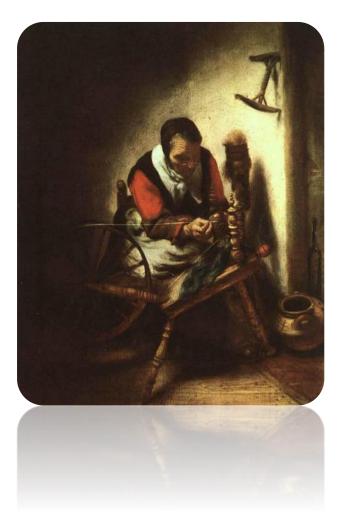
Where did all the workers go?





Women, industrialization, and the decline of hand spinning in Europe and Asia

Inaugural lecture, Elise van Nederveen Meerkerk Utrecht University, 8 September 2022, 16:15



Mijnheer de rector magnificus, Geachte aanwezigen,

For the sake of inclusion, I will give this lecture in English.

Introduction

You are all sitting here with your clothes on. Probably, many of you today have even tried their best to wear something a little more special than usual. But have you ever wondered how much labour is needed to make a dress or a blouse and trousers to be fully clothed? Assume that there are about 150 people in this room, one-third of whom are wearing a dress, and the rest is wearing trousers with a shirt or a blouse. Now, add to this another 50 togas, assuming (and hoping) that all professors in the room are wearing them over their regular clothes.

Table 1 - Thread needed to clothe us all

			Required number of 8-hour workdays		
	km of thread per piece	total km needed	1 spinning machine 2022	labour time for 1 hand spinner 1700	
150 people with trousers	10		0.4		
150 people with blouses	10	1500	0.4	1875	
50 people with dresses	15	750	0.2	938	
50 togas	20	1000	0.3	1250	
		4750	1.2	5938	
time needed			1.2 days	more than 20 years!	

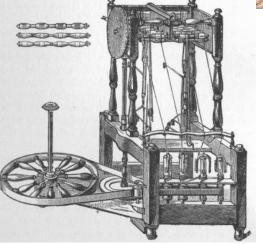
Together, your clothes would require about 4,750 kilometers of yarn: one long thread running from here to Tehran, in Iran. A modern spinning machine would be capable of making such an amount in about 10 hours, so a little over one 8-hour working day. Imagine, however, that all of this thread would have to be

spun by hand! One hand spinner in India, on a *charka* cotton spinning wheel, would spin about 10 meters per hour, and a hand spinner of wool in Europe would spin even a bit less, around 9 meters per hour. As the table indicates, this means that one hand spinner would have to work almost 6,000 8-hour working days, or, more than 20 years, to clothe you all!¹

This example makes clear how dearly hand-spinners must have been needed for textile production before the Industrial Revolution at the end of the eighteenth century; not only to make clothing, but also many other products in which textiles were use – ranging from fishing nets to sails for ships. Millions and millions of people – predominantly women – have since pre-historic times been engaged with hand-spinning to provide all of this yarn. When cotton cloth had become increasingly popular in the seventeenth and eighteenth centuries, the need for cotton yarns increased spectacularly, and most of it came from Asia. Most spinners in Europe were not able to spin fine cotton, and only spun wool and linen. Spinning formed such a bottleneck in the production process of fabrics, that it was the first to be mechanized, kickstarting the industrial revolution. In 1767 the spinning jenny was introduced, allowing one hand-spinner to spin multiple threads at a time. Later, water power and steam power were added to drive increasingly larger spinning machines, of which you can see some pictures here.



Crompton's spinning mule, 1779



Arkwright's water frame, 1775

Within the relatively short time span of a few decades after the invention of the first spinning machines, millions of home-based hand-spinners lost their work. Where did all these labourers go? Interestingly, the process of massive abandonment of hand-spinning occurred almost everywhere in the world, though clearly with a different timing and at a different pace. In this inaugural lecture, I would like to make a start to explore how and why this transition took place, taking a global comparative approach. I will provide examples from Europe and Asia, most notably from four countries: England, India, Japan, and colonial Java. This lecture is just a starting point. It aims to lay the foundation for a more systematic comparative book project, in which I hope to establish possible trends as well as explanations for the significantly different developments in women's work activities during and after industrialization across the globe.



Where did all the workers go?

Relevance for today



When I first Googled the title of my lecture, to see if it was original enough, I only got hits referring to the present-day overheated labour market. Why do we experience such a shortage of workers at the moment all over the world? Explanations for the current disappearance of workers are manifold. They range from the covid-measures taken in recent years to more structural explanations such as ageing of the population. One of the less well-known facts is that during covid, with the rise of home-based work, many people realized that they wished to spend more time with their family instead of commuting and working long hours per day and they decided to work less. It is thus very important to take such households' decisions on how members allocate their labour power into serious consideration for explaining larger economic phenomena. If this is true for the present, this certainly also holds true for the past, when in many periods the household perhaps formed an even more crucial interdependent unit of individual workers. Not coincidentally, the ways in which household members of different sexes and generations have dealt with their labour allocation choices has been a central question running through my academic work as a common thread.

Relevance for economic historians

Why is it relevant to know about the lost economic activities of hand-spinning women for the field of economic history? There are several important debates to which such knowledge may contribute, of which I only mention a few here.

First of all, there is a longstanding debate on living standards during the Industrial Revolution. How were households able to survive under structurally changing economic conditions, such as industrialization? This debate has especially been rampant for Great Britain since the nineteenth century.² In recent decades more attention has been given to women's contributions to the household income, and there were even a few studies on hand-spinning and the consequences of its disappearance in Europe.³ Still, there is much work to be done on women's earnings in cash and in kind, within and outside the British context.

A second debate concerns the rise of the male breadwinner model. Some economic historians have argued that with industrialization, the wages of men rose, allowing for a male breadwinner society. According to this model, the man worked outdoors, the woman stayed at home, tending to unpaid household chores and childcare, and children would go to school. This would have fit societal gender norms on what were proper roles for men and women. Households would have happily and harmoniously adjusted the labour allocation of the different members to this ideal.⁴ Nevertheless, in reality, real wages for men only started to rise decades after the demise of hand-spinning. Were societal ideals about women's role indeed the driver of their withdrawal from the labour market, or was it rather the narrowing of opportunities? How did the loss of their work affect the status of women in the household?⁵ I am not only talking about the position of individual women with regard to their husbands and children, but also about differences between groups of women, for instance coming from different regions or distinct social classes. And, finally, how did the loss of hand-spinning affect different regions of the world, given their uneven timing and pace of industrialization?

Third, studying the eradication of hand-spinning contributes to one of the most fascinating puzzles in economic history: the Debate on the "Great Divergence". Why was it England, and not other countries in Europe, or China, which industrialized first? One prominent answer to this question has been provided by Robert Allen. Based on historical wage series, he argues that wages were remarkably high in England on the Eve of the Industrial Revolution around 1750. At the same time, capital was relatively cheap because interest rates were low, and energy, especially coal, was much cheaper in Britain than elsewhere in the world. This is why it made sense here, and not so much in other countries, to invest in technology and machines that saved on labour costs. Women and children too, were part of what Allen called the "high wage economy" before industrialization. Because their wages were relatively high too, and rising in the eighteenth century, the new spinning machines were invented to raise labour productivity in spinning.8 In the rest of Europe and more so in Asia, labour was much cheaper, so there it made sense to continue to use many workers for textile production for a much longer time.9

Allen's view has not gone uncriticized. Recently, Jane Humphries and Benjamin Schneider have revisited his data and method, and claim that his estimates of what hand-spinners earned were far too optimistic. Because spinners were paid by the piece, their earnings depended very much on how much time they had available. When we take into account how productive spinners were, their daily earnings were in fact much smaller! Humphries and Schneider rather suggest that it was the low productivity of hand-spinning and the low quality of hand-spun yarn in a period when demand rose spectacularly that explain the wish for new technologies. While this debate has so far largely concerned the case of Britain, including other European and non-European countries into the equation by comparing hand-spinners' foregone earnings in the course of industrialization would be most enlightening. Especially beyond Europe and the United States, there is still a world to win in the research on changing living standards. Not only did a lot of countries in the so-called "Global South" experience the consequences of rapid globalization, they also had to

endure long periods of colonial rule. Studies of how ordinary households – men, women and children – in colonized societies coped with these challenges are still in their infancy.¹¹

A fourth debate I wish to mention here is that on the "Asian Little Divergence". This refers to the question as to why Japan, compared to other countries in Asia, industrialized relatively early and effectively, becoming a modern economy in the first half of the twentieth century. Compared, for instance, to China and India, which also started to industrialize in the late nineteenth century, Japan was successful whereas the other two former economic giants were not. Interestingly, cheap female labour played a major role in Japan's rapid transformation of the textile industry, more so than in most other industrializing countries. It thus seems likely that the role of women in industrialization, as well as their socioeconomic position following this transformation, is an important factor to reckon with when studying historical economic development.

Case studies

Before I dive into the specific developments in Great Britain, Japan, India and colonial Indonesia, I would like to briefly explain why I chose these four case studies. Britain was the first country to industrialize, which means it was both looked upon as a model, and some developments may have shown a different timing, possibly with more trial and error. Japan was a late but relatively successful industrializer, and for a long time the only industrial power in the non-Western world; India and Java were both colonized by the British and the Dutch respectively. Both were regions with a long tradition of textile production, India being the major cotton cloth exporter until the eighteenth century, while Java mostly catered to its own relatively large population and exported to other islands in the Indonesian archipelago. The specific initial conditions of both colonized countries had significantly differentiating effects for women's work, as a comparison between India and Indonesia will show.

England

1743

Man, to the Plough,
Wife, to the Cow,
Girl, to the Yarn,
Boy, to the Barn,
And your Rent will be netted.

1843
Man, Tally Ho
Miss, Piano,
Wife, Silk and Satin,
Boy, Greek and Latin,
And you'll all be Gazetted.



This poem was made around 1850 by John Robey, to illustrate how much the household economy had changed in 100 years' time. ¹⁴ From hard-working family members engaged in agriculture and spinning yarn in the 18th century, men, women and children in the mid-19th century would have converted into creatures that passed their time with hobbies and idleness. Obviously, Robey was very critical about this transformation, and he thus felt the need to exaggerate. He also was incorrect to suggest that all formerly industrious farmer families were rich enough to afford a life of leisure. In the nineteenth century, there was still a lot of poverty and people worked hard. He was right though, that no girl or woman produced yarn by hand anymore.

In the eighteenth century, this had indeed been very different. Craig Muldrew has estimated that in the wool industry alone, there was employment for around 650,000 wool hand-spinners by 1750.¹⁵ Moreover, with the increasing popularity of cotton cloth, cotton spinning also increased, especially in the region of Lancashire. Before mechanization, we should at least reckon with tens of thousands of cotton hand-spinners in this region, as well as tens of

thousands of women spinning flax. This means that about a quarter of all British girls and women must have been engaged in hand-spinning in the mideighteenth century.

What happened to all of these women? In fact, this differed very much according to region and period. First, let us look at a cotton-producing region such as Lancashire. In the 1760s, when the first spinning jennies were installed, which were still relatively cheap and small enough to operate in the house, a proportion of hand-spinners transitioned to jenny spinning, for much higher wages. However, a jenny could spin about 8 to 16 times more than a single hand spinner, so this only provided work for a proportion of them. Many more abandoned spinners moved into the preparatory stages of yarn production, such as carding and roving the cotton. A few years later, with further mechanization of carding and roving, and the introduction of mule spinning, some women went to factories, but mostly not as spinners. Mule spinning became a highly skilled male occupation. For the first time in British history, spinning became an important job for men. The remainder of formerly hand-spinning women in these regions became primarily focused on housewifery (if they were wives of the well-paid factory spinners), 16 or they started handloom weaving, which was mechanized several decades later. This means that the age-old tradition of male weavers and female spinners had broken down in the specialized cotton areas!

In other regions, where wool was predominantly spun, effects were more mixed. As mentioned, wool spinning had been much more important in England than cotton spinning, concentrated in Yorkshire, but present all over the British countryside. The spinning of wool mechanized a bit later than cotton spinning, but when it did, the consequences were drastic. Demand for woolen textiles declined and employment as well as wages overall dropped. Many women became unemployed, and only a few women could find work in the factories, leading to serious reductions of the family income. There was not enough work for women in agriculture to employ them. This means that thousands and thousands of women lost their employment. Interestingly, before mechanization of the textile industry, male wages in agriculture could be kept

low, because employers counted on men's wages being supplemented by wool spinning. Towards the end of the 18th century, wages for male agricultural workers had to be raised exactly because of the loss of hand-spinning.¹⁸

Japan

Traditionally, textile work in Japan was women's work. In the Tokugawa period, from 1600 to 1867, Japanese peasants had started to diversify their incomes by taking on non-agrarian byemployment, such as silk-reeling and cotton weaving. These economic activities on the countryside, including spinning, were primarily done by women.¹⁹ In contrast to England, cotton was indigenous to Japan. Although estimates are very rough, some historians have assessed that around 1850, just before Japan opened up to world trade, around three million farm household members were working in cotton production, which was about 20 per cent of all women. The great majority of these women and girls will have been cotton hand spinners.²⁰



Japan was the first country in Asia to mechanize its industrial sector on a large scale, supported by State measures. The first industry to embark on mechanization in the 1880s, was textile production – most notably cotton spinning. As spinning came to be mechanized, factories employed predominantly young, unmarried migrant women from the countryside, about half of whom were 18 years or younger. Although young women were used in many mechanizing textile industries worldwide, in Japan they formed the bulk of the workforce, and this remained to be the case until the second World War. The girls usually stayed on for a relatively short period of time, between 1 and 3 years on average, and they typically lived in dormitories as they were recruited from further-off rural areas and were often too young to take care of themselves. 22

The younger of the millions of Japanese hand-spinners losing their work thus moved to spinning in factories, which was quite different from England, where men mostly took over spinning. But what happened to all of the adult women who used to spin? Did they become unemployed, as to a large extent happened to farmers' wives in the British countryside? I believe not. In a recent publication, my PhD student Aditi Dixit and I have argued that in Japan in the late nineteenth and early twentieth century, a distinct household division of labour secured work for many rural men, women and farmers' sons.

Table 2 - Schematic labour division in Japanese households, early 20th century

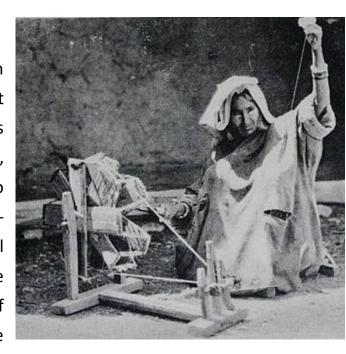
Husband	Agriculture, farm owner			
Wife	Agriculture, weaving			
Eldest son	Agriculture, heir of family farm			
Younger son(s)	Wage work in other farm or city			
Daughter(s)	Textile factory (av. 3 years)			

Until World War II, the number of farms hardly declined, and farm size stayed about the same. So, there were a lot of small, family farms, about 5.5 million. In the larger and medium-sized farms, adult women were weaving cotton, or were involved in silk reeling next to their agricultural tasks. The poorer farmers often sent their daughters to the factories, for some extra income. For them, there was not so much work on the family farm. In the typical peasant family with three to five children, the male head of household was crucial for the maintenance of the small-scale farm. The first-born son would inherit the property, and his involvement was thus necessary for the continuation of the farm. Younger brothers, who would not inherit the farm, either went out to perform wage work in agriculture elsewhere, or — especially after the First World War — migrated to urban areas to find work in trade, transport or heavy industry.

The housewife was needed for year-round agricultural as well as reproductive tasks, and in some contexts could earn considerable additional income with proto-industrial textile activities.²³

India

Like in Britain, the traditional division between hand-spinning and -weaving in India was that most spinners were women and most weavers were men. In contrast to England, however, this gender-division of labour was also influenced by caste. So, while most hand-spinners in India were women from agricultural households, in some areas, such as the Coromandel Coast, certain male members of the untouchable or "Dalit" caste formed the



majority of spinners. Hand-weaving too, was influenced by caste. There was a difference between the more skilled and luxury woven goods, which were produced by men from higher castes, and the weaving of coarser cloth, which was also done by lower-caste people. Although women and girls were formally not employed as weaver, many of them learned the trade by assisting their husbands and fathers. Especially in Northeast India, there were quite a few female hand-weavers active.²⁴

With the emerging imports of cotton yarns from foreign factories, especially from its colonizing power Britain, hand-spinning in India had rapidly declined after 1850, and it was mostly gone by 1910. The great majority of the rural hand-spinners were not coming from weaving households, and this explains why they did not go into hand-weaving. This was true for both female and male Dalit hand-spinners. Hand-weaving became even more confined to specific castes of weavers.²⁵ For hand-weaving households after the mechanization of spinning, the story was probably a bit different. Some male

weavers took an extra loom in the house, which may have meant that their wives who had formerly spun moved into weaving. Some households perhaps specialized in handloom warping. Anyhow, we know that these textile workers were very poorly paid.²⁶

As opposed to Britain and Japan, women were hardly employed in the textile factories that emerged in India in the late nineteenth century. Aditi Dixit and I have shown that this was related to the quite low productivity in Indian agriculture, which caused a large flow of male migrants from the countryside to the emerging textile factories in Bombay and Ahmedabad since the late nineteenth century. So, in India it was men, not women who provided capitalist textile employers with the so dearly wanted supply of cheap labourers to their factories.²⁷ Most women who had formerly spun, stayed in the countryside. Many of them had married very young and remained on the family farm working for subsistence, while their husbands found seasonal work in cities or as wage labourers on other farms. Tirthankar Roy has estimated that between 1875 and 1900, so the time in which hand-spinning disappeared, the agricultural workforce feminized tremendously, from about 60 to 75 per cent women. In the time of one generation, the number of Indian women available for agriculture rose with 22 million, while the number of men only declined with about 10 million.²⁸

Table 3 - India: men and women in agriculture, 1875 and 1900

	1875	1900	Change 1875-1900
Share of workers in agriculture	73.4%	74.9%	+ 1.5 percent point
Men	34.5 million	24.6 million	- 9.9 million
Women	51.8 million	73.8 million	+ 22.0 million

Thus, despite modest industrialization, fueled by male workers, in total, the agricultural workforce grew because of the influx of women! All of these labourers were in fact not needed in agriculture. This implies that the loss of

hand-spinning created massive un- and underemployment for about 12 million rural women in India.



Colonial Indonesia

Apart from Japan and India, which both experienced – successful and less successful –transitions to mechanized textile industry, it is interesting to look at a colonized region that did not industrialize on a significant scale before independence. Before 1600, Indonesian elites mostly consumed cotton and silk cloth from China and India, in exchange for spices and other goods. Most peasants produced cloth for their own use. In the seventeenth century, the Dutch East India Company (VOC) tried to gain control over trade in the Dutch East Indies, in particular Java and the 'spice islands' of the Moluccas. The VOC's interference in the region considerably raised prices of South- and East-Asian cloth over the course of the seventeenth century. ²⁹ In response, domestic cotton spinning and weaving on the Indonesian islands expanded between the late seventeenth to the early nineteenth centuries, because imports became so

expensive.³⁰ As a result of this growing indigenous production, the VOC started collecting cotton thread produced by the local Indonesian population to satisfy the increasing demand for cotton yarn in Europe. In some regions, the VOC even imposed a tax on the local population to be paid not in cash, but in yarn.³¹

Both hand-spinning and -weaving of cotton were thus traditionally women's work in Indonesia. They were usually peasant wives, who spun and wove in the agriculturally slack months. They used cotton that they cultivated themselves, or bought in a local market. Although hand-spinning remained existent until the late nineteenth century, it rapidly declined and almost completely disappeared towards the end of the century, except in some peripheral regions. Factory cotton yarns were increasingly imported from Europe, and later from Japan. As opposed to India, where textile factories were established in the late nineteenth century, the Dutch did not bother to mechanize textile production in colonial Indonesia until the 1930s. This means that factory work was not an option for the millions of hand spinners that lost their work as a result of mechanization.

Instead, hundreds of thousands of peasant women shifted from hand-spinning to hand-weaving after 1860. My former work has shown that the imports of Dutch factory-made cloth were not highly successful in Java, because the quality of the cloth could not compete with the durability of indigenous products. Until the First World War, indigenous hand-weaving rose spectacularly, and colonial officials reported that in some regions [and I quote] "There is hardly a quarter, a hamlet, or a house where the clattering of the loom does not resonate. That which the industrious mother of the house produces in excess of what is needed to clothe the family she brings to the market." [end of quote]³² It made sense to shift from hand-spinning to weaving, because the profits that could be gained from selling woven cloth on local markets were much higher than for spun yarn. Nevertheless, the number of hand-spinners had probably been larger than the number of hand-weavers required to spin the imported factory yarns. So, it is plausible that a share of the former hand-spinners retreated into agricultural work, either for subsistence, or in the

emerging plantations owned by Europeans, where they were badly treated and poorly paid.

Conclusion: Patterns in Women's work

From this first analysis of the disappearance of hand-spinning, it is clear that there were immense regional differences in terms of timing as well as consequences for women's work. What is clear, is that within a relatively short period of time, even if at different moments, as this graph shows, millions of hand-spinners lost their gainful employment, ranging from almost a million in Britain, to about 12 million in colonial India. It appears that what happened to these women was dependent on two factors: the traditional division of labour in the textile industry in combination with the alternatives for them in the labour market. These alternatives, in turn, hinged on the degree of structural change of the economy and social norms.

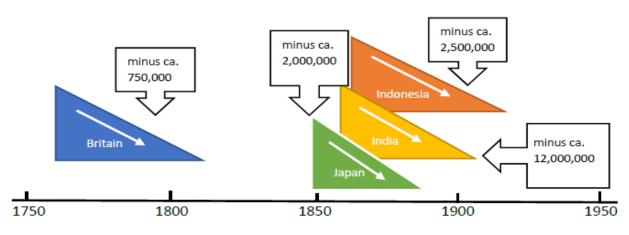


Figure 1 - Loss of hand spinners in our 4 case studies

In Britain and India, hand-weaving had traditionally been men's work, and hand-spinning women's work. With the introduction of mechanized production, this age-old labour division changed, and the better paid factory spinners were mostly men. In both regions, peasant households suffered the most, and there were few alternatives in agricultural work for the former hand-spinners. However, factory weaving and other jobs were opened up to both men and

women in England, thus providing alternatives at least in the industrial regions. In India, however, factories largely excluded women, because there were so many cheap male labourers available who could not find work in the countryside. Also, stricter gender and caste traditions play a role in defining who could do which work.

In both Japan and Indonesia, in contrast, hand-weaving had traditionally been performed by women, and this formed a viable alternative for hand-spinners when cotton yarns were increasingly factory-made. In Japan, which industrialized quickly, there was the additional opportunity for peasant daughters to work for a few years in a spinning factory. This was different from Indonesia, where the colonial state did not invest in mechanized textile production. So, while part of the hand-spinners found employment in hand-weaving, there must have also been many Indonesian women going into subsistence or commercial agriculture or trade.

How do these observations relate to the historical debates I mentioned in the beginning of this lecture? With regard to living standards, there were clear differences between households within countries. It seems that peasant households in England and India lost out due to the loss of the extra income of rural women from hand-spinning. In both cases, there were not many alternatives. However, for British women in industrial cotton regions, especially Lancashire, there were opportunities to contribute to the family income by working in the emerging factories, not as spinners, but as weavers and in ancillary textile jobs. In wool production, some new opportunities for women in hand-weaving arose, but in the early 1800s, the wool industry had shrunk considerably. In India, women were likely to move into subsistence agriculture, or agricultural wage work, which was hardly available. As mentioned, only a small percentage of women went to the emerging textile factories. There was some differentiation in India too: traditional handweaving families were able to continue and even increase their output, and sometimes women informally took on hand-weaving. But they were an exception. In contrast, both in Japan and Indonesia, hand-weaving was greatly stimulated by the use of factory yarns.

This meant that those women who shifted from hand-spinning to weaving probably made a greater contribution to the household income than before.

With regard to the male breadwinner model, historian Ivy Pinchbeck has argued that for Lancashire textile households, the relatively high wages paid to men in the spinning factories relieved married women from the necessity to perform paid work. They were able to withdraw into the domestic sphere, attending to household and childcare duties and enjoying increasing leisure and consumption.³³ More recent studies have shown, however, that for much of the nineteenth century, such households were rather the exception than the rule. For many more, especially rural families, the loss of hand-spinning both in the wool and cotton sectors led to more poverty. Thus, the male breadwinner model was far from attainable for the majority of the British population, and structural change in first instance led to under- and unemployment for many women in the countryside.³⁴ Only decades later, around the turn of the twentieth century, would the male breadwinner model become feasible for large parts of the population. In colonized Asian countries the male breadwinner model would not gain ground, simply because male incomes generally remained insufficient to support this on a large scale. In India and Indonesia this was supported by colonial policies keeping wages for men very low, which served the business demands of European and indigenous elites. Interestingly, colonial authorities and missionaries did propagate the male breadwinner ideology for indigenous households around 1900, in the context of their "civilizing missions", but economic interests weighed more heavily.³⁵

Finally, with regard to the **Great and Little Divergence debates**, it is clear that more in-depth studies on the level of the household into the multiple pathways to industrial societies are wanted. As, for instance, the comparison between India and Japan shows, the different opportunity costs for women's labour led to distinct patterns in the mechanization and efficiency of their textile industries. In combination with state policies stimulating the general education of girls in Japan, something mostly neglected by the colonial states in India and Indonesia, women's role in human capital formation and economic growth can

hardly be underestimated. These factors have all contributed to the fact that in many regions of the Global South today, the bulk of textile production is still being performed by women, under difficult circumstances, and mostly poorly paid.

Dankwoord

Please allow me to speak some words of thanks in Dutch.

In een tijdspanne van vier jaar, toen ik mijn vorige rede uitsprak, kan er veel veranderen. Maar toch blijft er gelukkig ook veel hetzelfde.

Destijds was het in Nijmegen, nu bij mijn Alma Mater, de Universiteit Utrecht. In eerste instantie wil ik de vorige decaan van de Faculteit Geesteswetenschappen, Keimpe Algra, en alle andere leden van het Faculteitsbestuur hartelijk danken voor het in mij gestelde vertrouwen om deze leerstoel in het leven te roepen. Tevens kijk ik uit naar de samenwerking met onze nieuwe decaan, Thomas Vaessens. Ook het Departementsbestuur van Geschiedenis en Kunstgeschiedenis, en vooral Leen Dorsman, ben ik veel dank verschuldigd.

Net als vier jaar geleden wil ik graag al mijn collega's bedanken van de instellingen waar ik de afgelopen tweeëntwintig jaar werkzaam ben geweest: Universiteit Utrecht, Radboud Universiteit Nijmegen, Universiteit Wageningen, Internationaal Instituut voor Sociale Geschiedenis, Universiteit Leiden. Het zijn nog steeds te veel collega's om stuk voor stuk te noemen, maar elk op jullie eigen manier hebben jullie bijgedragen aan mijn academische vorming en het feit dat ik hier vandaag sta. Enkelen wil ik echter met naam en toenaam noemen, in chronologische volgorde.

Gerard Trienekens, Maarten Prak en Jan Luiten van Zanden vergrootten met hun prachtige colleges mijn enthousiasme voor de sociale en economische geschiedenis tijdens mijn studie in de jaren '90. Zij hadden oog voor zowel de grotere sociale en economische structuren als de ervaringen van de "gewone man en vrouw" in de geschiedenis. Gerard, jouw verhalen over spinsters vormden de inspiratie voor mijn proefschrift en hebben mij, zoals je vandaag hebt gehoord, zevenentwintig jaar later nog niet losgelaten. Maarten en Jan Luiten, met jullie heb ik de laatste vijf jaar intensief en prettig samengewerkt en ons team verder uitgebouwd. Jan Luiten las een eerdere versie van deze oratie, waarvoor extra dank.

Jan Lucassen, Marcel van der Linden, en Lex Heerma van Voss, hebben mij, ieder op hun eigen wijze, gevormd en verder geïnspireerd om vergelijkend historisch onderzoek te doen naar arbeidsverhoudingen wereldwijd in mijn tijd op het IISG van 2000 tot 2012. Jan begeleidde mijn proefschrift vol enthousiasme en met veel vrijheid, Marcel had altijd oog voor de theorie en met Lex werkte ik samen aan verschillende historisch-vergelijkende projecten.

Manon van der Heijden en Leo Lucassen dank ik voor mijn tijd in Leiden, waar ik alle ruimte kreeg om mij verder te ontwikkelen als onderzoeker en bovendien ruime ervaring op te doen in het onderwijs, iets waar ik op het IISG natuurlijk weinig gelegenheid toe had.

Samen met Ewout Frankema bouwde ik tussen 2013 en 2017 aan de succesvolle groep aan de Wageningse Universiteit die inmiddels Economic and Environmental History heet. Vier jaar geleden stonden wij er anders voor dan nu, maar de goede herinneringen aan de jaren in Wageningen blijven, en ik hoop onze vriendschap ook.

In oktober 2018 ging mijn ERC-Project TextileLab van start. Sindsdien hebben wij zoveel gedaan met zijn allen. Corinne Boter, Sarah Carmichael, en Faheem Rokadiya dank ik voor de goede samenwerking. Met Aditi Dixit en Kate Frederick presenteerde en publiceerde ik bovendien veel gezamenlijk nieuw werk. Aditi, Kate, thanks so much for our wonderful collaboration: it was great fun! Kate and Corinne, thanks for your comments to an earlier version of this lecture! En natuurlijk wil ik Bianca Visser, de altijd kalme, drijvende kracht achter ons project, die ook in de organisatie van deze dag zoveel heeft betekent, hartelijk danken.

Vier jaar geleden zat mijn vriendin en briljante vakgenoot Janneke Raaijmakers nog in de zaal. Nu is zij er niet meer om lief en leed met elkaar te delen. Janneke, in mijn hart ben je er bij.

Henk, jij was een hele tijd niet in mijn leven, en toen plotseling weer wel. Daar ben ik zo gelukkig mee. Dank voor je optimisme, zachtheid, en: tegengas wanneer ik dat nodig heb.

Hanne, Yula, Yune en Myla, bedankt voor jullie vrolijkheid, steun en liefde. Mama, van jou heb ik zoveel geleerd. Bedankt voor je inspiratie en voorbeeld als studerende, werkende en liefhebbende moeder.

Lieve Rena en Noam, mijn geweldige kinderen. We hebben veel meegemaakt de laatste jaren. Dat was soms zwaar, maar we hebben elkaar – en onszelf – daardoor nóg beter leren kennen. Ik wens jullie toe dat jullie in alle vrijheid jullie talenten kunnen blijven ontwikkelen en van het leven kunnen genieten.

Ik heb gezegd.

¹ For historical productivity rates see: Virginia Postrel, *The Fabric of Civilization: How Textiles Made the World* (New York: Basic Books 2020), 49; Present-day productivity rates are gauged from: https://textilelearner.net/ring-spinning-machine-drafting-system/ (Accessed 26 July 2022).

² Porter (1851); J.H. Clapham, *An Economic History of Modern Britain* (Cambridge, Cambridge University Press), Vol. II; T.S. Ashton, "The Standard of Life of the Workers in England 1790-1830", *Journal of Economic History* 9:S2 (1949), 19-38; Peter Lindert and Jeffrey H. Williamson, "English Workers' Living Standards during the Industrial Revolution: A New Look", *The Economic History Review*, 36:1 (1983), 1-25; Charles Feinstein, "Pessimism Perpetuated: Real Wages and the Standard of Living in Britain during and after the Industrial Revolution", *The Journal of Economic History*, 58:3 (1998), 625-658.

³ Elise van Nederveen Meerkerk, *De draad in eigen handen. Vrouwen en loonarbeid in de Nederlandse textielnijverheid, 1581-1810* (Amsterdam: Aksant 2007); Craig Muldrew, "'Th'ancient Distaff' and 'Whirling Spindle': Measuring the Contribution of Spinning to Household Earnings and the National Economy in England, 1550–1770, *Economic History Review*, 65:2 (2012), 498–526; Jane Humphries and Benjamin Schneider, Spinning the Industrial Revolution", *Economic History Review*, 71:2 (2019), 126-155; Corinne Boter, "Living Standards and the Life Cycle: Reconstructing Household Income and Consumption in the Early Twentieth-Century Netherlands", *Economic History Review*, 73:4, (2020), 1050-1073.

⁴ Gary S. Becker, "A Theory of the Allocation of Time", *Economy Journal*, 75 (1965), 493-517; Jan De Vries, *The Industrious Revolution: Consumer Behavior and the Household Economy, 1650 to the Present* (Cambridge: Cambridge University Press, 2008).

⁵ Sarah Horrell and Jane Humphries, "Women's Labour Force Participation and the Transition to the Male-Breadwinner Family, 1790-1865", *Economic History Review*, 48:1 (1995), 89-117.

⁶ Corinne Boter and Pieter Woltjer, "The Impact of Sectoral Shifts on Dutch Unmarried Women's Labor Force Participation, 1812–1929", *European Review of Economic History*, 24:4 (2020), 783-817.

⁷ Robert C. Allen, *The British Industrial Revolution in Global Perspective* (Cambridge: Cambridge University Press, 2009).

⁸ Robert C. Allen, "The High Wage Economy and the Industrial Revolution: A Restatement", *Economic History Review*, 68:1 (2015), 1-22.

⁹ Steven Broadberry and Bishnu Gupta, "The Early Modern Great Divergence: Wages, Prices and Economic Development in Europe And Asia, 1500–1800", *Economic History Review*, 59:1 (2006), 2–31; R.C. Allen, J.-P. Bassino, D. Ma, C. Moll-Murata, and J.L. van Zanden, "Wages, Prices, and Living Standards in China, 1738–1925, in Comparison with Europe, Japan, and India", *Economic History Review* 64:S1 (2011), 8–38. ¹⁰ Humphries and Schneider, Spinning the Industrial Revolution, 153.

¹¹ Anne Booth, "Measuring Living Standards in Different Colonial Systems: Some Evidence from South East Asia, 1900–1942", *Modern Asian Studies* 46:5 (2012), 1145–1181; Pim de Zwart and Jan Luiten van Zanden, "Labor, Wages, and Living Standards in Java, 1680–1914", *European Review of Economic History* 19 (2015) 215–234; Van Nederveen Meerkerk, *Women, Work and Colonialism*, chapter 5; Jörg Baten and Laura Maravall, "The Influence of Colonialism on Africa's Welfare: An Anthropometric Study", *Journal of Comparative* Economics, 49:3 (2021), 751-775.

¹² Jean-Pascal Bassino and Pierre Van der Eng, "Asia's 'Little Divergence' in the Twentieth Century: Evidence from PPP-Based Direct Estimates of GDP per Capita", *Economic History Review*, 73:1 (2020), 185-208.

¹³ Patricia Tsurumi, "Female Textile Workers and the Failure of Early Trade Unionism in Japan", *History Workshop Journal*, 18:1 (1984), 3–27; Janet Hunter, *Women and the Labour Market in Japan's Industrialising Economy: The Textile Industry Before the Pacific War* (London: Routledge, 2003); Aditi Dixit and Elise van Nederveen Meerkerk, "Supply of Labour during Early Industrialisation: Agricultural Systems, Textile Factory Work and Gender in Japan And India, ca. 1880–1940", *The Indian Economic and Social History Review*, 59:2 (2022), 223–255.

¹⁴ Satiric poem by John Robey, c. 1850. Quoted in: Pinchbeck, *Women Workers*, 37.

¹⁵ Muldrew, "t'Ancient Distaff", 518.

¹⁶ Pinchbeck, Women Workers, 153.

¹⁷ Jane Humphries and Benjamin Schneider, Gender Equality, Growth, and How a Technological Trap Destroyed Female Work, Oxford Economic and Social History Working Papers Series, No. 191 (2021), 8.

¹⁸ Pinchbeck, Women Workers, 144.

¹⁹ M. Umemura, "Agriculture and Labour Supply in the Meiji Era", in Kazushi Okhawa, Bruce F. Johnston,

and Hiromitsu Kaneda, eds, *Agriculture and Economic Growth: Japan's Experience* (Princeton: Princeton University Press, 1970), 175–197, 190; Hunter, *Women and the Labour Market*; M. Tanimoto, "From Peasant Economy to Urban Agglomeration: The Transformation of "Labour-Intensive Industrialization" in Modern Japan", in G. Austin and K. Sugihara, eds, *Labour-Intensive Industrialization* (London: Routledge, 2013), 144–175, 148-150.

- ²⁰ Janet Hunter and Helen Macnaughtan, "Gender and the Global Textile Industry", in Els Hiemstra-Kuperus, Lex Heerma van Voss, and Elise van Nederveen Meerkerk, eds, *The Ashgate Companion to the History of Textile Workers*, 1650–2000 (Aldershot: Ashgate, 2010), 703–724, 307.
- ²¹ Tsurumi, "Female Textile Workers", 5. In 1897, 30% was even younger than 14 years old. Gary Saxonhouse and Y. Kiyokawa, "Supply and Demand for Quality Workers in Cotton Spinning in Japan and India", in R. Stern, G. Wright, and H. Patrick, eds, *The Japanese Economy in Retrospect. Selected Papers by Gary R Saxonhouse*, Vol. 1 (New Jersey: 2010), 253–287, 179.
- ²² Gary Saxonhouse and Gavin Wright, "Two Forms of Cheap Labor in Textile History", *Research in Economic History* 3:S4 (1984), 3–32, 5.
- ²³ Y. Masui, "The Supply Price of Labor: Farm Family Workers", in Okhawa, Johnston, and Kaneda, eds, *Agriculture and Economic Growth*, 222–249, 223-228.
- ²⁴ Samita Sen, *Women and Labour in Late Colonial India: The Bengal Jute Industry* (Cambridge: Cambridge University Press, 1999), 77.
- ²⁵ K.N. Chaudhuri, "The Structure of Indian Textile Industry in the Seventeenth and Eighteenth Centuries", *The Indian Economic and Social History Review* 11:2–3 (1974), 127–182; Thirtankar Roy, "Labour Intensity and Industrialisation in Colonial India", in Austin and Sugihara, eds, *Labour-Intensive Industrialization*, pp. 107–121.
- ²⁶ Conversation with Karuna Dietrich Wielenga, Friday 1 July 2022.
- ²⁷ Dixit and Van Nederveen Meerkerk, "Supply of Labour", 239.
- ²⁸ Tirthankar Roy, "Globalisation, Factor Prices, and Poverty in Colonial India", *Australian Economic History Review* 47:1 (2007), 73–94, 88.
- ²⁹ Hiroshi Matsuo, *The development of Javanese cotton industry* (Tokyo 1970) 2; Om Prakash, *The Dutch East India Company and the economy of Bengal, 1630-1720* (Princeton 1985).
- ³⁰ Barbara Watson Andaya, "The cloth trade in Jambi and Palembang society during the seventeenth and eighteenth centuries", *Indonesia* 48 (1989) 27-46, 38-40; William Gervase Clarence-Smith, "The Production of Cotton Textiles in Early Modern South-East Asia", in: Giorgio Riello and Prassanan Parthasarathi (eds.), *The Spinning World. A Global History of Cotton Textiles*, 1200-1850 (Oxford 2009) 127-142, 131-134.
- ³¹ G.P. Rouffaer, "Aanhangsel: De voornaamste industrieën der inlandsche bevolking van Java en Madoera", appendix in: C.Th. van Deventer, ed., *Overzicht van den economischen toestand der inlandsche bevolking van Java en Madoera* (The Hague 1904), 12-13.
- ³² Rouffaer, "Aanhangsel", 12.
- ³³ Pinchbeck, Women Workers, 4.
- ³⁴ Humphries and Schneider, Gender Equality, 8.
- ³⁵ See e.g. Elise van Nederveen Meerkerk, "Grammar of Difference? The Dutch Colonial State, Labour Policies, and Social Norms on Work and Gender, c.1800–1940", *International Review of Social History* 61:SI (2016), 137–164; Van Nederveen Meerkerk, *Women, Work and Colonialism*, chapter 6.