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# *Market wage or discrimination? The remuneration of male and female wool spinners in the seventeenth-century Dutch Republic*[1]

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In the historical debate, the gender wage gap is usually attributed either to productivity differences or to gender discrimination. By analysing a newly constructed series of spinning wages in the seventeenth-century Dutch Republic, the wages of male and female textile workers for the same work could be investigated. At first sight, the evidence on equal piece rates for spinning men and women seems to rule out wage discrimination. Nevertheless, more deeply rooted gender discrimination resulting from the segmented seventeenth-century labour market restricted women's access to many professions. Exactly this segmentation determined differences in wage earning capacities between men and women.

## I

'Sex segregation and differences in payment between men and women are highly intertwined. Women's work was usually low-paid, but it also worked the other way around: if a certain position was poorly rewarded, it was usually women's work'.[2]

In recent years, the gender wage gap has received ample attention from economic and social historians. Most historians acknowledge that there have been significant differences in the rewarding of men's and women's work through space and time. For the pre-industrial period, various studies have shown that—spatial and temporal variations notwithstanding—women's wages generally constituted between one-third and two-thirds those of men.[3] Therefore, rather than on the question of *if* women and men received different payment, the historical debate has usually focused on the *nature* and *causes* of these variations in remuneration.[4]

Proponents of neo-classical economic theory assume that wage rates depend purely on supply and demand in the labour market. Wages equal the marginal

[1] I wish to thank the editors and anonymous referees of the *Economic History Review*, as well as Bas van Bavel, Regina Grafe, Lex Heerma van Voss, Karin Hofmeester, and Jan Luiten van Zanden for their useful comments on earlier versions of this paper.

[2] de Groot, *Fabricage van verschillen*, p. 29.

[3] Burnette, *Gender, work and wages*, p. 73. For wage gaps in agriculture, see e.g. Kussmaul, *Servants*, pp. 143–4; Bardsley, 'Women's work reconsidered', p. 29; Burnette, 'Investigation', pp. 258–9; Burnette, 'Wages and employment', p. 672; Ogilvie, *Bitter living*, pp. 111–4. For wage gaps in the industrial sector, see e.g. Berg, 'What difference', p. 31; Sharpe, *Adapting to capitalism*, pp. 139–40; Simonton, *History of European women's work*, p. 45; Burnette, 'Investigation', p. 258. Of course, changes over time occurred, but the inequality was not resolved by industrialization. See also Horrell and Humphries, 'Women's labour force participation'; de Groot, *Fabricage van verschillen*, pp. 29–30; Boot and Maindonald, 'British cotton industry'.

[4] See e.g. Burnette, 'Investigation'; Bardsley, 'Women's work reconsidered'; Hatcher, 'Debate'; Bardsley, 'Reply'; Boot and Maindonald, 'British cotton industry'; Burnette, *Gender, work and wages*, p. 9.

product of the supplied labour, i.e. the additional output an additional unit of labour of a given quality would yield (the demand side), in relation to the relative evaluation of work and leisure by the suppliers of labour power (the supply side).[5] Accordingly, wage differentials can only be the result of differences in productivity.[6] Women's lesser body strength, for instance, and their responsibility for the household and taking care of children, would supposedly have led to huge productivity gaps with men.[7]

Conversely, gender and social historians have claimed that wage differentials are caused by wage discrimination against women. Instead of free market mechanisms determining their wages, women's remuneration was based on socially constructed notions of skill and wage earners' needs, also referred to as 'custom wages'. Consequently, women's work was structurally undervalued compared with the work men performed.[8] Whereas men's work was more often defined as 'skilled', as the outcome of a long process of training and experience, women's capacities were seen rather as 'natural' and not as the result of years of (informal) training or practice.[9] Moreover, women's work tended to be labelled as 'supplementary', implying that their need for a full wage was unnecessary, as they were not their family's main breadwinner. These discriminating views on women's capabilities and their work led to the underpayment of women, solely because they belonged to a subordinate gender.[10]

Possibly, the knife cuts both ways. Recently, Ogilvie has suggested that although some of the discrepancies between male and female wages may be attributed to differences in physical capabilities, this is not the whole story. She argues that relative wages cannot have been an indicator of pure differences in productivity. This might have been the case in a perfectly functioning market with free competition. However, as far as this situation can ever exist in practice, this was definitely not the case in early modern labour markets. Ogilvie's research on women's work in pre-industrial Germany suggests that there were many institutional restraints for women, resulting in highly distorted markets. These imperfections were caused, for example, by guild pressure, community norms, and the inefficiency of information flows.[11] In this article, I will argue that one of these market distortions significantly influencing men's and women's work—and therewith their remuneration—was the segmentation of the pre-industrial labour market.

A problem with much of the existing literature on the gender wage gap is that it is often unclear to what extent historians are talking about unequal payment between the sexes for the same work.[12] Some studies do not even specify the kind of work women and men did in relation to their wages, but instead focus on

[5] Elson, 'Differentiation', p. 481.
[6] Hatcher, 'Debate'; Burnette, 'Investigation'.
[7] Hatcher, 'Debate', pp. 192–4; Burnette, 'Investigation', pp. 272–7; Burnette, *Gender, work and wages*, pp. 12–13, 327.
[8] For example, Berg, 'What difference', p. 31; Simonton, *History of European women's work*, pp. 46–7; Honeyman, *Women, gender and industrialisation*, p. 49; Sharpe, *Adapting to capitalism*, p. 100.
[9] Elson and Pearson, 'Subordination of women', pp. 149–50.
[10] Elson, 'Differentiation', pp. 489–90.
[11] Ogilvie, *Bitter living*, pp. 149, 323–4.
[12] See also Honeyman, *Women, gender and industrialisation*, pp. 55–71.

 

average wage differentials in an entire branch.[13] In order to gain clearer insight into the gender wage gap, I investigate *comparable* men's and women's wages in the Dutch textile industry in the seventeenth and eighteenth centuries, most notably spinning wages. This represents an interesting case, first because little is known about the wages of hand spinners in the pre-industrial Dutch economy, nor in the more general international context, as I will briefly point out below. I have constructed a new series of spinning wages, which enables me to draw more substantial conclusions than from the—rather fragmented—data known previously.

Secondly, hand spinning is an outstanding example of work that is usually depicted as 'supplementary', and that moreover is considered to have been 'women's work' in most pre-industrial societies. Nevertheless, quite remarkably, in the Dutch Republic both men *and* women appear to have been hand spinning.[14] The presence of male spinners makes the Dutch Republic an excellent case study to investigate to what extent the pre-industrial gender wage gap can be ascribed to wage discrimination. Also, I explore to what degree differences in productivity accounted for wage differentials. I demonstrate that it is crucial to take into account the sexual division of labour in the labour market as a whole when analysing the gender wage gap. Ultimately, I aim to draw some more general conclusions about women's wage labour in the textile industry. Was their work rewarded equally, and only restricted by productivity differences? Or were discriminatory mechanisms in fact 'at work', either explicitly or rather more implicitly? Were women, in the words of Honeyman, regarded as 'eternal amateurs' who were expected to perform a great variety of market and non-market tasks?[15]

## II

Before industrialization, which occurred comparatively late in the northern Netherlands,[16] woven woollen and linen cloths were the most important textiles produced in the Dutch Republic. In the first half of the seventeenth century, the main production centres were cities in the coastal province of Holland—most notably Leiden (woollen weaving) and Haarlem (linen weaving) (see figure 1).[17] However, from 1650 onwards, woollen and linen weaving shifted to the more outlying and agrarian regions of the Republic, the eastern province Overijssel and the southern province Brabant. Following the Peace of Westphalia (1648), these border provinces no longer faced the threat of war. Merchants from Holland started to contract wage-working weavers and spinners in these regions, where nominal wages were relatively low. Consequently, the Holland cities began to concentrate more on the finishing and trading of textiles. In Haarlem, linen weaving was totally

[13] For a recent example, see Boot and Maindonald, 'British cotton industry'.

[14] van Bavel has traced this internationally exceptional situation back to the late middle ages. However, in this period, it still only concerned some men. van Bavel, 'Early proto-industrialization?', pp. 1131, 1151–2.

[15] Honeyman, *Women, gender and industrialisation*, p. 24. See also Simonton, *History of European women's work*, pp. 35–6.

[16] The textile industry was the first sector to industrialize on a large scale, but only after 1840. de Jonge, *Industrialisatie in Nederland*, pp. 97–104.

[17] For Leiden see: Posthumus, *Geschiedenis*; Moes and de Vries, *Stof uit het Leidse verleden*. For Haarlem: Rombouts et al., *Haarlem ging op wollen zolen*.

 


Figure 1. *Map of the northern Netherlands, c. 1629–1795*

abandoned after 1650.[18] Leiden, however, despite its drastic decline, remained the largest producer of woollen fabrics until about 1800, although competition from Tilburg, a village in Brabant, grew in this period.

Early modern textile production consisted of several stages, ranging from the preparation of raw materials to the finishing of the cloth, all of which involved separate specialized textile workers. If we take the example of the production of one white (i.e. undyed and unfinished) woollen cloth, the following labour input was needed: somebody washing the wool, somebody flattening the wool, two

[18] Mulder, 'Haarlemse textielnijverheid', p. 64.

 

people fluffing the wool, two people carding, four spinners, and two weavers.[19] Hand spinning, in particular, was highly labour intensive, and—depending on the type of cloth—four to eight spinners were required to provide enough yarn for one woven piece. There are many indications that spinning formed the major part of total labour costs in this process. Both in the seventeenth century and around 1800, total spinning wages on average amounted to 40 per cent of all labour costs, and around 17 per cent of total production costs.[20]

In most Dutch towns, woollen and linen weaving was traditionally organized in guilds. Generally, only male citizens with sufficient means and suitable vocational training could attain guild membership. Although there were usually no formal rules excluding women, it was common practice that women would not become independent guild masters. An exception was made for masters' widows, who in many guilds were entitled to continue their deceased husbands' workshop if they wanted to.[21] Typically, the two most important production centres, Leiden and Tilburg, had no weaving guilds in the seventeenth and eighteenth centuries. In Leiden, the guild had been abolished in 1561 when the Old Drapery (heavy woollen cloth) had almost vanished, and it had not been re-established when the New Draperies (lighter woollen fabrics such as serge and baize) emerged in the 1580s. Instead, the different types of textiles (*neringen*) were vertically organized: drapers-entrepreneurs managed the entire production chain from the preparation of the wool to the weaving, allowing for more capitalist—instead of traditional corporate—production relationships.[22] In Tilburg, as in most areas in the countryside, a weaving guild was never established, and here as well, an (early) capitalist organization of production came into existence.[23] Interestingly, despite the absence of guilds, only a few (widowed) women were weaving in Leiden or Tilburg.[24] Apparently, social norms regarding the sexual division of labour were stronger than formal or informal rules of guild institutions. In all probability, not only men, but also women, for instance wives and daughters from artisan families, adhered to these social norms, as they limited competition from single women in the craft industries.[25]

In contrast to the weaving and finishing (e.g. dyeing, cloth shearing, bleaching) of textiles, most of the preparatory stages of the production process were never guild-organized. Not surprisingly, we find an abundance of female textile workers only in these activities, for example in wool fluffing, carding, and spinning. This gender division of labour in the Dutch textile industry is in line with more general theories about labour market segmentation, which predict that men are active in the 'core' (or primary) sectors of the economy, whereas women (and migrants) work in the 'peripheral' (or secondary) sectors. The core represents industries and

[19] Posthumus, *Bronnen* (vol. V), no. 434.

[20] This was true for the cloth, serge and baize industries. Compare Posthumus, *Bronnen* (vol. V), no. 434; idem, no. 467; Nederlands Econmisch Historisch Archief (NEHA), Bijzondere Collecties, inv. no. 064-3.

[21] Schmidt, *Overleven*, p. 146. This right for masters' widows also existed elsewhere, for instance in Germany. Ogilvie, 'Women and proto-industrialisation', pp. 92–3.

[22] Posthumus, *Geschiedenis*, pp. 350–1, 501–26; Davids, 'Neringen'.

[23] de Bruijn, Ruiter, and Stroucken, *Drapiers en buitenwevers*, pp. 9–10.

[24] van Nederveen Meerkerk, 'Segmentation', p. 201, tab. 3 (Leiden) and p. 209, tab. 5 (Tilburg).

[25] In her recent inspiring book on gender and wages, Burnette also claims that gender ideology was frequently employed by specific social groups to promote their own economic interests. Burnette, *Gender, work and wages*, pp. 5, 14.

Table 1. *Male and female spinners in four localities in the Dutch Republic, 1581–1812*

| | *Men* | | *Women* | |
|---|---|---|---|---|
| *Town and year* | n | % | n | % |
| Leiden 1581 | 7 | 5 | 133 | 95 |
| Leiden 1749 | 771 | 49 | 815 | 51 |
| Leiden 1808 | 197 | 46 | 230 | 54 |
| Den Bosch 1742 | 5 | 83 | 1 | 17 |
| Den Bosch 1775 | 48 | 40 | 73 | 60 |
| Tilburg 1665 | 54 | 29 | 131 | 71 |
| Tilburg 1810 | 626 | 25 | 1,841 | 75 |
| Zwolle 1712 | 11 | 13 | 71 | 87 |
| Zwolle 1742 | 14 | 8 | 171 | 92 |
| Zwolle 1812 | 6 | 12 | 45 | 88 |

*Sources:* see van Nederveen Meerkerk, *Draad in eigen handen*, pp. 328–31.

activities that are highly productive, capital-intensive, and profitable, and that require formal education. In contrast, the periphery of the labour market consists of labour-intensive, poorly rewarded and unskilled labour.[26]

It is probable that alternatives for women in the pre-industrial labour market were fewer than for men.[27] This sexual segmentation of the labour market led to an abundant supply of female workers in a small number of professions: the phenomenon of 'occupational crowding'.[28] The dual structure of the labour market has been observed for the early modern period by several historians.[29] I will argue here that the segmentation of the labour market in general influenced the type of work women did, also at the level of one single occupation: hand spinning. Although at first sight conditions appear to have been fairly equal, with men and women actually performing the same work, a closer look tells us that inequalities in earning capacities between the sexes did exist, albeit not directly caused by wage discrimination, nor by productivity differences.

Remarkably, both men and women were employed as spinners in the Dutch Republic. Male hand spinners were present in many places in the Dutch Republic, but most notably in the city of Leiden, which was the centre of the European textile industry from about 1580 to 1650. Perhaps not coincidentally, we also find many male spinners in the other emerging early capitalist centre of wool production, the village of Tilburg (see table 1).

In all of these localities, adult men of all ages spun wool. Their numbers, especially in Leiden and Tilburg, are too significant to write them off as physically disabled workers, or as workers unable to perform other work. Moreover, comparisons between poor-relief records and census data point out that most of these male spinners did not depend on social assistance, as disabled or very old men

[26] Beck, Horan, and Tolbert, 'Stratification in a dual economy', pp. 706–7; Bradley, *Men's work, women's work*, p. 65.

[27] Note that some forms of exclusion also existed according to citizenship or social status. See, for instance, de Vries, 'Pre-industrial labour markets', about dual-layered labour markets for immigrants and non-immigrants.

[28] Brown, 'A woman's place', p. 218; Wiesner, 'Spinsters and seamstresses', p. 202.

[29] Hartmann, 'Capitalism'; Honeyman and Goodman, 'Women's work'; van Nederveen Meerkerk, 'Segmentation'.

 

probably would.[30] Another supposition, that men were spinning in name, but delegated the actual work to their wives and children, is also unlikely.[31] Although it is very hard to find historical evidence for the ways in which early modern families allocated their labour time, and it is possible that they formed a single unit of production, the scarce evidence for the proto-capitalist organized Dutch textile industry suggests otherwise. Elsewhere I have shown that married women's spinning activities in export-orientated textile production were more likely to have been performed in the context of wage labour relations than in the context of the family economy.[32] If husbands and wives indeed had related occupations (i.e. both spinners, or weaver and spinner), they were often registered separately, and some evidence shows that they received wages independently of each other.[33]

There must therefore be other explanations for this widespread presence of male spinners. Either working as a wool spinner paid well enough to also be an acceptable occupation for able-bodied adult men, or the alternatives to work in other professions had declined for a significant proportion of male workers. As I show below, the answer is probably two-sided, although both relate to the 'capitalist' (as opposed to corporative) organization of the Dutch woollen industry. In times of economic prosperity, wages in the export-orientated textile industry developed relatively favourably, attracting male wage workers as spinners in some specialized branches. On the other hand, in times of decline (in Leiden after 1670, in Tilburg somewhat later) options to work both within and outside the textile industry became scarcer, and for some male workers spinning was the only alternative to unemployment.[34] Below I substantiate these ideas with evidence on spinning wages, firstly by some general observations about the remuneration of spinners and secondly by comparing male and female spinning wages in the Dutch textile industry.

## III

Information about pre-industrial spinning wages in the international historical literature is scarce. Most studies imply that hand spinning was predominantly performed by women. In general, their wages are typified as supplementary and very low, both in the seventeenth and in the eighteenth centuries.[35] Incidentally, historians mention male spinning wages, but they usually refer to the period of industrialization, when men entered the spinning factories as highly skilled workers, for instance at the ring spinning machines. They were sufficiently rewarded for their work, or at least structurally better paid than female hand

[30] Compare, for example, Municipal Archive 's-Hertogenbosch (GAHt), Oud Archief, inv. nos. 3328–38, with GAHt, Oud Archief, inv. no. 6818.

[31] It would, for instance, be highly unusual that these spinning men were registered with the occupation of a family member, instead of their own occupation, in the censuses, from which the figures in tab. 1 are derived.

[32] van Nederveen Meerkerk, 'Couples cooperating?', pp. 244–6. My findings are in line with what de Vries has very recently suggested about the allocation of labour power by family members in 'industrious households': 'In fact, it was usually individuals rather than entire family units who participated in proto-industrial labor'. de Vries, *Industrious revolution*, p. 101.

[33] For example, Regional Archives Leiden (RAL), Hallen, inv. nos. 216–21, 279; Regional Historical Centre Tilburg (RHCT), Volkstellingen, inv. nos. 1275–7.

[34] For a more elaborate argument concerning proletarianization, see van Nederveen Meerkerk, 'Segmentation', pp. 205, 212, 214–5.

[35] Clark, *Working life of women*, p. 129; Berg, 'Women's work', pp. 78–9, 140.

 

spinners.[36] Some studies have revealed that there were indeed variations in wages *among* female spinners. Women who spun flax, for instance, earned significantly less than female wool spinners.[37] On the other hand, particular groups of spinning women, for instance in the seventeenth-century British cloth industry, were able to make a reasonable living.[38] And in early eighteenth-century Essex large numbers of single female spinners could live off their wage earnings, without having to rely on poor relief.[39] The same applied to specific groups of spinning women in the French Pays-de-Caux.[40]

Even less is known about spinning wages in the Dutch Republic. First, this can be explained by a lack of sources: spinners do not often emerge in archival material, let alone information about their working and living conditions. Secondly, there have been few attempts systematically to compare the data on spinning wages that are available. Generally, historical reconstructions of wage series for the Netherlands are based on male time wages, usually in the construction industry.[41] However, most wage labourers in the early modern period, both male and female, received piece rates for their work. This also typically applied to textile workers in the Dutch Republic. Employers favoured piece rates because they motivated their workers to work quickly, and for the workers themselves it had the advantage that they were able to manage their own working hours.[42] The question of whether time or piece rates prevailed in a certain sector is quite relevant when studying the gender wage gap. Some neoclassical economists state that only different piece rates paid to both sexes would suggest wage discrimination of women.[43]

Partially out of dissatisfaction with the traditional wage series, van Zanden has recently reconstructed wage series of unskilled labourers in the Dutch textile industry. He concluded that the nominal wages of textile workers, despite of some variations, in general followed a similar development to those of construction workers between 1500 and 1800.[44] Unfortunately, van Zanden's series contain only three mentions of wool spinning wages, and it is not entirely clear which kind of yarn it concerns. In the following, it appears that there were large differences between individual spinning wages, and that it mattered considerably whether the yarn was intended for warp or weft, and for which industry.

From several primary and secondary sources, a chronologically ordered series of spinning wages in the Dutch Republic could be reconstructed, ranging from about 1600 to 1800 (see the appendix for this series and details of the sources used). Some conclusions can be drawn from this dataset. First, it was of importance what kind of raw material was spun. There is unfortunately little information about piece rates in flax or hemp spinning, but the few data suggest that wool spinning

[36] Honeyman, *Women, gender and industrialisation*; Gullickson, *Spinners and weavers*, pp. 74–5.
[37] Clark, *Working life of women*, p. 129.
[38] Idem, pp. 147–8.
[39] Sharpe, *Adapting to capitalism*, p. 31.
[40] Gullickson, *Spinners and weavers*, p. 78.
[41] See, for instance, Noordegraaf, *Daglonen in Alkmaar*; de Vries and van der Woude, *First modern economy*, pp. 609–17. More recently: van Bochove, *Economic consequences*, pp. 63–77.
[42] DuPlessis, *Transitions to capitalism*, p. 267.
[43] See, for instance, the debate between Hatcher and Bardsley in *Past and Present*. Hatcher, 'Debate', pp. 192–4.
[44] van Zanden, 'Revolt', pp. 623–5.

 

was far more profitable, which is in line with some other literature.[45] Secondly, the data show that there were large variations between different woollen fabrics as well. A comparison between the cloth, baize, and serge industries in seventeenth-century Leiden makes clear that wages were significantly higher in the cloth industry than in the other branches of the textile industry. Also, the spinning of combed wool, for instance used for the warp in the baize industry, was more poorly rewarded than the spinning of carded wool, which was processed in the cloth industry from 1630 onwards.[46]

In the serge and baize industries, a coarser yarn was processed than in the cloth industry, for which a finer, higher quality yarn was used. It took more time to produce a finer yarn, and the wages for spinning it varied accordingly. This may also explain the difference between piece rates for spinning of warp or weft. Yarn for the warp had to be strong, and in order to achieve this, the thread had to be twisted more than the yarn that was required for the weft. Thus, in the cloth industry, a pound of warp thread contained about seven skeins, whereas a pound of weft thread amounted to approximately five skeins.[47] An even more crucial explanation for this difference may have been that cloth was the most important textile export product of Leiden, at least between 1630 and 1670. Market mechanisms drove up wages in the production of this particularly popular, relatively high-quality fabric. Furthermore, there were important regional differences. The scarce source material from the Dutch countryside shows that in the seventeenth century, spinning wages formed about 50–60 per cent of nominal spinning wages in Holland, notably Leiden.[48]

Thus, there are serious difficulties in comparing spinning wages uncritically, because one has to take into account variations in raw material, industry, type of yarn, and region. The most consistent series of spinning wages over a long period of time can be reconstructed for carded wool warp yarn in the Leiden cloth industry (see figure 2).

The figure shows that until around 1670, the development of spinning wages in this industry largely paralleled that of unskilled construction workers in Holland, with a steep rise in nominal wages, although this increase began a few years earlier in construction than in wool spinning. After 1670, however, construction wages remained relatively stable, whereas spinning wages fell rapidly.[49] More in general, the development of spinning piece rates was far more volatile than that of time wages in construction. Part of these fluctuations can be explained by the relatively small number of spinning rates compared with the vast amount of data on construction wages in Holland. A more important reason, however, is that the textile industry was a highly trend-sensitive branch, in which wages were more directly subject to fluctuations in the economy than in many other branches of

[45] See, for instance, van Wijngaarden, *Zorg voor de kost*, p. 167; Boot, 'Silezische en andere linnengarens', p. 49; Prak, 'Arme und reiche Handwerker', p. 258.

[46] Posthumus, *Geschiedenis*, p. 255; idem, *Bronnen* (vol. V), no. 343; de Vries, 'Leidse textielnijverheid', pp. 81, 85.

[47] van Gorp, *Tilburg*, p. 36. A skein is a varying amount of spun yarn, loosely tied together, which usually has to be re-wound on a spool before using it for weaving. Note that a skein is not a specific unit of length, it is just the form in which yarn is often sold.

[48] For example, RHCT, Schepenbank, inv. nos. 1907, 2019, 4624, 5997.

[49] This is in line with the comparison of developments in others textile wages (weaving, combing) and construction wages by van Zanden, 'Revolt', p. 623.

 

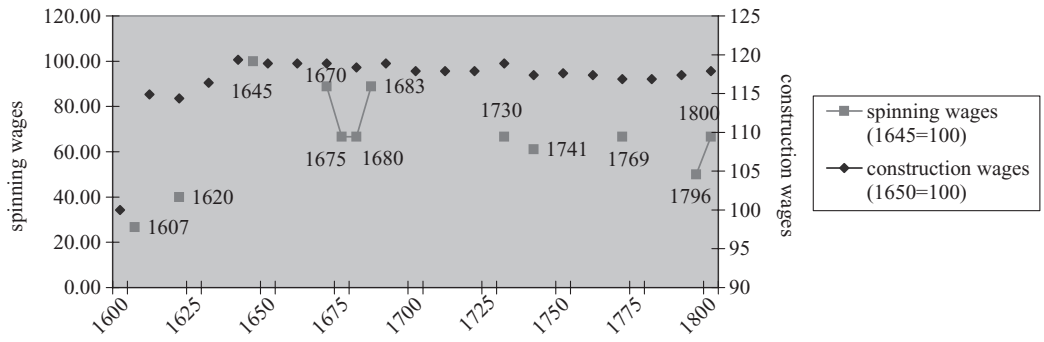


Figure 2. *Comparison of indexed nominal spinning wages and construction wages*

industry.[50] As mentioned above, spinners did not have the existing corporate organization at their disposal to protect wage levels, in contrast to most workers in the construction sector.[51] There are indications that spinning wages in other branches of the textile industry, e.g. serge and baize industries, had even declined more sharply after 1650. In contrast to these textile specializations, the Leiden cloth industry was able to compete reasonably well with upcoming international textile centres until about 1670, and this was reflected in wages.[52]

These findings suggest that market forces were important in establishing spinning wages. In this respect, I tend to agree with Burnette that women were not necessarily paid 'custom wages' in the pre-industrial or industrializing eras.[53] This market determination may be explained by the fact that unlike most corporately regulated professions, spinning was not protected by a professional organization. In times of labour scarcity, this could have benefits for hand spinners. However, when the economic tides turned, the fall in wages and job security were instead far greater in the unregulated branches of the economy.[54] Wages were far less volatile in guild-organized professions, both within and outside the textile industry. Not surprisingly, it was exactly these protected, better paid professions that were inaccessible to most women.[55]

## IV

Where comparable data on piece rates paid to men and women for the same spinning work are available, it appears that there were no significant differences in

[50] van Zanden, *Arbeid*, pp. 145–9; de Vries and van der Woude, *First modern economy*, p. 646.

[51] Furthermore, as opposed to Leiden textiles, the Dutch construction sector did not compete on an international market. See for a further explanation of diverging wage trends in 'tradable' and non-tradable' goods: Balassa, 'Purchasing-power parity doctrine', pp. 586, 593.

[52] Posthumus, *Bronnen* (vol. V), no. 30, par. 14, 29, 30, 31, and 33; de Vries, 'Leidse textielnijverheid', p. 85.

[53] Burnette, 'Investigation', p. 260; eadem, *Gender, work and wages*.

[54] de Vries and van der Woude, *First modern economy*, pp. 646–7.

[55] This inevitably leads me to conclude that competition on the free market was, at least in times of economic decline, unfavourable for women. This contrasts with Burnette's statement that competition was likely to be favourable for women. She does acknowledge that labour market segmentation led to imperfect competition, but only relates this to the highest-paying occupations. Burnette, *Gender, work and wages*, p. 329. I would instead argue that the exclusion of women from certain (in my view many) branches of the economy *also* led to imperfect competition in all other segments of the economy.

 

Table 2. *Piece rates of men and women spinning in the Leiden cloth industry, 1678–79*

| *Year* | *Stuivers* per skein | Per pound | *Occurrences* |
|---|---|---|---|
| *Warp, men* | | | |
| 1678 | 2.75 | 19.25 | 3 |
| 1678 | 3.25 | 22.75 | 4 |
| 1679 | 2.75 | 19.25 | 12 |
| 1679 | 3 | 21 | 6 |
| 1679 | 3.25 | 22.75 | 15 |
| 1679 | 4.4 | 30.8 | 1 |
| Average male rate: per skein: 3.1 st.; per pound: 21.4 st. | | | 41 |
| *Warp, women* | | | |
| 1678 | 2.75 | 19.25 | 7 |
| 1678 | 3.25 | 22.75 | 1 |
| 1679 | 2.75 | 19.25 | 16 |
| 1679 | 3 | 21 | 7 |
| 1679 | 3.25 | 22.75 | 9 |
| 1679 | 3.5 | 24.5 | 1 |
| 1679 | 4.5 | 31.5 | 1 |
| Average female rate: per skein: 3.0 st.; per pound: 20.8 st. | | | 42 |
| *Weft, men* | | | |
| 1679 | | 5 | 50 |
| 1679 | | 5.25 | 1 |
| 1679 | | 5.5 | 2 |
| Average male rate per pound: 5 st. | | | 53 |
| *Weft, women* | | | |
| 1678 | | 5 | 1 |

*Source:* Posthumus, *Bronnen* (vol. V), no. 496.

remuneration between the sexes (see appendix). This becomes very clear when we look at a series of wage data collected from a Leiden cloth merchant's administration over the years 1678 and 1679. This merchant kept a very detailed account of the weekly output of his workers and the wages he paid them. In the account book, there are 94 occurrences of male spinners and 43 occurrences of female spinners.[56] Their earnings varied by the week, because the men and women were paid for the amount of yarn they supplied their master every week, which fluctuated considerably. By relating the amount of yarn to their total payment, their piece rates can be calculated easily (see table 2).

On average, the merchant paid approximately the same piece rates to men and women: about 3 *stuivers* per skein of warp yarn and 5 *stuivers* per pound of weft yarn. It is remarkable that women hardly spun weft yarn for this merchant: over two years only one female weft spinner was recorded: Margryet Christoffel, who earned the same as her male counterparts. Dutch historian Posthumus deducted from this that men monopolized weft spinning in the Leiden cloth industry, because it paid better.[57] According to him, the spinning of warp yarn, which supposedly paid less, was preferably left to the women. Below, I will return to the question of whether weft spinning did indeed pay much better than warp spinning.

[56] Their names were not always listed consistently, so exactly how many different individuals it concerned is uncertain. Nevertheless, it is clear that it involved at least 15 men and at least 8 women. Small as this sample may be, the data in the appendix indicate that in other cases, male and female spinning wages did not differ significantly as well, but this account book represents the largest data set for a short period of time, which rules out large fluctuations in the economic trend.

[57] Posthumus, *Geschiedenis*, p. 626.

Furthermore, apart from weft spinners, there were also many male warp spinners in the Leiden cloth industry.[58] Therefore, it is probable that more generally male spinners were predominant in the *cloth* industry, because wages were highest in this branch of the textile industry.[59]

In addition to data for adult wages, there is some information about children's piece rates in the Leiden textile industry. Most children received weekly wages or payment in kind, but about 5 per cent of spinning apprentices in the cloth industry were paid by the piece. The little information we have on their rates suggests that boys and girls were treated equally. Their piece rates were between 1.5 and 2 *stuivers* per skein warp yarn around 1650, which amounted to 33–44 per cent of the adult piece rates in the same period.[60] One could of course argue that this discrepancy between adult and child wages was due to children's inferior bargaining position with their employers. However, there are several indications that the difference was rather an expression of insufficiently accumulated human capital. First, their parents or the orphanage represented children who were apprenticed with textile workers, drawing up official contracts. In advance, agreements were made about increasing wages for the second year of the apprenticeship.[61] Secondly, parents often paid varying sums of money to the cloth drapers to get their children a spinning or weaving apprenticeship. Sometimes, these apprentice fees were quite high, on the condition that a 'full wage' (read: adult wage) would be paid to a child, but more often both the fees and the wages were rather modest.[62]

Thus, piece rates for similar spinning work were indeed identical for men and women, which would support the view that differences in total earnings were not due to wage discrimination. At the same time, piece rates for children were substantially lower, indicating that quality differences did matter, and reinforcing the idea that adult males and females were seen as producing the same quality. Of course, similar piece rates for men and women, or for boys and girls, are not the whole story. The total income spinners brought in depended very much on their labour time and productivity. Exactly because piece rates were customary, the income capacity of spinners would have varied according to the time they spent at work, their physical abilities, and their skills. In order to say more about male and female spinners' productivity, I now look into the relationship between spinning wages and labour time.

## V

When looking at the possible weekly earnings of adult spinners in the Leiden textile industry, we may again conclude that there were substantial differences between the different branches. Textile entrepreneurs in 1663 expressed that a good spinner in the serge industry, 'spinning diligently and doing nothing else', was able to spin a maximum of 2.5 pounds of yarn. In this particular year, piece

[58] See, for example, RAL, Hallen, inv. nos. 216–18; Posthumus, *Bronnen* (vol. V), no. 496.

[59] van Bavel uses a similar reasoning in explaining the occurrence of men in the relatively high-quality proto-industrial woollen industry in the Dutch countryside in the sixteenth century. van Bavel, 'Early proto-industrialization?', p. 1152.

[60] Compare, for instance, RAL, Hallen, inv. nos. 127a and 127j, with RAL, Hallen, inv. no. 218.

[61] RAL, HG Weeshuis, inv. nos. 3844, 3845, 3847, 3848, 3849; RAL, Hallen, inv. nos. 127a–127j

[62] RAL, Hallen, inv. no. 127b, 1641.

 

Table 3. *Average weekly production of cloth spinners, and their incomes per week, Leiden 1678–9*

| *Name* | *Sex* | *Type of yarn* | *Production* | *Average weekly income* |
|---|---|---|---|---|
| Frans Willem | Male | Warp | 34.0 skein | 102 stuivers |
| Adriaen van der Poel | Male | Weft | 15.4 pound | 77 stuivers |
| Marij Gillis | Female | Warp | 25.1 skein | 75.3 stuivers |
| Thomas Rense | Male | Weft | 14.9 pound | 74.5 stuivers |
| Jan Visbeeck | Male | Warp | 22.0 skein | 66 stuivers |
| Goslick | Male | Warp | 21.5 skein | 64.5 stuivers |
| Jacob de Nijs | Male | Weft | 11.4 pound | 57 stuivers |
| Margriet Vincent | Female | Warp | 12.4 skein | 37.2 stuivers |
| Jan Pieterse | Male | Weft | 6.4 pound | 32 stuivers |

*Source:* Posthumus, *Bronnen* (vol. V), no. 496.

rates in this industry were around 10 *stuivers* per pound, which meant that spinners could earn 25 *stuivers* at the most. In the baize industry, a spinner could at best spin 11 pounds a week, which with a current piece rate of 3 *stuivers* amounted to a maximum of 33 *stuivers*.[63] As a single woman in Holland around 1650 needed about 25 *stuivers* a week to survive,[64] we can conclude that the weekly incomes of the best spinners in these industries barely exceeded subsistence level. Weekly returns in the cloth industry could be significantly higher, as table 3 indicates.

Table 3 shows the average weekly production of a selection of spinners appearing frequently in the administration of the merchant mentioned above. Almost weekly they brought varying amounts of spun wool to their employer and received wages in return. There were large differences in the weekly output between spinners, but women were not necessarily less productive than men.[65] Moreover, table 3 shows that weft spinning did not necessarily generate a higher weekly income than warp spinning, as Posthumus has argued.[66] Furthermore, average weekly production could also vary a great deal among men, and even the production per individual fluctuated by the week. Margriet Vincent, for instance, in some weeks only spun 8 skeins, whereas in others she produced 17 skeins. Accordingly, her weekly income varied from 24 to 51 *stuivers*. Most spinners were able to earn more, on average between 60 and 80 *stuivers* a week.

With regard to their productivity, it is debatable to what extent these cloth spinners spun alone or with help from family members. As I have argued above (see n. 31), most people—and especially men—tended to be defined by their own occupational denomination in early modern source material. In some weeks, however, the output of individual spinners was remarkably high. The female spinner Marij Gillis, for instance, with an already high weekly average of 25 skeins, in some weeks provided her employer with more than 40 skeins. From parish records it appears that Marij was indeed married, notably to the weaver and cloth spinner Abraham du Preu.[67] It is unknown whether the couple had any children,

[63] Posthumus, *Bronnen* (vol. V), no. 30.
[64] As calculated in van Nederveen Meerkerk, *Draad in eigen handen*, p. 301.
[65] Only two women are included in table 3, because they were mentioned very regularly, but in the merchant's account book many more appear, with weekly yields that do not differ significantly from men's weekly production.
[66] Posthumus, *Geschiedenis*, p. 626.
[67] RAL, DTB Leiden, inv. no. 12, fol. 95v.

 

but as they were both widowed at their marriage, the likelihood is that they did. Another spinner from the merchant's administration, Jan Visbeeck, married for the second time in 1677. Unfortunately, his second wife passed away some years later. Remarkably, Jan remarried in 1681 to Marij Gillis, his above-mentioned colleague, who in the meantime had become widowed because of the death of Abraham.[68] It is thus clear that marriages and remarriages among textile workers were quite common. This is remarkable because in the literature it is often assumed that women, especially from the lower ranks of society, had few chances of a second or third marriage because they lacked financial capital.[69] In probability, the labour power of both spouses was a valuable asset, which could well compensate for the absence of financial capital.[70]

Despite these relatively high weekly spinning wages in the cloth industry, spinning wages were structurally low compared with those of other textile workers such as weavers, or unskilled labourers outside the textile industry. The average unskilled construction worker, for instance, could earn about 105 *stuivers* a week in Holland around 1680.[71] Although spinners in the Leiden cloth industry may have incidentally approached this weekly income, they normally earned less.

However, the fact that spinning was generally regarded as a part of the production process that required a large reservoir of 'unskilled' labourers did not mean that there were no productivity gains to be made. For one thing, both in woollen *and* in flax and hemp spinning, a long learning period of at least two years was required. Usually, children received this training from a very early age, either serving a master, as in the Leiden textile industry, or being apprenticed in work houses, as for instance in seventeenth-century Zwolle. Between the first month and the first year of their learning period, children's productivity rose by 50 per cent, and even during the second year, there was an average productivity rise of another 16–33 per cent.[72]

Furthermore, even among experienced spinners, there could be significant productivity differences. Good adult spinners were very welcome, and employers often fought about them when the cloth industry was booming, as many Leiden court cases suggest.[73] There seem to have been no differences between male and female spinners in this respect. According to the regulations of the cloth industry, spinners who were contracted by an entrepreneur were not allowed to switch employers at any time, even if another master was prepared to pay higher wages.[74] Regulations like these, serving to protect the interests of capitalist entrepreneurs, distorted the free market mechanism of further rising wages that the large demand for spinners would lead us to expect. As Leiden spinners (or weavers) had no corporate organization, they were unable to oppose this wage regulation.

Similar productivity rates are also suggested for apprenticed boys and girls in the Leiden cloth industry. From the apprenticeship books, it appears that they

[68] RAL, DTB Leiden, inv. no. 12, fol. 244 and 285.
[69] See, for instance, Schmidt, *Overleven*, p. 237.
[70] See also van Nederveen Meerkerk, 'Couples cooperating?'.
[71] Average *daily* wage of a bricklayer: 17.5 *stuivers*. Noordegraaf, *Daglonen in Alkmaar*, p. 47.
[72] Historisch Centrum Overijssel (HCO), Stadsarchief, inv. no. 3908.
[73] See, for instance: RAL, Hallen, inv. nos. 217, 13-03-1643, 20-03-1643, 27-03-1643, 29-04-1643, 26-06-1643, 30-06-1643, 20-05-1644.
[74] Posthumus, *Bronnen* (vol. IV), no. 308.

 

Table 4. *Average weekly income from spinning (in stuivers and relative to total income) among the Zwolle poor according to family composition, 1683–90*

| *Family composition* | *No.* | *Average weekly income from spinning* | *Women's spinning wages as % of total income* |
|---|---|---|---|
| Woman alone (widow or single) | 82 | 5.0 | 53.9 |
| Couple alone, wife spins | 13 | 6.7 | 40.5 |
| Couple alone, both spinners | 2 | 21 (together) | Unknown |
| Couple with children, wife spins | 40 | 6.4 | 18.5 |
| Couple with children, both spinners | 6 | 21 (together) | Unknown |
| Widow/abandoned wife without working children | 27 | 6.6 | 50.7 |
| Widow/abandoned wife with working children | 79 | 6.7 | 24.7 |
| Total | 249 | 6.5 | 31.6 |

*Source:* Database Poor Relief Zwolle, courtesy of Hilde van Wijngaarden.

received on average the same weekly wages for spinning.[75] Another source providing information about spinners' weekly earnings are the poor-relief records of the town of Zwolle. An analysis of these records show that the weekly incomes from spinning varied greatly according to sex and family composition (see table 4).

The first conclusion is that it hardly mattered for the nominal weekly income of spinning women if they had younger or older children.[76] It appears that the care of their children did not, in general, interfere with the time they devoted to spinning. This is an important finding, because it counters the usual assumption that married women's productivity was seriously hampered by the care of their infant children.[77] The reason that women alone had significantly lower incomes from spinning was that they were usually too old and disabled to earn very much. Most young single women did not end up in poor relief, and they had to earn their own living. Nevertheless, the poor overseers also expected elderly women to bring in some additional income, instead of relying solely on poor relief.[78]

Table 4 also shows that although the nominal wages of spinning women with children did not vary much according to family type, their relative contribution to the family income varied somewhat. If their children were young and did not work, the income from spinning mothers constituted 40–50 per cent of the family income, regardless of if there was a man in the house. However, once the children grew older and started working, the relative income of their mothers declined to less than 20–25 per cent, although their average nominal income remained about the same.

Finally, couples with both a husband and wife spinning on average earned the most, whether they had children living with them or not. Although the data may be biased because of the small number of men, it is probable that the significant difference in weekly spinning earnings must be explained by gender work roles. Men in Zwolle generally spun wool, which paid much better than spinning flax or hemp, normally women's work.[79] However, in these poor-relief records, it was

[75] RAL, HG Weeshuis, inv. nos. 3845, 3847, and 3848; RAL, Hallen, inv. nos. 127a, 127b, and 127j.

[76] In the table, younger children are defined as not working, whereas older children are working. Although there are exceptions to this rule, the detailed data show that there was a rough age division among the children of poor families, who generally started working at age six.

[77] See, for instance, Burnette, 'Investigation', p. 274.

[78] For one of many examples, see HCO, Stadsarmenkamer, inv. no. 311, fol. 49v.

[79] van Wijngaarden, *Zorg voor de kost*, p. 167.

 

explicitly mentioned that husband and wife spun wool *together*. In probability, the wives of male spinners had more possibilities to spin wool together with their husbands, which gave them a relatively favourable position compared with other women who were alone (with or without children), or whose husbands had another or no profession. The segmentation of the labour market already observed for the wider economy as well as within the textile branch in particular thus also played a role at the subsistence level of urban economies.

## VI

At first sight, the Dutch evidence on male and female hand spinning wages seems to suggest that neoclassical economic theory is correct. Most comparable nominal wage data we have for men and women show that there were no differences in piece rates for the same kind of spinning work. This means that there was no direct wage discrimination against spinning women.

On the other hand, there are no reasons to assume that in principle the labour productivity of spinning women would have been lower than that of spinning men. Evidence from Leiden and Zwolle indicates that women's productivity was not necessarily hampered by reproductive or physical restraints. Equal piece rates indicated that in work such as spinning, gender differences in strength or skill did not matter. Poor-relief data suggest that the presence of small children did not reduce mothers' paid working hours. Furthermore, single women did not even have reproductive responsibilities.

However, this does not mean that women generally earned the same as men in the spinning industry. In the Dutch Republic, at least in the export-orientated textile industries, the segmentation of the early modern labour market manifested itself even at the level of spinning. My argument here is that it is vital to take this sexual division of labour into account when analysing the gender wage gap in the pre-industrial textile industry. Much of the labour market segmentation was based on gender-biased assumptions, instead of realistic calculations, about the capacities and obligations of women. It is highly likely that expectations regarding their future tasks or assumptions about their lesser capabilities formed the basis of women's general exclusion from most of the guild-regulated, higher status crafts. Both men and women from certain social strata and marital status had reasons to comply with these gender norms.

In general, men spun in the better paying textile branches. This is why we find many spinning men in the relatively profitable Leiden cloth industry and hardly any in other branches such as the baize and serge industries. The higher wages in the cloth industry attracted men from the wage-earning ranks of society in times of economic growth. When economic contraction occurred, exactly this process of proletarianization explains why men remained active as spinners, in spite of the declining wages: it was a welcome alternative to unemployment. Women were crowded into even less rewarding spinning jobs. In Zwolle, there was a somewhat different dividing line, which was demarcated by the raw material that was processed. Here, wool spinning was more of a male domain, whereas flax and hemp spinners were exclusively female. Although this segmentation was hardly ever formally circumscribed, inequalities and restrictions for women in accessibility to the labour market led to differences in the earning capacities of male and female

 

spinners. The fact that the lesser paying spinning tasks were left to relatively more women, the phenomenon of 'occupational crowding', will have depressed wages in these branches even further, thus enforcing *seemingly* market-regulated, but in fact discriminatory, mechanisms.

Nevertheless, women were not entirely excluded from the better paying spinning jobs, contrary to many other crafts in the early modern period, notably the guild-organized crafts. We do find single women spinning in the cloth industry in Leiden and in the wool industry in Zwolle. It also appears that in some cases marriage more easily offered women opportunities to spin in these branches. There are examples of wage labouring textile workers in the Leiden cloth industry marrying, offering both partners the possibility of profiting from each other's labour capacity. This made them attractive marriage partners, and it is not surprising that both men and women in the Leiden cloth industry soon remarried after they had become widowed. In the Zwolle poor-relief records, most women who spun wool did this together with their husbands. Even in the lowest strata of society, marriage seems to have reduced the degree of de facto labour market segmentation, leading to some opportunities for married women.

Capitalist market relations had largely been carried through in the early modern Dutch production centres of specialized export textiles, leading to relatively trend-sensitive fluctuations in wages for spinners. Nevertheless, despite the abandonment of a corporately organized textile production, informal social norms regarding the division of labour often survived. Where the boundaries of traditional work roles were to some extent crossed, as was the case with hand spinning, men still obtained the best paid positions. Thus, although the cloth spinning branch of the industry was not exclusively male, and men and women working as cloth spinners were equally rewarded, male spinners were only to be found in this relatively well-paid industry. This all suggests that income differentials between men and women must be attributed not solely to productivity differences, nor to wage discrimination alone. Rather, apparently free market mechanisms can have underlying discriminatory foundations, based on gender inequalities in the labour market and widely supported societal norms about men's and women's work roles.

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# APPENDIX

## *Series of spinning piece rates, the Dutch Republic, 1607–1800*

| *Year* | *Place* | *Piece rate in stuivers* | *Unit of yarn* | *Type of yarn* | *Branch of textile industry* | *Sex* | *Source* |
|---|---|---|---|---|---|---|---|
| 1607 | Leiden | 8.6 | Pound | Warp | Wool | Unknown | Posthumus, *Geschiedenis*, p. 214. |
| 1617 | Tilburg | 1.8 | Pound | Weft | Wool | Unknown | RHCT, Schepenbank, inv. no. 1907. |
| 1620 | Leiden | 12.6 | Pound | Warp | Wool | Unknown | Posthumus, *Geschiedenis*, p. 214. |
| 1620 | Leiden | 12.5 | Pound | Warp | Wool | Unknown | van Zanden, 'Revolt', p. 623. |
| 1622 | Tilburg | 1.9 | Pound | Weft | Wool | Woman | RHCT, Schepenbank, inv. no. 2019. |
| 1638 | Leiden | 12.6 | Pound | Warp | Cloth | Boy | RAL, Hallen, inv. no. 127a. |
| 1639 | Leiden | 14 | Pound | Warp | Cloth | Boy | RAL, Hallen, inv. no. 127a. |
| 1640 | Leiden | 14 | Pound | Warp | Cloth | Girl | RAL, Hallen, inv. no. 127a. |
| 1640 | Leiden | 12.25 | Pound | Warp | Cloth | Girl | RAL, Hallen, inv. no. 127a. |

APPENDIX *Continued*

| *Year* | *Place* | *Piece rate in stuivers* | *Unit of yarn* | *Type of yarn* | *Branch of textile industry* | *Sex* | *Source* |
|---|---|---|---|---|---|---|---|
| 1641 | Leiden | 4 | Pound | Weft | Cloth | Boy | RAL, Hallen, inv. no. 127a. |
| 1641 | Leiden | 3.75 | Pound | Weft | Cloth | Girl | RAL, Hallen, inv. no. 127a. |
| 1641 | Leiden | 9 | Charge | Unknown | Cloth | Girl | RAL, Hallen, inv. no. 127a. |
| 1641 | Leiden | 10 | Charge | Coloured yarn | Cloth | Boy | RAL, Hallen, inv. no. 127a. |
| 1641 | Leiden | 8 | Charge | White yarn | Cloth | Boy | RAL, Hallen, inv. no. 127a. |
| 1642 | Leiden | 100 | Half chain | Unknown | Cloth | Man | RAL, Hallen, inv. no. 217, 11-12-1642. |
| 1645 | Leiden | 31.5 | Pound | Warp | Cloth | Man | RAL, Hallen, inv. no. 218, 15-09-1645. |
| 1648 | Leiden | 3.5 | Pound | Unknown | Baize | Woman | Posthumus, *Bronnen* (vol. V), no. 30, par. 30. |
| 1648 | Leiden | 13 | Pound | Unknown | Serge | Woman | Posthumus, *Bronnen* (vol. V), no. 30, par. 31. |
| 1651 | Leiden | 10.5 | Pound | Warp | Cloth | Girl | RAL, Hallen, inv. no. 127j. |
| 1655 | Leiden | 3.5 | Pound | Weft | Wool | Woman | Posthumus, *Bronnen* (vol. V), no. 343. |
| 1655 | Leiden | 7.5 | Pound | Warp | Wool | Woman | Posthumus, *Bronnen* (vol. V), no. 343. |
| 1656 | Leiden | 14 | Pound | Warp | Cloth | Boy | RAL, Hallen, inv. no. 127j. |
| 1663 | Leiden | 3 | Pound | Unknown | Baize | Woman | Posthumus, *Bronnen* (vol. V), no. 30, par. 30. |
| 1663 | Leiden | 10 | Pound | Unknown | Serge | Woman | Posthumus, *Bronnen* (vol. V), no. 30, par. 31. |
| 1665 | Leiden | 7 | Pound | Unknown | Unknown | Unknown | Posthumus, *Bronnen* (vol. V), no. 81. |
| 1667 | Leiden | 2.625 | Pound | Weft | Baize | Unknown | Posthumus, *Bronnen* (vol. V), no. 357. |
| 1667 | Leiden | 3.25 | Pound | Warp | Baize | Unknown | Posthumus, *Bronnen* (vol. V), no. 357 |
| 1670 | Leiden | 5.5 | Pound | Weft | Cloth | Man | RAL, Hallen, inv. no. 219, 16-10-1670. |
| 1670 | Leiden | 28 | Pound | Warp | Cloth | Man | RAL, Hallen, inv. no. 219, 27-02-1670. |
| 1674 | Leiden | 5 | Pound | Weft | Cloth | Man | RAL, Hallen, inv. no. 219, 22-03-1674 |
| 1677 | Leiden | 21 | Pound | Warp | Cloth | Man | RAL, Hallen, inv. no. 219, 04-03-1677 |
| 1678 | Leiden | 5 | Pound | Weft | Cloth | Woman | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1678 | Leiden | 19.25 | Pound | Warp | Cloth | Man | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1678 | Leiden | 22.75 | Pound | Warp | Cloth | Man | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1678 | Leiden | 19.25 | Pound | Warp | Cloth | Woman | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1678 | Leiden | 22.75 | Pound | Warp | Cloth | Woman | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1678 | Leiden | 4.3 | Pound | Weft | Cloth | Man | RAL, Hallen, inv. no. 219, 02-06-1678 |
| 1679 | Leiden | 24.5 | Pound | Warp | Cloth | Man | RAL, Hallen, inv. no. 219, 27-06-1679 |

## APPENDIX *Continued*

| *Year* | *Place* | *Piece rate in stuivers* | *Unit of yarn* | *Type of yarn* | *Branch of textile industry* | *Sex* | *Source* |
|---|---|---|---|---|---|---|---|
| 1679 | Leiden | 5 | Pound | Weft | Cloth | Man | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1679 | Leiden | 5.25 | Pound | Weft | Cloth | Man | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1679 | Leiden | 5.5 | Pound | Weft | Cloth | Man | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1679 | Leiden | 19.25 | Pound | Warp | Cloth | Man | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1679 | Leiden | 21 | Pound | Warp | Cloth | Man | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1679 | Leiden | 22.75 | Pound | Warp | Cloth | Man | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1679 | Leiden | 30.8 | Pound | Warp | Cloth | Man | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1679 | Leiden | 19.25 | Pound | Warp | Cloth | Woman | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1679 | Leiden | 21 | Pound | Warp | Cloth | Woman | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1679 | Leiden | 22.75 | Pound | Warp | Cloth | Woman | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1679 | Leiden | 24.5 | Pound | Warp | Cloth | Woman | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1679 | Leiden | 31.5 | Pound | Warp | Cloth | Woman | Posthumus, *Bronnen* (vol. V), no. 496. |
| 1680 | Tilburg | 10 | Pound | Warp | Cloth | Man | RHCT, Schepenbank, inv. no. 4624. |
| 1683 | Leiden | 28 | Pound | Warp | Cloth | Man | RAL, Hallen, inv. no. 219, 08-07-1683. |
| 1687 | Zwolle | 1.75 | Pound | Karrel | Hemp/ flax | Unknown | HCO, Stadsarmenkamer, inv. no. 3906. |
| 1687 | Zwolle | 1 | Pound | Unknown | Hemp/ flax | Children | HCO, Stadsarmenkamer, inv. no. 3909. |
| 1687 | Zwolle | 0.75 | Pound | Unknown | Hemp/ flax | Children | HCO, Stadsarmenkamer, inv. no. 3908. |
| 1699 | Leiden | 5.5 | Pound | Weft | Cloth | Man | RAL, Hallen, inv. no. 220, 05-11-1699. |
| 1722 | Leiden | 10 | Pound | Weft | Cloth | Man | RAL, Hallen, inv. no. 221, 19-08-1722. |
| 1730 | Leiden | 21 | Pound | Warp | Cloth | Man | RAL, Hallen, inv. no. 221, 17-11-1730. |
| 1741 | Leiden | 19.25 | Pound | Warp | Cloth | Man | RAL, Hallen, inv. no. 221, 23-02-1741. |
| 1769 | Leiden | 3.25 | Skein | Coloured/ blue yarn | Unknown | Unknown | Posthumus, *Bronnen* (vol. VI), no. 339, par. 31. |
| 1769 | Leiden | 2.5 | Skein | Warp | Serge | Unknown | Posthumus, *Bronnen* (vol. VI), no. 339, par. 31. |
| 1769 | Leiden | 19.25 | Pound | Warp | Cloth | Unknown | Posthumus, *Bronnen* (vol. VI), no. 339, par. 31. |
| 1769 | Leiden | 21 | Pound | Warp | Cloth | Unknown | Posthumus, *Bronnen* (vol. VI), no. 339, par. 31. |
| 1769 | Leiden | 22.75 | Pound | Warp | Cloth | Unknown | Posthumus, *Bronnen* (vol. VI), no. 339, par. 31. |

## APPENDIX *Continued*

| *Year* | *Place* | *Piece rate in stuivers* | *Unit of yarn* | *Type of yarn* | *Branch of textile industry* | *Sex* | *Source* |
|---|---|---|---|---|---|---|---|
| 1777 | Amersfoort | 2.75 | Skein | Warp | Wool | Unknown | HUA, Diaconie, inv. no. 912, 04-10-1777. |
| 1777 | Amersfoort | 2.5 | Skein | Warp | Wool | Unknown | HUA, Diaconie, inv. no. 912, 04-10-1777. |
| 1777 | Amersfoort | 2.25 | Skein | Warp | Wool | Unknown | HUA, Diaconie, inv. no. 912, 04-10-1777. |
| 1777 | Amersfoort | 2.125 | Skein | Weft | Wool | Unknown | HUA, Diaconie, inv. no. 912, 04-10-1777. |
| 1778 | Amersfoort | 2.5 | Skein | Coloured | Wool | Unknown | HUA, Diaconie, inv. no. 912, 19-01-1778. |
| 1781 | Gouda | 2.5 | Skein | Warp | Wool | Unknown | HUA, Diaconie, inv. no. 912, 12-02-1781. |
| 1782 | Tilburg | 17.5 | Pound | Warp | Cloth | Unknown | RHCT, Schepenbank, inv. no. 5997. |
| 1782 | Tilburg | 7.5 | Pound | Weft | Cloth | Unknown | RHCT, Schepenbank, inv. no. 5997. |
| 1782 | Tilburg | 3 | Pound | Weft | Cloth | Unknown | RHCT, Schepenbank, inv. no. 5997. |
| 1790 | Haaksbergen | 1.5 | Skein | Unknown | Flax | Unknown | Boot, 'Silezische en andere linnengarens', p. 49. |
| 1796 | Leiden | 15.75 | Pound | Warp | Cloth | Unknown | RAL, Werkhuis, inv. no. 1, 19-04-1796. |
| 1800 | Amersfoort | 2.5 | Skein | Warp | Cloth | Unknown | NEHA, Bijz. Coll., inv. no. 064-3. |
| 1800 | Amersfoort | 7 | Pound | Weft | Cloth | Unknown | NEHA, Bijz. Coll., inv. no. 064-3. |
| 1800 | Leiden | 21 | Pound | Warp | Cloth | Unknown | RAL, HG Weeshuis, inv. no. 3711. |
| 1800 | Leiden | 22.75 | Pound | Warp | Cloth | Unknown | NEHA, Bijz. Coll., inv. no. 064-3. |
| 1800 | Leiden | 8 | Pound | Weft | Cloth | Unknown | NEHA, Bijz. Coll., inv. no. 064-3. |
| 1800 | Tilburg | 14.875 | Pound | Warp | Cloth | Unknown | NEHA, Bijz. Coll., inv. no. 064-3. |
| 1800 | Tilburg | 4.75 | Pound | Weft | Cloth | Unknown | NEHA, Bijz. Coll., inv. no. 064-3. |

*Sources:* The data in this appendix are derived from several primary and secondary sources (see the last column for specific references). Some scattered data come from the literature, mostly for Leiden (Posthumus, *Geschiedenis*; van Zanden, 'Revolt'), but also from other locations: Boot, 'Silezische en andere linnens').

The other data are all derived from primary source material or published sources. Posthumus's various editions of source material from the several Leiden textile industries have been very helpful. Apart from his edition of the merchant's accountbook (*Bronnen* V, no. 496), his editions contain various more prescriptive sources, such as regulations for the different *neringen* (*Bronnen* V, nos. 30, 343 and *Bronnen* VI, no. 339) and requests to the governors or city council (*Bronnen* V, nos. 81, 357), providing data on current spinning wages in particular years. The registrations ('Books of questions') of conflicts in the cloth industry (RAL, Hallen, inv. nos. 217–21) were useful for gathering piece rates of spinners in many other years, particularly after 1670. Furthermore, I have made use of apprenticeship accounts for wages of Leiden children (RAL, Hallen, inv. nos. 127a and 127j).

For Tilburg, the huge collection of court records available in the Tilburg Regional Archive was particularly informative (RHCT, Schepenbank, inv. nos. 1907, 2019, 4624, 5997). For Zwolle, information about flax and hemp spinning wages was derived from poor-relief records as well as the records from the (short-lived) workhouse (HCO, Stadsarmenkamer, inv. nos. 3906-3909). Another spinning house, established in late eighteenth-century Utrecht, provided additional data on other small Dutch towns (Het Utrechts Archief (HUA), Diaconie, inv. no. 912).

And, finally, a singular textile entrepreneur's diary was traced at the NEHA, Bijzondere Collecties, inv. no. 064-3, providing information on spinning wages in both Leiden and Tilburg around 1800.

 