Board of Trade.
- FO	Foreign Office.
- T	Treasury.

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VIII

ECONOMIC INTEGRATION AND THE PRESERVATION OF POST-WAR CONSENSUS IN THE BENELUX COUNTRIES[1]

by

Arend Jan Boekestijn

1. Introduction

In traditional historiography the argument is frequently put forward that Dutch, Belgian and Luxembourg policy-makers endorsed the Benelux customs union project because they subscribed to the assumptions of a specific economic theory.[2] According to this body of economic theory, much in vogue in the forties and fifties, the rationale behind a customs union was simple: if all restrictions on the movement of factors of production were removed from a particular area this would maximize the efficiency with which those factors were used, thus maximizing output, income and wealth over the same area to the point where the benefits to each part would be greater than if that part had remained outside the union.[3]

This economic view was soon merged with two additional elements: a specific interpretation of the economic history of the inter-war years and a political analysis. The historical interpretation of the interbellum ran as follows: the protectionist policies of the period had reduced economies of scale, economic growth and gains in labour productivity. In order to raise productivity levels the post-war governments therefore had to change their pre-war protectionist policies. After the traumatic experience of the thirties when both the volume and value of world trade stagnated, countries increasingly interested in economic growth after 1945 directed their commercial policies towards the liberalization of foreign trade by lowering tariffs and removing quota restrictions.[4]

At this stage a second political element entered the equation. Economies of scale, economic growth and market expansion were not only judged from a welfare perspective but were also seen as the cornerstone of political consensus and stability.[5] Economic growth would make the life of politicians much easier because rising real incomes of every citizen secured their re-election.[6]

In other words, the interrelated need to enhance political stability and to encourage economic growth required a departure from the pre-war protectionist practices in favour of trade liberalization. In a fascinating book, Alan Milward has recently challenged this interpretation of post-war economic history.[7] He accepts that economic growth increased political stability but rejects the idea that post-war policy makers completely renounced pre-war protectionism. On the one hand, he argues, the contribution of foreign trade to economic growth, integral to satisfying electors' needs, made them prepared to cooperate with trade liberalization plans. On the other hand, the process of trade liberalization itself would increase the costs of interdependence and therefore inevitably endanger the position of some elements of the post-war consensus. The political need to appease dominant pressure groups asking for protectionism and the decision to protect industrialization plans with import quota, gave the commercial policies of the period their peculiar mixture of liberalism and protectionism. While it was believed that liberalization of foreign trade would encourage the growth of productivity and incomes it was also believed that protection would stimulate technological modernization. It was in the pursuit of this difficult compromise that governments developed another characteristic of the period, close links between industrial policies and commercial policy.[8]

In order to explain this mixture of free trade and protectionism Milward introduces the concepts of integration and interdependence. Interdependence refers to the phenomenon that interactions between national states, as they develop economically, generate reciprocal costly effects.[9] Modern economies are increasingly dependent on imports and exports and therefore more and more dependent on decisions taken outside national borders. Consequently, modern nation states lose much of their capacity for independent policy formulation and for control of their own destiny. Integration has in Milward's book a very different meaning. It refers to a policy choice to surrender limited areas of national sovereignty to the supranation in order to formalize, regulate and sometimes limit the costs of interdependence.[10] According to Milward, European states were reborn as puny weaklings into the post-war world. They developed particular bundles of domestic policies to satisfy a coalition of political interests. To support these policies they had an inherited international order available which had accepted, to a varying degree, the principles of interdependence. Some of the domestic policies which they chose could be advanced through this interdependent international order. Others could not and required something different; integration. The choice for integration or interdependence depended on the capacity of either system of international order to advance domestic policy choices.[11]

The close similarity between the sets of domestic policies chosen by Western European countries meant that integration was a path which could be chosen with reasonable hopes of success on several occasions. National governments of the Europe of the Six strove for a Common Market because it would serve as an

irreversible trading system with the Federal Republic whose expanding economy was, and continued to be, an engine of Western European economic growth. At the same time the shared commitment of these national governments to the welfare state and full employment implied that economic relations between them required the option of limiting the costs of interdependence. The preservation of the post-war consensus in these countries also required a Europeanization of support of agricultural incomes and protectionism in the form of the Common Agricultural Policy.

In Milward's terms, the topic of this paper, Benelux cooperation, is not a form of integration in a strict sense since it did not precipitate a transfer of sovereignty to a supranation. Neither is Benelux cooperation a good example of unlimited interdependence of economic forces. On the contrary, part of the Benelux edifice seems to have been erected to control and limit interdependence in those areas (agriculture, transport and sensitive industries) crucial for the preservation of the post-war consensus systems of the Benelux countries. This is a task, however, which Milward links explicitly to supranational integration but only if other non-supranational solutions were not at hand. How can we explain why in the case of Benelux, intergovernmental cooperation was capable of producing a formalization, regulation and sometimes limitation of interdependence and did it really contribute to a preservation of the post-war consensus systems of the Benelux countries?

More questions need to be answered. According to Milward the close similarity of domestic policies based on the welfare state and full employment of the Western European countries meant that integration was a likely option because it allowed them to regulate interdependence. In the case of Benelux, however, the participating countries, although formally acknowledging the importance of full employment and the welfare state, endorsed diametrically opposed domestic policies resulting in divergent wage and price levels. This automatically leads us to the question whether the divergent cost structures of the Benelux economies can explain why intergovernmental cooperation was chosen to regulate the costs of interdependence instead of a supranational one. But, if this is the case, how is it possible that the divergent domestic policies of the Benelux countries made them accept the supranational framework of the Common Market while those very same domestic policies did not produce a supranational Benelux? Is it possible to argue that, with the benefit of hindsight, the Benelux countries were only prepared to sacrifice sovereignty in a limited number of areas if a purely intergovernmental framework does not produce their desired form of regulated interdepence?

The crux of Milward's argument seems to be that the preservation of the post-war consensus and political stability required a mixture of free trade and protectionism. The question whether Milward's approach is relevant for the Benelux case depends very much on clear evidence of this peculiar mixture of free trade and protectionism in intra-Benelux trade. If I do find a mixture of free trade

and protectionism how is it connected to the post-war consensus in the Benelux countries? And again, can this link between the mixture of free trade and protectionism and the post-war consensus systems also explains why Benelux cooperation was kept in intergovernmental waters?

The reason why Benelux remained intergovernmental may also be related to the relative importance of protectionism in terms of total liberalized Benelux intra-trade. If research shows that a considerable part of intra-Benelux trade was not liberalized, then supranational integration as way of formalizing, regulating and sometimes limiting the costs of interdependence may perhaps produce better results than intergovernmental cooperation. A transfer of sovereignty may be justified on the grounds that a procedure based on majority voting may lead to package deals which might increase exports, but this is not necessarily so. However, and this brings us back to Milward's theory, a supranational Benelux can only evolve if it supports the post-war consensus systems in both the Netherlands and the Belgian Luxembourg Economic Union (henceforth BLEU).[12] Was this a viable option given the nature of their post-war consensus systems?

Finally, integration as a way of limiting the costs of interdependence looks more plausible if a substantial part of a country's trade is directed towards the integrated area. If this is not the case the price a state pays by losing sovereignty as a consequence of formalized interdependence through the process of integration may be too high since it cannot be justified by large export expansion. The importance of intra-Benelux trade as a percentage of the total trade flows of the Benelux countries, therefore, should be examined here.

This article is divided in three sections. In the first section, which deals with the period 1945-1952 when the Dutch had a structural balance of payments deficit, an attempt is made to establish the connection between the mixture of free trade and protectionism, the need to preserve the post-war consensus and the decision to organize Benelux on an intergovernmental basis. In the second section the same issues are dealt with for the period 1952 until 1957 when the Dutch structural balance of payments deficit was replaced by a surplus. In the last section an attempt is made to assess the relative importance of regulated intra-Benelux trade in terms of total intra-Benelux trade for the period 1952-1959. The answer to this question affects the supranationality issue because, if it should turn out that a substantial part of total intra- Benelux trade continues to be regulated, the question arises whether a non-intergovernmental Benelux setting might have produced a higher degree of intra-Benelux trade liberalization. To answer this question satisfactorily, however, I also have to raise the question whether the importance of intra-Benelux trade in terms of their total trade can explain why a transfer of sovereignty to a supranation did not take place.

2. *Reconstruction and recovery 1945-1952*

After the war the Benelux countries had very different economic starting positions which made it very difficult to liberalize intra-Benelux trade. There were a number of reasons why the Dutch position was weaker than those of Belgium. First of all, Dutch war damage was considerably worse than in Belgium. Belgium was liberated with comparatively little fighting in September 1944 while the Netherlands was not liberated until eight months later, in May 1945. In these last months there was heavy fighting in both Luxembourg and the Netherlands. The Germans took much of the Dutch moveable wealth and broke the dykes. A considerable part of the country was flooded. All this implied that Dutch industrial capital losses amounted to 27 % of the 1939 level.[13] In Belgium this was only 4 %.[14]

The relatively small Belgian war damage can partly explain why their foreign exchange position was much better than that of the Netherlands. There were, however, more factors which explain the more favourable Belgian exchange position. The Belgian Congo had continued to earn foreign exchange during the war. Moreover, after the early liberation, Belgium became a main base for American and British troops which resulted in large foreign exchange earnings. Finally, the collapse of the German economy gave Belgium a unique chance to conquer new export markets which increased their foreign exchange reserves even more. It used these reserves to buy raw materials for its industry that was only marginally damaged by the war. The country was therefore ideally placed for producing steel and textiles and textile products for a seller's market.[15]

In the Netherlands, all these positive Belgian elements were absent. Belgium was earning dollars, gold and sterling while the war was still being waged on Dutch territory. The Dutch East Indies, traditionally an important foreign exchange earner, was first occupied by the Japanese and subsequently became a reason for politically delicate and costly military expenditure. In addition, the collapse of the German economy affected the Benelux economies differently. It gave Belgium the chance to take over traditional German export markets in steel, machinery and textile products. For the Dutch, however, German economic decline was less helpful. Dutch industry relied more heavily than Belgian industry on the use of German machinery for which replacements and spare parts could now be obtained only with great difficulty.[16] This made the shortage of convertible currencies in the Netherlands even more painful. German economic demise and the de-industrialization policies of the Allied authorities in the occupation zones not only hampered Dutch industrial imports but also negatively affected its agricultural exports. This not only closed one of the principal markets for Dutch foodstuffs but also decreased the traditionally very important transit traffic of German and Central European imports and exports through the Netherlands. Finally, the heavy loss of the Dutch merchant shipping fleet in the war and the

damage done to the port of Rotterdam were further heavy blows to Dutch earnings from shipping and transit traffic which were normally so important.[17]

The opposite initial economic positions of the Benelux countries go some way towards explaining why their domestic economic policies were so different. The much more favourable foreign exchange position of the Belgians enabled them to rapidly establish decontrol. The larger scarcities of domestic and imported products caused by higher war damage and shortage of convertible currencies forced the Dutch government to continue to impose direct controls on imports, exports, prices, wages, subsidies, rationing and house rents. Naturally, these divergences in direct control made it impossible to remove quantitative restrictions on intra-Benelux trade.[18] If it had been possible goods which could not be imported by Dutch entrepreneurs because of Dutch trade restrictions would have simply been imported by Belgian entrepreneurs and sold to Dutch consumers, thereby undermining Dutch commercial policy.

Different domestic economic starting positions, however, were not the only reason for the difference in domestic economic policies and the inability of the Benelux governments to fully liberalize intra-Benelux trade. Divergent domestic policies were also rooted in opposite economic ideologies and, more speculative, different state perceptions of Dutch and Belgian citizens. To begin with the latter, historical experience has made the Belgians less ready to accept economic controls than the Dutch. Belgium has a long history during which it more often than not had to cope with foreign occupation. This historical heritage has made its citizens weary of centralization. They have a long standing tradition of trying to evade alien controls. If we can believe Dutch senior civil servants of the time, tax evasion, for instance, was, and perhaps still is, seen as an acceptable attitude in Belgium.[19] According to these same Dutch civil servants, this mentality was less dominant in the Netherlands, where the carrying out of state regulations was seen as a social and, for some groups, even a religious virtue. Unlike the Belgians, the Dutch had not experienced German occupation in the First World War and the economic controls associated with it.[20] This may have made them less allergic for étatistic policies.

More importantly, however, divergent economic policies and, therefore, the incompleteness of the Benelux Customs Union were closely related to diametrically opposite economic ideologies. During the war the Belgian four party Pierlot government was impressed by the virtues of *dirigiste* war policies of the British government. After the war the Van Acker government, however, strongly influenced by the Louvain economists, rejected *dirigisme* and endorsed a liberal economic policy as a counter-inflationary weapon.[21] Most of the rationing schemes were abolished and price mechanism was used to restore equilibrium between demand and supply. Given the high post-war demand for goods, the market mechanism failed to operate as a counter-inflationary instrument, and Belgian wages and prices rose substantially.[22]

Given their less favourable economic starting position Dutch post-war Cabinets had little difficulty in endorsing the principles of a mixed economy. This is not to say that all Dutch politicians or entrepreneurs were ardent advocates of government intervention but they were prepared to tolerate them during the reconstruction period. Regulation, subsidies and controls kept prices and wages down, essential goods were rationed, and a large share of the country's current income was directed into investment while at the same time interest rates were kept low. In Belgium the smaller war damage and the laissez faire policies gave the state a much smaller role in investment. While Dutch interest rates were kept low, Belgian interest rates rose. This, together with their 1946 banking regulation which forced commercial banks to hold at least 65 % of their reserves in the form of treasury paper, restrained investments.

The opposite economic ideologies were also a reflection of different post-war consensus systems. In the Netherlands socialist ideas on inaugurating statutory trade organizations met with severe criticism.[23] The socialist hobby-horse of economic planning beyond wage, price and rent control was soon watered down to indicative global planning, and even in that respect it was not very successful.[24] At the end of the day, the planning element succeeded only in keeping wages, prices and rents down.[25] In this respect, however, Dutch policies were much more successful than those of Belgium. Dutch politicians were convinced that the need to find jobs for the growing population and the need to earn foreign exchange could only be fulfilled if exports were increased as fast as possible. In their view the best way to do that was to keep wages low. In Belgium planning even in the area of wage and price policies never got off the ground. The liberals and Christian democrats rejected state intervention in the wage formation because they argued that the market mechanism should not be disturbed. The socialists tried hard, and not unsuccessfully, to obtain for labour a share of the rising profits in the form of wage rises. The government, even if it had wanted it, could not intervene in the struggle between capital and labour. Government interference was simply not tolerated by the trade unions and the employers federations.[26] Even if they had tolerated it, there was still the institutional inability of the Belgian government to intervene in the process of wage formation. A Belgian state-led wage policy would have involved new legislation for which a parliamentary majority would not have been at hand.[27]

The difference in economic starting positions and domestic economic ideologies stood in the way of a complete liberalization of intra-Benelux trade. The rapid recovery of the Belgian economy enabled the government to abolish most of the price controls and rationing schemes in 1947. All efforts were focused on raising production levels as fast as possible in order to conquer as many export markets before the Germans were back on their feet. In their effort to boost exports quickly the Belgians felt the negative effects of the difference in domestic economic policies between the Benelux countries for the first time. They resented the fact

that the Dutch low-wage policies supported by price controls and a house rent freeze kept Dutch demand for Belgian products low. The decision to support reconstruction with cheap money policies implied that import controls had to keep inflationary demand in check. Disappointed, the Belgians began to press the Dutch to make real steps into the direction of a customs union.

Tariffs, however, had lost much of their meaning in a post-war world dominated by quantitative trade restrictions.[28] Ironically, the implementation of the customs union at the beginning of 1948 was actually facilitated by all the quantitative restrictions on intra-Benelux trade. Hence, when the Benelux countries implemented the customs union in the beginning of 1948 by eliminating internal tariffs and introducing a joint external tariff, the Belgians complained that Dutch import quotas were still there and continued to control their exports to the Netherlands. However, the elimination of all internal trade barriers was, to some extent, complicated by the refusal of the Belgian governments to buy as much Dutch agricultural products as the Dutch would have preferred. Like that of most Western European countries, Belgian post-war consensus was based on agricultural protectionism. If the Belgians had decided to open their markets for Dutch agricultural products, this would have had the benefit of reducing Belgian wage rises because food prices would have fallen. However, this would have happened against huge political costs. No post-war Belgian government could ignore the wishes of the Flemish Boerenbond and its Walloon counterpart. Belgian farmers could not compete with Dutch farmers because they had to operate under higher wages, rents, taxes and social security contributions. In addition Belgian farmers were handicapped by smaller feeding stuffs subsidies, a different marketing organization with less control on production and prices and considerably less legislation which allowed for state intervention. Consequently, Belgian agricultural protectionism prevented the Dutch from improving their asymmetrical trade position with Belgium by selling more agricultural products.[29]

This argument, however, should not be pushed too far. Although in 1947 Belgian farmers were protected by a system of minimum prices for diary and market garden products, this still meant that Dutch products received preferential treatment. This, plus the fact that it took until 1949 before Dutch agriculture was again in a position to export large quantities of goods, implies that the Dutch had little to complain about until 1949.[30] This was certainly the official Belgian point of view. They believed that if somebody had the right to complain, it was not the Dutch but the Belgians themselves. They became more and more disappointed about the amount of industrial export products which they could sell on the Dutch market. To their resentment, they soon discovered that Dutch domestic economic policy was not only reducing Dutch demand for Belgian products, but also developing ambitious industrialization plans (steel, textiles, chemicals). These industries were being fully protected by the government through quantitative import restrictions. The Belgians found themselves in a situation in which they

were practically financing their own exports to the Dutch market with generous loans, while at the same time, witnessing Dutch import substitution activities which would undermine future BLEU exports to the Dutch market. In this context the Belgians began to press for investment coordination within the Benelux area.[31]

Attempts to coordinate investments, however, were incompatible with both post-war consensus systems. The Belgians dreamt of having a real say in Dutch industrialization programmes but soon discovered that investment coordination required national laws which they simply lacked. Although the Dutch did have the required legal basis, the so-called *Bedrijfsvergunningenbesluit*, to influence decisions on investments, they were not prepared to use it for the interest of the Union as a whole. Moreover, investment coordination was soon just as all the other *dirigiste* elements, except those on wages, largely irrelevant in the general process of decontrol. Coordination of investments required a *dirigiste* concept of the role of the state in the economy which went way beyond what was acceptable for the entrepreneurs and the majority of the politicians in both countries. Consequently, when in the beginning of January 1948 it was agreed to make a list of industries for which there should be compulsory prior consultation before investment was permitted, it was based on an intergovernmental procedure. The ultimate investment decision remained firmly in national entrepreneurial hands.[32] Not surprisingly some of the products of the list were to produce four years later huge competitive problems for Belgian industry.[33] Defending Belgian commercial interests following the indirect route of supranational investment coordination was incompatible with both post-war consensus systems. Doing the same thing on the basis of intergovernmental investment coordination had not produced tangible results.[34] After 1949 nothing more was heard about investment coordination. It was simply taken off the agenda.[35]

Supranational regulation of financial policies had no chance either. Apart from the inability to coordinate investments, which if it had been possible would have improved chances for trade liberalization in the future, divergent domestic financial policies did little to further the cause of free trade. If an unlimited flow of credits from the surplus country to the deficit country is politically impossible and if exchange rates are not allowed to float because of international agreements, the formation of a customs union between partners with divergent balance of payments positions can only be achieved by the adoption within each country of financial policies appropriate to the country's balance of payments position. Each country must then ensure that its monetary, budgetary and wage policies are such as to secure overall balance of payments equilibrium without the need for controls on transactions with its union partners. It is sufficient that both countries choose financial policies which will put them in roughly the same degree of overall deficit. They will then have created the option of a truly joint system of import controls vis-á-vis third countries, instead of having separate national schemes.[36] This option of a joint system of import controls naturally depends very much on the

willingness of national governments to rapidly establish an overall balance of payments equilibrium. This, however, implies that Belgian and Dutch policy-makers not only had to embrace the same economic ideology but also accept a transfer of sovereignty to a supranational institution. Both were unattainable. In the meantime, divergent financial policies actually deteriorated the divergence in the balance of payments positions. In the period up to 1951 the Belgian balance of payments position was in equilibrium or in surplus, while Dutch balance of payments was in continuous deficit. Instead of using their internal policies to reverse this situation in order to liberalize intra-Benelux trade and implement a joint import policy vis-à-vis the outside world, the actual financial policies made things worse. The Belgians eliminated price controls and import restrictions at an early stage but this inflationary option required rather stringent budgetary and monetary policies. The Dutch, however, were in the position to endorse less stringent monetary and budgetary policies because they continued their price controls and border restrictions.

Although these non-supranational divergent domestic policies made any proposal to eliminate Dutch border controls problematic, some steps on this road had to be made if the Belgians[37] and the Americans were not to lose their interest in Benelux. If Benelux cooperation collapsed, all the advantages of it would collapse too. From 1946 onwards the Dutch found it very difficult to finance their structural import surplus with the BLEU area. Until 1949 they had only managed to do this by a sequence of Belgian loans and severe import controls. In 1949, a successful attempt was made to acquire Marshall aid for this purpose. In the year 1949/1950, the Dutch acquired 156,5 million dollars of drawing rights in the frame work of the trade liberalization programme of Marshall-Aid of which 139 million were used to cover the Dutch deficit with the BLEU area. In return, however, the Benelux countries had to make an important step on the road towards the formation of a customs union. Although the different devaluation percentages of the Benelux countries made the decision to accept the intra-trade liberalization package of the Pre-Union Treaty easier, the Dutch kept on worrying about BLEU exports to their markets.[38]

During the subsequent negotiations within the OEEC it transpired that the Dutch were much more worried about imports than the Belgians. This is important to note here because the next section will show that, as far as imports are concerned, both Dutch worries and the Belgian dispassionate attitude were unjustified. It will be shown that, given their strong competitive position Dutch protectionism was too pessimistic while the relatively liberal import policy of the Belgians was too optimistic about the high-cost structure of their economy.

The Americans were unwilling to supply Marshall Aid if the OEEC countries were planning simply to continue their protectionist policies. The 1949 so-called OEEC liberalization programme was therefore inaugurated with the purpose of liberalizing an increasing percentage of 1948 intra-OEEC imports of private trade.

Although a high intra-Benelux trade liberalization percentage should not be expected given the divergent domestic economic and financial policies and the non-coordination of investments, the actual liberalization percentage of intra-Benelux trade in 1950, on the basis of the Pre-Union Treaty, was considerably higher than the obligations of the Benelux countries within the framework of the OEEC liberalization programme. In the beginning of 1950, 90 % of intra-Benelux trade (of the 1948 import levels) was liberalized, compared to only 55 % of Dutch imports and 56 % of Belgian imports from OEEC countries combined.[39] With the exception of some agricultural and fishery products, BLEU imports from the Netherlands was free.[40] The Dutch continued to protect mainly industrial products.[41] In the beginning of the fifties, therefore, attempts to adopt a joint Benelux liberalization list were doomed to fail because the Dutch and the Belgians wanted to keep out different products. Belgium was much more keen to protect its agricultural sector while the Netherlands wanted to protect its industrialization projects. Once again it is possible to observe differences that were incompatible with a supranational approach.

Although the Benelux governments wanted to keep out different products and Dutch import policies were much stricter than those of the Belgians, the principle of Benelux preferentiality explain why the degree of internal trade liberalization between the Benelux partners was much higher than their liberalization achievements vis-á-vis intra-OEEC trade. When the Americans decided that the 75 % liberalization target for the beginning of 1951 should be reached on a non-discriminative basis, the Dutch government had great difficulties in meeting this obligation. If the 60 % liberalization of intra-OEEC trade had to be endorsed on a non-discriminative basis, the Dutch could not use their much higher intra-Benelux trade liberalization percentage to improve their overall percentage. It did not take long for the Managing Board of the OEEC to discover that the inability of the Dutch government to reach the 75 % target was due to the high degree of intra-Benelux trade liberalization. Non-Benelux members of the OEEC began to ask themselves why they should pay for the realization of the Benelux customs union while earning nothing in return.[42] A more credible Dutch position in the OEEC could have been attained if they had compensated their insufficient OEEC liberalization percentage with a de-liberalization of intra-Benelux trade. The Dutch had been all too eager to follow this path because a de-liberalization of imports of textiles from the BLEU area appeased their textile entrepreneurs, who right from the start, had feared Belgian competition on their own market. At the end of the day, the Dutch balance of payments position became so much stronger that there was no need to implement the de-liberalization package in the Benelux framework. The OEEC target could also be met.[43]

There were, however, more fundamental reasons than successful protectionist lobbying of a clique of Dutch textile barons behind the divergent attitude of the Benelux countries towards imports. The Benelux countries pursued different

commercial policies.[44] The Dutch felt that they could not operate without quotas if they wanted to sell their rather weak export products to trading partners with higher tariffs. In their view, they could only obtain lavish Dutch export quotas for their weak products from a specific country if they would offer in return to buy weak products from that same country. The Belgians feared that the use of quotas would only provoke retaliations by trade partners which would, at the end of the day, only serve to undermine Belgian exports. This trade political assumption, together with their balance of payments surplus, explains why the Belgians were not so concerned about the impact of the gradual abolition of import quotas of the OEEC liberalization programme. In addition, the Belgians used liberal import policies as a counterinflationary weapon. The Belgian government lacked the Dutch competence to control wages directly, but they could still influence wage negotiations indirectly by exchange rate policies (the over-valued Belgian franc generated unemployment which reduced wage demands) and by liberal import policies.[45] All of this implied that, at least until 1951/52, the Dutch were much more worried about imports than the Belgians. Immediately after the defeat of Germany, the Dutch government had decided to develop industrialization plans to generate import substitution and export increases in those sectors which used to be dominated by German industries. It was decided to concentrate investment on the metallurgical and the machine industry, the chemical industry (both dominated by Hoogovens) and on the pharmaceutical, textile, transport and electro-technical industries. In all these products the industrialists were mainly prepared to produce for the domestic market.[46] Most of these Dutch products received initial protection through quantitative restrictions.[47] If the Belgians produced them too, these products also found a place on a secret list attached to the Benelux Pre-Union treaty[48] containing Dutch import products which would not be liberalized.[49] At the beginning of 1950 many of these products appeared again on the so-called negative OEEC lists of products for which the countries refused to remove quotas. In 1956 these quotas were still in place.[50]

Naturally, the Belgians too, endorsed import substitution policies after the German defeat. Their country, however, was already heavily industrialized and was therefore less in need for 'infant industry' protection. Moreover, for the time being, the collapse of the German economy made them confident that the joint Benelux tariff would generate sufficient protection when needed. Apart from their adherence to liberal import policies as a counterinflationary weapon, there was also a third reason why the Belgians did not worry about imports. The outbreak of the Korean War increased Belgian exports of raw materials and end products to the Dutch market, aggravating Dutch import surplus with the BLEU area.[51] The asymmetrical nature of intra-Benelux trade, therefore, simply continued to manifest itself. Given the imbalance in intra-Benelux trade detrimental to the Dutch, it was evident that the Belgians had no need to worry about Dutch competitive strength on their home market. In all fairness, it should be added here that the

Belgian desire to establish investment coordination did embody genuine fears about future Dutch competition. Naturally they resented the failure to establish investment coordination, but the continuing imbalance in intra-Benelux trade reduced Belgian fears about the consequences of Dutch industrialization projects.

They could not have been more wrong. From 1952 onwards Belgian entrepreneurs had great difficulties in competing with Dutch products on their home market. These events did not come at a very propitious moment. Internal Benelux tariffs had already been abolished in 1948 and quota restrictions on BLEU imports from the Dutch market had, in the framework of the Pre-Union Treaty, been limited to agricultural and fishery products. Alternative protectionist instruments had to be found as soon as possible in order to appease powerful Belgian protectionist pressure groups in order to save the post-war consensus in Belgium.

3. Expansion and consolidation 1952-1957

In 1952, the economic positions of the Benelux countries changed dramatically. Before 1952 the Dutch had experienced an overall balance of payments deficit with the dollar and the OEEC area. In 1952 this changed. Dutch balance of payments was now running a surplus with the OEEC area. In the same year, the Belgians began to feel the results of the Dutch industrialization programme. Dutch industrial products had always been low priced but had not been available in large numbers before 1952. After 1951 they were available and still low priced. Belgian products had been available for several years but at much higher prices. Belgium's relatively high prices in a buyers' economy began to trouble its trade relations with the Dutch. In this context the Belgians proposed to introduce some form of internal policy coordination within Benelux, in the hope that this would reduce the wage and price gap and therefore reduce Dutch competitive strength on their home market.

This was not a view which was acceptable to the American economist, Diebold, who published at the time on European integration. In his eyes, the solution to the problem of implementing a customs union between partner countries with divergent cost structures was simple. Governments should refrain from establishing a pre-alignment of wages and prices before the customs union is actually implemented since this contradicted the essence of the whole operation.[52] Prealignment means that there is no sense in freeing the obstacles on the free movement of the means of production as there are no more differences which are beneficial. Moreover, all arrangements which are designed to support industries or regions whose competitiveness fall short of the requirements of the customs union area should be of a temporary character. If this is not the case then, from a union point of view, the efficient use of the productive resources would clearly be in danger.[53]

As far as pre-alignment was concerned, Diebold had in the case of Benelux nothing to complain about. Prealignment was completely unacceptable for the Dutch but not because they were worried about the negative welfare implications for the union which Diebold had stressed. They had more mundane reasons for rejecting internal policy coordination. Why should they surrender their competitive position on world markets by accepting coordination of internal policies within Benelux? No Dutch government member was therefore prepared to alter the famous étatistic low wage policy which had been so effective in boosting Dutch exports. Consequently, every proposal for establishing supranational internal policy coordination within Benelux, was simply unacceptable.[54] Within the framework of the Common Market, the Dutch continually opposed internal policy coordination, in this case in the form of harmonization of some social regulations, too. At the end of the day, however, they had to accept some degree of social harmonization. Why did they accept this while they refused internal policy coordination in the framework of Benelux?

The answer is simple. First of all, one cannot really compare the relatively unimportant social harmonization package of the Treaty of Rome with the Belgian proposals for coordination of wages within Benelux. This for the simple reason that the social harmonization package hardly influenced competitiveness whereas wage coordination does have a direct impact on the cost-structure of the economy. Seen from this perspective it is hardly surprising that the Dutch found wage coordination unacceptable within Benelux whereas they were prepared to swallow the harmonization deal of the Treaty of Rome. Supranational wage coordination was not feasible within the Benelux framework, because the Dutch would constantly be outvoted by the high-cost Belgians and Luxembourgers who agreed on crucial issues, like the need to limit Dutch agricultural exports and the need to establish internal policy coordination.[55] Moreover, as we can be seen in the next section, the Dutch felt that a transfer of sovereignty to a supranational Benelux organization in return for better access to the relatively small BLEU market, was too high a price to pay.[56] Dutch benefit was small while the costs of accepting internal policy coordination would endanger their post-war consensus.

This is not to say that the Dutch had little difficulty in accepting the less harmful harmonization package of the Common Market. In their desire to establish a supranational framework safeguarding an irreversible commitment to buy Dutch export products even under recessionary conditions, they, however, had to accept the condition of the high-cost countries (including Belgium), that some degree of social harmonization would be implemented too.[57]

As is asserted, the state led low wage policy was the corner-stone of Dutch post-war consensus. Dutch trade unions exercised great restraint in the interest of post-war recovery and the need to find jobs in the industrial sector for the growing population. They bargained primarily for cost-of-living adjustments in order to prevent a decline in real wages. In 1951, during the Korean War boom, the unions

even accepted a five per cent cut in real wages to counter the deteriorating terms of trade of the country. From 1954 onwards, to prevent a further drop in the share of wages in national income, increases in wages were linked to the development of per caput national income in money terms. In contrast, the consensus in the BLEU did not allow for rigid wage controls of the type the Dutch Board of Mediators endorsed. There were two reasons for this. First, government interference in this area was neither tolerated by the trade unions nor by the employers' federations. The only form of government intervention was the introduction, in 1952, of a system linking wages and social transfer payments to the consumer price index. The Dutch did the same thing from 1945 onwards but they kept wages lower because they were much more successful in keeping the cost of living in check.[58] Second, successive Belgian governments attached greater weight to a strong currency and to price stability than to full employment. While the Dutch used income policies to keep costs under control, the Belgians relied on their somewhat higher unemployment figures compared to the Dutch[59], to achieve wage moderation. This strategy was a success in the sense that nominal wages rose more slowly than in the Netherlands. However, although the difference narrowed, there was still a wage gap in 1959.[60]

Labour productivity levels of the Benelux countries cannot be compared since they are based on different calculations. Nevertheless, it seems that the Belgians could not compensate their higher wages with higher labour productivity since their growth of indices of industrial productivity were between 1948 and 1957 identical to those of the Dutch. This despite of the fact that the Dutch devoted a much larger share of their national product to investment than Belgium. Instead of the familiar pattern of growing output,productivity and employment like in the Netherlands, the faster Belgian rise in productivity than in output implied a one percent fall in employment between 1948 and 1957.[61] Belgian deflationary policies based on an overvalued currency, hardly improved the country'_ competitive position, but only worsened the trade off between inflation and unemployment.[62] Since Belgian exporters were generally price takers on the world market, the burden of adjustment fell, to a large extent, on profits. Low profits encouraged the greater part of Belgian investments to be directed towards stagnating industries.[63] Although the Dutch exports commodity position was also biased towards products with stagnating prospects, success was achieved in overcoming this structural handicap through a much more competitive wage level.[64]

The indirect route of internal policy coordination blocked, the Belgians had to find other means of solving their competitive problems. Erecting new tariff walls was simply impossible because a customs union implies that no such barriers exist. The only solution, therefore, was to create new temporary non-tariff trade barriers which would protect the Belgian sensitive sectors. Long and arduous negotiations unravelled during which a consensus had to be found on when a product deserved to be deemed sensitive, thereby requiring governmental regulation. After some

hesitation the Dutch were willing to walk along this non-tariff trade barriers road. This was not because they liked it, but because they disliked the alternative of internal policy coordination even more. Dutch acceptance of non-tariff trade barriers, however, was linked to the condition that they should be implemented on a private basis[65]. Private arrangements between Benelux entrepreneurs was favoured by the Dutch government because of fear that an automatic state intervention procedure would ultimately lead to a kind of Industrial Protocol in the spirit of the famous Benelux Agricultural Protocol which had been so effective in protecting Belgian farmers from unlimited Dutch exports of agricultural products.[66] They were convinced that state sanctioned cartels would be much more difficult to abolish than private ones.[67]

Not surprisingly, the Belgians took a different view. Private arrangements alone would not be sufficient to appease their entrepreneurs. Moreover, if the Benelux states would not sanction private arrangements, some entrepreneurs could easily get round the price cartel.[68] The Belgians had great difficulties in convincing the Dutch that private arrangements were not sufficient. They did manage to acquire Dutch approval for the creation of special committees for the sensitive sectors of tobacco, leather, paper, furniture, stoves, furnaces and enamel ware and textiles. These committees, however, in which representatives of entrepreneurs and workers sat, and which were presided over by Benelux civil servants tried to promote private arrangements.[69] This was exactly what the Dutch had wanted: the committees would produce private arrangements instead of state sanctioned ones. They were even more with the decision taken at Knocke to inaugurate a special commission which would only do research on the wage and price policies of the Benelux countries. Doing research was a nice way of delaying state intervention.[70] Three months later, in December 1952 state intervention became unavoidable. The Benelux ministers were informed that only in the special sensitive sector committees dealing with tobacco, enamel ware, stoves and furnaces, problems had been solved with price arrangements or quotas. Consequently, tension in the other unsolved sectors (wooden furniture, clothing, paper products) began to build up. Private arrangements were not sufficient to solve the Belgian competitive problems with Dutch products. An automatic state intervention procedure was now absolutely necessary.[71]

It is not surprising that private agreements alone could solve the problems. Private business arrangements between a high-cost producer and a low-cost one will always be in the interest of the former because the latter can safely rely on the market mechanism. It is understandable that not all Dutch entrepreneurs were prepared to limit their exports to the BLEU market. Although they could make large profits by selling a limited amount of Dutch goods at Belgian prices (as part of the cartel arrangement), they could perhaps make even higher profits if they could sell an unlimited amount of Dutch goods at Dutch prices. At the end of the day the Dutch therefore had to accept an automatic procedure. An automatic trade

restriction mechanism, although restricting Dutch exports to the BLEU area, at least had the advantage of securing Dutch sovereignty in the field of wage policies. Instead of attacking the automatism of the escape clause, the Dutch negotiators now chose a different strategy. All their energy was now focused on the exact formulation of the escape clause which would only temporarily hamper Dutch exports, would apply to as few sectors as possible, would make no mention of wage differentials and would not entail an automatic levy system.[72] The Dutch opposed levies because they would almost certainly be based on wage differentials and therefore focus the attention again on their state led low-wage policy. Moreover, a system based on levies would be extremely difficult to abolish because Belgian entrepreneurs would base their investment plans on the assumption that this protectionist device would continue to exist. The Dutch view was that quotas could be abolished much more easily.

The final outcome of the negotiations on the wording of the escape clause was clearly a Dutch victory. Article 7 of the Industrial Protocol stipulated that temporary help could be given to a specific sector if it met the criteria of the escape clause. If a product met either criteria based on imports or criteria based on production figures, temporary help could be given to weak sectors. This was the case if imports from the partner country had increased by at least 60 % or by an amount equal to 15 % of the production of the sensitive sector in any six-month period compared to the equivalent six-month periods of the two previous years. A product could also acquire the status of being sensitive if its production fell in any six-month period by at least 15 % compared to the corresponding six-month periods of the two previous years, provided that more than 75 % of this shift caused by an increase in imports from the partner country.[73]

The Dutch were satisfied. No reference to wage differentials was made. The shifting point of reference of the clause secured its temporary effect. Moreover, it applied only to five sectors (rayon textiles, knitting yarn, charmeuse, enamel ware and leather shoes).[74] Finally it did not embody an automatic levy system but left the option open for the Dutch preferred quotas and minimum prices.[75]

The Belgians were willing to accept this escape clause because first of all, they were desperately looking for something which could be used to appease their entrepreneurial pressure groups.[76] After all, the clause did allow for restrictive action in five crucial sectors. Second, the Belgians managed to get Dutch approval for a *clause de souplesse*. If the Benelux Board of Presidents, or the Benelux Committee of Ministers felt that a specific Dutch export product which did not met the conditions of the escape clause still created serious problems, restrictive actions could also be taken. However, this required an unanimous vote. The Benelux partners decided to apply this clause to woollen clothing for women and men. This procedure, however, did not produce tangible results for the Belgians. They solved, as I will demonstrate in the next section, their competitive problems in the woollen clothing sector with national subsidies.

The Dutch , in their turn, acquired Belgian approval for a *clause de sauvegarde*. If the implementation of the escape clause created unreasonable consequences for the exporting country, the Benelux Board of Presidents or the Committee of Ministers could decide to withdraw, amend or change the restrictive measures. This clause was applied to woollen textiles and printed textiles.[77] Just as the *clause de souplesse* had not been a useful protectionist instrument for Belgian protectionism, the *clause de sauvegarde* status of these products did not produce free trade. Dutch exports in this area were regulated by quotas, subsidies and one private arrangement.

With the benefit of hind-sight the outcome of these negotiations can teach us quite a lot about the link between protectionism and the need to maintain the Belgian post-war political consensus. It is clear from the Dutch archives that the Belgian government was desperately looking for ways to restrict Dutch exports. If it could not succeed in this, unemployment in the sensitive sectors would rise even further and make the re-election of the Belgian politicians even more difficult. Belgian acceptance of the escape clause implies, however, that they were not completely defenceless when pressure groups demanded an immediate regulation of Dutch exports. This because the mathematical precision of the escape clause did not allow the Belgian government to appease those pressure groups which were the most important in economic or electoral terms, or for some other reason difficult to ignore their demands. It only allowed for import restriction in those areas where Dutch export penetration was reaching the highest levels and these were not necessarily the most important in terms of voters' allegiance. The fact that the Belgians accepted this arithmetical basis implies that they were in a position to keep on governing alleviating only those sectors which were most hurt.

As is shown, the formation of a customs union between partners with diverging internal policies originating from different post-war political consensus mechanisms ultimately produced state- induced temporary trade controls. The question is whether these temporary trade controls and other artificial elements really were temporary and if not, how important they were in terms of total intra-Benelux trade.

4. Quantitative analysis of protectionism in intra-Benelux trade

As has already been shown in the previous section the price the Dutch had to pay for their refusal to accept internal policy coordination was an automatic state-induced trade regulation mechanism which, however, only applied to a very limited range of products. It is difficult to see how the Dutch government could have defended the alternative option of internal policy coordination. As is argued, nobody in the Dutch government was prepared to accept internal policy coordination as this would undermine the national competitive strength on third markets.

The idea that the Dutch would be willing to jeopardize one of the corner stones of their post-war consensus in return for a better access to the rather small BLEU market was a naive one.

Table 1 demonstrates that after 1953 Dutch exports to the Federal Republic of Germany outmatch those to the BLEU. It shows that in 1948, 1953 and 1957 Dutch exports to the BLEU were only between 15 and 16 % of total Dutch exports.

Given the relatively small size of the Belgian market, Dutch rejection of internal policy coordination may seem to have been sensible but the same cannot be said for the Dutch preference for solving the Belgian competitive problems by stimu-

Table 1. *Geographical distribution of Dutch international trade, 1948-1957.*

(Percentages of total Dutch trade)

	Imports			Exports		
	1948	1953	1957	1948	1953	1957
BLEU	14.8	17.2	18.1	15.6	15.4	15.5
Federal Republic	5.4	15.9	18.5	5.9	14.0	18.5
France	4.9	3.9	3.2	8.1	4.6	4.7
Italy	1.1	1.0	1.3	2.0	1.9	2.7
Europe of the Six	26.2	38.0	41.1	31.6	35.9	41.4
United Kingdom	9.9	9.9	8.0	14.4	10.7	10.8
USA	17.4	10.0	13.1	3.1	8.4	5.1
Dutch Antilles						
Surinam						
Dutch New Guinea	1.6	1.1	0.6	1.1	1.5	1.8
Indonesia	6.7	5.5	2.9	7.4	3.6	2.3
Rest of the world	38.2	35.5	34.3	42.4	39.9	38.6
Total	100	100	100	100	100	100

Source: *Benelux 1948-1958. Statistisch overzicht van 10 jaar samenwerking*, 113.

lating private arrangements between Benelux entrepreneurs. The policy of promoting cartel like-arrangements was based on the assumption that these would be much easier to abolish than state sanctioned ones. Table 2 shows that this assumption was wrong.

It appears that the abolition rate of privately arranged products and escape clause products are almost equally low. It also appears that both the *clause de sauvegarde* and the *clause de souplesse* products continued to be regulated by artificial arrangements. On all accounts Dutch assumptions were wrong. Most of the Privately arranged products and the escape clause products were not abolished. Out of a total of 59 sensitive products, only in 20 cases were the artificial arrangements of a temporary character. Why did the Dutch accept this situation while they had constantly argued that artificial arrangements should be temporary?

The answer to this question lies in the nature of the arrangements and in their relative insignificance. Beginning with the latter, Table 3 shows the hard-core of Belgian protectionism and indicates how unimportant the regulated Dutch sensitive export products were in terms of total exports.

Although the majority of the artificial arrangements were not temporary, it amounted only to between 6 and 8 % of total Dutch exports to the BLEU area.[78] The question whether a supranational approach based on binding majority voting would have increased this percentage is not easy to answer. On the one hand, majority voting would not have increased this percentage because Luxembourg and Belgium, both having protectionist interests, could have outvoted the Dutch. On the other hand, supranational package deals might have produced better results than the intergovernmental consensus machine. One thing, however, is clear, even if supranationality had increased this percentage, it would doubtlessly have created huge political problems in Belgium. If supranational integration super-

Table 2. *Abolition rate of artificial arrangements dealing with escape clause products, clause de souplesse products, clause de sauvegarde products and privately arranged products, 1952-1959.*

	Percentage	Number
20 Escape clause products	40 %	8 out of 20
3 *clause de sauvegarde* products	0 %	0 out of 3
5 *clause de souplesse* products	0 %	0 out of 5
31 privately arranged products	38,71 %	12 out of 31

Source: Minutes of the Benelux committee of Trade and Industry in ARA: BEB, box 312, 322, 329, 353, 355, 369-371,380, 382.

Table 3. *Share of sensitive products in Dutch exports to BLEU 1950-1959.*

(Percentage based on a calculation in which all sensitive Dutch exports which took place in a regulated way are totalled minus the generous quota arrangements; one unit is 1000 guilders)

	Total Dutch exports to BLEU	Regulated Dutch sensitive exports to BLEU	Dutch sensitive exports to BLEU as a % of Dutch total exports to BLEU
1950	721 528	0	0.00
1951	1079 009	0	0.00
1952	1240 229	0	0.00
1953	1255 418	48 597	3.87
1954	1278 590	83 476	6.53
1955	1411 368	107 755	7.63
1956	1542 813	102 851	6.67
1957	1825 978	113 937	6.24
1958	1830 076	116 161	6.35
1959	2008 885	132 451	6.59

Source: See Table 2.
Note: The Benelux Committee of Industry of Trade used the CBS statistics for its calculations. The minutes of this committee mention the CBS numbers of the sensitive products which enabled me to use the CBS trade statistics.

sedes the nation state by undermining the post-war consensus in one of the partner countries, it may result in the collapse of the whole operation, including the mutual advantages which it provided. In addition, even if a supranational approach had enabled the Dutch to double these percentages, they would still have only been a small percentage of total Dutch exports. Surely, the Dutch would not have wanted to imperil Benelux cooperation for such small benefits. Supranationality therefore, was not an easy option. These considerations must have made it easier for the Dutch to accept that intergovernmental Benelux cooperation also implied that there was no guarantee that the artificial arrangements would always be abolished, and in fact it did.[79]

This is not to deny, however, that the Belgians did very well in protecting their sensitive sectors. Table 4 shows how they increasingly replaced quotas on Dutch exports with Belgian subsidies to their entrepreneurs. An interesting picture emerges. In 1953 and 1954 at the time when the Belgian problems were most

Table 4. *The relative impact of specific artificial arrangements on Dutch sensitive exports to the BLEU, 1953-1959.*

(Absolute figures, and as a percentage; Belgian protectionism excluding the generous quota arrangements)

	I	II	III	IV	V	VI	VII	VIII	IX
1953	48597	0	9721	3172	357	0	26874	0	0
1954	83476	12310	9959	3770	444	617	51877	248	4251
1955	107755	36082	24797	5854	318	874	32933	481	6416
1956	102851	59648	17182	7013	556	764	8478	513	8697
1957	113937	69427	17813	4145	543	749	10551	655	10554
1958	116161	61667	21230	5981	425	522	13515	414	12407
1959	132451	73386	21753	6249	346	477	16585	477	13178

Percentages

	I	II	III	IV	V	VI	VII	VIII	IX
1953	100	0	20.00	6.53	0.73	0	55.30	0	0
1954	100	14.75	11.93	4.52	5.32	0.74	62.15	0.30	5.09
1955	100	33.49	23.01	5.43	0.30	0.81	30.56	0.45	5.95
1956	100	57.99	16.71	6.82	0.54	0.74	8.24	0.50	8.45
1957	100	60.93	15.63	3.64	0.48	0.66	9.26	0.50	8.82
1958	100	53.09	18.28	5.15	0.36	0.45	11.63	0.36	10.68
1959	100	55.41	16.42	4.72	0.26	0.36	12.52	0.36	9.95

Source: See Table 3.

Explanation of Roman numbers:

I Belgian subsidies to their national entrepreneurs
II Price arrangement
III Levies on Dutch exports to the BLEU area
IV International cartel between BLEU, The Netherlands and the Federal Republic
V Market division, unclear what it meant exactly, presumably quotas
VI Quotas
VII Agreement not to hurt Belgian interests, unclear how it was done
VIII Agreement to reduce total Benelux imports of the sensitive product
IX Agreement to impose a combination of quotas and price arrangements

Table 5. *The share of sensitive products in Dutch exports to the BLEU and in total Dutch imports, 1950-1959.*

(One unit is 1000 guilders)

	Dutch sensitive exports to BLEU	Dutch sensitive imports from BLEU	Dutch sensitive exports as a % of Dutch total exports	Dutch sensitive imports as a % of Dutch total imports	Dutch sensitive imports as a % of Dutch sensitive exports
1950	0	0	0.00	0.00	0.00
1951	0	0	0.00	0.00	0.00
1952	0	0	0.00	0.00	0.00
1953	48 597	16 027	3.87	1.05	32.98
1954	83 476	71 108	6.53	3.90	85.18
1955	107 755	73 931	7.63	3.35	68.61
1956	102 851	97 016	6.67	3.64	94.32
1957	113 937	104 700	6.24	3.72	91.89
1958	116 161	76 727	6.35	3.12	66.05
1959	132 451	101 231	6.59	3.69	76.43

Source: See Table 3.
Note: Based on a calculation in which all sensitive Dutch exports which took place in a regulated way are totalled, minus the generous quota arrangements.

acute, the Benelux partners most preferred regulative mechanism were quotas. This is not surprising. Quotas are compared to alternative protectionist devices like tariffs, cartels, subsidies and non-tariff barriers, well known for their precise impact on trade flows. More security is exactly what entrepreneurs in crisis situations want. In 1955 the picture changed dramatically; the amount of quotas dropped to one-third of total Dutch sensitive exports while subsidies jumped to one-third and price arrangements to one-fifth. In the subsequent years subsidies rose to more than a half of all regulated products while price arrangements fell to one-sixth and quotas consolidate at one ninth.

The nature of the artificial arrangements also explains why the Dutch had no choice other than to accept them. To begin with the predominant subsidies, state support of business companies was not affected by Benelux regulations and therefore still very much a national affair. The Dutch simply had to accept such subsidies because there was nothing else they could do about it. The same is true

Table 6. *Regulated intra-Benelux trade as a percentage of total intra-Benelux trade in 1957.*

	million guilders	% of Dutch exports to BLEU
Dutch total exports to BLEU	1 825.98	100
1. industrial Protocol products	113.94	6.24
2. minimum price agricultural products	89.18	4.88
3. non-liberalized agricultural products	5.52	0.30
4. non-liberalized non agric. products	5.48	0.30
Total regulated Dutch exports BLEU	214.12	11.72

	million guilders	% of Dutch imports from BLEU
Dutch total imports from the BLEU	2816.23	100
5. minimum price agricultural products	9.86	0.35
6. non-liberalized agricultural products	4.15	0.15
7. non-liberalized non agric. products	3.11	0.11
8. subsidised Belgian coal	106.51	3.78
Total regulated Dutch imports BLEU	123.63	4.39

Source: A combination of the tables in this article and Table 59 non-liberalized intra-Benelux trade in Benelux statistieken 1948-1958, 107

Explanation:

1. Industrial Protocol products are the so-called sensitive Dutch export products which were regulated because of the Industrial Protocol or on a private basis. Dutch imports of those same products was free.
2. Cattle, pigs, cattle meat, pork, salted/dried/smoked/boiled meat, fresh milk, cream, condensed milk, butter, eggs, tomatoes, onions, potatoes, cauliflower, red or white cabbage, chicory, lettuce, carrots, beans, peas, grapes, apples, pears, cherries, prunes, strawberries and sugar beets
3. Foals, flowers, wheat, seed rye, seed barley, seed oats, wheatmeal, groats of wheat, margarine, beet sugar, inverted sugar
4. Calf hides, roof tiles, diamonds, coins, scrap
5. Same products as by 2

6. Flowers, wheat, wheatmeal, twaddle, linseed, castor oil, fatty acids, margarine, beet sugar
7. Cable and rope of hemp, tin carbage
8. In 1957 Belgian coal exports were subsidized by the Belgian government and by the ECSC

for all the other artificial arrangements. Dutch anti-cartel law was weak because it was part of their post-war consensus that national cartels 'controlled' by the government would keep prices down.[80] International Benelux cartels would naturally boost inflation and also consolidate the price and wage gap between the Benelux countries, but even if the Dutch had desired to abolish them they lacked the legal instruments to do it. International cartels were excluded from their anti-cartel legislation.[81] The only thing the Dutch could control was the application of the escape clause to specific products. However, here too, in a substantial number of cases the abolition of state intervention was compensated with new artificial arrangements.

The predominance of subsidies in Table 3 while supporting Lamfalussy's defensive investment theory requires more detailed explanation.[82] Cartels are fine regulative devices but they do not always work out well if they consist of partners with divergent cost structures. Dutch entrepreneurs were hesitant to create cartels with their high cost Belgian counterpartners which would, inevitably, undermine their competitive position on the BLEU market. The fact that from 1955 onwards the proportion of subsidies in the total number of regulative devices rose spectacularly was the result of disappointing cartel negotiations between Benelux entrepreneurs. Table 3 shows that in 1955 only one-fifth of Dutch sensitive exports could be 'solved' with price arrangements. This left the Belgians with no other choice than national subsidies, and these were badly needed because in all those sectors a wage gap detrimental to the Belgians, and in some cases to the Luxembourgers as well, continued to made itself felt on Benelux intra-trade and increased unemployment.

The Belgian subsidies and the other artificial arrangements seem to have been very effective. Table 5 shows, that from 1954 onwards, two-thirds (and sometimes even more than that) of sensitive Dutch exports were covered by Dutch imports of products which were sensitive on the BLEU market. This table shows that the Belgians have done quite well in the hard-core protectionist sector. From 1954 onwards, artificial arrangements enabled the Belgians to match between 66 and 94 % of Dutch sensitive exports with sensitive Dutch imports. The table shows, however, also that this protectionist racket constitutes from 1955 only slightly more than three per cent of total Dutch imports. The fact that in most cases artificial arrangements were not abolished did not generate a situation in which a large part of Dutch total exports and imports were artificially regulated. Again, this made it

easier for the Dutch to accept that their intention to prevent permanent arrangements had, to a large extent failed.

Having analyzed the industrial sector so far, the conclusion is clear. I did find Milward's mixture of free trade and protectionism. In addition this mixture was closely connected to divergent domestic policies reflecting different post-war consensus systems. It should be added, however, that the protectionist devices did not cover a substantial part of total intra-Benelux trade. A fair account should include the protectionist elements in other areas. Table 6 includes not only the industrial Protocol products which have been dealt with above, but also agricultural products which were still under the vigour of minimum prices, other non-liberalized agricultural products, other non-agricultural non-liberalized products and subsidized ECSC products (only Belgian coal).

The conclusion from Table 4 is clear, if we include all other regulated sectors only 11.7 % of Dutch exports and 4.39 % of Dutch imports took place in a regulated way. The difference in percentage can perfectly be explained by Belgian competitive problems in industrial as well as agricultural sectors. It also explains why Dutch imports from the BLEU market in terms of total Dutch imports was larger than Dutch exports to the BLEU in terms of total Dutch exports (Table 1).

In other words we have founds Milward'_ mixture of protectionism and free trade but it cannot be said that a substantial part of intra-Benelux trade is regulated. How can we explain this? Perhaps small and open economies like the Benelux countries cannot afford a high degree of protectionism. They earn a considerable part of their national income across their borders. In this specific situation too much protectionism would undermine exports because their trading partners would simply retaliate. Exports are simply too important for the preservation of the post-war consensus in the Benelux countries. This explanation, however, is probably much too simplistic. Much more research is needed of overall quotas, tariffs and trade structures, to validate this hypothesis.

5. Conclusion

The Benelux case provides further empirical evidence for Milward's argument that the need to maintain the post-war consensus required a mixture of protectionism and free trade. Protectionism found its origin in different post-war consensus systems and asymmetric economic starting positions and subsequent economic developments. Until the end of 1949, intra-Benelux trade liberalization was impossible, given the divergent economic positions and different domestic economic policies. At the end of 1949, intra-trade liberalization increased, not because Dutch balance of payments position had dramatically improved, but because Dutch demand for goods was high while the Americans were willing to co-finance it. The situation changed when the Belgians began to feel the consequences of

their high-wage policy. From then onwards they began to press for de-liberalization of intra-Benelux trade. Supranational internal policy coordination could have prevented this, but this option was incompatible with the cornerstone of Dutch post-war consensus, the state-led wage policy. Supranational investment coordination in the forties would have been helpful too, but this option required a concept of the role of the state in the market which went way beyond what the majority of Dutch and Belgian politicians found acceptable. Finally, a devaluation of the Belgian franc could also have reduced protectionism but this was incompatible with the decision of the Belgian authorities in the fifties to make the defence of the Belgian franc their battle cry.

The only alternative left was a state induced reintroduction of non-tariff trade barriers. The Dutch preferred private arrangements between Benelux entrepreneurs because they hoped that these would be easier to abolish than state sanctioned ones. It soon turned out, however, that this was insufficient to save the Belgian post-war consensus. At the end of the day the Dutch accepted an automatic state intervention procedure since they found it less repulsive than internal policy coordination. Such a procedure at least had the advantage that it did not affect the sacrosanct nature of Dutch internal policies. Moreover, it was anticipated that its impact would only be temporary. This anticipation was incorrect. Out of a total of 59 sensitive products, only 20 were completely liberalized in the period 1952-1959. Research also showed that the Dutch expectation that private arrangements would be easier to abolish than state sanctioned ones was ill-conceived. Both were almost equally difficult to abolish.

Supranational internal policy coordination might have been better in terms of boosting Dutch exports to the BLEU area than permanent artificial trade distortions, but this would also have undermined Dutch competitiveness on third markets. Given the relatively small size of the BLEU market, this was too high a price to pay. The Dutch had no choice but to accept the sub-optimal world of the Industrial Protocol. After all, the regulated sensitive area amounted to only between 6 and 7.6 % of total Dutch exports. Supranational administration of temporary trade controls might have increased this percentage but would certainly also have undermined Belgian post-war consensus. This might have brought an end to the whole operation including the mutual benefits which it embodied.

Limiting the costs of interdependence in the form of supranational internal policy coordination would have been beneficial for Belgium with its high-cost economy but was simply rejected by the Dutch. During the Common Market negotiations, the Belgians eventually achieved internal policy coordination in the form of social harmonization albeit not on a supranational basis. The Dutch desire to acquire an irreversible trade political commitment in the larger area of the Common Market made them finally accept the long-standing Belgian (and French) demand for social harmonization.

NOTES

Abbreviations

ARA	Algemeen Rijksarchief, The Hague, including:
- BEB	Foreign Trade Section, Dutch Ministry of Economic Affairs
- MR	Ministerraad [Dutch Cabinet]
- REA	Raad voor Economische Aangelegenheden [Ministerial Council for Economic Affairs]
ABZ	Archives, Dutch Ministry of Foreign Affairs, The Hague, including:
- DGEM	Economic and Military Cooperation Section
- DGES	European Cooperation Section
AEZ	Archives of the Dutch Ministry of Economic Affairs, The Hague, including:
- DGHN	Trade and Industry Section
LAE	Luxembourg Archives de L'État du Grand-Duché de Luxembourg

1 The author wants to express his gratitude for the comments of Prof. Dr. R.T. Griffiths, Prof. Dr. A.S. Milward and Prof. Dr. J.L. van Zanden on earlier versions of this article.

2 The literature in which this argument is put forward is overwhelming. To mention some of them: G. Brouwers, 'The problems of integration and the lessons to be drawn from the Benelux experiment', *Quarterly Review Rotterdamsche Bankvereeniging* (June 1961) 5-19; K.A. Kalshoven, *Benelux* (Rotterdam 1960); J.E. Meade, *Negotiations for Benelux: An annotated chronicle 1943-1956* (Princeton 1957); W. Robertson, 'Benelux and problems of economic integration', *Oxford Economic Papers* 8 (1956) 35-50; M. Weisglas, *Van nabuurstaten tot uniepartners* (Amsterdam 1949).

3 A.S. Milward, *The reconstruction of Western Europe* (London 1987) 57-59.

4 This idea has been put forward by: H. van der Wee, *Prosperity and upheaval. The world economy 1945-1980* (London 1986), see especially ch. 9, 345-379. J.M.M.J. Clerx has defended the same idea in *Nederland en de liberalisatie van het handels- en betalingsverkeer 1945-1958* (Groningen 1986).

5 A.S. Milward, 'The chairman's view of possible areas for discussion arising from the papers', unpublished conference material for the Economic History Conference in Leicester 1992. The notion that economic growth would promote political stability was very much an American idea. See: P. van der Eng, *De Marshall-hulp. Een perspectief voor Nederland 1947-1953* (Houten 1987) 244.

6 Ch. S. Maier, 'The two postwar eras and the conditions for stability in twentieth-century Western Europe', *American Historical Review* 86 (1981) 327-367.

7 A.S. Milward, *The European rescue of the nation-state* (London 1992).

8 *Ibidem*, 37-40
9 Milward's work draws here on the important conceptual contributions of Keohane and Nye. See R.O. Keohane & J.S. Nye, *Power and interdependence. World politics in transition* (Boston 1977) 8, 9. The concept of interdependence is not the same as interconnectedness. Interconnectedness refers to the rising number of international transactions between states in the sense of increased flows of money, goods, people and messages across international boundaries. Where interactions do not have significant costly effects, there is simply interconnectedness. Where there are reciprocal costly effects of transactions, there is interdependence. The effects of transactions on interdependence will depend on the constraints, or costs associated with them. A country that imports all its oil is likely to be more dependent on a continual flow of petroleum than a country importing furs, jewellery, and perfume will be on uninterrupted access to these luxury goods.
10 Milward, *The European rescue*, 5, 19.
11 *Ibidem*, 437.
12 In 1921 a treaty between Belgium and Luxembourg established the Belgian Luxembourg Economic Union. Interestingly, from the Luxembourg point of view, this treaty had 'a second best' character. Luxembourg, deprived from her former position in the Zollverein, discovered after the First World War that the outcome of a national plebiscite favouring an economic alliance with France was rejected by the latter. Tiny Luxembourg, therefore, had to find another partner in order to overcome its economic problems related to the small size of its market. At the end of the day, Belgium, which had been bent on annexing Luxembourg for some while, turned out to be the only viable option. Many difficulties typical for Benelux were not problematic in the BLEU because the latter involved cooperation between a small state and a much larger state, enabling Belgium to point out the direction of the operation. The BLEU, for instance, adopted in essence a common monetary circulation for the whole union. This greatly facilitated intra-trade payments between Belgium and Luxembourg. In contrast, Benelux did not have a common monetary circulation which made the divergent balance of payments positions of the Benelux countries, which the BLEU never experienced, even more difficult to handle. See for more information on the BLEU: J.E. Meade, 'The Belgium Luxembourg Economic Union 1921-1939', in: J.E. Meade, H.H. Liesner & S.J. Wells, *Case studies in European economic union. The Mechanics of Integration* (London 1962) 13-58.
13 J.L. van Zanden & R.T. Griffiths, *Economische geschiedenis van Nederland in de twintigste eeuw* (Utrecht 1989) 185-186.
14 J. van der Mensbrugghe, *Les unions économiques. Réalisations et perspectives* (Brussels 1950) 39-40. Van der Mensbrugghe does not use the revised Dutch figures which can be found in Van Zanden & Griffiths, *Economische geschiedenis*, 185, 186.
15 M. Weisglas, *Benelux*, 239-242.
16 Meade, Liesner & Wells, *Case studies*, 104.
17 Van Zanden & Griffiths, *Economische geschiedenis*, 196. See also, Van der Eng, *De Marshall-Hulp*, 31-32.
18 J.E. Meade, *Negotiations for Benelux*, 10-12.
19 These arguments were frequently put forward by Dutch civil servants. See for instance: ABZ: 610.20, box 30, letter from Harinxma, the Dutch Ambassador in Brussels, to the Dutch Minister of Foreign Affairs 24-1-1946. See also: ABZ: 610.20, box 30, Note of the Economic Section of the Dutch Ministry of Foreign Affairs

written for their own minister entitled *Aantekening ten behoeve van het a.s. bezoek van de Belgische Ministers 30-3-1946*, undated.

20 Meade, Liesner & Wells, *Case studies*, 103.

21 F. Baudhuin, *Histoire économique de la Belgique 1945-1956* (Brussels 1958) 54. See also: Ch.P. Kindleberger, *Marshall Plan days* (London 1987) 238.

22 J.E. van Dierendonck, 'Het industriële loonpeil in Nederland', *Economisch-Statistische Berichten* (1948) 907. Before the war Belgium had been a low-wage country. In 1937 average industrial hourly wages amounted to 27.5 Dutch cents in Belgium compared to 39.5 cents in the Netherlands. In 1947 the situation was reversed: 85 cents in the Netherlands and 106 cents in Belgium.

23 J. De Vries, *The Netherlands economy in the twentieth century* (Assen 1978) 102, 103.

24 R.T. Griffiths, 'Het Nederlands economisch wonder', *Bijdragen en Mededelingen voor de Geschiedenis der Nederlanden* (1986) 97-115.

25 P.W. Klein, 'Wegen naar economisch herstel 1945-1950', in: P.W. Klein & G.N. van der Plaat, eds, *Herrijzend Nederland* (The Hague 1981) 85-101, see especially 93.

26 W. van Rijckeghem, 'Benelux', in: A. Boltho, ed., *The European economy* (Oxford 1982) 585.

27 R. Vandeputte, *Economische geschiedenis van België 1944-1984* 21, 34-35.

28 R.T. Griffiths, 'The stranglehold of bilateralism', in: R.T. Griffiths, ed., *The Netherlands and the integration of Europe* (Amsterdam 1990) 1-26, in particular 2.

29 T.E. Mommens, 'Agricultural integration in the Benelux', in R.T. Griffiths, *The Netherlands and the integration of Europe*, 49-68. The same can be said of transport. Competition between the ports of Rotterdam and Antwerp in transit trade was fierce. Belgium had no need of Dutch shipping services. For a summary of Dutch complaints about intra-Benelux transport disputes, see: ABZ, 610.20, box 30, letter of Secretary General Foreign Affairs to the Dutch Minister of Foreign Affairs 21-7-1949.

30 T.E. Mommens, 'Belgische en Nederlandse visies op het landbouwprobleem en de vorming van de Benelux in de jaren vijftig', in: E.S.A. Bloemen, ed., *Het Benelux-effect* (Amsterdam 1992) in particular 112.

31 ARA: BEB, 468, Benelux Tolunie 1944-1949, note from the BEB for the Dutch Minister of Economic Affairs entitled *De Tolunie met België als practische politiek*, 27-11-1945. See also: ARA: REA, Cabinet Minutes, box 570, 10-12-1945. Dutch perception of Belgian policy intentions can be found in: AEZ: DGHN, 1895, dossier 06/6, file 5, letter of the Dutch Minister of Economic Affairs, Huysmans to the REA 26-2-1947, enclosed a note of the President of the Dutch delegation in the Benelux Council for the Economic Union entitled *Rapport van den voorzitter van de Nederlandse delegatie in de Raad voor de Economische Unie ten behoeve van de ministeriële bespreking te Brussel op 12 Maart a.s.*, undated. See also: ARA: REA, Cabinet Minutes, box 570, 5-3-1947.

32 ARA: REA, Cabinet Minutes, box 571, 23-2-1949.

33 The list contained the following: plate glass, cement, asbestos cement, rubber, carbon dioxide, sodium carbonate, copper sulphate, nitrogen, explosives, sugar refining, oil refining, milling, brewing, rice refining, coal mining, coke, bicycles, bicycle chains, cellulose, iron and steel products, ball-bearing, wooden products and strawboard. See the protocol of the Luxembourg conference 29-31 January 1948 in: AEZ: DGHN, Benelux, box 76, file 2.

34 With the exception of the plate glass industry. The Dutch plate glass industry was extremely small, the Belgian very large. Belgium became the sole supplier of plate glass for the Dutch market. See: *Beraadslagingen van de Tweede Kamer der Staten-Generaal*, 17 August 1948. Drees informed Parliament that the government had been prepared to drop their initial plan to produce plate glass on Dutch territory.
35 Meade, Liesner & Wells, *Case studies*, 112.
36 *Ibidem*, 138.
37 From the beginning of 1946 onwards the Belgians had tried hard to make their loans dependent on Dutch liberalization plans. See: ARA: REA, Cabinet Minutes, box 570, 21-1-1946.
38 ARA: REA, Cabinet Minutes, box 571, 21-9-1949. The Dutch followed the British example and devalued the guilder by 30 %. The Belgians devalued their franc by 12 %. Before the devaluation Belgian wages had been 20 % higher than Dutch wages. After the devaluation this became 50 %. See: J.M.M.J. Clerx, *Nederland en de liberalisatie*, 135.
39 ABZ: DGEM, 1130, box 52, letter of Spierenburg to the Dutch Minister of Foreign Affairs 18 July 1950. See also: ARA: REA, Cabinet Minutes, box 572, 26-7-1950.
40 For the list of agricultural products see: Table 6, point 2. Apart from these so-called Agricultural Protocol product, other products were restricted too: coal, cokes, meat, live animals, oil products, industrial oil, dextrine, fascines, flax straw, salt, chloride, caustic soda, caustic potash, penicillin, peat, fatty acids, benzene, cinema films, carton boxes, flax fibres, hemp, jute, cable and rope of hemp, linoleum, artificial teeth, diamonds, gold, bicycle brake blocks, explosives. I have not found this list in the Dutch archives. The Luxembourg Archives contain a copy of the list. See: LAE: 11583, letter from Bech to the President of the Conseil d'État of Luxembourg 23-3-1954, enclosed this secret list.
41 These products are mentioned in the secret annex II of the 1949 Protocol. BLEU exports of the following products continued to be regulated with quotas: fishery, chemical products, hides, copper, wood, textile products, furniture parts, plate glass, cigarette paper, coal, car tyres, steel products, diamond, cars, weapons, medical drugs, caustic soda, carbon dioxide, perfume, coffee, meat, fur, palm oil, corn, caustic potash, etheric oil, saccharine. See LAE, ibid. Not surprisingly, some of these protected Dutch products were also to be found on the list of industries on which prior consultation in the Benelux framework was compulsory before investments could be made. See note 32.
42 ARA: REA, Cabinet Minutes, box 572, 24-8-1951.
43 ARA: REA, Cabinet Minutes, box 571, 21-11-1951.
44 For a survey of the distinct commercial political traditions of the Benelux countries, see: AAZ: BEB, Commission Permanente, minutes of the 113 meeting, 18-19 February 1953, 1-12.
45 A. Lamfalussy, *Investment and growth in mature economies* 28, 29. See also: Van Rijckeghem, 590-591.
46 R.T. Griffiths, 'Economic Reconstruction Policy in the Netherlands and its international consequences, May 1945-March 1951', *EUI Working Paper* 76, p. 7-16.
47 W. Asbeek Brusse, 'The Stikker Plan', in: R.T. Griffiths, ed., *The Netherlands and the integration of Europe*, in particular 83, 84, 90.
48 In this pre-Union Treaty the Benelux countries expressed their desire to work in the direction of an economic union. In reality the Treaty was nothing more than a classical

bilateral trade treaty. See: A.J. Boekestijn, 'Een nagel aan Adam Smiths doodskist. De Beneluxonderhandelingen in de jaren veertig en vijftig', in: Bloemen, *Het Benelux-effect*, in particular 152-154.

49 LAE: 11583, Pre-Union Protocol 15 October 1949, Secret annex II, The following products were on this list: fish, chemical products, hides, copper, wood, textile products, furniture components, plate glass, cigarette paper, coal, car tyres, steel products, diamonds, cars, weapons, fur coats, pharmaceutical products, caustic soda, sodium carbonate, slaughtered products, fertilizers, perfume, coffee, palm oil, maize, saccharine, etheric oil, carton boxes, bicycles, yarn made from flax, jute, hemp fibre, ropes and wires, artificial teeth, gold, linoleum, brake blocks, cinema films.

50 Asbeek Brusse, 'The Stikker Plan', 90.

51 ABZ: 610.20, box 31, Note of the Benelux Board of Presidents without a title dated 25-8-1951.

52 W. Diebold, *Trade and payments in Western Europe 1945-1951* () 347, 348.

53 J. Tinbergen, *International economic integration* (Amsterdam 1965) 107-116.

54 ARA: REA, Minutes, box 573, 30-7-1952. The state-led low-wage policy was the cornerstone of the Dutch post-war political consensus. It was designed to boost exports in order to combat a structural balance of payments position. The agricultural sector could never absorb the growing population. Competitive Dutch export products were meant to generate jobs in the industrial sector.

55 ABZ: 610.20, file 434, letter from Sauveplanne of DEU/BE to the Secretary General of the Dutch Ministry of Foreign Affairs 17-1-1955.

56 See Table 1.

57 R.T. Griffiths, 'The Common Market', in: Griffiths, *The Netherlands and the integration of Europe*, in particular 184.

58 The Dutch continued until 1950 the 1941 German freeze on house rents and agricultural lease holdings. After 1950, the house rent and lease increases were moderate. They also kept domestic prices of agricultural products at a low level. Until 1953 Dutch agricultural prices were lower than world market prices. As a consequence relative wage levels were between 1948 and 1953 30 % below the level of 1938. In 1954 an incidental wage increase decreased the gap with the 1938 level. In the period 1954 until 1961 relative wage increases followed relative cost of living. In 1961 relative wage levels were still 20 % lower than the 1938 level. See: Van Zanden & Griffiths, *De economische geschiedenis*, 45, 94-95.

59 Belgian unemployment figures were roughly more than double and sometimes triple those of the Dutch between 1948 and 1958. One should, therefore, not push this argument too far. See: *Benelux Statistieken 1948-1958*, 16-17.

60 Benelux Secretariat General, *Benelux loononderzoek 1953-1957* (Brussels 1958).

61 Lamfalussy, *Investment and growth*, 8, 9.

62 Van Rijckeghem, 'Benelux', 590, 591.

63 Lamfalussy, *Investment and growth*, 79-94.

64 E. Roselle & J. Waelbroeck, 'La position de la Belgique vis-á-vis de ses concurrents du Marché Commun', *Cahiers économiques de Bruxelles* (January 1961) 324-333. See also: J.L. van Zanden, 'De economische ontwikkeling van Nederland en België en het succes van de Benelux 1948-1958', in: Bloemen, *Het Benelux-effect*, 13-32.

65 ARA: REA, Minutes, box 573, 8-10-1952.

66 The Dutch also knew that things could have been much worse. The preferential treatment the Dutch received on the BLEU market was successful enough to produce feelings of envy in the rival Danish camp.
67 ARA: REA, Cabinet Minutes, box 573, 10-12-1952.
68 ABZ: 610.20, IMO, Permanent Ministerial group inaugurated by the Protocol of Knocke, part 2, box 31, letter from DEU/BE to the Secretary General of Foreign Affairs 11-12-1952.
69 ARA: MR, Cabinet Minutes, box 397, 16-10-1952.
70 ARA: REA, Cabinet Minutes, box 573, 3-11-1952.
71 ABZ: 610.20, IMO, box 31, letter from Zahles to Beyen 17-12-1952.
72 ABZ: 610.20, a copy of a letter from the Dutch Treasury to the Society for National Reconstruction 19-1-1954.
73 Provided that Belgian production had not increased compared to the same equivalent six-months period, that the total increase in imports was not for more than 20 % caused by imports out of third countries, that the increased imports out of the partner country had not substituted imports out of third countries and, finally, that imports out of the partner country represented at least 7 % of the total consumption of the partner country in trouble.
74 Clothing, wooden furniture and paper products did not met the criteria of the escape clause. Tensions in the sector of clothing were solved with Belgian subsidies. As far as wooden furniture is concerned the Belgians imposed generous quotas which were larger than actual Dutch exports which can be explained by secret private arrangements but there is no proof of this. In the sector of paper products, most of the ungenerous Belgian quotas were not abolished. See: ARA: REA, Cabinet Papers, box 605, letter of Zijlstra to the REA, enclosed a report of the Benelux Committee of Trade and Industry dated 24 May 1953, 9. See also: ARA: REA, Cabinet Papers, box 603, Letter of the President of the Dutch delegation in the Benelux Board of Presidents to the REA 11 October 1953, REA no. 41569, discussed during the REA meeting of November 11 1953. Finally, see: ABZ: 610.20, DGES Archief, minutes of the Benelux Board of Presidents September 29 1955, 4.
75 ABZ: 610.20, secret letter from Luns to Van Zeeland and Bech 24 July 1953.
76 The reader might wonder why in this article, as far as Belgium is concerned, so much attention is paid to Belgian pressure groups while in the case of the Netherlands the focus is primarily on the perception of the Dutch government and civil servants. The answer is simple. Dutch entrepreneurial pressure groups thought that the Dutch policy of delay by stressing the importance of private arrangements was compatible with their interests. It seemed to be the most sensible way to conquer as much as possible of the BLEU market. See: ABZ: 610.20, a copy of a letter from the Dutch Treasury to the Dutch Society for National Reconstruction 19-1-1954. Dutch employers' and employees' organizations were members of this society.
77 ABZ: 610.20, box 30, secret letter from Luns to Van Zeeland and Bech July 4 1953.
78 This percentage increases naturally if one relates it to total Dutch industrial exports to the BLEU. In 1957, for instance, Table 3 shows that Dutch sensitive exports to the BLEU amount to 6.24 % of total Dutch exports. If we total in this same year SITCH 5,6,7 and 8, Dutch industrial exports to the BLEU amount to 982.3 million guilders. Table 3 shows that regulated Dutch sensitive exports to the BLEU amounted to 116,161 million guilders which is 11.83 % of total Dutch industrial exports. Source: *Benelux 1948-1958*, table 61, 110, 111.

79 The Secretary General of the Dutch Ministry of Economic Affairs, Prof. Brouwers, who had led the Dutch negotiating team during the escape clause negotiations, argued along these lines. See G. Brouwers, 'The problems of integration and the lessons to be drawn from the Benelux experiment', *Quarterly Review Rotterdamsche Bankvereeniging* (June 1961) 5-19. See also: ABZ: 610.20, Benelux, DGES Archives, file 494, Minutes of the Benelux Board of Presidents, September 21 1955, 5.

80 ARA: BEB, minutes of the Benelux Committee for Industry and Trade, October 16, 1952. See also the remarks made by the Dutch social democratic Member of Parliament, Nederhorst, during a Parliamentary debate on the implementation of the Wet Economische Mededinging (anti-trust law), verslag van het mondeling overleg, schriftelijke stukken, 28,37, 7-3-1956, session 1955-1956, *Handelingen van de Staten-Generaal*, appendix 3295. Nederhorst argued that anti-trust law gave the Dutch government an instrument for counter-cyclical policy. Finally, during the Common Market negotiations, one of the reasons why the Dutch negotiators opted for an incremental adaptation of Dutch anti-trust law to EEC law was the fact that the latter would force them to counter export cartels which had been so favourable for the 'national cause'. The Dutch decided not to intensify Dutch anti-cartel policy beyond a level which would endanger vital Dutch interests. See: AEZ: box 802, letter of the Director of Ordeningszaken, Verloren Themaat, to the Dutch Minister of Economic Affairs 1-8-1957, cited on page 68 in an unpublished Master Thesis of the University of Utrecht written by J.C.M. van Hulten.

81 ABZ: 610.20, DGES Archives, file 496, letter from DEU/BE to the Secretary General of the Dutch Ministry of Foreign Affairs, September 22 1957. See also: Minutes of the Benelux Board of Presidents, June 19 1956, 9.

82 This evidence of the predominance of subsidies fits nicely into Lamfalussy's theory of defensive investment which he used to explain the sluggish Belgian growth figures in the fifties. See: Lamfalussy, *Investment and growth*, 79-94. Lamfalussy argues that more than fifty percent of Belgian output came from industries relying on defensive investment which aimed at lowering costs sometimes with the aid of government subsidies as a protective device when competition from abroad was active and profits were squeezed. This prevented capital from flowing from declining industries to expanding industries and thus slowed down the country's overall growth.

IX

MEASURING REAL OUTPUT AND PRODUCTIVITY IN DUTCH MANUFACTURING 1921-1960

by

Herman de Jong

1. Introduction[1]

In the field of economic history more and more effort is being put into the compilation of a quantitative framework for description and analysis of economic development before the Second World War. Such quantification is indispensable for comparative economic history, and for analysis of processes of divergence and convergence. One of the major fields within this kind of research is directed towards the study of levels and growth rates of sectoral output and productivity. Most recent studies on comparative output and productivity before the Second World War are based on the pioneering work of Rostas[2] and focus on comparisons between countries of output and productivity in manufacturing industry for a limited number of benchmark years.[3] For the postwar period, statistical sources for comparisons are more readily available. Recently Van Ark compared the performance of manufacturing industries in ten western and non western countries for the period 1950-1990.[4] Although the present article aims to link up with the sectoral approach of output and productivity measurement, its purpose is not to compare different countries. Instead it provides a quantitative description of the long term development of output and productivity in Dutch manufacturing between 1921 and 1960. Real indicators are presented on an annual basis and several methods of deflation are used to establish output and productivity values in constant prices.

Until recently little was known about the performance of manufacturing industry in the Netherlands during the interwar period. The Dutch Central Bureau of Statistics has published several general indexes for the period 1921-1938, based on different indicators such as physical inputs or outputs. In these indexes,

weighting schemes are defined by the relative size of employment.[5] In 1947 Keesing published a new series based on the so-called *Produktiestatistiek*, the Dutch census of production.[6] Use was made of output values of the manufacturing industries mentioned in the survey. To obtain an index of real gross output (in constant prices) Keesing deflated the production values with a wholesale price index. A major improvement of the existing data occurred in 1987 when Seegers calculated 14 indexes of different branches, mainly based on physical indicators, but partly also on output values from the Dutch production statistics.[7] Finally, Van Zanden and Griffiths published several indexes of manufacturing output which slightly revised the CBS-data.[8] A comparison between all indexes reveals similar growth patterns for the twenties but large differences for the depression years from 1930 onwards. These are mainly caused by differences in classification schemes (sometimes construction and mining were added to manufacturing industry) and by differences in indicators (physical quantities versus output values). However, none of these indexes is based on the, nowadays, widely accepted approach of measuring output in terms of value added, which is the difference between the value of output minus costs of inputs and intermediate products. Data on inputs and outputs are more easily obtainable and more homogeneous for the postwar period. After the war the CBS gradually extended the number of indicators (which were partly based on physical quantities and partly on output values).[9] Partial indexes of manufacturing branches were weighted with the value added shares of the different branches. Unfortunately, because of changes in products and in classification and of changes in weighting schemes, it is very difficult to link the postwar indexes of the individual branches with the prewar indexes.

The aim of the present study is to tackle the problem of output measurement by using the value added concept per sector instead of measuring output by physical indicators. Also the problem of the continuity is dealt with by linking the prewar and postwar output series. The central source providing the statistical data is the annual survey of the manufacturing sector by the Dutch Central Bureau of Statistics, the *Produktiestatistiek*. This survey not only provides information on output and value added, but also on employment. This allows us to establish indexes on output and productivity from one and the same source. The available indexes of manufacturing productivity in the interwar period, however, are difficult to interpret and to combine because information on output and employment are based on various sources and they do not fit well into the internationally accepted classification standard.[10] As with the indexes of output, it is not possible to link the available prewar productivity indexes to the available postwar productivity indexes of the CBS, which are based on the partial output indexes and separate employment indexes already mentioned.[11] By using the *Produktiestatistiek*, the measurement of labour productivity can also be extended to the postwar period.

What follows elaborates on several aspects of these surveys which, in fact, form the statistical basis of a larger study on development and structure of Dutch manufacturing industry in the twentieth century. In this article I confine myself to the presentation of some empirical results. First, the production statistics are compared with the outcomes of the (re)constructed national accounts figures. Second, the methodology used to calculate value added and productivity in constant prices is explained. Third, the outcomes concerning input and output prices, double and single deflated value added and productivity are presented. For reasons of convenience and brevity the emphasis in this article lies on the aggregate outcomes. It is self-evident that for further analysis a lower level of aggregation is necessary.

2. *The Dutch production statistics and the national accounts compared*

Dutch production statistics, formally the *Statistiek van Voortbrenging en Verbruik der Nijverheid* (= statistics of output and inputs in manufacturing industry) are the major source for output and productivity analysis in the Netherlands. The first survey was made during the First World War for the years 1913 and 1916.[12] This survey was a deliberate mix of production censuses from the United Kingdom and the United States (which focus on the calculation of value added) and German industrial statistics (which provide a great detail on inputs and intermediate products used). From 1921 onwards the Dutch statistics appeared annually. This makes it possible to construct consistent time-series for industrial inputs and outputs at the sectoral level. Unfortunately, the surveys do not cover all of the manufacturing sector, except for those of 1913 and 1916. Elaborate and time-consuming surveys of this kind were seen by the government as too expensive, and so only the most important industries were covered. However, in the course of time the coverage of the surveys was gradually expanded. Production statistics were published in the CBS monthly, the *Maandschrift*.[13] After 1954, the statistics were published separately, summary statistics being published in the annual publications of the Bureau, the *Jaarcijfers* and the *Statistical Yearbook of the Netherlands*. The extended versions of the production statistics contain information for each group or major group of industry on the following items: number of establishments, quantity and input value of raw materials, energy consumption and intermediate inputs, quantities and gross values of output and sales, total employment and mechanical capacity (motive power).

Although the information was collected on an establishment basis, not all establishments were included. Small firms and home industries were left out. Minimum size was sometimes defined by employment, sometimes by gross output. In most cases, however, at least 95% of total gross output of the collected establishment-information was included in the publications. A list of the survey

Table 1. *Major groups of manufacturing industries in terms of value added (gross, current market prices) and labour force composition in 1921 and 1938.*

SIC*	1921	1938	1921	1938	1938	
	Value added in million guilders		Value added as percentage of total		labour force	percentage of total
20/21	352	508	24.3	35.9	197 559	22.5
22	153	111	10.5	7.8	85 057	9.7
23	185	117	12.7	8.3	104 233	11.9
24	42	35	2.9	2.5	19 608	2.2
25	81	46	5.6	3.2	63 247	7.2
26	18	35	1.2	2.5	17 156	2.0
27	82	65	5.6	4.6	48 120	5.5
28/31	74	81	5.1	5.7	42 075	4.8
32	69	43	4.8	3.0	43 933	5.0
33/37	368	356	25.3	25.1	244 773	27.8
38/39	28	19	1.9	1.3	13 742	1.5
Total	1452	1416	100	100	879 503	100

Sources: G.P. den Bakker, 'Beroepscategorieën in de beroepsbevolking 1930 en 1938', *Sociaal-Economische Maandstatistiek* 2 (1992) Supplement, 10-16, and Den Bakker (forthcoming)

* Standard Industrial Classification of the Netherlands:
20/21 Food, beverages, tobacco
22 Textile products
23 Wearing apparel (except footwear)
24 Leather, footwear, leather products
25 Wood products and furniture
26 Paper and paper products
27 Printed matter
28/31 Chemicals, petroleum and rubber products
32 Building materials, earthenware and glass products
33/37 Metal products, machines, electrical machinery and transport equipment
38/39 Miscellaneous

Table 2. *Major groups of manufacturing industries in terms of value added (gross, current market prices) and labour force composition in 1947 and 1960.*

ISIC*	1947	1960	1947	1960		1960
	Value added in million guilders		Value added as percentage of total		labour force	percentage of total
20/22	1269	2966	26.7	20.8	193 544	15.5
23	536	883	11.3	6.1	106 820	8.6
24	407	706	8.6	5.0	125 887	10.1
25/26	222	445	4.7	3.1	70 901	5.7
27	148	437	3.1	3.1	29 809	2.4
28	149	679	3.1	4.8	63 886	5.1
29/30	108	238	2.3	1.8	23 453	1.9
31/32	333	2083	7.0	14.6	83 224	6.7
33	150	522	3.2	3.7	54 338	4.4
34	123	670	2.6	4.7	34 821	2.8
35/36		1590		11.2	192 134	15.4
37	1281	1522	27.0	10.7	93 443	7.5
38		1085	7.6		143 362	11.5
39	18	415	0.4	2.9	30 162	2.4
Total	4744	14 241	100	100	1 245 784	100

Sources: CBS (National Accounts), CBS (Population census 31/5/1960)

* International Standard Industrial Classification:
20/22 Food, beverages, tobacco
23 Textile products
24 Footwear, wearing apparel
25/26 Wood products and furniture
27 Paper and paper products
28 Printed matter
29/30 Leather and rubber products (except footwear)
31/32 Chemicals and petroleum
33 Building materials, earthenware and glass products
34 Basic metals
35/36 Metal products and machinery
37 Electrical machinery
38 Transport equipment
39 Miscellaneous

industries is given in Appendix 1.The Dutch production census is now the most important source of the manufacturing industry estimates in the Dutch input-output tables, on which the national accounts are based. As the forerunner of the production census, the (less complete) production statistics were a major source for the reconstruction of the national accounts from 1921 to 1939. The production statistics have been used in several CBS-publications to calculate gross value added of manufacturing industry in current prices.[14] Nevertheless, there are large differences between the manufacturing industries covered in the survey and the industry total in the national accounts. The composition of the major groups has varied from time to time. This is why I had to split the period 1921-1960 in two sub-periods. The first half (1921-1939), for which Gert den Bakker of the CBS is reconstructing the national accounts, is classified according to the latest international classification standard. The second half (1945-1960) is classified according to an earlier ISIC-standard. For the first period (see table 1) I have listed eleven clusters of major groups. The most important clusters (measured by gross value added) are 20/21 (food, beverages and tobacco) and 33/37 (metal products, [electrical] machinery and transport equipment). In 1921 the share of these groups in total manufacturing was almost 50% and in 1938 61%.

During the depression years between 1931 and 1937, value added in current prices of all major groups fell sharply, except for cluster 20/21. Demand for food products was more stable than for other items such as investment and postponable consumption. Hence the relative rise of food manufacturing in the 1930s.

Apart from changes in relative prices, the sector structure of manufacturing industry seems to have been rather stable during these years. The third most important group were textiles, wearing apparel and footwear (22/24). This cluster was 26% of value added in 1921, but fell to 18% in 1938. After the Second World War these manufacturing groups regained their earlier position.

In terms of labour force participation, the picture is different. Although clusters 20/21, 22/23 and 33/37 are still important, food, beverages and tobacco were 'only' 22.5% and metal products etc. 27.8%. This indicates that value added per person employed was relatively high in the food sector. It should be noted here, that in the ideal case, what has to be measured is employment per sector and not the labour force per sector. Figures on unemployment (the difference between labour force and employment) per manufacturing group, however, are not very reliable.

Table 2 shows the figures for the postwar period. This table differs from Table 1 in time, in classification and in the level of aggregation. There are fourteen groups instead of eleven. Compared to the year 1921 the structure of manufacturing industry in 1947 in terms of gross value added was almost the same. From 1947 to 1960, however, some major shifts occurred. First of all the major groups 20/22 food, beverages and tobacco fell in relative terms from 26.7% in 1947 to 20.8% in 1960. Metal products, electrical machinery and transport equipment

taken together were by far the largest cluster as well as in the beginning as in the end of the period mentioned: 29.6% in 1947 and 34.2% in 1960. Although value added of 23/24 (textile products and footwear and wearing apparel) rose considerably between 1947 and 1960, the relative position of these groups was almost halved from 19.9 to 11.1%. Their place was taken in by the chemical and petroleum sector, which augmented its value added from 7.0 to 14.6% of the total. All other groups made progress in nominal terms, but this did not alter their relative position very much. The most important change which can be discerned in the manufacturing industry in the 1950s is the rise of chemicals and petroleum products and the simultaneous relative decline of foodstuffs, textiles, footwear and wearing apparel.

Looking at the distribution of the labour force in 1960, it can be seen that the employment structure was not the same as the value added structure. There were large differences in the value added per person employed between the groups. Again, there are no reliable employment figures on this level of aggregation available. Therefore the labour force statistics of the 1960 population census are used here.

In Tables 3 and 4 (see pages 235 and 236), coverage ratios are calculated to illustrate the representativeness of the production statistics. These ratios show value added in the production statistics as percentage of the national accounts. Value added at factor cost best represents the industry's relative contribution to total output. This definition is net of price-increasing taxes. However, the statistical data in the production statistics are given at market prices, or more precisely as ex-factory values. Therefore the most practical procedure is to leave indirect taxes embodied in the values of the final products.[15]

A look at the totals in the tables shows that in the years 1921, 1938, 1947 and 1960 the coverage ratio rose from 29.0 to 30.7% and from 35.9 to 44.3%. These differences between the production statistics and the national accounts can be explained by three phenomena. Firstly, the annual survey of the production statistics did not cover all manufacturing industries. At the beginning of the survey only 21 groups of industries were counted. Over time more groups were added. Fifty different industries were counted in 1960. Secondly, the production statistics refer to establishments with a certain minimum size, sometimes defined by the number of people employed and sometimes by the size of physical output. From time to time limits were changed. For instance, in the machinery industry only establishments with 25 workers or more were included in the sample, and after 1950 establishments larger than 49 workers. The reason for redefinition was the amount of time that could be saved by the Central Bureau of Statistics in calculating the data. The effects of this are that sudden jumps appear in the statistics on inputs, outputs and value added, which are not caused by real or cyclical events, but by redefinitions. Another effect of the prospected exclusion

of small-scale industry is an upward bias of apparent labour productivity performance.

The third reason for the observed difference between the production statistics and the national accounts data is that I have only included those industries which are covered by the survey both prior to and after the war, in order to obtain consistent time-series for the whole period 1921-1960. If the industries which were gradually included in the production statistics after 1950 were to be taken into account, the coverage ratio for 1960 would rise from 44.3 to 73.0% of total gross value added. Especially chemicals and petroleum (value added in 1960 in the production statistics 2 428 million guilders) and food, beverages, tobacco (773 million guilders) would contribute to this increase. This also illustrates the gradual improvement of the survey in terms of coverage of manufacturing industry.

The highest coverage ratios for 1921 and 1938 were found in the major groups 22 (textiles), 24 (leather, footwear), 26 (paper), 32 (building materials) and in the cluster 33/37 (metal products, [electrical] machinery, and transport equipment). Two of these major groups (22 and 33/37) were also among the largest in manufacturing industry. The largest major group 20/21 (food, beverages, tobacco), however, was poorly covered by the survey. Some groups (25 wood products and 27 printed matter) were not covered at all. The coverage of the total labour force in 1938 (interpolated from the population censuses of 1930 and 1947) shows the same pattern. The percentages are, with the exception of two, lower than the percentages of gross value added. This does not necessarily indicate that the labour productivity of the survey-industries (defined as the gross value added per person employed) was higher than the average of all the manufacturing industries in the national accounts. What is measured in the production statistics is real employment, whereas the total is based on an interpolated labour force estimate.

After the war coverage of the surver increasey furthed, not so much because new groups were added, but because of higher coverage ratios of especially group 35/38 (metal products, [electrical] machinery, transport equipment). It can even be seen that the measured gross value added of electrical engineering in 1960 according to the production statistics was higher than gross value added according to the national accounts. This, in fact, reflects two are different concepts of value added. The measurement of gross value added taken from the production statistics includes the cost of purchased services from outside the manufacturing sector. The national account concept of value added is net of costs of purchased services.

It is difficult to establish precisely how well the survey represents total manufacturing. Clearly, it tends to be biased towards the observed manufacturing groups in the 'sample'. For example, after the war the relative shares of textiles and wearing apparel in the national accounts decreased. Simultaneously, however, the coverage ratio of both groups was lifted substantially. This implies that the weighting given to both groups in the 'sample' of the survey is higher than the

actual weight in the total manufacturing sector. Therefore care has to be taken in assessing the significance of sample outcomes for the whole manufacturing sector in the national accounts.

3. Estimating real output and productivity

Measurement of real output and productivity falls into three general categories. The first is the physical productivity measures which show changes in the amount of goods produced per unit of labour. These are only appropriate if a relatively small number of items of a fairly homogeneous nature are involved, and if the production process is not too integrated. Most prewar measures are on physical output per man-year or even per working- hour.[16] However, these measures only take technical efficiency into account and do not include inputs. The second category is the gross output and productivity measures, based on (deflated) gross production values. If appropriate price-indexes are used, these measures take shifts in the relative importance of products and component sectors into account. However, they do not reflect changes in material requirements per unit of output. To measure real value added, the third category, net output and productivity measures, is needed. These measures also require information on materials consumed and, in the ideal case, appropriate input deflators to calculate real input.

Although the Central Bureau of Statistics compiled several price indexes (on raw material, wholesale and consumer prices) for the period after 1900, none were collected specifically for deriving real output indexes. They are not sufficiently detailed to relate to the values of output and input in question, and would have given unsurmountable problems of classification and weights if they had been used. An alternative method, which is used here, is the derivation of prices from the values and quantities which are obtained from the production statistics. The method involved is based on the industry-of-origin approach. This approach is especially fruitful in studies on international comparisons of real output and productivity based on production censuses.[17] In these studies price ratios for product samples compiled from the production statistics are used to construct a common currency. This common currency is then used to calculate real value added of the countries compared. By using the censuses instead of the national accounts both output and input information for each country can be obtained from the same source. Prices are also obtained from the censuses by calculating unit values per product item.

For my research I did not compare output and productivity of two or more countries, but of successive years in one country. The method, however, is the same. One of the objects is to calculate appropriate unit value indexes. This procedure is accompanied by the usual problems of weighting, representativeness and consistency.

The general procedure is as follows. Indexes of output are calculated for each major group or group of industry by first constructing unit values for items in the survey for which data on both quantity and value are available. Next, the unit values for all the items of one industry (varying from one to five items) are current year weighted into a Paasche type of price index:

$$P_p^{uv} = \frac{\sum p_1 \; q_1}{\sum p_0 \; q_1} * 100$$

Within each industry there are generally some products for which no quantity or price information is available or for which output is negligible. Not all of the output value is represented by products of which both value and quantity data are available. I assume that the unit values of these products move in accordance with the weighted aggregative price-index of the known products. This procedure is better than one which assumes that changes in the volume of reported items represent changes in the volume of all items. The proportion of represented items is often subject to wide variations because of the introduction of new products or sharp changes in output of particular items.[18] Therefore the unit value indexes are limited in that only the primary products of each industry are included. For example, in 1938 the highest coverage percentages were found in the footwear-industry in which 99% of total recorded output was covered by products for which both quantity and price information was available, whereas in the machinery industry only 12% of the total output was covered.

To make allowance for new products and to tackle the problem of changing quantities caused by changing relative prices, the period 1921-1960 was split up into sub-periods of five years each. So for every five-year period a new base year was created. Therefore particular products were able to be added to or left out the index. As a rule, only those products for which the output was larger than 3% of the total value of output were included in the price index. Finally, the sub-period series were linked at the overlap years at the beginning and at the end of the sub-periods. The deflation of the total money value of output by this current year weighted Paasche price index (based on the items for which both quantity and value were recorded) resulted in a base year weighted Laspeyres volume index, which is a conceptually desirable output index:

$$Q_L = \frac{\sum P_0 \; Q_1}{\sum P_0 \; Q_0} * 100$$

The calculation and weighting procedure of unit value indexes for the inputs was done in the same way as for the output index. Again, I included one to five different

inputs per industry, for which data on quantity and value were available in the statistics. The constructed weighted price indexes were used to deflate the nominal input values of the various manufacturing industries resulting in Laspeyres volume indexes of inputs for each industry.

Where both the real output values and real input values were judged to be accurate enough for the measurement of an index of net output, the real input value was deducted from the output value according to the following formula associated with Fabricant and Geary [19]:

$$Q_L = \frac{\sum P_0 Q_1 - \sum p_0 q_1}{\sum P_0 Q_0 - \sum p_0 q_0} * 100$$

in which Q and P stand for the quantities and unit values of products (output) and q and p stand for the quantities and unit values of materials, fuel, and electricity consumed in the production process and other intermediate inputs. The outcome of this formula is an index of the constant price volume of gross value added. This real volume-index of value added can, for instance, be compared with an index on physical output, which is also a volume index. The difference between the two indexes is that the value added index is, by definition, a value index (in constant prices), not directly related any more to physical quantities of output (for instance bicycles or ships). Variations of the index in time (when measured in constant factor inputs) point to changes in efficiency of production and changes in the production structure.

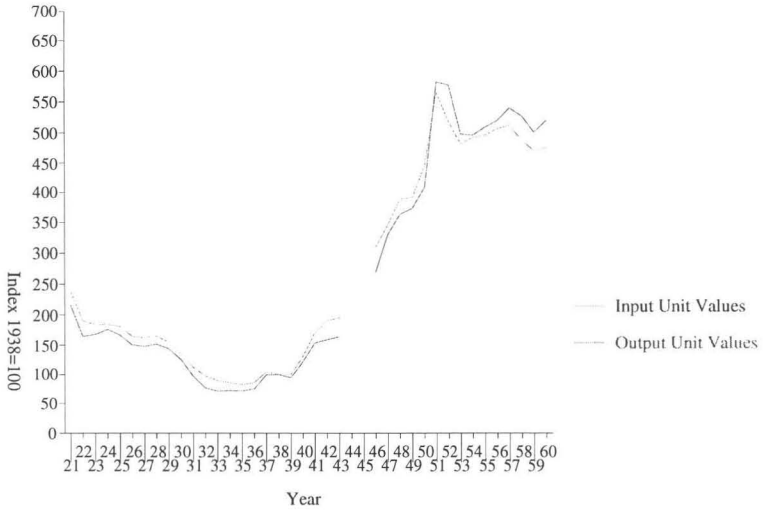
This double deflation technique, however, can give rather volatile results, especially when the ratio of input to gross output is high. The volume indexes can even produce negative results. This happens, for instance, if the constant price value of the inputs becomes higher than the constant price value of outputs. If input prices fall and consequently more inputs are consumed, the quantities will be weighted (according the formula) with base year prices, which are higher than current prices. This will result in a (too) high estimate of the real value of inputs, which in an extreme case can exceed the real value of output. In these circumstances an alternative procedure is to deflate value added in current prices with the output deflator. This method was introduced by Maizels who called it the 'modified net index'.[20] It is a single deflation of gross value added. The use of this method assumes that the prices or unit values for the inputs move in accordance with the compiled output unit values. Therefore changes in the structure of inputs are not measured.[21] However, in most cases it is very useful to calculate both single and double deflated gross value added (and productivity). As the former implicitly takes changes in volumes and relative prices into account, the latter registers only changes in volumes. Therefore comparison between the two indexes may reveal the consequences of changing relative prices.

4. Price indexes of input and output

To obtain one general input deflator and one general output deflator, the compiled input and output unit value-indexes of all the industries in the sample were aggregated into one 'sample' input and one 'sample' output series. This was done by weighting all input and output unit value-indexes with the value added share of each relating industry in the total sample value added.[22] Sub-periods of five years were constructed with changing value added weights linked at the overlapping years. Figure 1 shows the aggregated weighted input and output unit value indexes based on production statistics.

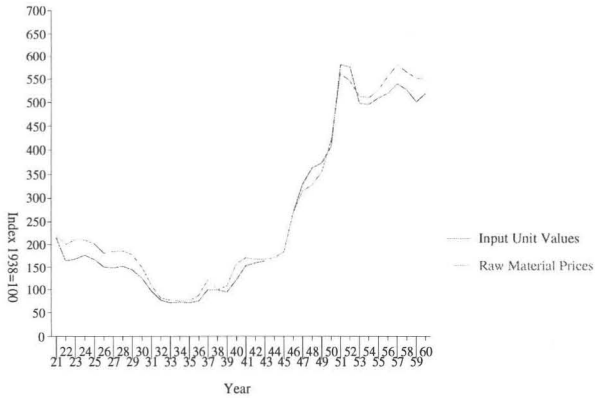
Several general remarks on the movement of both indexes can be made. From 1920 onwards unit values (or prices) declined very rapidly (after the postwar inflation, which is not shown in the graph). After the short depression of 1923, prices stabilized somewhat, but showed a slightly downward trend during the rest of the twenties. Prices which had already declined in 1929 further decreased rather quickly until 1932. The absolute minimum was reached in 1935. Recovery occurred quickly after the abandonment of the gold standard in 1936. In 1938 and 1939 prices were at about the same level as at the beginning of the depression.

FIGURE 1



Unit values of input and output in manufacturing, 1921-1960. Weighted Paasche price indexes (1938=100).
Source: Appendix 2.

FIGURE 2

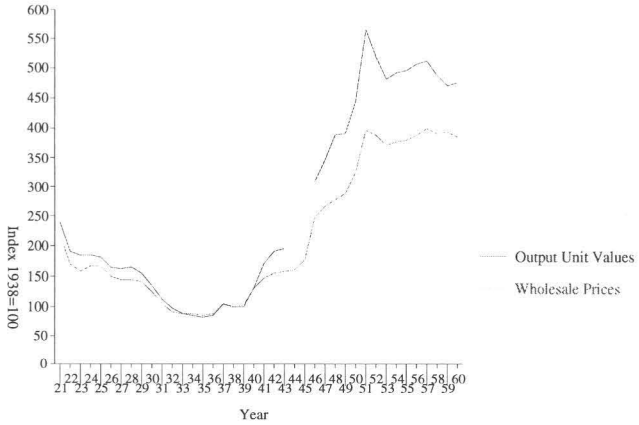


Unit value index of input items and CBS-index of raw material prices, 1921-1960. Index 1938=100.
Source: Appendix 2 and CBS, *Zeventig jaren statistiek in tijdreeksen 1899-1969*. (The Hague 1970).

Between 1939 and 1943 the unit values of both inputs and output increased quickly. The blank spots in 1944 and 1945 are caused by the fact that the CBS did not produce statistics for the manufacturing industry during those years. After the war, prices went up at an enormous pace. The postwar period was characterized by scarcity of raw materials and final products. Prices reached a maximum during the Korean War in 1951. After this year prices dropped, rose again after 1953 but declined in 1957 and 1958. Comparing the price level in the second half of the 1950s with the level in the 1930s, the conclusion is that the unit values of the sample increased five- fold within 20 years.

A comparison of both sets of unit values shows that the movements in the curves are almost similar. However, the index of output prices moves mainly above the input price index (1938=100). (Choosing another reference-year, for instance 1923, would, of course, influence these levels but not their relative positions.) Around 1925 the price level of output is less than 10% higher than the price level of inputs, but for 1932 this is more than 25%. For the Second World War period there is a widening gap between output and input unit values. After 1951, however, a reversal in the movement of the curves can be seen. Input unit values become higher than output unit values, 12% for 1952 and 10% for 1960. The effects of this change in relative prices is dealt with later in the article.

FIGURE 3



Unit value index of output and CBS-index of wholesale prices, 1921-1960. Index 1938=100.
Source: See Figure 2

Figures 2 and 3 compare both unit value indexes with the official price indexes of the CBS on raw material prices and on wholesale prices respectively. Compared to the input unit values, the raw material prices are continuously higher (1938=100), except for the period 1947-1952. More important, however, are the relative changes in the curves. For instance, in the beginning of the 1930s the raw material price index declines much faster than the unit value index. The difference between both indexes can be explained by the fact that the input unit values are based not solely on raw materials, but also on other intermediate products like ironware, sugar, yarn, cast iron and rayon. Furthermore, the CBS-index is based on raw materials for six groups of industry (wooden furniture, chemical products, textiles, leather, metalware and paper), which do not correspond wholly with the materials in the unit value index. The same holds true for the weighting schemes. If the total input value of the sample industries were to be deflated with the 'official' raw material index, this would lead to a lower index of the real input volume and, subsequently, a higher index of real value added (apart from the period 1947-1952).

A comparison between the output unit values and the CBS wholesale price index (Figure 3) reveals much greater differences. Based on the reference year 1938, output unit values are higher than wholesale prices, except for the 1930s. For the war period wholesale prices are rather stable, whereas the unit value index shows a pronounced increase. For the period after the war the gap becomes even wider.

Of course, it has to be borne in mind that both indexes are based on different sorts of products. The index of wholesale prices is an unweighted index based on finished products from eight groups of industries: glass, wood, chemicals, textiles, leather and rubber, metalware, paper and foodstuffs. The unit value index is a weighted index of 32 intermediate and finished products from a sample defined by the production statistics. But there is more to it than this. In the first place, instead of the unit values, which are ex-factory prices, the wholesale prices also include margins for transport and insurance. Furthermore, the wholesale price index embodies quoted, rather than actual, prices, and the two may differ. In times of shortages, premiums may raise actual prices above the published levels with the result that the index is understated. This probably explains the diverging developments between both indexes from 1940 onwards. The expansion of the money supply during the war years accelerated the rate of inflation. Actual ex-factory unit values increased more than wholesale prices. Although prices were strictly controlled from 1940 onwards stabilization occurred only after 1941 (and 1942 for the unit values).[23] Postwar scarcity lifted the rate of inflation. Again, ex-factory prices rose faster than wholesale prices. After 1952 both indexes show the same tendency.

Quite the opposite developments can occur when supplies are plentiful. In these circumstances the wholesale price index may be overstated because of the prevalence of discounts. Indeed, during the 1930s the unit values of the sample decreased faster than the wholesale price index. Finally, product mix shifts can also be responsible for discrepancies between unit values and wholesale prices. As already mentioned, the unit value index is based on five-year periods with diverging product items to allow for changes in the production structure. There is, however, no information on the consistency of products in the wholesale price index.

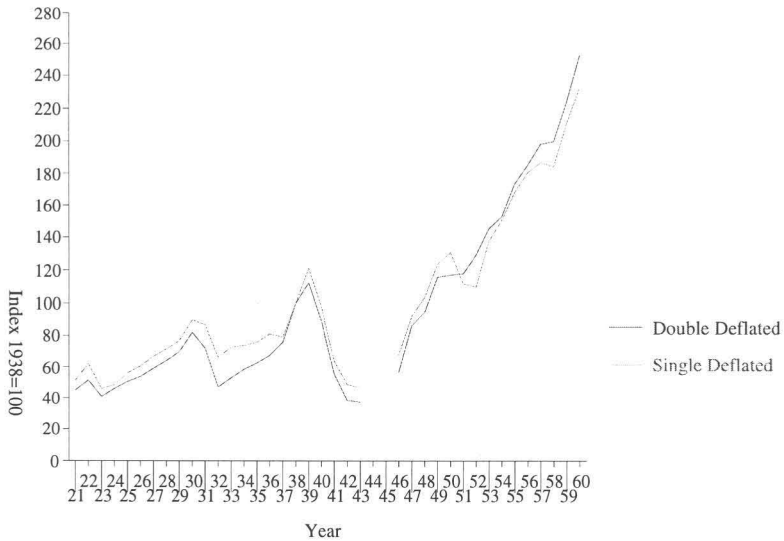
Of course, there are some general limitations common to most price indexes which are not readily overcome. For example, it is generally impossible to express all of the changing qualitative aspects of the goods recorded in commodity specifications. Since price indexes tend to fail to allow for improvements in quality they are overstated and, if used for deflation, they result in an understatement of the real output value or the real value added. When quality deterioration occurs, for instance in wartime, the opposite tendencies prevail. One way to overcome this problem is to specify as many products as possible. If production, however, is very heterogeneous and the variation in prices is very large, it is better to calculate price indexes on the basis of some important products of known constant quality.[24] However, a more satisfying explanation for the observed disparity between both indexes cannot be given at this moment.

5. The deflation of gross value added

Ideally, in the measurement of net output, the volume of purchased business costs, along with materials, fuel and electricity, should be deducted from gross output. However, for the production statistics, no information was collected on purchases of business services such as advertising, insurance, transportation and communications. The usual term for this concept is 'census value added', but it is also sometimes referred to as 'net output'. Furthermore, no allowance was made for capital depreciation. Therefore the concept of value added is a gross concept.

Figure 4 shows the real gross value added of all the manufacturing industries in the sample of the production statistics. Both double and single deflated value added are compared. Gross value added increased about sixfold from 1921 to 1960. We have to remember, however, that not only economic but also statistical factors influenced this development. The number of industries in the sample increased, and this can only be corrected if the size of the labour force (dealt with later) is taken into account.

FIGURE 4



Real gross value added of the sample industries, 1921-1960. Double and single deflated. Index 1938=100.
Source: Appendix 3

As with the development of prices, some phases in the development of value added can be discerned. From 1923 to 1930 value added increases steadily. After 1930 a rapidly downward movement occurs, but after 1932 growth rates are almost the same as before 1930, depending on the deflation technique used. The absolute peak is reached in 1939. From then on value added declines rapidly. For the period 1921-1939 growth rates of single and double deflated value added are 4.9 and 5.2% respectively (without 1939: 4.0 and 4.8%). The growth rate of real gross output is 4.6%. The higher growth rate of value added compared to gross output indicates that the relative share of intermediate inputs in gross output declined somewhat.

Estimates on manufacturing output performance, based on physical indicators, show lower growth rates. In a study covering 65% of manufacturing industry, Seegers found a growth rate of physical output of 2.9% between 1921 and 1938. This lower growth rate is mainly caused by the fact that Seegers's estimation begins from a relatively high level of output in 1921. CBS-estimates of physical output for the same period begin at a lower level. However, they show the same pattern as Seegers's figures, with a growth rate of 3.7%.[25]

After the war growth rates of value added are significantly higher. The average growth rates for single and double deflated value added are 9.2 and 11.3% per annum respectively. Real gross output rises by 9.8% per annum. The annual growth rate of Dutch GNP in the period 1951-1963 was 4.4%.[26] This illustrates the large share of manufacturing output growth in total GNP-growth. For the period 1921-1960, single and double deflated value added growth rates are 3.9 and 4.5% respectively, and real gross output increases by 3.9% per annum.

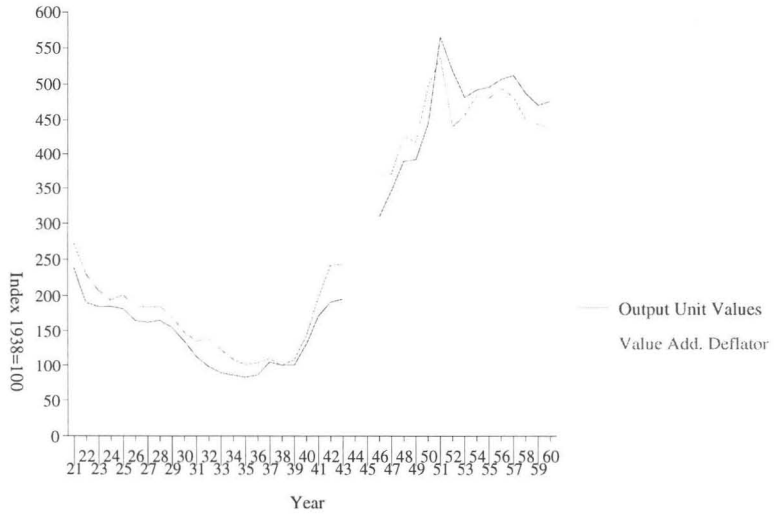
Large differences exist between the single and double deflated value added figures. Although the lines are almost parallel, the double deflation line is significantly lower for the 1930s, catching up again with the single deflation line in 1937. Seen in dynamical perspective, the adjustment for the relatively low input prices reveals a significantly lower volume of real value added. This does not seem logical, because lower input prices should lift up profits. The decreasing real value added and the known decreasing level of profits in the 1930s suggest otherwise. The explanation for this apparent discrepancy is that real value added is a volume indicator and not an indicator of profits. Prices of raw materials are generally believed to change earlier and fluctuate more widely than prices of finished products, partly because wage costs are relatively rigid, and partly because profits and overhead per unit of output vary. Industries where there is some degree of monopoly tend to keep prices fairly rigid whether demand and production are falling or rising. This actually might have been the case in the 1930s. Not only were nominal wage costs fairly rigid, but there was also a strong tendency towards cartelization in the manufacturing industry, supported by the government.[27]

In the early postwar years real value added increases very rapidly. However, because of the low output level in 1946 it takes more than three years before the

prewar level of 1938 is reached again. In contrast to this, CBS-reports state that the prewar level of manufacturing output had already been reached again by 1947. However, these estimations only were based on physical output.[28] After 1950 the reversal in relative prices, that is the relative increase of input prices, indicates a faster growth of double deflated value added as against single deflated value added. Whereas single deflation indicates that there was an absolute decline of value added in 1951 and 1952 and a stabilization in 1957 and 1958, double deflated value added indicates only a declining growth of value added for both periods.

The index of double deflated value added multiplied by the nominal value added of the base year produces an 'implicit' real value added, that is the volume of net output in constant prices. With this it is possible to obtain an 'implicit' value added price index by dividing the nominal value added for each year (in current prices) by the real value added. Figure 5 presents this value added deflator, together with the output unit value index. The value added deflator takes both the fluctuations in the input and output prices (relative prices) into account. Obviously, the volatility of the value added deflator is much greater than the output deflator. For instance, the increasing gap between the input unit values and output unit values in the 1930s and during and after the Second World War results in a very high

FIGURE 5



Index of output unit values and the implicit or value added deflator, 1921-1960. Index 1938=100.
Source: Appendices 2 and 3

value added deflator. This has the effect of depressing the values of real value added rather heavily. After 1950 the reversal in relative prices drives the value added deflator to a level below the output deflator.

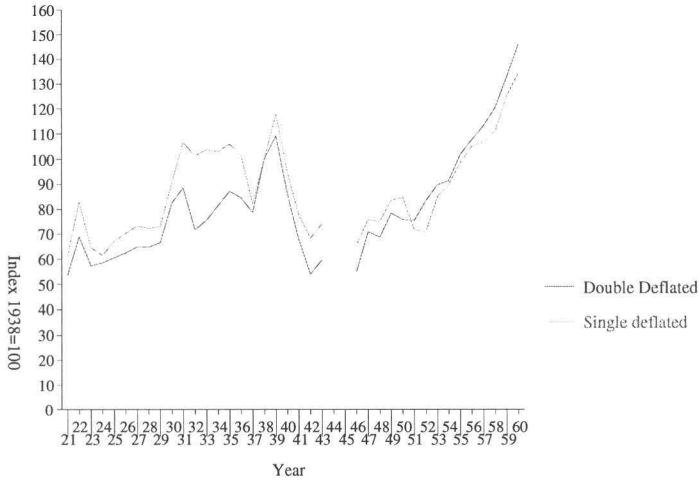
6. Developments in labour productivity 1921-1960

Productivity can be defined as the ratio of output to any related input or combination of inputs. In this section, output (in terms of value added) is related to labour input. If value added and employment are to be related, the classification basis for reporting the two sets of data should be the same. The Dutch production statistics contain information on the total number of persons employed per industry-branch per year. As a rule, employment was measured on 15 September each year. Because this counting date was the same every year, fluctuations in activity should also be revealed in these employment data, except for specific events such as strikes etc.

Unfortunately there were no annual estimates of average weekly working hours per industry for the pre-1945 period. However, there was another source which could be used to verify the data of the production statistics. From 1903 on the accident statistics of the State Insurance Bank included information on the numbers of standard workers per group of industry. However, an additional problem was that the production statistics and accident statistics had no uniform classification system. A complete reconciliation between the two series has never been attempted. All that could be used were the employment data of the production statistics already mentioned. This partially offset the results of the elaborate and intricate process of calculating real value added. Therefore more care had to be taken in assessing the labour productivity values resulting from the production statistics. The index of real gross value added divided by the index of total persons employed (Appendix 3) gives an index of real value added per person employed. In Figure 6 two series of labour productivity are shown, one single and one double deflated.

For the period before the Second World War double deflated labour productivity is far below single deflated productivity. Obviously this is caused by the fact that the input and output price indexes are different. For 1921 to 1939 single deflated productivity has an annual growth rate of 3.7% (1921-1938: 2.9%), double deflated productivity growth is 4.0% (1921-1938: 3.7%) These percentages are higher than comparable outcomes of contemporary estimates, based on physical indicators from various sources and on employment indexes taken from accident statistics already mentioned.[29] Average productivity growth for the period 1925-1935 can be estimated at 3% per annum. For the same period the single and double deflated productivity reveal growth of 4.7 and 3.8% respectively. Van Zanden and Griffiths estimated growth rates of industrial productivity

FIGURE 6



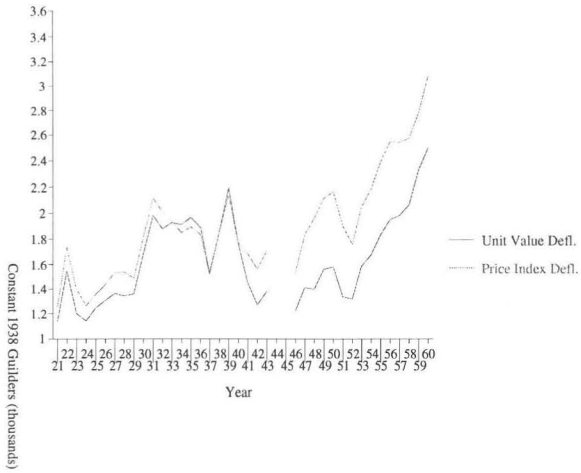
Real gross value added per person employed, 1921-1960. Double and single deflated, index 1938 = 100
Source: Appendix 3

for the periods 1921-1929 and 1929-1939 at 3.3 and 2.5% respectively.[30] These estimates differ also substantially from the present estimates (for both periods double deflated productivity is 2.7 and 5.1% respectively). It is not clear, however, whether Van Zanden and Griffiths used current or constant prices in their estimation of output.

For the 1930s especially, the graph shows large differences between double and single deflation. The level of single deflated productivity is much higher. This is probably overstating the 'real' productivity because the decline of prices of inputs relative to output prices has not been taken into account. Productivity declined in 1932, 1936 and 1937. Looked at in both ways, however, the trend in productivity increases considerably during the depression years. The steep productivity rise in 1930 and 1931 can be conceived as a swift defensive reaction to declining demand through doing away with less productive labour. Apart from price disparity, the difference between the two lines might also point to more structural changes in the production process in the sample industries, because of changes in relative prices.

The rapid decrease of productivity during the Second World War is obvious from the graph. Because output unit values rose much more than the input unit values, double deflated productivity declined faster than single deflated produc-

FIGURE 7



Real gross value added per person employed, 1921-1960. Single deflated with output unit values and with wholesale prices form the CBS. In constant 1938 guilders (thousands). Source: Graph 2 and Appendix 3

tivity. The graph shows that in the postwar period labour productivity did not increase as fast as gross value added (Appendix 3). By 1949 real gross value added had already reached its prewar level. The growth of labour productivity, however, showed a different pattern until 1952. From Figure 6 it can be concluded that the prewar level (1938) of productivity was not reached before 1954 or even 1955. This seems to be rather late. To discover whether this low productivity outcome is caused by the constructed unit value index, a comparison is made between the single deflated productivity of Figure 6 and real productivity obtained from the CBS wholesale price index. Figure 7 shows that in 1946 the former begins from a much lower point than the latter. Also growth rates are lower in the initial years. Remember that the CBS wholesale price index is much below the output unit value index for these years (Figure 3). Because of this, the prewar productivity level using the wholesale price is reached in 1947, although it falls back again in the early 1950s.

The problem faced with has already been dealt with in Section 5. Large disparities occurred between 'official' prices which were fixed by the authorities, and unit values, which were more influenced by scarcity and therefore driven upward much faster. In view of this price disparity, it is very difficult to establish a 'true' and consistent price index which covers both the war and postwar years.

The quality problem has to also be mentioned for the postwar years. To the extent that the quality of some products has improved, which of course was almost unthinkable so shortly after the war, the output and productivity series will have a downward bias if intrinsic quality changes are not met in the unit value index. The same applies, however, for the wholesale price index.

The retardation in productivity growth (relative to output growth) in the sample industries is confirmed in the literature. Brakel found that industrial labour productivity did not equal the prewar (1938) level before 1953. CBS-statistics on physical productivity in manufacturing also suggest a return to the prewar (1938) level in 1953.[31] De Vries explained this retardation by referring to delayed replacement of machinery during the German occupation and to the scarcity of raw materials and intermediate inputs.[32] Brakel also mentioned the influence of the Korean War-boom encouraging employers to hire more workers. This however, had a depressing influence on average productivity. During the mild recession in 1952, employment declined.[33] After 1952 an unprecedented growth of productivity set in, which lasted throughout the decade. The calculated annual growth rate of productivity for the period 1952-1960 is slightly less than 8%, approaching the growth rate of real value added.

7. Conclusion

This article presents real output and productivity estimates of Dutch manufacturing, based on production statistics. The process of industrial development can be described and analyzed quite accurately, because the statistics are not confined to a few benchmark years but produce annual data. The most important advantage of calculating net output or value added indicators is that they also provide an excellent check on the adequacy of the basic data. If they are compared to indexes of labour input, materials used, and gross output, they permit a critical examination of related industrial statistics and play an important part in the improvement and integration of these basic data. However, more certainty is needed on the representativeness of the sample industries in relation to the total sector.

To deflate values of inputs and outputs, special unit values were constructed from the production statistics and aggregated into a weighted index. Both input and output indexes were limited in that only the primary products of each industry were included. Nevertheless, they produced satisfying results, both for single and double deflation. Comparison of both indexes with the CBS raw material price index and the wholesale price index respectively showed rather large differences, especially for shortly before and after the Second World War. Since price indexes are an indispensable instrument for linking the prewar and postwar output and productivity performance, price developments in this period need more investigation.

Table 3. *Coverage ratios. Gross value added of sample industries as a percentage of total manufacturing in the national accounts (at current market prices), 1921 and 1938, and as a percentage of the total labour force in 1938.*

SIC*	Coverage of sample value added (% of total) 1921	1938	Coverage of sample employment (% of total) 1938
20/21	8.2	6.4	7.1
22	69.9	85.1	77.3
23	0	26.0	25.6
24	51.5	65.9	76.3
25	0	0	0
26	51.9	52.0	32.8
27	0	0	0
28/31	17.9	19.3	14.2
32	0	66.0	50.8
33/37	65.4	54.1	38.5
38/39	0	0	0
Total	29.0	30.7	28.4

Sources: CBS production statistics 1921-1960.

*	Standard Industrial Classification of the Netherlands:
20/21	Food, beverages, tobacco
22	Textile products
23	Wearing apparel (except footwear)
24	Leather, footwear, leather products
25	Wood products and furniture
26	Paper and paper products
27	Printed matter
28/31	Chemicals, petroleum and rubber products
32	Building materials, earthenware and glass products
33/37	Metal products, machines, electrical machinery and transport equipment
38/39	Miscellaneous

Table 4. *Coverage ratios. Gross value added of sample industries as a percentage of total of manufacturing in the national accounts (at current market prices), 1947 and 1960, and as a percentage of the total labour force in 1960, according to the census.*

ISIC*	Coverage of sample value added (% of total) 1947	1960	Coverage of sample employment (% of total) 1960
20/22	10.3	8.0	11.1
23	73.6	97.8	86.1
24	35.4	58.8	46.9
25/26	0	0	0
27	24.6	46.1	32.5
28	0	0	0
29/30	51.4	76.7	61.8
31/32	8.9	5.3	5.9
33	53.0	49.0	40.5
34	0	0	0
35/36		96.2	65.3
37	64.8	100 (107.8)	100 (103.5)
38		81.3	46.5
39	0	0	0
Total	35.9	44.3	41.1

Sources: *CBS production statistics* 1921-1960.

* International Standard Industrial Classification:

20/22	Food, beverages, tobacco
23	Textile products
24	Footwear, wearing apparel
25/26	Wood products and furniture
27	Paper and paper products
28	Printed matter
29/30	Leather and rubber products (except footwear)
31/32	Chemicals and petroleum
33	Building materials, earthenware and glass products
34	Basic metals
35/36	Metal products and machinery
37	Electrical machinery
38	Transport equipment
39	Miscellaneous

APPENDICES

Appendix 1. Manufacturing industries in the Dutch production statistics, 1921-1960.*

Major group	Group	Period
20/21 Food, beverages, tobacco	20.4 Flour mills	1921-1960
	20.6 Margarine works	1921-1960
	20.7 Vegetable and food	1937-1960
	20.9 Cocoa and chocolate	1921-1960
22 Textile industry	22.1 Woolspinning/weaving	1921-1960
	22.2 Cotton industry	1921-1960
	22.3 Hosiery and knitted goods	1921-1960
	22.5 Carpets industry	1934-1960
	22.9 Manufacturing of narrow fabrics	1930-1960
23 Wearing apparel	23.1 Ready-made clothing	1933-1960
24 Leather,footwear	24.1 Leather factories	1928-1960
	24.3 Shoe factories	1921-1960
26 Paper, paper products	26.1 Paper mills	1921-1960
29 Chemical industries	29.7 Soap factories	1921-1960
31 Rubber and synthetics	31.1 Rubber products	1921-1960
32 Building materials, earthenware and glass	32.1 Bricks/roofing tiles	1934-1960
	32.2 Earthenware	1937-1960
	32.3 Sand-lime bricks	1934-1960
34 Metal products	34.1 Hardware, hollow-wareand stoves	1921-1960
	34.2 Wire-industry	1921-1960
	34.3 Steel furniture	1933-1960
35 Machinery	35 Mechanical engineering and construction	1921-1960
36 Electrical machinery	36 Electrical engineering	1921-1960
37 Transport equipment	37.2 Motorcars and bodies	1934-1960
	37.4 Shipbuilding	1921-1960
	37.6 Bicycles	1921-1960

* Only those industries that were covered in the survey both prior to and after the Second World War are mentioned here. See also Section 2.

Appendix 2. Unit values of input and output, 1921-1960.

(Weighted Paasche price indexes; 1938=100)

Year	Unit Values of Input	Unit Values of Output	Year	Unit Values of Input	Unit Values of Output
1921	215.6	238.4	1941	153.4	171.1
1922	164.4	190.3	1942	159.1	191.0
1923	168.1	184.2	1943	164.5	195.6
1924	176.6	184.5	1944		
1925	166.9	181.2	1945		
1926	150.1	164.6	1946	269.3	309.3
1927	147.9	162.4	1947	330.2	346.5
1928	151.7	165.3	1948	364.2	389.7
1929	143.6	155.1	1949	373.7	391.9
1930	125.6	134.8	1950	408.5	445.0
1931	97.3	112.6	1951	582.4	565.5
1932	76.9	97.9	1952	577.7	518.5
1933	71.5	89.3	1953	498.0	481.9
1934	72.6	85.9	1954	496.1	492.4
1935	71.9	82.9	1955	509.4	496.2
1936	75.4	86.2	1956	519.9	507.1
1937	100.1	104.7	1957	540.2	512.3
1938	100.0	100.0	1958	527.3	487.9
1939	94.8	100.3	1959	501.4	471.0
1940	122.1	130.8	1960	519.8	476.2

Source: Calculated from production statistics in: CBS *Maandschrift* (1921-1952), CBS *Produktiestatistiek* (1953-1960).

Appendix 3. Gross value added, employment and productivity in sample industries, 1921-1960.

(Gross value added [V.A.] and labour productivity double and single deflated; sample industries in Appendix 1)

(Index numbers; 1938=100)

Year	Employment	Gross V.A. Double Deflated	Gross V.A Single Deflated	Lab. prod. Double Deflated	Lab. prod. Single Deflated
1921	84.3	45.1	51.5	53.5	61.1
1922	74.7	51.4	62.1	68.9	83.1
1923	71.2	40.8	46.0	57.3	64.6
1924	78.8	46.1	48.4	58.5	61.4
1925	83.7	50.6	56.2	60.4	67.1
1926	86.3	53.8	60.7	62.4	70.3
1927	91.2	59.1	66.9	64.9	73.4
1928	99.0	64.1	71.6	64.7	72.3
1929	105.0	69.7	76.8	66.4	73.2
1930	99.5	82.1	90.1	82.6	90.5
1931	81.4	72.3	86.9	88.7	106.7
1932	65.6	47.1	66.4	71.8	101.2
1933	70.0	52.9	72.7	75.6	103.8
1934	71.8	58.6	73.9	81.6	103.0
1935	71.7	62.6	76.0	87.3	106.0
1936	79.8	67.6	81.2	84.7	101.8
1937	96.2	75.9	79.3	78.9	82.4
1938	100.0	100.0	100.0	100.0	100.0
1939	102.6	112.2	121.0	109.3	117.9
1940	102.8	89.0	97.6	86.6	95.0
1941	81.9	55.5	63.9	67.7	78.0
1942	71.1	38.4	48.6	54.0	68.4
1943	62.5	37.4	46.5	59.8	74.3
1944					
1945					
1946	103.1	56.7	67.8	55.0	65.8
1947	121.7	86.4	92.4	71.0	75.9
1948	137.8	94.8	103.6	68.8	75.2
1949	147.2	115.7	123.4	78.6	83.8
1950	153.8	116.9	130.7	76.0	85.0
1951	155.6	117.6	111.8	75.6	71.9
1952	154.6	129.1	109.8	83.5	71.0
1953	161.7	145.4	137.7	89.9	85.2
1954	167.0	152.9	150.4	91.5	90.1
1955	170.5	173.6	168.2	101.8	98.6
1956	171.9	185.2	180.5	107.7	105.0
1957	175.1	198.2	186.9	113.2	106.7
1958	165.8	199.8	184.3	120.5	111.1
1959	168.6	224.0	210.9	132.8	125.1
1960	173.2	252.9	232.7	146.0	134.4

Source: Calculated from the production statistics in: CBS *Maandschrift* (1921-1952), CBS *Produktiestatistiek* (1953-1960).

NOTES

1 I would like to thank Gert den Bakker of the CBS for kindly letting me use his estimates on gross value added in Dutch manufacturing industry in the interwar years. I am grateful to Bart van Ark, Rainer Fremdling, Angus Maddison and Dirk Pilat for giving me very helpful comments and suggestions. René Oude Vrielink assisted with some of the statistical work and the graphs.

2 L. Rostas, *Comparative productivity in British and American industry* (Cambridge 1948); L. Rostas, *Productivity, prices and distribution in selected British industries* (Cambridge 1948).

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15 The inclusion of indirect taxes embodied in the values means that they are also embodied in the derived price (= unit value) deflators. In this way every tax-caused change in the value of produced or consumed commodities will be neutralised in the deflated, constant-price values. Cf. *Output, input, and productivity measurement* (Princeton 1961) 214.

16 The first estimates on output and productivity in Dutch manufacturing industry were made by Van der Schalk and by the CBS: Van der Schalk, *De wiskundig-statistische analyse*; CBS, *Onderzoek*. The CBS has also published quantum indexnumbers of industrial production from 1921 onwards. See for instance: J.B.D. Derksen, 'Indices van de industriëele productie van Nederland', *De Nederlandsche Conjunctuur* (1939) 45-51; CBS, 'Indices van de industriële productie van Nederland', *Statistische en Econometrische Onderzoekingen* 1 (1946) III: 34-36; CBS, 'Index numbers of industrial production in the Netherlands', *Statistical Studies* 19 (1967). For the period 1921-1938 Seegers produced new indexes on output per major group of industry, mainly based on the CBS production statistics. Some estimates are based on value added; J.J. Seegers, 'Produktie en concurrentievermogen'.

17 For instance the project on the international comparisons of output and productivity at the University of Groningen. See for instance: B. van Ark, 'The ICOP approach: Its implications and applicability', *Explaining economic growth. Essays in honour of Angus Maddison* (Amsterdam 1993) 375-398.

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29 CBS, *Onderzoek*, 132

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31 W. Brakel, *De industrialisatie in Nederland na 1945* (Leiden 1954) 25; CBS, *Zestig jaar in tijdreeksen*, 60.
32 J. de Vries, *De Nederlandse economie tijdens de twintigste eeuw* (Utrecht/Antwerpen 1972[1]; Bussum 1983[2]) 89. For an assessment of the economic war damage in the Netherlands, see C.A. Bochove & W. van Sorge, 'Constant wealth national income: Accounting for war damage with an application to the Netherlands', *Review of Income and Wealth* 35 (1989) 187-208; Van Zanden & Griffiths, *Economische geschiedenis*, 184-187.
33 Brakel, *De industrialisatie*, 24.

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