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Kathryn E Gary

Work, wages, and income: remuneration and labor patterns from different types of labor in Sweden 1500-1850
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1. Motivation and aim

The aim of this dissertation is to investigate differences in remuneration from different kinds of labor and payment in early modern Europe, through the lens of what is today southern Sweden. Wages and well-being are some of the oldest and most frequently revisited topics in economic history and related disciplines. Wage studies have been common since the beginning of the twentieth century, and in-depth investigations into early modern work patterns in both rural and urban contexts are a staple of historical research. But even with this abundance of research, it has been difficult to quantitatively match these studies together. Wage studies have relied on less-typical work, and connecting labor markets together in a way that can describe growth and development has been extremely difficult. This dissertation takes advantage of new data from women and men, working in both the countryside and in towns, as well as employed both by the day and on long-term contracts, in order to make an in-depth quantitative look at the relationships between different kinds of work and how they were compensated within an extended labor market.

Since the earliest studies based on long-term indexes of wages and prices\(^1\) wage series have been used to sketch economic development at a macro level, as well as a tool to look into individual and household experiences. Wages have been deployed to sketch the changes happening between European countries over the men (e.g. Humphries 2013) – though of course the former is dependent on a reasonable understanding of the later.

The question of how individuals and households made a living in the early modern period is central to many of the most important narratives in economic history and is axillary to many more. And yet recent research has made it abundantly clear how little we properly understand, despite decades of wage research. From 2001, but even more in the past five years, several studies have shifted both how we use wages as measurement tools as well as the macro-scale narratives which we draw from wage studies (c.f. Allen 2001, Allen and Weisdorf 2011; Humphries and Weisdorf 2016). If even after so many decades of studies, the perspectives drawn from real wages can change so quickly with simple (and very important) methodological innovations, it is clear that wage studies and an examination of methodological approaches are still an important and living tool for anyone hoping to better understand the past.

As wages have been used in an increasingly comparative context it has been more important than ever to understand how we translate raw wage payments into real wage series. Comparability and consistency, or at least transparency, are essential. In parallel, as recent studies using different types of wages (Humphries and Weisdorf 2015; 2016) have indicated very different patterns of development from traditional approaches, it is clear that a larger body of data must be included in wage studies in order to give a more robust representation of historical labor and income. In combination, it is clear that our methodological approaches need more attention and refinement.

This dissertation makes a start at delving into the first steps in this process, by addressing the following research questions in the case of southern Sweden:

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-Brown and Hopkins (1956)
1) How did wages for casual laborers and annually-employed workers develop over the early modern period? What can this tell us about well-being for individuals who were earning these wages?

2) Were there differences between the developments of these wages for different groups, such as by gender, skill, or urban / rural divides?

3) What were the differences between the developmental patterns of wages earned by the day and those earned by the year? What can these differences tell us about how our methodological approaches shape interpretations?

4) What do these data tell us about ‘typical’ working patterns in the early modern period?

2. Contribution

This dissertation makes several contributions to the body of historical wage data on early modern Europe, to our understanding of different kinds of wages for unskilled workers, and to methodological approaches to day wage calculations. Importantly these data also include information on women’s work and wages, which is often underrepresented in historical sources.

2.1 Data

Most clearly this dissertation develops several new wage series based on primary archival data from southern Sweden between 1500 and 1850.

This data is sorted into two databases, one for day wages and one for annually-paid wages. Both data sets are extensive; the daily paid database contains nearly 28,000 observations in total, and the annually-paid database almost 24,000 observations, including wage data for skilled men and women which is only lightly touched upon in this dissertation.

The data are the basis for wage series for unskilled men and unskilled women, working in day-labor as construction workers and as annually hired workers in both towns and the countryside. These are, to my knowledge, only the second set of long-term series developed for workers in annual position in early modern Europe – the others are for British workers from 1260-1850, also for women and for men, by Jane Humphries and Jacob Weisdorf. These new data series are important because they allow for an extension of the new methodological approach developed by Humphries and Weisdorf (2015, 2016) to both a new context, and to a context which is not British. British wage data has often been at the forefront of real wage methodological development, with good reason: many of these papers have questioned what led England to industrialize and experience modern economic growth first. It makes sense to focus on what could have led to such important changes and developments.

But a function of England’s exceptionalism is that it is, definitionally, not ‘typical’ of early modern Europe. Just as it is important to understand the forerunners of economic growth, so is it important to understand the laggards, the regulars, those left behind. These were, after all, the great majority of the European population. This is an important contribution of these data; they allow a similar investigation to Humphries and Weisdorf’s papers, but in an environment that is more representative of the more typical and peripheral parts of Europe. This takes cutting edge methodology and a new approach to data and allows a comparison between the development leader and a representative of more typical Europe. This is especially important because both women and men can be part of this comparison.
Day laborers, too, are an important contribution. The data in this dissertation expand the coverage of builders’ day wages to a new region, and are the first Danish long term wage series to extend earlier than the eighteenth century. Even when Malmö becomes Swedish in the seventeenth century the wages are still from a more peripheral region than Stockholm, which provides some more nuanced perspective of regional development. The fact that Malmö’s development is so different than Stockholm’s- as shown in section xxx as well as Gary and Radu (2018), is a clear indication that these regional wage series continue to give an important perspective of wage development.

The database of day labors is remarkable for a few reasons; one is its female population. There are over 1600 unskilled women working in construction, and they are often earning high wages compared to their male counterparts. While this is not a particularly large component of a 28,000 observation database, it is still a significant number of observations on women’s casual work, especially in a physical environment, and is an important insight into how women worked.

The other important aspect is that the large majority of the data all come from the same source, and are a complete collection of the data over the majority of the 350 year period. This is not often the case; because of the labor involved in collecting data many wage series are based on samples. Many series are also built on multiple kinds of sources, which can lead to some heterogeneity. Because of the extensiveness and the consistency of the backbone of this database it is able to stand as a more representative component of the casual labor market, which makes it possible to draw extensions from the data such as patterns of labor seasonality (Gary 2018c) which have previously been essentially black boxes. This paper is the first to investigate labor seasonality and the early modern working year using direct wage payment data so far back in time or over so long a period, and is the first to demonstrate changing labor seasonality patterns directly.

Along with new series of wage data this dissertation also compiles two new price series each for Malmö, Stockholm, and Kalmar. These prices series are congruent with the methodology developed by Allen (2001), and represent the cost to support a single man at either a bare bones (subsistence) or a more comfortable (respectability) level for one year. These are useful tools to enable more direct comparison with a growing body of real wages. These price series are also contributions in that they introduce fish, in this case herring, into the price series, which acknowledges the importance of fish to a Scandinavian diet.

2.2 Literature and debates
In addition to new data, this dissertation contributes substantially by producing new information which informs discussions and debates both in a Swedish as well as a broader European context.

2.2.1 Sweden
The data in this dissertation are an important extension of long-term wage data within Sweden, and so allow important extensions of research within Sweden. The results show that development within Sweden could be significantly different based on region. This is especially important because so much of the macro-level statistics for Sweden in the distant past are based almost entirely on data from Stockholm. While Stockholm was the capital and the largest city, it was still relatively small and not very representative of the kingdom as a whole. These investigations into Malmö, a smaller city, and the rural Scanian countryside, are completely new perspectives on wages and development in early modern Sweden.
The data are in agreement with new regional GDP series for Sweden (Enflo and Missiaia 2018), but this series is forced to rely on a benchmark indicator in 1571 and then continues again from 1750, which means that a large period of development and change – including the period when Scania shifted from a Danish position to a Swedish – is necessarily passed over. While the overlapping arts of the regional GDP for Scania and the wage series developed here show similar developments, the wage series which are part of this dissertation make it clear that there was significant change and development within this missing period, which would be improperly represented if the missing values were filled with a linear interpolation. While it is of course hardly surprising that regions develop differently, having concrete data which can be used to trace these developments is an important contribution for understanding the actual divergences and how they interacted with each other as well as macro-level development.

The data in this dissertation are, to my knowledge, also the first series of rural wages based on actual wage data to stretch into the early modern period. Wage data from Jörberg (1972) have relied on market scale rates which are not ‘true’ wages, but rather a negotiated agreement about what work was worth which was not typically directly paid, but was part of tenancy agreements. The new data presented here allow for a direct comparison with these market scales, which is the first chance to directly assess how well the market sales lined up with true wage rates.

2.2.2 Europe
While the data and the context of this dissertation are rooted in early modern Sweden, the aim has been to address European debates and advancements about wages and well-being for different kinds of workers in the early modern period. There is an especial focus on our methodologies; what makes sense when we measure wages?

The dataset which underlies this dissertation is unique because it represents so many types of work from the same labor market, over such a long period. This gives the opportunity for comparisons which have in the case of England taken many different scholars’ many years of data collection, and which have not been possible yet with other historical data sources. As mentioned above, this is also an important chance to look at a more typical and peripheral economy, which is important for our overall understanding of early modern economic development.

The results show a substantial disconnect between the synthetically calculated wages which are earned by day-earners and the somewhat more stable wages that are associated with annual work, which is similar to findings by Humphries and Weisdorf (2015, 2016). At the same time, it also indicates that the methodology for calculating annually-earned wages in these two papers might flatten out both differences between the types of wages earned this way, as well as the development of these wages over time, which is a problem which has not yet been addresses or examined.

Women are a strong component of the datasets in this thesis; while still minority workers, women do appear in both casual construction work as well as annual service work. Because of women’s consistent underrepresentation in sources as well as in large-scale quantitative work (though the later has been changing), new data that allow a long-term picture of women’s work is always important. This data is especially interesting because it shows women in manual labor working in the cities, as opposed to for example agricultural work, which give a different perspective than much of the work done on women in the past. The findings from these data give more insight into why and under what conditions women worked; here, women seem to be responding to demand forces, working in physical labor during periods when building work was especially needed.
One of the biggest contributions in this dissertation is the insight it provides into the length of the working year for casual workers. The length of the casual working year is a substantial question which has been a fundamental problem in the European real wage literature, and is of course a vital component to estimating what an actual annual income would have been. Previous studies have supplied piecemeal direct evidence on the length of the working year, but most casual workers worked only short periods at each job, so it is hard to work directly from evidence like this. More recent papers (Allen and Weisdorf 2011, Humphries and Weisdorf 2015, 2016) are able to estimate an implicit work year using the relationships between different types of wages and prices; these methods are also used to refine the estimates in this dissertation. But because the data in this thesis cover a relatively extensive part of an urban labor market, it is possible to use the wage payment data themselves to estimate the typical length of the working year, and how it changed over the centuries.

3. Coverage and context

3.1 Early modern Sweden and Denmark

Scania and Malmö were originally Danish, but were ceded to Sweden in 1658. Because of Malmö’s proximity to Copenhagen, lying just across the Oresund Sound, the region was heavily influenced by the Danish economy before the territorial change; afterward it fell more in line with Swedish development (see Gary and Radu 2018).

At the beginning of the fifteenth century Denmark was dominant in the Baltic region and in Scandinavia, with a strong navy that allowed Denmark to control and tax access to the Baltic. Denmark was an important exporter, especially of grain and cattle, both of which were especially important to the Scanian economy. This trade was strongly connected with the Netherlands, which had an extensive and established global trade network (Petersen 2001).

Denmark’s military control of both sides of the Sound, especially at narrow points both between Helsingor and Helsingborg, and between Copenhagen and Malmö, additionally gave Denmark the uncontested ability to collect duties. The sound tax was an important source of revenue for the Danish state during this period (Myrdal 2011).

In the seventeenth century Denmark lost Scania and neighboring county Blekinge to Sweden. With this loss Denmark also surrendered its absolute dominion over the Baltic with the loss of the cities of Malmö and Helsingborg, located in Scania. As Denmark declined, Sweden’s military strength grew, though economically Sweden was still fairly stagnant (Söderberg, Jonsson and Persson 1991). The Danish ‘golden era’ of trade lasted from 1560 to 1620, though continued at a diminished level through the beginning of the 1640s (Petersen 2001). Sweden claimed Scania and neighboring territories in 1658, and the seventeenth century was known as Sweden’s ‘Great Power Era’, until defeat following the Great Northern War in 1721 ended its period of military domination (Myrdal 2011).

The transition of Scania from a Danish to a Swedish possession seems to have been a relative non-event for the majority of the occupants of the region. A strong indicator of this is the indoctrination of the Swedish language which appears to have been minimally intrusive: as David Kirby puts it, “In all likelihood, the natives of Scania gradually came to regard Swedish as the official language corresponding to their own dialect, in much the same way as they had earlier regarded Danish.” (Kirby 1992)

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Rights and privileges of the noble classes were also largely preserved which allowed significant continuity for the upper classes (Gary and Olsson 2017).

Scania was hit particularly hard by the Danish and Swedish wars. As a result population was relatively stagnant in the plains areas, and Scania’s population was fairly constant in the sixteenth and seventeenth centuries at about 140,000, even as Sweden’s population overall increased (Myrdal 2011: 104). The continuing warfare also led to a general increase of fortifications in Scania and surrounding regions. Kristian IV of Denmark devoted considerable effort to fortifying defenses against the Swedish, including the construction of Kristianopel in Blekinge, founded in 1609 and Kristianstad in in Scania in 1610. The military construction work is clear in the archival records used in this study, especially in work done renovating Malmö castle at the end of the sixteenth century.

Scania has always been dominated by agricultural production both for domestic consumption and for export. While Scania exported grain in the sixteenth century, indicating some degree of expansion, famine in 1649-1650 stopped all exports from Sweden and ushered in a period of grain imports. Famines in the 1690s continued the period of decline. Scania and the other regions that were acquired by Sweden after 1658 were not fully integrated into other Swedish legal regulations - for example, Scania was able to continue its international cattle trade even when it was banned in the rest of Sweden (Myrdal 2011: 107)

In Sweden, Stockholm was the most important commercial city, but did not become the administrative center of Sweden until the seventeenth century, after which it gained increasing prominence. Sweden was in a state of financial crisis through the eighteenth century and so Stockholm was never an opulent city. Stockholm was not as directly impacted by battle as Scania was, which likely did not increase the demand for fortification and military building as warfare did in Scania. However, Stockholm’s position as a growing European capital and naval port did mean that there was considerable demand for construction and shipbuilding (Oakley 1992; Söderberg 2010). The seventeenth century especially was one of construction and physical growth. This was typical among European capitals and major cities, including also Copenhagen. Much of this construction and administrative expansion was in response to political turbulence and continual military conflict and Sweden’s militarization during its period of military strength during the seventeenth century (Söderberg 2010).

Territorial losses and military defeat after the Great Northern War in the early eighteenth century marked the end of Sweden’s position as a European military power, though Sweden attempted several times throughout the eighteenth century to regain its former position. The loss of territory decreased Sweden’s capacity for income, leaving the kingdom in an increasing state of indebtedness; the Crown was bankrupt, short on revenue, short on ways to create revenue, and short on ideas of how to solve their problems. Added to the lack of funds was significant financial instability; the government lacked any long-term, of even any short term, planning and recent political decisions had put it at odds with the international community (Karonen 2008).

The eighteenth century was not the best for Sweden as a whole, as Stockholm and much of Sweden continued to stagnate, but there were some improvements by the end of the century. At this point Sweden and Scandinavia were emerging as leaders in Europe’s developing knowledge economy. Sweden had a remarkably high literacy rate, was the first country to hold regular censuses in the middle of the eighteenth century, and was the first country to introduce banknotes in the same century (Edvinsson and Söderberg 2010). By 1686 Sweden had already introduced pioneering laws that were aimed at increasing literacy (Baten and van Zanden 2008), and a trend of rapidly increasing book production through the early modern period, as Swedish per capita book consumption jumped from
1.1 per 1000 in 1500-49, well below the majority of Europe, to 214.1 per 1000 in 1750-99, second only to consumption in the Netherlands (de Pleijt and van Zanden 2016).

Despite the increase in human capital it was not until the nineteenth century that Sweden began to recover economically and to enter into sustained economic growth. The shift occurred first in Stockholm with wage and GDP growth from the early decades of the 1800s (Söderberg 2010, Söderberg, Jonsson and Persson 1991).

3.2 Labor organization in early modern Sweden and Denmark
This dissertation deals with several different types of labor; casual labor and labor for those on annual contracts, both urban and rural, and for women and men. While many conclusions depend on comparing wages from these different earned types, the wages tend to refer to different kinds of work and institutional traditions. The following sections outline different forms of work and how they fit into a broader society.

3.2.1 Rural employment
3.2.1.1 Lifecycle employment – rural annual contracts
Early modern Sweden, like much of Western Europe, was characterized by a cultural norm of lifecycle employment; that is, different kinds of work and employment were associated with specific life stages. Lifecycle employment refers to a pattern of young people working in service during their late teenage years and into their mid-to-late twenties. If they are able to save enough to afford marriage and establishing their own households after which they stop working as servants and take over a farm or household of their own. Young adults worked for several years, usually moving between farms, until they built up enough savings to afford to establish their own households. The lifecycle servant system relied on a rural European society and a system in which there was a substantial as well as a fairly stable need for manual farm labor. Peasant children worked at home on their parents’ farms, and as teens typically moved out and worked as domestic and farm servants for other peasant farms. In Scania children tended to leave home between ages 15 and 20 (Kussmaul 1981; Dribe 2000; Uppenberg 2017). The age of marriage was relatively late, often not until the late twenties, and many never married at all because of the expenses associated with household establishment. Those who married and established their own households were typically able to reach the same economic and status level as their parents (Dribe 2000), though many who were not able to marry ended their lives in poverty (Uppenberg 2017).

In Sweden, young unmarried persons were required by civil statute to enter into annual service if they had no independent means of support; those not in service were called to a magistrate to prove that they had a legitimate reason for not being in service (Lindström et al 2017). This obviously had huge influence over work patterns and strongly reinforced a life-cycle pattern of service. This, in turn, means that neither women nor men were particularly free to make the calculation of whether they preferred to work in casual labor or annual service – this differentiation was predominantly dependent on marital status.

These servants would have been the typical annually-employed, low-skilled workers, especially in the countryside. Servants would work both inside and outside, as domestic and farm hands. On larger farms or estates the labor was more likely to have been divided and specialized, with a stronger gender segregation – this is clear in the data used in this dissertation, as well as consistent with patterns found in other work (e.g. Lindström et al 2017). Unfortunately the vast majority of households where servants
would have been employed were farms from which no records remain – the rural data on annual employment in this dissertation rely on data from manorial estates, which both employed more people and kept more thorough records than more typical households.

Servants lived in with their employers, as more or less a member of the family, and were expected to eat the same food and live in the same spaces as the nuclear family (Kussmaul 1981). This seems to have been respected as the norm, as there are instances of servants taking their employers to court when they did not feel they were receiving acceptable treatment, often in the form of poor diet and board (Uppenberg 2017).

This lifecycle pattern was common among almost all of the social classes in rural areas, though the children of the landless were more likely to leave home at earlier ages and so are likely more represented in the young servant class (Dribe 2000). It is also possible that children of wealthier families would have access to more desirable positions, such as manor houses and larger estates (see Kussmaul 1981); however, this may have been less likely in a Swedish context, as freeholder peasants, typically the wealthier group, may have been more keen to preserve their independence from the manorial system.

Servants were highly mobile, but only within a limited range. Most servants stayed at a position for only one year, and the vast majority of stayers did not remain for a third. Kussmaul (1981) finds that although hiring fairs typically took place on the county level, which would imply that in theory servants could be hired across counties or even further, if the servant lived at the nexus of two counties, in practice servants took up a new position near to their previous position, which was in turn near to their place of origin. Dribe (2000) confirms these patterns in nineteenth century Scania; almost sixty percent of servants stayed at a place of employment for one year, with an additional twenty four percent remaining fixed for two years. This is slightly less mobility than what Kussmaul identifies in England. In the four Scanian parishes studied by Dribe, seventy-eight percent found a new position within fifteen kilometers of their previous appointment, and only three percent relocated to a town from the countryside (Dribe 2000; pp 138). This is important; even though the society as a whole was highly mobile, there was not much urban growth or influx of young people into the cities.

There could be quite a degree of homogeneity of wages and perquisites between different employers, so servants would probably not have gained an extraordinary degree of material improvement by changing situations. But as Kussmaul (1981) highlights, changing employers could be a way to find a more desirable position, to expand one’s skillset, and to expand one’s social network and marriage network. Kussmaul also emphasizes that frequent changes could be a strategy for young women, especially, to ensure that their servant-master relationships did not become too close and that they were less open to sexual predation. Too, moving frequently was a way to end relationships with employers or employees which had not been satisfactory, for whatever reason. Regardless of the underlying reasoning, frequent and regular mobility was intrinsic to the servant institution and early modern peasant economy.³

3.2.1.2 Manorial labor organization

Along with servants in annual employ, a system of corvée, or semi-coercive labor taken as part of the rental contract, covered the majority of the agricultural labor needs in Scania until the later part of the eighteenth century. This means that even in the countryside there is very little casual paid labor in

³Though there were of course exceptions: Lindström et al (2017) discuss a woman who had been with the same master for twenty years and intended to continue to work in his service (pp. 225).
agriculture. This is counter to other European economies where wages for casual agricultural labor are a frequent focus of wage studies (see for example Burnette 2004).

Scania, the region under study in this dissertation, was a relatively manor-rich region. At the end of the medieval period about half of Scanian farms were under the manorial system (Olsson 2006). There were three classes of peasant farmers, and each group had at times different rules and regulations. Peasants could be tenants of the nobility, of the Crown, or could be freeholders. Noble estates were the most likely to implement a corvée system, and so to not have many paid days of casual labor. Scanian Noble estates were considerably larger than those throughout most of the rest of Sweden, due largely to a tendency of consolidation throughout the early modern period (Gary and Olsson 2017).

Due to Scania’s history as a Danish province the county maintained several aspects of Danish noble privileges, which translated to restrictions on the peasantry. The extensive corvée system was part of this. In the sixteenth century noble Scanian estate holders gained the right to evict tenants who would have previously expected to enjoy lifetime tenancy (Olsson 2006; Gary and Olsson 2017), and were also able to restrict the mobility and freedom of location of peasants who lived on their estates during portions of the seventeenth and eighteenth centuries (Olsson 2006). Tenants on Crown land, however, had stronger tenancy protection throughout the period, with de facto property inheritance rights from the seventeenth century. This meant that many farmers who lived on noble land might have somewhat precarious guarantees and protections.

Scanian estates extensive corvée system was to a large extent unregulated. This labor was what produced the output on the manorial demesne, or the manor’s own land, which would then be sold on the market. In the later medieval period and into the sixteenth century the Scanian manors were primarily dependent on rents paid by their peasant tenants for income, but from the mid-seventeenth century they relied more or less equally on rental incomes and income from the demesne, the lands cultivated for sale directly by the manor. The importance of the demesne for manorial income continued to grow as agricultural output itself increased, and from the mid-eighteenth through mid-nineteenth century manors became almost wholly dependent on the income generated from the demesne. This meant that tenant labor on the demesne also became increasingly important. This increased the work load on those tenants, and left Scanian peasants who were subject to corvée systems with some of the highest labor dues in Europe (Olsson 2006). Figure 1, taken from Olsson 2006, shows this drastic increase in labor requirements.

The raising of corvée dues meant that tenants needed to hire additional labor of their own in order to meet their labor dues. Estates, too, increased their labor force, hiring larger numbers of day labors as well as married farm hands, called statare. The increasing importance of statare in the nineteenth century in some way allowed for a continuity of employment possibility for those groups who would have been peasant tenants before the largescale evictions. However, the increasing dependence on
day laborers was a new development, and a departure from previous centuries when the corvée system had met Swedish agricultural labor needs without the need for additional seasonal labor.

3.2.2 Urban employment

3.2.2.1 Domestic service

Like the countryside, the most common employment for young people in the cities was typically as domestic servants in other people’s homes, though means of support could be varied and from multiple sources. As in the countryside labor was typically divided by marital status, especially for women (Ågren 2014a). Unfortunately, also like domestic servants in the countryside, the vast majority of records for this type of worker do not survive.

3.2.2.2 City employees

The early modern period was an important period of state formation in Sweden. This process led to an increasingly bureaucratic state, and the role of towns as employers consequently grew. This is readily apparent in the data itself; new jobs appear in the registers over time and more people are hired by the cities per position. This increase was necessary not only as municipalities themselves grew but as the role of formalized taxation became increasingly important as a mechanism for funding the state apparatus (Ågren 2014b). This increased employment led to a large number of low level officials tasked with carrying out the more mundane tasks of the city and taking care of the town; it is these types of workers that make up the urban annually employed sample in this dissertation.
While in the late mediaeval and into the early modern period performing the duties of a civil servant was the purview of only the nobility, the state formation process necessitated an expansion of positions beyond what members of the nobility could fill. Many of these jobs were also not as glamorous or as well-remunerated as more traditionally noble-held positions and so they held little appeal for people of higher standing. More middle class workers filled these roles, especially during seventeenth and eighteenth century expansions. In theory, someone entering into civil service would have needed to have some access to ready capital in order to facilitate the cash-based nature of the job and the frequent need of the state to draw on its offices for loans. These positions could be a path to increasing personal wealth, but could also lead to personal debt and destitution (Ågren 2014b).

Ågren (2014b) pays particular attention to customs officials, who were a large component of this growing low-level bureaucracy. Unlike in England, for example, where state employed tax collectors were fairly specialized and had some degree of theoretical knowledge, Ågren claims that the Swedish counterparts were only basically educated, very unspecialized, and roundly disparaged by the citizenry. The job was neither well-paying nor particularly prestigious. In the same article, Ågren emphasizes the importance of wives’ financial contributions to households in which the male head was employed as a low-level civil servant; without significant income from wives and other members of the family such employees would not be able to support their households.

3.2.2.3 Urban casual labor
Casual labor in the cities could take many forms. In this dissertation all casual labor is in construction work. This was of course not the most common occupation, but it is the one which has survived most consistently in archival sources throughout Europe. This has made casual construction work the de facto norm for estimating wage development throughout early modern Europe.

Hawking and selling textiles was a common occupation for women, especially married women who had to supplement low male incomes. Ågren (2014b) discusses one wife of a toll-collector who earns a considerable portion of her husband’s income making bread in other families’ homes, somewhat bridging the gap between the domestic servant marital divide. Other women produced and sold cloth within the city. The importance of women engaging in small-scale service continued throughout the early modern period, and was still an important (and regulated) source of female income well into the nineteenth century (Bladh 1992). Other small-scale tasks, such as running errands, making deliveries, or providing childcare could be other ways of making ends meet (Ågren 2014b). Most of this labor flies below the radar, and is not easily retraced.

3.3 Studying women’s employment
Women’s work and income have been often overlooked and discounted. This is true both in reference to historical sources and how they record women’s or household labor, and for professional historians, economists, and economic historians, who have taken it for granted that women did not work in certain fields in the past, or that women were constrained to work in the home. A recurring criticism of conventional real wages studies is their focus on men’s income while ostensibly measuring household-level well-being; this has been a criticism of the Allen-style baskets in particular, since this measurement explicitly attempts to measure well-being at the household level, including the consumption needs of women and children (e.g. Humphries 2013).
Recent work has shifted this position considerably; it is increasingly acknowledge that women worked in similar patterns as well as tasks to men (e.g. Lindström et al 2017; Humphries and Sarasúa 2012). This is of course reasonable on an intuitive level; in a rural and agricultural society there would not be a large degree of flexibility in what work needed to be completed or when. But women’s work still tends to be hidden, often subsumed with male work or domestic or unpaid. Men’s work, too, was often similar in nature, but some of the differences have led to its stronger preservation in written records.

One of the major difficulties in measuring or reconstructing women’s work has been how many missing variables there are with regards to women, such as labor force participation or market work attachment outside the home outside of a small number of specified and in-depth studies. This is largely the case for men as well, but the literature has been willing to make more assumptions about men’s work in order to develop more streamlined methodology than it has about women’s. Without firm evidence investigators have been reluctant to include women in macro-series which currently only represent men.

However, the inclusion of women is quite apparently vital for understanding total household well-being. Household labor market attachment and who worked inside and outside the home changed substantially over the centuries. These changes developed both temporally, as styles of agricultural and economic production changed (Pinchbeck 1930), as well as cyclically, as social preferences and domestic ideals changed (de Vries 2008).

This exclusion of women (and children, though they are not discussed in this dissertation) was especially problematic when studies are very long-term, since the ways in which households organized themselves in relationship to the labor market changed substantially over time. De Vries (2008) for example founds his argument on the changing patterns of household consumption, industrious behavior, and changing labor regimes on the changes between women working primarily in the domestic sphere and primarily outside the home for money. These shifts occur over centuries, and the ‘norm’ has changed several times – clearly not only are women important, but women’s contributions are not constant and cannot easily be assumed without further empirical investigation.

Unfortunately this dissertation is not able to make the leap to develop a stronger and more inclusive estimation of household level income and living standards. However it does make a significant contribution to the long-term and quantitative investigation of women’s wages and earnings.

The importance of women’s economic participation and of their contribution to family well-being is well established by historians of women’s work and labor. This literature has not developed in as linear or methodological way as real wage studies, for example; there are important and novel contributions which continue in many forms. The literature about women’s work and labor force participation tends to be localized and in depth. Many texts are largely qualitative, or combine smaller and localized quantitative investigations with large amounts of qualitative information. Because of this, this section will cover some of the most noteworthy studies of women and work, with particular attention to women working in physical labor and in early modern and rural contexts. Though the work in this vein has been extensive, it has still been slow to bring women into the mainstream.

Ivy Pinchbeck already in 1930 wrote an exhaustive study on the impact of industrialization of women’s work, wages and income, and household attachment. One of the earliest and most impactful changes was due to changes in agricultural technology and organization, especially the shift to enclosures from the older common field system. This is an impact that we are more likely to see in early modern Sweden as well. Pinchbeck describes the preindustrial (and pre-enclosure) system as one in which women’s labor was crucial not only for the family’s comfort and home life, but for their financial well-being.
Women’s use of the agricultural commons and kitchen gardens to raise dairy cows and grow extra vegetables provided both dietary and nutritional variety and steady income to the household. When the commons were eliminated women and poor households lost access to this vital land, which changed the nature of household market-orientation. With women less able to provide for their families in more traditional and non-market ways, their paid market labor became more important. However it was also difficult to access market work from the regions which would have been so predominantly agriculturally oriented.

More recently Burnette (2008) investigates women working during England’s industrial revolution. This text is in many ways a culmination and expansion of much of her earlier work, building on extensive archival investigations of wages and employment throughout the major labor markets both changing and emerging during England’s industrial revolution; she uses this expertise to explore what biological, cultural, and institutional factors influences women’s relative earnings and access to paid labor. The major focus is the driver of the gendered wage gap: why did women earn less, and what kept it this way? The primary conclusion is that women do earn less, but at least in traditional and unskilled occupations this is largely reflective of women’s lower efficiency: the average woman does not have as much upper body strength as the average man and so could not be as efficient in occupations or tasks which depended primarily on physical strength.

This led to occupational segregation in occupations like farming, where different tasks required different degrees of strength. The tasks that women worked were typically paid less than men, though Burnette claims that they were still typically paid fairly in relation to their productivity. According to Burnette, this segregation actually lowered the gendered wage gap, because it allowed women to be relatively more efficient than they might have been in more strength-dependent tasks.

The situation was less straightforward in skilled occupations and in unskilled work which did not require strength. Within skilled trades generations of guild, and later union, leadership worked to protect their trades and wages against competition from female workers, and they often still were able to protect against this kind of competition because women often did not have the same human capital opportunities as men. In less skilled trade which did not require strength union leaders tended to lose out to more capitalist-oriented owners who were eager to profit off of the lower wages they were able to pay women. The trades which most completely were able to remain sex-segregated were those which were customer-facing; for many services consumers’ own discrimination removed financial incentives to hire women, since customers were not interested in paying for their work.

Quantitative investigations have often focused on women’s labor force participation, and the disparity between official census records and the actual participation rates shown by employment registers. Horrell and Humphries (1995) and Humphries and Sarasúa (2012) trace women’s labor force participation using alternative sources to demonstrate the complexity and extent of women’s work during the industrial revolution and before and individuals’ contribution to household income. Together these papers, and others, make the case that women have been overlooked and undervalued as economic participants and income earners in the past.

There have also been strong theoretical assumptions about what determines or places constraints on women’s work. Traditional models tend to emphasize the supply side of female labor, and this has carried over into more recent literature as well. These approaches focus on women’s marriage and role as mothers as impediments to waged work, especially work that takes place outside the home. Humphries and Sarasúa (2012) argue, as do I in the second paper in this dissertation, that women were strongly influenced by demand factors when they made decisions about entering the labor force and reacted to labor market conditions when deciding to work or not.
Mainstream economic historians are beginning now to take more notice of women working in the pre-industrial period, but these typically are still understood as specific studies as opposed to ‘general’ real wage series; unfortunately the field seems to still be divided into ‘economic history’ and ‘women’s economic history’. There are many highly informative and have covered many labor contexts, including the Netherlands (van Nederveen Meerkerk 2010), Sweden (Stanfors, Leunig et al. 2014), and England (Burnette 2004, van Zanden 2011).

Humphries and Weisdorf (2015) develop perhaps the first long-term study of women’s real wages which is constructed in a manner which is intended to be directly comparable to the real wage studies which have long been used for men. The series covers both casually and annually employed women in England in a variety of unskilled positions 1260-1850.

4. Development of real wage studies

4.1 Early real wage studies

Real wage studies have been one of the most used tools to estimate changes and trends in well-being, economic development, and living standards. The fundamental principle is simple: to measure the wellbeing of a group of workers, usually a group which represents a ‘typical’ worker, by calculating what they could buy with their wage. This is a simple indicator of well-being and living standards which is much more local or specific than GDP, for example, which can only be calculated on a national level. The ability to break down real wages on different levels and by different regions make real wages a very valuable tool for examining the differences between groups. This more precise measurement makes real wages particularly suited to a period such as the little divergence, during which international as well as intra-national inequality was increasing substantially.

However, there are several ways to estimate real wages. Perhaps the most substantial differences between methodologies during the earlier literatures is the denominator, or the way in which prices or cost of living is calculated. Perhaps because of this, along with data limitations regarding the types of wages which have been used, the denominator or CPI has been the component which has been most debated and altered over the past century of wage studies. Debates about the CPI or deflator have centered both around the correct methodology to best estimate the CPI, as well as what exactly the CPI or price index should be measuring.

Worthy of note is that many of the methodological problems highlighted in early studies are the same with which modern scholars still struggle; it is an unfortunate fact of historical research that some data will never be complete or available to researchers. Phelps Brown and Hopkins, in their seminal 1956 paper on British builders’ wages from 1264 to 1954, begin with a list of problems familiar to any modern researcher of historical wages: lack of information about the number of days builders worked in a year and about other sources of income; almost no data about the cost of rent; price data from primarily wholesale transactions, not the retail prices that these workers would actually be facing; and only piecemeal information about household consumption and diets. These problems and their implications on our interpretations will be discussed in more detail later, but for now it is important to realize that most of the differences between the different real wage studies are authors’ attempts to combat the same set of problems, all rooted in the lack of historical data and information. Another common theme is the use of builders’ wages as the numerator in real wages estimates: Builders’ wages were probably initially used because of their comparative availability in the historical record, but the construction work they represent is also fairly comparable throughout Europe and throughout the early modern period, which makes it continually appealing for modern researchers who value
international comparability. Later sections will also discuss what this has meant for how real wages and well-being have been estimates, but again, for now, we will discuss the development of these wage studies.

A full review of real wage studies is not possible; even Elizabeth Gilboy in 1936 comments on the vast number of studies already published. Instead this section will walk through the studies which have furthered methodological approaches or spurred significant debates. Because of a number of factors, including language, the strength of British economic history, and England’s history as the first industrial nation, the overwhelming majority of these studies investigate British real wage development. This does not mean however that there have not been other studies on other parts of Europe and the world.

The historiography of historical real wage studies can be divided into three main periods. First, the early periods from the 1930s through the 1960s. This was the period when national accounts and macro-style data series were first being developed and used systematically, and real wage studies also became more systematic and scientific. During the second phase, from the 1950s and 60s into the 1990s, early historical real wage series from England were revised heavily, and series for many other countries were developed. However, the methodology and approach were largely unchanged. In the third period beginning in the late 1990s and early 2000s the most important developments were changes in methodology and efforts to expand the notion of real wages to include different types of jobs and workers than earlier series, with the hope of better representing the development of living standards and economic development.

Historical wage series were first developed in earnest using British data, as is the case with many parts of economic history. Elizabeth Gilboy is one of the first scholars to develop long-term historical wage series, and then real wage series incorporating a price index, covering eighteenth century England (Gilboy 1936). She used the wages of construction workers, including “bricklayers’, masons’, paviers’, and plasterers’” wages to represent the wages of “common labor” (pp 138); using wages from the building sector is still standard for wage data used in modern real wage studies. However, most of more recent series separate unskilled workers from the groups of more skilled workers such as masons which are folded into Gilboy’s series.

Gilboy separately compiles wages for London and for Lancashire, highlighting the different developments in London and in the north of England, and also highlighting one of the benefits of real wage studies for regional analysis. The wages are only recorded as day rates, as is typical in the data. To deal with this Gilboy transforms the wages into an index, and divides the wage index by the price index with a base year of 1700.

Gilboy’s price index is also not so far distant from what modern scholarship develops. Gilboy creates an arithmetic mean of thirty price series, with weights for each of five commodity groups: cereals; animal products; candles and coal; beverages and condiments; and clothing, based on detailed budget reports from the eighteenth century (135). Her prices come from a combination of wholesale and retail prices – she discusses the difficulty of finding retail prices in the historical record, a problem which still frustrates researchers today. Unlike some more modern deflators (cf Allen 2001, discussed below) Gilboy’s 1936 index contains some very specific items, such as raisins, felt hats, and biscuits – this leads to a more detailed index which is more likely to reflect actual consumption, it also makes the index very specific to time and location, and so harder to use in a comparative context.

Phelps Brown and Hopkins (1956) expand British historical real wage coverage with a real wage series from 1264 to 1954 – though they take pains to clarify that it is not a ‘proper’ real wage series due to the lack of information on a typical work year for the wage earners in their data, among other issues.
Their price index incorporates six, instead of Gilboy’s five, component group, though the groups are essentially the same, and the foodstuffs comprise of eighty percent of the index. As one might expect, the data are not available for every commodity for the entire time period. Both because of this and because the authors intentionally change the components of the index to reflect changing consumptions, tastes, and availability, the price index is not homogenous for the entire period. However, the relative quantities in each of the main categories in the index remain constant; while this provides continuity in calculation, it is also at times misleading; as the authors point out, when wages fall, as they did in the sixteenth century, consumers would naturally buy less of high-priced commodities such as meat and would instead substitute toward cheaper food sources (pp. 303).

Consumption is based off of household budgets from contemporaries; the quantity and value of the price index is set at what one hundred pennies could buy in the period 1450-1475. When commodities are replaced, new commodities are incorporated at the volume that the cost of the departing commodities could purchase in the base period, in order to maintain as much continuity in the purchasing power as possible.

4.2 Twentieth century debates

During the 1970s through 1990s there was a lively and persistent debate over what happened to British workers’ living standards during the early modern period, especially during industrialization and into the early decades of the nineteenth century during the Napoleonic Wars. This phase was dominated by close attention to data specifics and to data collection, as well as debate about the correct mobilization of existing methodology; however, there was little fundamental innovation in the basic methodology itself.

The debate went back and forth between groups self-styled as ‘optimists’ and ‘pessimists’; each side, rather self-evidently, with a different view of how the working class fared during England’s industrialization. Optimists, including Lindert and Williamson (1983), maintained that the wages of workers in the early nineteenth century grew faster than the cost of food, and so blue collar workers experienced a substantial increase in material well-being during this time. Pessimists, such as Feinstein (1998), instead held forth that wages and prices grew more-or-less in tandem, and so there was literal material gain while the upheaval and uncertainty due to changing markets likely pushed down overall well-being. This back-and-forth stimulated the creation and reevaluation of several real wage indices and price deflators, attempting to get most accurately at the ‘true’ costs to and income of the working classes.

These debates were characterized by detailed and technical discussion about the correct application of index bases years and weights, as well as the proper index style to use, as well as increased precision in the cost index contents and weights (see discussion in Flinn 1974). Many of the differences between authors’ estimates of well-being could be attributed to differences in how prices were indexed. Choice of base years had a huge impact; Feinstein (1998), who wrote the final major article in this debate, on the side of the pessimists, partially attributes the rise of living standards during the first part of the nineteenth century reported by (optimistic) Lindert and Williamson (1983) to their use of 1851 as a quantity-weight base year for the entire preceding century (Feinstein 1998 pp. 641). At the same time there was an emphasis on precise data measurement; for example the proper textile commodity prices formed a minor sub-debate (Lindert and Williamson 1983; Feinstein 1998).

Flinn (1974) criticizes what emerge as a heterogeneity in approaches, calling the collection of base years as well as the differences in composition and weighting of price series “not particularly helpful”
in directly comparing results or in reaching a consensus; the problem was especially significant when years of political, but not price- or wage-related significance were selected as cutoff dates, which Flinn felt gave undue weight to unrepresentative or misleading periods (pp. 396).

In the 1980s and 90s there was also a strong inclination toward a multidisciplinary (or at least multi-data driven) approach toward the standard of living debate. These papers will not be discussed here, but during this period wage historians increasingly turned toward anthropometric data such as heights as well as mortality data to confirm (or refute) the evidence of wage and price developments. Crafts’ (1997) application of the Human Development Index to the historical standard of living debate is a good example of the integration of many different factors and variables into a cohesive measure of well-being – however, it, too, is sensitive to re-weighting of the sub-indices, to the point where alternative weights return different results.

This multidisciplinary perspective was motivated by an expansion of the well-being discussion to include information reflecting living standards and life experience such as urban health penalties and disease load, which might offset increases in well-being indicated by real wages alone. Increasing consumption of previously luxury goods such as coffee and sugar are also taken as important ‘non-quantitative’ indicators of increasing well-being.

This period was essentially brought to a close by the work of Allen (2001), who devised a system of real wage estimation with a more concretely-interpretable index number which was designed to be broadly comparative across time and space – this reflects the growing global and comparative perspective in the practice of British economic history. Allen developed a ‘basket’ of goods which broadly comprised the necessary costs of keeping a household running over the course of the year. This basket is much simpler than what had previously been calculated for British workers – for example, the cost of rent is assumed to be five percent of the cost of the rest of the basket, and is added as a simple inflation; in contrast Feinstein (1998) calculated the cost or rent in Britain by using tax assessments and poor relief records to estimate the aggregate cost of rent for all of Great Britain, which he divided by the number of occupied homes. Additionally, the basket contents intentionally are not altered over time – this subverts other previous problems with how to model changing consumption patterns. Instead, the basic consumption patterns represented in the price series are intended to represent a theoretic base-level of well-being, with the understanding that workers and consumers could and would substitute for higher quality and variety of products instead of simply consuming more of the basic essentials. While commodities reflect consumption patterns to some extent, and make substitutions for different products consumed in different parts of Europe, the theoretical base of the consumption baskets is based to a large extent on nutritional and caloric needs. These simplifications were important for Allen’s primary purpose, which was to compare the development of many countries over a long time span – the data load of the more sophisticated indices is too high for many regions, and the changes in composition and complications that come with a pure index introduce too many variables to make a clear or direct comparison particularly useful.

In the first iteration of Allen’s work the household is assumed to be a man, a woman and two children, which is assigned a level of consumption equal to the costs of 3 adult men; however later critiques have led to different weights being assigned to reflect a household’s likely higher caloric needs (see for example Humphries 2013).

Men’s day wages are multiplied by the number of working days that an early modern casual worker was assumed to have worked – this it taken as the annual income. Both values are calculated in the local currency, without conversion to silver prices, as in van Zanden (1999), or index values, as virtually all other previous methods. The income is divide by the cost of supporting a household, which gives a
number representing how many ‘consumption baskets’ the income could purchase a family over the year. This resulting number is both intuitive and easily comparable, which has led to this methodology becoming the standard since its introduction. However, Allen’s approach has not come without criticism or commentary. Much of this will be discussed in the next section.

4.3 Recent studies
Real wage studies have gone through two primary phases: first was a wave of primarily British studies meant to measure how certain groups fared during different periods of economic development. More recently the predominant focus of real wage studies has been to compare development between different countries, cities, and economies through important periods of development and divergence. Real wages, used in this second manner, have been a vital tool for measuring Europe’s Little Divergence.

Jan Luiten van Zanden (1999) undertook one of the first broadly comparative European real wage studies, which compared wages across Europe from 1500 through the nineteenth century. He used the price of local grain to deflate the daily wage rate, resulting in a measure of how many liters of grain an unskilled day laborer could buy in a day. This was an important step toward broad comparability and toward an index number with some tangible interpretation, but at the same time the interpretation was somewhat difficult. Deflating by grain prices gives an impression of inflated living standards to regions where grain is produced, and therefore cheap; these regions in some cases correlate with areas which are known by other means to have been among the poorest, such as Poland, in van Zanden’s study, and Sweden when studied with a similar method (see Gary 2014).

However, Allen’s (2001) study shifted the focus of real wage debate and study to this more broadly comparable. Because his price deflator is not meant to ‘perfectly’ represent consumption, it is methodologically simpler to take it as an indicator of baseline needs, and so interpret the resulting index as a bottom level for consumption-based well-being. This simplification both lowered the data load for real wage studies and created a comparative framework which spurred an outpouring of real wage studies from across Europe and, increasingly, from around the world. Most of these studies have followed the framework of Allen (2001), though many make some adjustments for local differences in diet or standard commodities, as did the initial study. However, this section continues to focus primarily on those studies which were the most methodologically innovative.

The most recent studies of real wages and waged work have for the most part taken a departure from the more classic approaches in an attempt to capture a larger part of the working population as well as reflecting living standards more accurately. These involve critiques of Allen (2001) and attempts to adjust his methodologies to better reflect actual caloric needs and work patterns, as well as attempts to include women and children; to take into account backward-bending labor supply curves and workers’ preferences for leisure; and to incorporate workers other than casual day laborers, who would not have been the ‘typical’ early modern worker.

Perhaps the exception to the new direction of real wage studies is Clark (2005), who collected a large quantity of new data to update the builders’ wage series – most studies after this use his nominal wage series, together with some version of Allen’s (2001) price series for England, when examining British wages.

Other studies have sought to address long-standing problems inherent to the real-wage methodology, often caused by missing data and information. One of the primary and longstanding problems with real wage series as they have been computed is that they have relied on the day wages of (typically)
construction works. This is because of the relative availability of day (or ‘casual’) wage data, and because it is also usually more straight-forward than wage payments for servants who received their compensation largely in the form of room and board. The majority of workers who were not self-employed likely worked for a small cash supplement on top of room and board, and imputing the value of the compensation in perquisites has been challenging.

To deal with the problem of valuing room and board, Humphries and Weisdorf (2015, 2016) add the cash value of the Allen-style price basket to the cash wash which annually-employed workers received to approximate the full value of compensation. They have applied this methodology to wages for both women (2015) and men (2016), with both studies showing a substantial difference in development for wages earned by the day and by the year – this further indicates that a closer look at the way we treat day wages and the assumptions about the working year should be taken. The shifting relationships between the amount of casual work days needed to make a respectable living or to meet the equivalent of an annual salary also show a dynamism in early modern work patterns which requires closer attention.

The third paper in this dissertation takes a similar approach as the Humphries and Weisdorf papers to examine the relative developments of different labor markets in southern Sweden, and similarly finds a substantial disconnect between the potential earnings for those employed by the day and those working for a full year.

A huge piece of missing information has to do with the length of the working year, and the extent to which casually-employed workers would change their work patterns as a function of how high day wages were – essentially, was there a backward-bending supply curve, with laborers only working enough days to meet their basic subsistence needs, or did laborers tend to work a regular or fixed number of days every year?

Allen and Weisdorf (2011) invert the standard (Allen 2001) approach to measuring real wages, which multiplies the average daily wage in a given year by a set number of working days. This number of work days is largely an assumption based on somewhat better-known patterns from later periods. Instead of calculating real wages, Allen and Weisdorf calculate how many days an unskilled man would have needed to work in each year to meet his and his family’s basic consumption needs; instead of dividing the wage by the basket, the basket is divided by the wage. They find that their ‘implied’ working year, derived from the days of work needed to get by, is reasonably in line with the independent estimates of the working year which are available – this does indicate that laborers worked more to meet consumption needs than to increase incomes in order to consume at higher levels.

However, Allen and Weisdorf (2011) continues to frame the working year as a supply-side decision, in which workers are able to decide themselves whether and how much to work – however working days must also depend on the availability of work and demand from employers. The final paper in this dissertation examines the seasonality of paid work days in the unskilled construction sector to estimate the actual demand for construction work over the period 1500 to 1800. Because the paper relies on actual data it is able to uncover more about the working year of casual laborers than other studies in the past, indicating that casual labor was very seasonal and not available in large enough quantities to meet the assumptions of Allen-style models, as well as showing that seasonality increased farther back in time; of these findings indicate that further adjustments may be necessary to properly model the differences in working patterns and work availability both regionally and temporally.

There are other important efforts which have been made to improve our use of data and methodology in real wage studies. Stephenson (2017) conducts another important study in this area, reexamining the archival material and organization of the data which underlie the British casual real wage series.

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She finds that the wage data that have been used to estimate British real wages during the industrial period actually include a substantial markup for contracting fees, which has not been realized or acknowledged in previous studies – this would indicate that the true wage level could be as much as twenty percent lower than what real wage historiography has relied on in the past.

4.4 Real wages in Scandinavia

There have been a few long-term real wage studies on Scandinavian data. However, these have tended to either be shorter term, beginning in the eighteenth century, or used an index which is not directly interpretable or comparable.

Sweden has perhaps the best real wage series of the Nordics, with a series of builder’s real wages stretching back to 1730 published already in 1987 (Söderberg 1987) and subsequent improvement and expansions back to 1365, but with a more-or-less continuous series from 1500. These series are all based on data from Stockholm, predominantly compiled and made available by Johan Söderberg – these data are also used in this dissertation to estimate welfare ratios for Stockholm. Söderberg’s study describes a Malthusian system without any sustained economic growth up through the beginning of the nineteenth century, a pattern in line with Allen’s (2001) and others’ description of the peripheral economies during Europe’s little divergence. These wages are estimated using an indexed CPI.

Danish series of ‘absolute’ real wages have been published for the period 1731-1913 (Khaustova and Sharp 2015) and with an indexed deflator from the late medieval period (Abildgren 2017). The wage and price data which underlie these series are fairly heterogeneous, covering different types of work and different parts of Denmark during different periods. Khaustova and Sharp (2009) apply Allen’s (2009) methodology to already-published data, and find that Danish laborers were poor, like much of the periphery, through the eighteenth century and maintaining a comfortable family living would have required several family members to work. Danish male workers rapidly caught up with leading economies in the nineteenth, and were among the wealthiest workers in Europe by 1870. This is not unlike the development of what is known about the wages of workers in Stockholm.

The series by Abildgren (2017) is rather unusual in the field of early modern wage studies in that it estimates real hourly wages, while most studies of this kind estimate daily or yearly wages, due to the considerable lack of data on the working day or the working year. Patterns in the preindustrial period are rather like those in Stockholm, with some minor real wage decline in the sixteenth century, some recovery in the seventeenth and decline again in the eighteenth, before much strong growth going into the later decades of the nineteenth century. According to Abildgren’s comparison of hourly wages in Sweden from the late medieval period, which he has derived from other sources, the decline and recovery before the eighteenth century was much more pronounced in Denmark than in Sweden, with Denmark experiencing a real wage trough significantly below Sweden’s around 1550. Abildgren also notes the dramatic decline of wages in both countries in the later part of the 1770s; certainly this is an important finding of this dissertation as well, with indications that a single earner would not have been sufficient to support a family, and that even single men would have struggled to support themselves comfortably with seasonal and unskilled work (see papers 1 and 3).

Unfortunately Norwegian data does not reach so far back as her Scandinavian siblings, with real wages dating back only to 1726. This series is, like Denmark, comprised of heterogeneous sources and types of labor and deflated with a national CPI. Though on a shorter time scale, the patterns still reflect those in Sweden and Denmark, with declining wages through most of the eighteenth century and a sharp, and likely highly detrimental, drop in real wage levels right at the turn of the nineteenth century.
Existing real wages studies, while lacking a common base or comparable unit, show similar trends between Scandinavian countries; this is not surprising given the physical proximity and multiple political unions throughout the centuries. In a study of early modern integration around the North Sea region, van Bochove (2008) uses data on prices and wages from Allen (2001) augmented with other published sources including Söderberg’s work on Stockholm to build welfare ratios in the style of Allen and this dissertation – his work indicates that while the patterns in wage development might have been similar, wage ratios in Copenhagen were at a higher level than in Stockholm for the period when both are available, after the beginning of the eighteenth century. Both Stockholm and Copenhagen performed substantially below the level of the European leaders, and unskilled male workers in Stockholm did not make enough to comfortably support a family throughout the entire period, ending in 1800.

Each of these nations only has one national real wage series into the early modern period. There is of course much more information for later periods; for Sweden there are several studies of wages on a regional basis: from 1732 for agricultural work, and from the later part of the nineteenth century for other industries.

The dominant literature on Sweden’s regional development has been the significant convergence both in real wages and in GDP since the middle of the nineteenth century (Enflo and Rosés 2015; Collin 2016) and the relative high level of equality in Sweden, but recent research has indicated that Swedes faced much higher levels of regional inequality in the pre-industrial period than what later data have indicated, and that inequality grew substantially from the early modern period into the nineteenth century and industrialization (Bengtsson et al 2017; Enflo and Missiaia 2017, 2018). Regional GDP benchmarks from 1571 to 1850 indicate that Scania has been among the poorest regions in Sweden, with Malmöhus County consistently recording among the lowest GDP per capita index in the country, often in competition with Jönköping County for the bottom spot. Malmöhus and Scania performed their relative best between the late eighteenth and early nineteenth century, with slightly above-average performance in 1800.

These more recent studies with an emphasis on earlier periods indicate how different patterns in the early modern period were both from what we witness in the eighteenth and nineteenth centuries, but also between different regions of Sweden, and through this it becomes apparent how important studies of particular groups are, and the impact of reaching as far back in time as possible.

5. Modern debates and real wages
Real wage studies of course tell us something about the progression of wages and what workers could afford at certain times, and this has been a useful and important tool for understanding the back-and-forths of a population’s well-being at a more concrete or relatable level than, say, GDP.

But wages have also been used to formulate and test some of the major debates and theories in economic history, through their use alone, in comparison with other wage data, and in contrast to other statistics. Part of this is because wage data are often the most frequent survivors of history’s cull of written information. Wages were and are ubiquitous, and are paid to top level employees as well as casual farm hands. Though not all were written down, many of course were, and some of those have been found and utilized by economic historical researchers.
Another factor is that wages simply existed before other measurements became common. GDP and other macroeconomic indicators are modern inventions. Production and consumption figures, while important to independent suppliers, did not catch the interest of governing bodies in the same way that they do today.

Because of both their usefulness and their relative frequency in archival sources, wage data is at the backbone of many of economic history’s most important and perennial debates. However, wages are not straightforward. While they in some ways feel intuitive and simple to interpret, the ways in which wages are calculated, manipulated, and compared have massive impacts on what type of market functions they represent, both at the global and at the household level. So too can a focus on a particular type of data, either because of convention or difficulty in finding and using other data, present significantly different interpretations of both local and global developments.

It is difficult to overstate the importance of the differences in interpretation and results that different uses – or misuses – of wage data have led to, and how they have shaped and reshaped the meta-interpretations of early modern European economic development.

This section outlines some of the most vital theories and discussions which have a strong basis in wage data, with emphasis on how different manipulations of the data or use of different types of wages lead to radically different narratives. These discussions (and sometimes heated debates) illuminate why it is so important to continue to collect new kinds of wage data representing different types of workers and why new types of analysis are so essential to economic historians. It also emphasizes the difficulties which can be found in using data for a purpose other than for which it was collected; without serious criticism of the source material and the initial impetus for collection, such data can lead to misleading or exaggerated conclusions.

5.1 Standardizing wage units and how it can change interpretations
Some debates use wages to explain developments; other to describe them. The Little and Great divergence typically fall into the second category. With an important exception, described below⁴, wage levels are used to illustrate the shifting of economies away from each other but are not taken to have necessarily caused these divergences.

‘The Little Divergence’ describes the divergence in growth trajectories between England and the Netherlands, in the Northwestern part of Europe, from the rest of continental Europe in the early modern period. Most European economies had fairly similar levels of wages in the fifteenth century, and economic development was also fairly evenly spread, though slow. Following this homogeneity in the late medieval period, the Netherlands, and then England, diverged and underwent a substantial increase in both wages and GDP levels. These were the first instances of modern economic growth, and resulted in British workers receiving wage levels beyond any other European workers.⁵ The rest of Europe, on the other hand, experienced declining wage levels, even in formerly wealthy regions, such as the Italian cities which had been central to Europe’s access to the thriving Mediterranean (Allen 2001).

⁴See section 5.1.
⁵The data underlying this story has recently been called into question. This debate will be addressed more closely in section 5.1.3
Wages have been one of the predominant measurement techniques used to describe the development of the little divergence, beginning with the first major description in Allen’s (2001) study. Wages here are used as a rough proxy for economic development; regions with higher wages are strongly associated with higher GDP and stronger economies. The use of wage data has supported a level or resolution which is not typically feasible with indicators such as GDP which require a higher data load and can be more difficult to focus on specific cities or small regions. This has allowed for a more direct comparison between specific economic regions, as opposed to larger political entities. When making distant and intercontinental comparisons this is especially important; the huge differences in size and population make comparisons at the country level meaningless when the strong growth is concentrated in smaller regions. It is of course an imperfect stand-in.

When wages have been used as descriptors in the Little Divergence literature they have been based on the model described in Allen (2001); a day rate paid to unskilled workers, which is typically the most readily available type of wage data is multiplied by an assumed number of work days to estimate an annual income. This is applied universally across time and space. This issue is the focus of Gary (2018c), and so this section will not discuss the issue in depth, but it is one of the most important methodological considerations which has, until this point, been unaddressed (or unaddressable). Because workers likely had little control over when work was available, and the availability work was likely to be different in different regions, this universal inflator imposes certain pattern on the data which might not exist in reality. This is especially the case if there are consistent differences in the number of days worked between different markets, as the discussion in Gary (2018c) suggests.

There are several assumptions in the Allen (2001) model which are being questioned from many different sides. This derived wage is both assumed to also support a set number of individuals, or adult male equivalents, and to come to the family though only one source. None of the work in this dissertation directly addresses the assumed size of the family, but Humphries (2013), discussed below in section 5.xxx, approaches this from several different angles. Gary (2018b) indirectly addresses the issue of a single household earner, though an investigation and analysis of women’s comparative earnings in construction work.

The pattern of wage divergence within Europe is of course only a part of economic divergence on a global level. Europe was emerging as the new global trade and economic center, with, of course, an emphasis on the European growth leaders in the North Sea region. Europe’s pull away from other previously strong economies is known as the Great Divergence.

The question central to the Great Divergence debate is at what point economic development in Europe truly pulled ahead of economic development in the rest of the world, primarily in Asia, with the leading regions in China often compared against leading European regions. Pomeranz’s (2000) major book The Great Divergence does not use wages as the central measurement of regional differences, but wages are used as evidentiary support. Wages are also central in critiques of the theory (for example Broadberry and Gupta 2006). Different interpretations of the relative wage levels between East Asian and Europe largely hinge on how the differences are measured, whether it be by wages compared against local living and food costs, which relate to living standards or wages converted into grams of silver, which acts more as a measure of the strength of wages on an international market.

These differences are at the front in discussions over the timing and the extent of Europe’s and Asia’s ‘Great Divergence’, and highlights the important question, ‘how do we measure wages?’, or, perhaps more accurately in this case, ‘what do wages measure?’

When compared to caloric needs and basic subsistence, the purchasing power of wages in China, Japan, and India are not dissimilar level to much of Europe through much of the early modern period;
Pomeranz (2000) for China and Parthasarathi (1998) for India both find consumption-based wage levels that are commensurate with those through much of peripheral, but not leading, European cities before 1800. However silver wages were much higher than those in Europe, which Broadberry and Gupta (2006) claim indicates a much less developed value-add in international trading; the relative affordability of foodstuffs combined with low silver wages instead indicates high productivity in agriculture in a way which could be compared with Poland. Broadberry and Gupta use this difference in the different type of wage gaps to challenge both Pomeranz’s and Parthasarathi’s later dating of divergence between Asian and European economies. While the dating and definition of divergence are difficult and elusive, it is abundantly clear that measuring wages is not straightforward, and the choice of comparison unit is essential to the economic factors that the wage is used to indicate.

5.2 Difficulties with wages collected for other purposes
What is more problematic is when wage data are misused, and when interpretations do not line up with what the data itself can reasonably represent. This presents problems when hypotheses go beyond what are appropriate or can be supported by the data which is used; it is of course much more difficult to adjust data to suit one’s needs than it is to fix a model. Again, because of its prominence, Allen’s (2009) high wage economy hypothesis presents an example of a lively discussion over what wage data represent and how they can be interpreted, as well as the pitfalls of relying on data which was collected for purposes other than what it is being used for. Both Humphries and Schneider (2016) and Stephenson (2017) present strong critiques against both the data which is used and how the data is utilized and interpreted.

One of the most revisited and chronically debated topics in economic history is the question of why England industrialized first. Allen’s (2009) ‘high wage economy’ hypothesis addresses this question; his thesis centers on the role of England’s supposedly high wages levels as a causal push toward industrialization. The argument proposes that England had high wages compared to both other countries and compared to the price of capital and coal. In its simplest terms, high and rising labor costs in combination with very low prices of coal incentivized investments into labor-saving technologies. This did not occur elsewhere both because wages were much lower and because the cost of the fuels needed to run the new and inefficient steam technologies in other regions was so high. This meant that investment into labor-saving technology made little economic sense elsewhere, leading to a divergence in capital investment and labor savings innovations to further reduce labor input costs.

Here wages play a central and causal role; if wages had been lower, Allen claims, capitalists would have had little incentive to invest in capital-intensive production techniques. Without these investments, there would have similarly been little incentive for or return to innovation. In this model of course Allen is interested in wages as the cost of labor, not as a signaler of well-being (see Allen 2015). The argument has been increasingly criticized in recent years, both in its interpretation of what wage data represent and in the type of data which has been used to frame the argument. This hypothesis and its critical responses has become one of the most lively and vivid debates in economic history, with several high-profile critiques followed by responses and defenses by Allen.

The main critiques are that the proposals Allen makes rest on inaccurate uses and interpretations of wage data (Humphries and Schneider 2016; Stephenson 2018). Much of the data which has been used to build and support this hypothesis was collected for other purposes, by other people, and often was done decades ago. This has in the eyes of some led to a lack of clarity about what exactly these wages represent in terms of actual remuneration to individuals.
5.2.1 Spinners’ wages

A crucial mechanism of Allen’s (2009) argument is that industries with particularly high wages were incentivized to invest in labor-saving technology; as a result, the industries which mechanized earliest and most completely should have been those with the highest wages, or at least should have had relatively high wages. The spinning and weaving industries were famously the first to industrialize. Because these were largely (though not exclusively) dominated by women, it is ‘women’s wages relative to the cost of spinning machinery’ (Allen 2009, cited in Humphries and Schneider 2016) which should have been the driving factor behind investment in mechanization.

Allen uses estimates of spinners’ wages collected by Muldrew (2012), which in turn come from contemporary social commentators’ accounts of the state of the industry, as related to them primarily by the capitalists who were engaging the spinning labor and selling the finished material. That is to say, these are not typically direct accounts of direct wage payments, and are ‘likely to overestimate the level and growth of wages’ due to the commenters’ social position and social goals (Humphries and Schneider 2016 pp 3). But due to the complexity and difficulty of gathering and processing hand-spinning wage data, this had been virtually the only data on hand-spinning available in the mainstream economic history literature – Humphries and Schneider (2016) emphasize that the gender studies literature has paid more direct attention to hand-spinners over a longer period of time.

In such a case where reliable data is not readily available this kind of secondary view – reliant on secondary reports of wages, productivity, and work – can be immensely useful, but of course must always be viewed with the position and goals of the compiler in mind. In this case, it was to the benefit of the clothiers, especially, to report that employees were “well paid and employers … hard pressed” (Humphries and Schneider 2016 pp 12), which is not made apparent in Allen’s initial presentation of his hypothesis nor in his 2015 response to Humphries (2013) critique, which focuses much more explicitly on the relative wages of female spinners.

Humphries and Schneider (2016) take a bottom-up approach to construct spinners’ wages. The difficulties and complexities they describe in connecting different types of data, as well as converting piece rates to day wages, make it fairly apparent why collecting and analyzing similar wage data had not been fully undertaken before. Wages paid for spinning or other textile work are tricky; wages were paid by piece, not by time, and different rates for different types of spinning work compound the difficulty. Spinning was typically conducted as part of a putting out system, where the work was carried out at home and workers primary interaction with the employers was to turn in completed spinning work and to pick up fresh raw materials; this means that there is no direct observation of productivity. Spinners were typically paid by the pound of fiber spun, so any expression in wages as they related to hourly work depends on some knowledge of productivity. Further, the same starting weight could be spun into different lengths of yarn based on the fineness to which the spinner spun, which was less likely to be recorded. Obviously spinning finer, longer yarn required more skill and a higher time commitment, which further complicates calculations.

This recount of the difficulties in calculating spinners’ hourly or daily wages is to illustrate the difficulty with reconstructing these wages and the meticulousness and attention to detail needed in order to reconstruct them in a useful manner. Through this reconstruction Humphries and Schneider estimate wage levels far below what evidence collected from social commentators indicated; while Allen cites wage levels as high as 12 pence a day in 1770, falling to 5 per day by 1779, Humphries and Schneider indicate that 4 to 6 pence a day was far more typical throughout most of the seventeenth and eighteenth centuries. Furthermore, any possible wage spike does not line up with the timing of Allen’s
hypothesis; there is no great change in wage levels after 1700s, as would be necessary to motivate that investment in mechanization was a result of rising wage levels. The estimates that Humphries and Schneider make are, on the other hand, much more in line with what had been accepted in gender historians’ work for many years (Humphries and Schneider 2016 pp 24). These wages were also incredibly low, and would have not given the earner a luxurious lifestyle. Neither does it seem that hand spinners had any large control over their conditions of work or influence on pay rates.

These findings would of course erode most of the support for the high wage economy hypothesis as presented in Allen (2009, 2015) – with no high wages, and no consistent trend of wage growth, these things could of course not act as incentives for investment in new technology.

Humphries (2013; Humphries and Schneider 2016) uses this evidence of quite low wages for women to counter Allen’s (2009, 2015) high wage economy hypothesis; it was the low wages of women and children along with the desire for more uniform and consistence textile production, she says, which were the big push for innovation and capital investment.

5.2.2 Builders’ wages
Stephenson (2017) similarly critiques Allen’s use of London builders’ wages. As were the spinners’ wages, the building wages that Allen (2001, 2009) bases his analysis and hypothesis on were collected for other purposes, several decades ago, including Gilboy (1936) and other foundational (real) wage series discussed in section 3.1, above. But, Stephenson contends, these wages are taken out of context. From at least the later part of the sixteenth century, wages rates represent the costs to the builder, rather than the wage paid to individual laborers. This cost includes a markup to contractors which does not make it to workers on the group, but is instead part of the profit margin of contractors and capitalists. Through her analysis of the context and work structure in which these wages were paid, she determines that the wages which unskilled builders directly received was up to twenty percent lower than what major building projects’ records would indicate, especially into the seventeenth century.

This is, again, an instance where the reported or recorded wage rates are not entirely aligned with what actual workers received as pay; another reminder that it is vital to examine the sources and to understand the purposes for which they were recorded. If Stephenson’s analysis applies to the British wages which underlie the real wage series at the foundation of the picture we’ve built of early modern Europe – but not to other key series, as she’s indicated is likely to be the case – then our current view of comparative early modern Economic development needs to be reassessed, with a serious eye to the data upon which our claims are based. This, too, is the inevitable conclusion of a reader of Humphries and Schneider (2016); we need to give our data more training and preparation before we send them to the front to fight our battles.

5.2.3 Revised wage series
Other reevaluations of data series are conducted on more simple grounds – the data collected do not line up with the use because they are not from the region they are meant to represent. Allen’s (2001) paper relied on a large amount of data, largely collected from other sources. After the publication of the data underlying the paper the main wage series have become somewhat canonical, and are frequently referenced and used in other investigations.
Because of the high profile of Allen’s initial study and the data series which were utilized in the paper, several of these studies have been further scrutinized and other authors have revised some of the wage series which featured in the initial study. Two of the poorest series in the original 2001 study have been revised by other authors. Revised estimates for Strasbourg (Geloso 2018) indicate that the town was much better off than in Allen’s estimates, largely because the original figures failed to take into account payments in kind. These wages also come from rural villages outside of the city, and so reflect a lower-waged paradigm than urban or town wages. This highlights how essential it is to ensure that comparisons are actually comparing similar types of wages – the whole impression of early modern French wage levels is significantly higher when wages from Strasbourg proper are used and adjusted for non-cash perquisites which would have been an important component of pay.

So too does comparing high wage and low wage regions as representatives of an entire country give a misleading result – Malanima (2013) argues that this has been the case for Northern Italian wages used in the Great Divergence literature. London wages are used as the comparison for England, but there are high in an English context; Malanima offers that when some corrections are made to better reflect comparability of markets and consumption, England overtook Italian wage levels much later than Allen’s (2001) initial estimate. Italian wages were likely above those of England in the end of the medieval period, and English and Italian wage levels converged during the sixteenth and seventeenth centuries; England overtook Italy only around the turn of the eighteenth century, not at the beginning of the early modern period. Again; when used in a comparative perspective we must be much more careful about the validity of what it is that we are comparing.

The ‘correctness’ of many of the wage series estimated in the original Allen (2001) Great Divergence paper has, as is apparent from the preceding sections, been an important drover of academic debate since the paper’s publication. This abundance of research has truly pushed the research frontier forward and improved our understanding of early modern work and remuneration.

5.3 New insights from different kinds of wages

All of the above wages have been based on wages paid by the day, or, in the case of spinners, by the piece. It is difficult to translate these wages into an ‘accurate’ measure of a year’s earnings because so little is known about a typical work year and how it might have changed over time. As a result economic historians have been forced to rely either on pure indexes which make it difficult to calculate a ‘concrete’ result, or on an assumed number of work days which can give a more approximate relation to tangible wage levels. As discussed above, Humphries and Weisdorf (2015, 2016) make a first serious foray into presenting wages earned by annually employed workers in a long-term and unified series, for women and then for men.

The series for men, especially, challenges many of the largest narratives which have been developed to describe and explain early modern economic and labor development; this is of course because the bulk of these theories are built on the back of men’s day wages.

Their new wage series suggest a new revisionist interpretation of early modern British growth. One of the great confounders in European early modern economic history has been the substantial divergences between real and GDP per capita. In the British case, these divergences have been the foundation for the so-called ‘Golden Age of Labor’ following the Black Death; in the thirteenth century GDP per capita was fairly flat, while real wages grew substantially. During this time unskilled workers are thought to have had a significant bargaining advantage due to the labor shortage caused by high death rates. The second relationship, termed ‘Engles’ Pause’ describes an inverse situation in which
GDP per capita increased significantly after 1650, while real wages stagnated. Here it is thought that capital gained the upper hand and profits grew at the expense of workers’ income (Humphries and Weisdorf 2016 pp. 3).

The annually-contracted wage series by Humphries and Weisdorf departs substantially from the day-constructed wage series, but not nearly so much from the GDP series; in fact the annually-earned wages are a near-fit to GDP. This has strong implications for overarching theories based on day wages inflated by 250 days; annually incomes earned in the ‘Golden Age’ were not so high as casual wages inflated with a 250 day work year would suggest, and causal workers probably worked as few as 100 days per year. Wages in the post-1650 period grew continuously, indicating that economic growth began significantly earlier than what has been suggested in previous scholarship.

As Humphries and Weisdorf (2016) acknowledge, their findings are highly in line with many speculations or inferences put forth by other works, most notably Hatcher (2011), which is very skeptical of the proposition of such high wage levels following the Black Death and into the sixteenth century.

Work such as this is a clear indication that no matter how many studies we have on something so (supposedly) fundamental or basic as (real) wages, there is still so much which is unknown about the most basic experiences in the early modern period. These findings, with such a revisionist set of implications on the essential narrative of the early modern worker’s experiences, are strong motivation for work such as this dissertation which continues to probe deeper into an early modern economy and work patterns.

6. Data and methodology
This dissertation is based predominantly on data from two databases of data on wages specifically compiled for this thesis. These data are combined with additional secondary data on wages, as well as secondary data on prices in order to create the numerous data series used in the dissertation.

6.1 Data sources
6.1.1 Primary data
The primary wage data collected for these studies are sorted into two primary datasets: wages for workers paid by the day, and wages paid to workers employed on long-term, typically annual, contracts.

Records for both types of wages come from the same sets of sources; most records books have data on both annually employed and casual workers. These are institutional, church, and manorial accounting records from between 1500 and 1830 (daily wages) and 1500 through 1850 (annual wages). Specific archival locations were selected because of their representativeness and completeness. The databases are a complete collection of all the recorded wage payments available in these records, except for daily wages after 1800; a random sample is taken during this period because of the quantity of recorded payments became too high to completely collect. These data represent a large proportion of the labor market for early modern Swedes: they capture girls guarding sheep and city councilmen, carpenters and organists, midwives and fishermen. The majority of captures observations are unskilled men working in construction work and paid by the day, which is the population that has most commonly been used to calculate real wages in past studies.
The distribution of observations is also very different, with casual work dominating in the sixteenth century, while annual work has strong peaks in the eighteenth century. Part of this is simply due to which records have survived and from where. Most of the records from manorial estates, where annual employment was more of the norm than casual, only exist from the eighteenth century and onward. Records from the cities, especially Malmö Borgerskap, from which the majority of the data used in this study come, dominate in the earlier period. The cities and churches always had annually hired staff, but their payrolls expanded significantly from the eighteenth century as urban centers grew and white collar employment became increasingly important.

On the other hand, the sixteenth century was a period when both Swedish and Danish governments were undertaking a process of nation-building, beginning with fortifying and updating existing defensive structures such as Malmö castle. The sixteenth century payment records form Malmö Borgerskap contain many large-scale projects on public works which are responsible for the large spikes of observations.

6.1.2 The two primary datasets

The wages and work that were earned, completed, and recorded are different for casual labor and for workers hired on long-term contracts.

This section describes the differences in how the data are recorded and how observations are measured. The different kinds of jobs and how that related to the early modern economy and society are discussed in section 2.1 above.

The primary wage data has different units of observation for wages earned by the day and those earned on a long-term contract: for casual, or day, wages, the unit of observation is paid work days. If one entry records an individual working for five days, this is counted as five observations; similarly, an entry recording seven workers each working for one day is counted as seven observations. This is to ensure that all data points are treated equally and given equal weight. It is not possible to link every entry to an individual worker, so if repeat work days for the same individual were eliminated from one record, this person’s work days would not be given the same amount of weight as other days worked by another individual which could not be connected.
Table 1: Wages by type and location

<table>
<thead>
<tr>
<th>Archive</th>
<th>Daily men</th>
<th>Daily women</th>
<th>Annual men</th>
<th>Annual women</th>
<th>Archive type</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>unskilled</td>
<td>skilled</td>
<td>unskilled</td>
<td>unskilled</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malmö borgerskap</td>
<td>16,066</td>
<td>3,509</td>
<td>324</td>
<td>1,013</td>
<td>Town</td>
<td>1517-1850</td>
</tr>
<tr>
<td>Kalmar cathedral</td>
<td>2,746</td>
<td>1,485</td>
<td>1,330</td>
<td></td>
<td>Church</td>
<td>1614-1709</td>
</tr>
<tr>
<td>Halmstad</td>
<td>35</td>
<td>26</td>
<td>-</td>
<td>-</td>
<td>Town</td>
<td>1594-1702</td>
</tr>
<tr>
<td>Jordberga</td>
<td>42</td>
<td>9</td>
<td>221</td>
<td>85</td>
<td>Manor</td>
<td>1756-1809</td>
</tr>
<tr>
<td>Karsholm</td>
<td>16</td>
<td>42</td>
<td>54</td>
<td>26</td>
<td>Manor</td>
<td>1681-1811</td>
</tr>
<tr>
<td>Knutstorp</td>
<td>41</td>
<td>21</td>
<td>12</td>
<td>414</td>
<td>Manor</td>
<td>1742-1849</td>
</tr>
<tr>
<td>Kristianstad</td>
<td>67</td>
<td>19</td>
<td>420</td>
<td>21</td>
<td>Town</td>
<td>1652-1770</td>
</tr>
<tr>
<td>Kristianstad Hospital</td>
<td>-</td>
<td>-</td>
<td>65</td>
<td>87</td>
<td>Hospital</td>
<td>1766-1830</td>
</tr>
<tr>
<td>Landkrona Rådhuset</td>
<td>160</td>
<td>58</td>
<td>-</td>
<td>-</td>
<td>Town</td>
<td>1699-1776</td>
</tr>
<tr>
<td>Lund Cathedral</td>
<td>241</td>
<td>65</td>
<td>153</td>
<td></td>
<td>Church</td>
<td>1676-1780</td>
</tr>
<tr>
<td>Lund Rådhuset</td>
<td>56</td>
<td>45</td>
<td>-</td>
<td></td>
<td>Town</td>
<td>1674-1757</td>
</tr>
<tr>
<td>Malmö Hospital</td>
<td>530</td>
<td>326</td>
<td>8</td>
<td>141</td>
<td>Hospital</td>
<td>1547-1689</td>
</tr>
<tr>
<td>Malmö Saint Petris Church</td>
<td>716</td>
<td>349</td>
<td>1</td>
<td></td>
<td>Church</td>
<td>1532-1681</td>
</tr>
<tr>
<td>Maltesholm</td>
<td>15</td>
<td>3</td>
<td>20</td>
<td>11</td>
<td>Manor</td>
<td>1738-1770</td>
</tr>
<tr>
<td>Rosendal</td>
<td>-</td>
<td>1</td>
<td>4</td>
<td>10</td>
<td>Manor</td>
<td>1672-1680</td>
</tr>
<tr>
<td>Skarhult</td>
<td>-</td>
<td>-</td>
<td>9</td>
<td>4</td>
<td>Manor</td>
<td>1679-1762</td>
</tr>
<tr>
<td>Trolle-Ljungby</td>
<td>206</td>
<td>10</td>
<td>1</td>
<td>700</td>
<td>Manor</td>
<td>1721-1807</td>
</tr>
<tr>
<td>Västena Rådhus</td>
<td>24</td>
<td>10</td>
<td>2</td>
<td>117</td>
<td>Town</td>
<td>1613-1740</td>
</tr>
<tr>
<td>Vittskövle</td>
<td>297</td>
<td>15</td>
<td>2</td>
<td>1132</td>
<td>Manor</td>
<td>1647-1828</td>
</tr>
<tr>
<td>Växjö Cathedral</td>
<td>35</td>
<td>71</td>
<td>6</td>
<td>23</td>
<td>Church</td>
<td>1658-1704</td>
</tr>
<tr>
<td>Ystad</td>
<td>40</td>
<td>92</td>
<td>-</td>
<td>275</td>
<td>Town</td>
<td>1633-1850</td>
</tr>
<tr>
<td>Årup</td>
<td>7</td>
<td>-</td>
<td>-</td>
<td>7</td>
<td>Manor</td>
<td>1623-1778</td>
</tr>
<tr>
<td>Total</td>
<td>21,348</td>
<td>6,456</td>
<td>1,686</td>
<td>4,822</td>
<td></td>
<td>1517-1850</td>
</tr>
</tbody>
</table>
Wages paid by the year on the other hand have a unit of observation of paid work year. This does create some disequilibrium in what is being compared; obviously a full work year of casual work will comprise many more observations than a full year of annually contracted work, which will be only one observation.

Payment records are also recorded slightly differently for those on annual contracts and those who are paid by the day, with day wages more likely to include the worker's name and annual occupations more likely to refer to a job title. Annual records include the occupation, the wage, and the length of the contract. The location of work, type of employer, and the year of employment are known from the record books themselves. It is not common for these records to include the names of the workers, especially when they are unskilled servants working on manorial estates. However, most occupational names are gendered, so sex can be fairly easily assumed. Records however do not include a description of tasks or responsibilities, or age or marital status.

Daily wage records usually include the occupation or job of the person employed though sometimes it is not specified. These records are more likely to include a description of the project on which they are
working. These records are also more likely to list workers by name, though this is not always the case. Most records indicate the day rate the worker is paid, the number of days worked, and the total payment at the end of the pay period. In these records men and women are sometimes referred to by the same occupational title, so when names are not also listed it is not possible to identify the sex of the worker.

6.1.3 Secondary wages
The primary data discussed above is supplemented by published wage series from Stockholm. Unskilled men’s wages from 1500 – 1719, unskilled women’s wages from 1600-1719, and skilled men’s wages from 1600-1719 come from Jansson, Andersson Palm et al. (1991). These are supplemented with men’s unskilled wages through 1850 from Söderberg (2007).

6.2 Methodology
6.2.1 Currency and coinage
One of the features of early modern Swedish and Danish wages is the variety of currency and coinage available for payment – in his chapter on early modern Swedish currencies Rodney Edvinsson describes it succinctly: “What characterizes most of the period [of 1534-1803] was the perplexing parallel use of several domestic currencies. Exchange rates fluctuated not only on foreign currencies ... but also between these domestic currencies” (pp 133), with in practice up to six currencies based on three metallic standards during the seventeenth century (pp 151) In addition to the change in currency units, attempts to control the global price of copper led to the introduction of copper coins, which were intended to circulate at parity to silver, but shifted away from face value toward intrinsic value, further complicating currency relationships and, as an extension, payment. Sweden’s currency again changed in 1803, at last stabilizing somewhat with a single currency, but the journey from 1500 to the nineteenth century was indirect and labyrinthine.

The bi- (and tri-) metallic standard and multi-currency system were able to persist because the silver and copper based currencies did not circulate at a fixed exchange rate, and so the cheaper money did not replace or force out the more expensive money – as might be expected if the different systems circulated at an exact conversion rate (Edvinsson 2010 pp 155).

Initially money in both Denmark and Sweden was based on a silver standard – though these currencies went through several debasements in the time under study here, the currency unit, called daler, was at least fairly straightforward.

It became much less direct in Sweden in 1624 when Sweden introduced a duel copper and silver standard. When copper was introduced it was intended for copper and silver coins to circulate at parity, with the face value of the copper coins representing the silver coin equivalent, and with copper as the official and primary currency. This was due to the Swedish government’s desire to use their vast copper reserves to manipulate the international price of copper.

However the value of the copper coins quickly slipped away from their silver counterparts, and the Swedish government on several occasions switched between which of the two metals was the ‘official’ metal of currency.

In 1633 silver was again the official metal, and copper had fallen enough vis-a-vie silver that it was officially debased to half the value of silver coins. It continued to fall and in 1643 it was debased again.
to the ratio of 2.5 copper daler to one silver daler, and the copper daler was again the official currency unit. By 1665 copper had continued to fall, ending at a three-to-one copper-to-silver valuation, and the silver daler was once more the official currency unit, though with copper still circulating as part of a de facto bi-metallic standard. The metals traded again once more, though still circulating at the same basic exchange rate as before, until the entire monetary system was overhauled in 1776 and the riksdaler was introduced. Though the currency was again overhauled in 1803, and once more in 1873 when the modern crown was introduced, there was more or less continuity between these later changes (Jörberg 1972).

Figure 3, as published in Edvinsson’s (2010) chapter, gives an indication of the development of just one term of demarcation in the early modern Swedish monetary system. Thankfully, not all these terms or units appear in the records. On the contrary, the payments themselves are most likely recorded as units of account, rather than the exact unit of payment (Lindström and Mispelaere 2015) – thankfully this also helps to avoid some of the difficulties associated with debasement and inflationary cycles. However, the same shorthand terms, such as ‘daler’, is often used, which could refer to several different units. More commonly the number of the unit and subunit of payment are recorded, without clarifying the currency or metal: for example one daler and four marks would be recorded as 1:4, or 1 & 4. This is perfectly clear where there is only one monetary option, but becomes less clear during periods of transition or multiple monetary standards. These ambiguities can be fairly simply cleared when the two currencies have a different number of sub-units – for example if currency one is comprised of 16 sub-units while currency two is comprised of 32 – and there are enough of the subunit

![Figure 3: “The bifurcation of the term ‘daler’ 1534-1873” as presented in Edvinsson 2010](image-url)

Source: Edvinsson 2010
accounted for in the payment to clear the benchmark. At other times it is necessary to compare with other sources from the same period in order to determine which currency and metallic standard is being used.

Because this dissertation deals with wages of unskilled and common laborers the monetary units and quantities addressed are comparatively small. Gold coins, or amounts that would require such large equivalencies, do not enter into the data, though they did exist during this period they were typically used on the international market.

All money in this dissertation has been transformed to a uniform currency – Swedish crowns – in order to present as uniform an analysis as possible. However, the Swedish crown is a modern unit, established only after the end of the study period (though the Riksdalar, introduced in 1803, is essentially different in name only). This means that the crown is a synthetic measure during this period. The multiple currency changes and lack of consistency further lead to some difficult decisions and transitions when the goal is to create a single and unified monetary series (Jörberg 1972). The changes in currency create the most difficulties in periods when the whole system shifts; here it is often not possible to connect the two currencies exactly, and so some break will exist.

6.2.1 Occupational coding

Obviously a collection of so many wage payments across so long a period and from different kinds of employers leads to heterogeneity in the types of work recorded. In order to make a meaningful set of studies and comparisons to other economies throughout early modern Europe this dissertation limits itself to predominantly unskilled occupations and paid work.

In order to separate skilled and unskilled work in as systematic and consistent a way as possible the HISCO system is used to code occupations, and then the HISCLASS system is used to separate these occupations into groups of various skill levels.

Often a worker’s job or occupation is inferred from a description of the work, rather than an explicit title. For example, a ‘man’ who is ‘doing some sort of work on the clock’ at the cathedral is identified as a clock repairman, even though him being listed as a ‘man’ without description would otherwise lead him to be labelled as unspecified unskilled worker.

The HISCO and HISCLASS systems were used to categorize the occupation of the workers and to sort them into skill groups. HISCO assigns a code based on the work or task carried out, and HISCLASS sorts this code into a skill scheme. Not all occupations in the primary data were present in the established HISCO and HISCLASS system, and so many were assigned occupation and skill groups based on the researchers’ experience, historical understanding, and context from the data itself. This was especially the case for the annually hired occupations, which required substantially more researcher discretion due to the novelty of the data sources and types. Day workers could usually be categorized into clear existing groups.

A description of what type of work or task the workers was carrying out was given preference over a listed title or occupation. Many times a stated occupation was not given, or the task being done was clearly more specialized or skilled than what the occupational title indicated. In some cases contextual wage information could also be used to reclassify workers when wage and occupation or skill
information was clearly not reflective of the actual work being done. A list of the primary occupations which were coded into the HISCO system for this dissertation are included in the appendix.6

Some payments were excluded. Anyone who was clearly a child (called *flika* or *pojke*; girl or boy) was excluded since we expect the employment and remuneration to be fundamentally different for children. This was done rather conservatively; only those who were explicitly children were excluded, and it is possible that some younger workers are still retained in the sample, especially in rural areas and in jobs that involved looking after animals. There were only about 200 explicitly labeled children in the sample who were removed, almost all of whom were working on longer contracts in rural areas. Widows receiving a pension were excluded; this was not uncommon in the cities. Prisoners are also dropped.

Other types of workers who were more typical workers are also excluded when wages could refer to work that could lead to compositional effects rather than reflecting ‘true’ wage changes. These are individuals, both men and women, who are working on a casual basis who are being paid for guard work; for working nights; for working for a combination of days and nights, making it impossible to isolate the true day rate; and for work for which part of the pay is also due to capital rent, such as driving carts. In order to be consistent and create something broadly comparable the data only uses observations which can be connected as closely as possible to a set task and period of work. This isn’t possible for payments which include day and night work together, or for work which also includes compensation for carts and animals. Payments for guard work and for night work (which was almost always also guard work) was also paid at much lower rates than typical day labor. Because these jobs were not as regular as standard day work they would introduce a heterogeneity into the series that is not due to actual wage fluctuations, and so they are omitted. Heterogeneous composition effects are especially a problem for women’s wages because of the lower number of observations.

All wages paid for work which was not in the construction field was also omitted from the casual labor series. This was in order to standardize the data as much as possible and to make it comparable to other similar data series which have already been published. The data which were omitted because of this were minimal, and included tasks such as cleaning the city hall as well as guard work such as that described above.

This dissertation is primarily concerned with the wages of unskilled workers, though skilled workers’ wages are at times incorporated for comparative purposes. Thus the vast majority of the analysis in the following papers is concerned with individuals who were working the least skilled tasks.

As with the HISCO coding, there were some times when the HISCLASS coding that was suggested by published materials did not match the patterns in the data or other contextual and historical knowledge. In some cases, several of which have an important impact on the final data series, context and historical knowledge were used to reassign the HISCLASS codes to categories that more accurately reflected the actual data. The most significant example of this is ‘*stadstjänare*’, a common occupation for low and unskilled men in the cities. The position as defined by the HISCO and HISCLASS which were initially assigned to it represented it as a much more skilled and managerial position that what the contextual evidence indicated.

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6This appendix does not yet exist. Sorry.
6.2.3 Calculating nominal wages

Yearly wage estimates for both types of wages are calculated as an arithmetic mean of all observations of a particular wage type in the given year, giving equal weight to all observations. Entries for casual labor which represent more than single work days are counted as multiple observations in order to give the strongest weight to the most typical wage. The data tends to be extremely modal in high-observation years – workers of the same type and in the same place are typically paid at the same rates.

Annually earned wages present a particular problem because the written or cash wage is only a part of the full remuneration; servants were also given housing and board as part of their compensation. This thesis follows Humphries and Wesidorf (2015, 2016) by adding the cash value of the consumption baskets (discussed below) to approximate the full value of workers’ compensation. This is discussed in more detail in Gary and Olsson (2018).

6.2.4 Constructing the price series

This dissertation builds and uses six separate consumption basket style price series, two each for the cities Malmö, Kalmar, and Stockholm from 1500 to 1914. The price baskets are based on the quantities in Allen (2013). This allows the baskets and the real wages calculated from them to be comparable with the price and wage data published in Allen (2001), and so facilitates an international comparison.

The baskets are comprised of the amount of food and other consumables that would have been needed to sustain a single adult man over the course of a year. The price of all of these commodities is taken as the cost of survival for the year. Real wages are calculated by dividing the annual wage or income of a worker by the cost of the basket – the basket can also be increased to represent the cost of living to a family or a household, instead of an individual. Using the cost of this basket of consumables as the denominator when calculating a cost of living or real wage index provides an index number that has a concrete interpretation – a value of 1 indicates that the wage paid could just sustain the individual (or the family) for the year, while an index number of greater than 1 indicates surplus income which could be spent on non-necessities or on higher quality consumables. A value under 1 indicates that there is not enough income to support the individual (or family) relying on that income at an optimal level.

There are two levels of baskets, one representing a family living at a comfortable, or ‘respectable’ level, and another representing a family who is surviving at a subsistence, or ‘bare bones’ level. The respectable level represents a more ‘typical’ consumption pattern (Allen 2013), with a larger variety and high quality foodstuffs. The subsistence, or bare-bones, basket is composed of cheaper alternatives which would still provide daily caloric needs but use lower quality alternatives. Both types of baskets are developed for Malmö, Kalmar, and Stockholm, using local price levels. The only change made to Allen’s quantity levels is to replace half of the meat allowance with herring, to more accurately represent a Scandinavian diet which relied heavily on fish as a source of protein (see Morrell 1989). This decreases the prices of the baskets from what their costs would be if the full protein allotment were meat due to herring’s lower price, and is probably an under-substitution toward the cheaper option.

Allen’s (2001, 2013) approach has become standard in the field and so using this methodology and basket composition allows for substantial comparability with other existing literature – since the goal
of much of this research is to understand relative economic development and development of living standards, this alone is a strong incentive for following suit. However, the quantities laid out in this approach are also a reasonable approximation of studies which investigate Swedish consumption and household expenditures toward the end of the early modern period and into the early twentieth century. This is especially true when we remember that potatoes were not available on a large scale in Sweden before the middle of the nineteenth century (Berger forthcoming) and so individuals in the period of investigation in this dissertation would not have had access to potatoes as part of their consumption basket. Table 2 shows the components of the consumption baskets used in this dissertation (Allen 2013) as well as those in studies of Swedish consumption and Allen 2009, which is used in some other real wage studies. Allen has updated the quantities of the consumables in the baskets over the years, though they have remained more or less similar. One divergence is his 2009 basket composition, which contains substantially more bread (or grain) than the 2001 or the 2013 versions. Because this dissertation is primarily concerned with comparability and long-term trends, I have chosen to use the basket composition which allows for the most straightforward comparisons. However, other important studies of real wages have used the weights in the 2009 study, notably both Humphries and Weisdorf 2015 and 2016. This means that the estimates of living standards as estimated in these studies will be comparatively slightly lower than what they would be if the same basket compositions were used as in this study.

It is an unfortunate and yet universal truth of quantitative historical research that there is always data which is impossible to locate or recover, or which was never recorded in the first place. This has certainly been the case with the construction of the price baskets, and several extrapolations, interpolations, substitutions, and adjustments have been necessary in order to create consistent time series which could be used to estimate living costs for Malmö, Kalmar, and Stockholm from 1500

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<th>Table 2: Summary of consumption basket contents</th>
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through 1914. Other studies, including Allen (2001), have also been forced to make extensive substitutions and extrapolations in order to estimate a consistent and useful price series. When substitutions or extrapolations are necessary data is used from the nearest or most similar county where data is available.

The data used in the price series are grounded in Jorberg 1972. This comprehensive volume records prices and wages in Sweden on the county level from 1732 to 1914. Estimates are based on market scale records.

The foundation of the consumption baskets are rye in the bare bones basket and rye bread in the respectability basket. Rye prices from Malmöhus County, where Malmö city is located, come from Jörberg (1972) are combined with rye prices from Burlöv, a village just outside Malmö, from 1616 to 1670 (Tommer 1964) and rye prices based on the same market scale data as Jörberg (1972) from 1658 to 1742. There are virtually no differences between the series at the points of overlap, but when there are the average price is used. The series is projected backwards to 1502 using an index of Danish rye prices (Albidgren 2010), since Malmö was Danish during this period. Because there are no values available for 1500 and 1501 the same values are used as estimated for 1502. This applies to the entire Malmö price series: other missing data are projected backward using the Danish CPI, which also begins only in 1502. This does not make a difference in this study because the wage data also only exist from 1502. Conversions of grain are carried out assuming a grain barrel size of 165 liters (Jörberg 1972), and rye is assumed to have a density of 74.25 kilogram per hectoliter, based on measurements of the rye harvests in Sweden from 1898 to 1900 (Flach et al 1909).

Unfortunately there is a lack of bread prices for early modern Sweden. This is not unique to the Swedish case: Allen (2001) also lacked substantial long-term series of bread prices throughout Europe. To address the lack of bread price data he regressed known bread prices on grain prices, mason’s wages to proxy for the markup in cost from the baker’s time, and a city fixed effect to capture taxes and rent, in order to create an equation to estimate bread prices. The price of bread is measured in grams of silver per kilogram of bread, and grain in grams of silver per liter. The coefficient on the grain price is 1.23 closely mirrors the requirement of one liter of grain to produce one kilogram of bread. The bread price is highest in Krakow, which has a coefficient of 0.245. This is also the city which is most likely to be similar to Malmö and Sweden: Poland was similarly situated on the European periphery and was a grain-producing region with consequently low grain prices, as was Scania in Sweden’s south. Because of the lack of data, the relationship between bread and rye in Amsterdam is used to adjust Swedish rye prices to estimate bread prices.

Pea prices are a mixture of prices from Malmöhus County and the neighboring county of Halland (Jörberg 1972). These are extrapolated backward to 1500 using the price of peas from the Netherlands. This is reasonable because peas were dried and traded, and the North Sea region was by this time a fairly well-integrated trade region (see Olsson 2006). Price changes would be fairly consistent across the area for preserved commodities, especially. Conversions between weight and volume are carried out assuming a weight of 80.05 kilograms per barrel of dried peas (USDA (Service 1992)).

Prices for beef for Malmö come from Jörberg, and before 1732 are extrapolated backward with prices from the Netherlands, as with peas.

Herring prices are estimated in the same way peas and beef. Herring were and are an important food item in Sweden; even today it is an important part of traditional holiday meals. Despite this important, or perhaps because of it, herring prices have been published using a myriad of Swedish currencies, weights and measures, and varieties of herring. This has made standardizing all the prices into a consistent series which represents the same type of fish, in the same currency, and with the same
barrel size an extremely unwieldy task, and I have been unable to come to any satisfactory result. A comparison between Dutch prices and the longest-available price series of Swedish herring prices from Stockholm shows that the price development was almost identical, both in growth and in levels. In the interest of using a consistent series which would not introduce any deviations due to changes in the underlying measurements, Dutch prices were adjusted to price levels in Malmö and used to extend the available data backward.

Beer prices are not available for southern Sweden. Instead beer prices from 1539 to 1620 (Söderberg 2002) are adjusted to Malmö levels using the difference in the price of Barley. Then they are projected forward and backward using the price of beer in the Netherlands.

Tallow prices are taken from Jörberg from 1732, but there are no prices available for Malmöhus; instead prices from neighbors Blekinge and Halland are used. These are extrapolated back using meat prices, and joined with tallow prices from Stockholm between 1539 and 1620 (Söderberg 2002) which are adjusted to Malmö levels. The same procedure is used for tallow candles, instead starting with data for Kristinastad County from Jörberg (1972) due to a lack of data for Malmöhus. There is no data for soap prices at all; instead tallow is again used to represent soap prices – this is done in the same way as in Allen (2001), who also used tallow to proxy soap prices. The same proxy is used for lamp oil.

Butter prices are not available for Malmöhus County until 1838, and so prices from Kristianstad County are projected back based on the (very small) difference between the regions. Before 1732 butter prices are projected back using the Swedish CPI. Neither are Malmöhus cheese prices available; cheese prices from Kronberg County are used and then projected back with the butter series. Eggs are computed in the same way.

Cloth prices are an average of prices for linen and coarse cloth Kalmar County. These are extrapolated back with the Swedish CPI.

Malmöhus pinewood prices from 1803 through 1875 are extrapolated back using prices in Halland to 1789, and then further extrapolated using Stockholm County (Jörberg 1972). Stockholm County is used instead of a more geographically neighboring county to Malmöhus because Scania was already quite deforested, like Stockholm, from its extensive agricultural land use. The same series is used to extend the Malmöhus series forward to 1914. This is joined with firewood prices from Stockholm (Söderberg 2002) from 1539 to 1620 using the Swedish CPI. Units are converted from cords and kilograms to British Thermal Units (BTU), a measurement of heat, using Jörberg (1972) and data from World Forest Industries.

Rent prices are unavailable. This is a standard piece of missing data throughout historical price and wage investigations. This series follows Allen (2013) by adding an additional five percent of the total basket price to account for the cost of rent.

Prices in both Stockholm and Kalmar are calculated in a similar way, though the counties where both of these towns are located have more consistent data than Malmöhus recorded in Jörberg (1972), and so there is less need for substitution. Additionally, there are more published data series from Stockholm for periods before Jörberg’s coverage.

Rye prices come from Jörberg from 1732 to 1914. Earlier prices are extrapolated backwards to 1540 using a rye price index from Stockholm provided by Lennart Schön. The calculated values from this projection are checked against converted values from Jansson, Andersson Palm, and Söderberg (1991) covering and Söderberg (2002) covering 1539-1620, and the index is clearly based on these data – thus
the index is preferred as it has better coverage than the individual series spliced together. The series is extrapolated back to 1500 using the Swedish CPI.

Bread prices are calculated in the same way as Malmö, by imposing the grain to bread price relationship from Amsterdam onto the Swedish data.

Peas and herring are computed in the same way as Malmö, by adjusting Dutch prices to Stockholm levels using data from Jörberg (1972).

Beef is compiled using Jörberg from 1732 to 1914, combined with data from Söderberg (2002) from 1539 to 1620. These are connected and extrapolated backward using indexed prices from the Netherlands, as in Malmö. Tallow prices are similarly based on a combination of Jörberg and Söderberg, and then connected and extended using the indexed meat prices.

Beer prices are based on beer prices from Söderberg and extended with Dutch beer prices.

Butter prices come from Jörberg and Söderberg and are connected and extrapolated using the Swedish GDP. The same adjustment as in Malmö is used to extend cheese prices backward based on indexed butter prices.

Cloth prices are the same as used in Malmö, due to a general lack of data on cloth and the assumption that manufactured goods would not have the same variation in prices as food products.

Firewood is estimated using data from Jörberg and Söderberg and projected using the Swedish CPI. Conversion from volume to BTU is the same as for Malmö. Rent is again a five percent increase on the basket price.

The Kalmar basket computation is almost the same process as Stockholm. As with Stockholm, the data in Jörberg is much more complete for Kalmar than it is for Malmö, though some substitutions did have to be made: pea prices are based on Jönköping County from 1732 through 1814, and are based on county Kronberg County from 1815 to 1914. Eggs are based on Kronberg County. Cheese is based on county 6 from 1734 through 1769, and are then based on county 7. Back projections are carried out using indexed prices from Stockholm. Bread and beer prices are adjusted based on the differences in grain prices. Cloth is again the same as Malmö.

The price basket is defined as the cost of the goods needed to support a single adult man for one year according to Allen’s (2013) estimations (see table 2, above). Calculations estimate the costs of two different income levels representing different lifestyles; one at the ‘bare bones’, or ‘subsistence’ level, which relies on inferior-quality goods and reflects the cost of just getting by. The second level is the ‘respectability’ basket, which represents a more costly lifestyle with both higher quality and a wider variety of food products. For both income levels the costs of the appropriate quantities for all goods are added together, and five percent of the base cost is added to approximate the cost of rent.

When the cost of living for a family, instead of a single man, is estimated the price basket is multiplied by 3.5 in order to approximate the caloric needs of a woman, man, and two children, following Allen (2001). This number is chosen primarily to aid comparison with earlier publications. There have been several different inflators used for family-level approximation – Allen (2013) uses an inflator of four, for example. Humphries (2013) leads an important discussion on the appropriateness of different levels of family-inflator values, with a particular focus on the underestimations of women’s caloric needs due to pregnancies and breastfeeding, as well as those of children who did not reach adulthood, and this is an important area of future study for regions beyond England. However, the majority of analysis within this dissertation relies on a single price basket and the inflator is not needed. When it
is, the resulting measurement is used predominantly in a comparative perspective; all levels would be impacted consistently with a universal adjustment to the family member inflator, and so the choice does not greatly impact interpretation here. It is, however, an important component of the real wage construction, and an area which requires further examination and work.

6.2.5 Constructing real wages

Real wages are calculated by dividing the nominal wage estimates by the price series. Wages for an individual earner are divided by a single basket for both women and men; wages for a family unit are divided by the basket multiplied by 3.5. For baseline estimations, wages earned by the day are multiplied by 250 days to approximate an annual income; however, problems with this assumption are discussed in both Gary and Olsson (2018) and Gary (2018c).

The resulting index number measures how many ‘baskets’ the wage would purchase in a year, or how many times over an income could support a family unit. An index number of 1 indicates that the wage is just enough to buy the contents of the respective basket; a value of more than one indicates that the wage could buy in excess of the basic requirements. A value under 1 shows that those depending on the wage would not have enough resource to meet their nutritional and living needs and would either need to substitute away to other goods or would need to find additional sources of household income.

While the costs of both the subsistence and respectability baskets are calculated, in practice the papers in this study focus predominantly on the respectability basket values. This is because they are more representative of what typical consumption patterns were, even during difficult times (see Myradel 1933 for a typical Swedish household budget in the late nineteenth century, reproduced in table 2 above). The respectability basket also incorporate a larger proportion of finished products, as opposed to raw materials, and so is more representative of the price movements that most non-producers, who are the typical wage earners in this study, would be facing.

6.3 The new data in context

6.3.1 Nominal wages

Because the nominal data series are so long, figure 4 shows both the long-term development of nominal wages in Malmö and Stockholm as well as the nominal wages in Malmö, Kalmar, and Stockholm from 1500-1800, truncated to make short-term fluctuations more visible. Wage levels in Kalmar tend to follow those in Malmö quite closely and are only differentiable from 1614 through 1709, so Kalmar is only shown in the truncated graph.

Nominal wages are usually, but not always, higher in Stockholm than in Malmö and Kalmar; wages in Kalmar and Malmö are very similar in both level and development. Stockholm wages are also much stickier than in the other two towns. From the 1650s wages in Stockholm clearly rise over those from Malmö and growth in the nineteenth century, especially, outpaces wage growth in the south. Wages
in Stockholm level off from approximately 1826. Both cities see stalling nominal wages during the Finish War in 1808-09, though Stockholm recovers while Malmö continues to stagnate.

These wage series for Malmö and Stockholm are the only Scandinavian wage series which reach back to the sixteenth century, but data on unskilled day wages in agriculture from the eighteenth century, taken from market scales, extend unskilled wages further forward to 1900 (figure 5). Market scales are not wages recorded from actual payments, but instead negotiated and agreed-upon price levels for labor that was performed as a part of labor contracts (Jörberg 1972). Comparisons are shown here in log scale, using data from Jörberg 1972 from the same counties in which Stockholm and Malmö are located, Stockholm län and Malmöhus län respectively, as well as the national average for all 24 Swedish counties, though the composition changes based on data availability.
The wage series are clearly harmonious, indicating unification between different kinds of unskilled labor, as well as a continued convergence between Malmö and Stockholm. During the crossover, Stockholm construction wages remain the highest, and Malmö construction the lowest, of all nominal wage series.

6.3.2 Prices

The price series are shown in figure 6 in log scale, in order to better see the relative size of fluctuations and growth. As one would expect, they have very similar trajectories and fluctuations; this is reasonable since they rely on similar data sources, especially in the earlier periods when extrapolation is more necessary. Also unsurprising is that they tend toward convergence over the long term; while a respectability basket in Kalmar could cost almost as little as a subsistence basket in Stockholm in the sixteenth century, there is a very clear clustering of respectability and subsistence basket costs by the seventeenth century, which only becomes more distinct by the end of the nineteenth century.

Kalmar is the least expensive, for both types of basket. In Stockholm prices are higher than in Malmö until the middle of the eighteenth century, but by the beginning of the nineteenth century Malmö’s respectability basket, at least, costs more than that in Stockholm. Price shocks are visible during periods of extreme debasement in the sixteenth century and following the end of the Great Northern War in 1721. Price increases are especially strong in the later part of the eighteenth century when inflationary tendencies are apparent.
6.3.3 The new data in Swedish perspective

Real wages are shown here for male unskilled builder deflated by the costs of supporting a family of 3.5 at a respectability level. Wage development follows general patterns discussed in previous literature, with an increase through the sixteenth century, decrease in the seventeenth, and recovery in the later part of the eighteenth or early nineteenth. However, what is clear here is that there are distinct differences between what is developing in Stockholm and in the south. Kalmar and Malmö have very similar patterns; they are so similar that they are only treated independently in paper 1 (Gary and Radu 2018) and are taken together with Malmö price levels in other analyses. Stockholm suffers a wage collapse far earlier and faster than the south during the sixteenth century, and later recovers and enters into modern economic growth both sooner and at higher wage levels than Malmö. Throughout most of the period however, Stockholm wage levels have a dominant trend toward stagnation, while the south has larger economic shifts.

Earlier comparative studies on real wages in Sweden were only able to compare long-term trends between regions from 1732 onward, and sometimes later depending on data availability. These wages were for day labor in agriculture; other types of wages are not widely available before the nineteenth century. The different developments of Stockholm and the south (or other regions) could only be examined from the eighteenth century onward, during which patterns give the impression of a perpetually poorer south only falling further behind Stockholm levels. More recent regional work on Swedish GDP (Enflo and Missiaia 2018) makes it clear that an inversion occurred between 1571, when Malmöhus County’s GDP was substantially above that in Stockholm, and 1751 when the south was

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Please note that this part of the analysis has not been done yet, but that it is intended.
relatively worse off, but there is a lack of intermittent data to flesh out the developments. It is clear from figure 7 that this gap omits substantial and important differences in regional wage development in early modern Scandinavia.
While Söderberg (2010) did not construct a consumption-basket style price index for Stockholm, he did construct a more traditional wage index, which is compared here to the real wage series constructed here for Stockholm (figure 8). Söderberg’s index values do not have a concrete interpretation, and are displayed on the secondary axis. There are some discrepancies, including a substantial difference in the very early years and a slightly higher real wage level in the early part of the nineteenth century, both of which are slightly less exaggerated when Söderberg’s index is compared to the subsistence basket (not shown). The differences at the end of the series are likely due to the fixed contents of the respectability basket over time; the contents of Söderberg’s index is changed over time.

6.3.4 Sweden in the Little Divergence

This dissertation situates itself as a part of the vast body of literature which examines changes in living standards and differences between groups’ living standards in early modern Europe, and so during the period when economic development throughout Europe was diverging as growth leaders pulled ahead of the rest of Europe.

The results from this study help further situate Sweden and Scandinavia’s place in early modern European economic development. Figure 9 shows the real wage ratios calculated in this dissertation for Malmö (which is combined with Kalmar) and Stockholm, together with wage rates from other European economies. Wage ratios are presented at the respectability levels, assuming 250 days of work and a dependency ratio of 3.5.  

Figure 9: The Little Divergence in real wages: Scandinavia in perspective 1500-1860


8 Though several papers in this study indicate that there are substantial problems with this methodology and with these values, this type of comparison is still a useful launching point for a comparative discussion.
Scandinavia spent the majority of the early modern period as a part of the European periphery; wages are clearly below the Northwestern growth leaders, Amsterdam and London, from the mid-seventeenth century onward. This is fairly expected. What is less expected is the rather high wage levels found in Malmö in the late sixteen through mid-seventeenth century; for a few decades they are on par with those in London and Amsterdam, though wages in Malmö decline by the beginning of the seventeenth century. Wages in Stockholm also reached a comparable level to the leading economies for a brief period in the middle of the sixteenth century, but drop off much sooner and remain more or less stagnant until the late eighteenth century. This relationship finds support in recent work on regional GDPs in Sweden in the very long run has shown that Malmöhus County was relatively wealthy in the mid-sixteenth century, with a GDP approximately 30 percent higher than in Stockholm (Enflo and Missiaia 2018a, 2017).

What sets Stockholm apart, and to a lesser extent Malmö, is the massive catchup in wages at the beginning of the eighteenth century. Stockholm rapidly made real wage gains, moving from among the lowest levels to among the highest, in only fifty years. This is not unexpected, given previous research on Sweden and Stockholm’s rapid catchup when Sweden at last entered into its first period of modern industrialization in the nineteenth century. Malmö shows a tendency toward catchup as well, though not as strong, and unfortunately the data cut off in 1830.

The different trajectories of Stockholm and Malmö wage levels can be connected to the different economies to which each city was tied during the early modern period. Malmö benefitted from several late sixteenth century economic trends, including Denmark’s power years as an important exporter, the herring runs, and increased construction work. Later periods of wage increase, or at least a halt in decrease, can also be tied to combinations of these factors.

Malmö remained a Danish city until 1658; between 1560 and about 1620, with a brief resurgence into the 1640s, is considered the ‘Golden Age’ of Danish exports, both of grain and cattle, to economies throughout the Baltic. This period coincides with Malmö’s highest wage levels. Wage collapse in the 1640s also parallels a more permanent trend of market stagnation in the Danish economy (Petersen 2001). It is not surprising that Malmö would play a strong part in Denmark’s economic golden period; the region is still known as a ‘bread basket’ and a grain supplier. It was also heavily dominated by cattle production before it became a Swedish region in 1658 (Myrdal 2011). Malmö and Scania’s position as a grain-producing region also led to lower food prices, effectively increasing real wages.

A comparison of wage levels with the distribution of the data (see figure 2, above) also shows that these years were a period of intense building projects, with by far the most paid labor undertaken throughout the entire study period; this would likely have had an upward pressure on wages in the building sector. Wage data from rural modern-day Denmark (presented in Gary and Radu 2018) also spike in the first decade of the seventeenth century, indicating that the economic boost reached across the sound and was not limited to solely urban areas.

Herring cycles, or periods where herring schools migrated to relatively shallow waters and were easily fishable, were immensely important to the southern Swedish economy. An important herring period in the second half of the sixteenth century, as well as the 1660s-80s and later eighteenth century probably influenced labor patterns in the city as well as wage levels.
Malmö’s economic decline from the 1640s, during which wages in Malmö drop down to – and then below – real wage levels in Stockholm, conforms to a familiar story to Swedish economic historians – in large part because so much of Swedish economic history before the nineteenth century is based on data from Stockholm. In this period Malmö wages are on a level with other members of peripheral Europe, including relatively nearby Krakow. Wage levels began to recover at the beginning of the nineteenth century, but were still far below those in Stockholm and European leaders. It is worth nothing that the wage series from Malmö ends in 1830 while Stockholm’s continues to 1850, which may indicate a larger gap than what was actually in place; however since both cities’ wages indicate a leveling-off in the 1830s it is possible that Malmö also did not experience wage growth to the same rapid extent as Stockholm in the following decades.

Stockholm on the other hand did not began its bureaucratic and administrative expansion in earnest until the 1620s, though it then grew considerably during the seventeenth century. However the end of Sweden’s ‘Great Power Era’, which was effected by Sweden’s 1721 defeat in the Great Nordic War, began a long period of stagnation in Stockholm. This was combined with a de-industrialization of the major textile production centers in the city which had been important in the sixteenth and seventeenth centuries, as well as a shift in the focus of trade from Stockholm and the Baltic toward the western coast and the Atlantic. Grain production also shifted away from the Stockholm region toward the southwest, with increased production while Stockholm’s surrounding estates stagnated (Söderberg, Jonsson, and Persson 1991). Stockholm did manage to remake itself as an important European capital city, and with industrial development at the beginning of the nineteenth century recovered and experienced substantial economic growth (Schön 2010), though not before a critical low-wage point in the final years of the eighteenth century.

Despite the clear regional differences in wage development between Malmö and Stockholm, as could be expected from their different contexts, both cities are clearly a part of the European periphery with low and stagnant wages during the seventeenth and eighteenth centuries, and only begin to catch up during the nineteenth century, after the period of this study.

The papers in this dissertation further expand upon the wage data from Malmö and southern Sweden in order to investigate different kinds of wages and employment and how they relate within the broader economy.

7. Summary of the papers

Paper 1: The impact of border changes, trade restrictions, and institutional changes on real wages in early modern Scania
With Cristina Radu

In the aftermath of Brexit there has been increased speculation into what national borders mean for economic and individual wellbeing. Similar events in history can help us understand some of these potential ramifications. In the middle of the seventeenth century Malmö, a city which up until this point had been Danish and located just across the straight from the capital of Copenhagen, was ceded to Sweden at the end of the Second Northern War. Sweden immediately established barriers to trade and to human capital flow between its new territories and Denmark, going so far as to prohibit Swedish attendance to Copenhagen
University and instead establishing its own university in Lund in 1666. Malmö and its surrounding region, Scania, quickly shifted from an important trade city located within sight of the capital to a distant periphery with limited trade capacity. This change in possession of Scania provides a natural experiment that can highlight the effect of institutional changes on well-being. By using rich archival sources, it is possible to develop unskilled day wage series and to construct price baskets in order to compute real wages. By using Danish wages and wages in Stockholm as control, we can test the impact of institutional changes on Scanian living standards.

Findings indicate that Scania’s change of possession had a strong negative impact on wages in the region, even apart from the impact of wars and the disappearance of the herring schools. However further empirical work is needed to complete this paper. These findings lend support to the idea that locations matter beyond the relationship to physical features. Here, a prosperous region, though already in decline, was more adversely impacted by its change in second nature geography than surrounding regions which, though impacted, maintained much more continuity in institutional and proximity to national capitals and established local networks.

Paper 2: Constructing Equality? Women’s wages for physical labor 1550-1759

This paper challenges investigates women’s wages and work patterns in casual construction work in early modern Sweden. Comparison with men gives insight into the differences between women’s and men’s casual work, as well as the conditions under which women enter the causal paid labor market. This is an unusual industry in which to study women’s work. Women are more commonly investigated in the agricultural sector, where timing was less flexible and work could not wait for a ‘preferred’ gendered labor force. However, this investigation shows the flexibility of women’s work and the early modern economy as well as the sometimes non-distinction between women’s and men’s work.

Findings show a tendency toward a lack of differentiation between female and male unskilled workers in both wages and labor, especially during periods of heavy building work when labor demand was highest. Periods of high work intensity benefitted women in particular, with the unskilled construction labor force comprised of from forty to sixty percent women in peak periods. Women’s wages were also higher in these times, reaching levels of parity and sometimes even out-earning men. This indicates that there could have been some degree of collective bargaining, or that worksites were in enough need to hire all workers. However, periods of lower labor demand saw women leaving the building sector faster and their wage levels dropping considerably compared to men’s, indicating that they were still the less-preferred workers.

This work adds considerable empirical data on women’s work in early modern Europe. It is remarkable in that it comes solely from the construction sector; while other works certainly draw on women’s work in construction it is not common to find so many working in this field in such high numbers. This paper also adds to the literature by strengthening previous findings that women respond to demand factors when entering paid work.
How did people in the past make a living, and what did they earn? Was one person’s income enough to get by, or did the whole family have to chip in? How much did these things change over time, and why?

These are some of economic history’s central questions, and have been for nearly the last century. Countless real wage series of various types of laborers and over different lengths of time, though have almost always used the same methodological approach – using the wages of day laborers to somehow impute changes in well-being on a national level, or at least for a class of workers.

Only recently has the research field come to explicitly and empirically address the limited descriptive function on this approach, with studies that addresses wages both in casual employment, as has long been the standard approach, and in annual positions, which while more standard a labor practice in early modern and medieval Europe has not been previously empirically addressed in the same way (Humphries and Weisdorf 2015, 2016). The hesitance to deal with annual wages in research has predominantly been due to the nature of employment and the difficulties inherent in measuring the actual compensation; most workers of this sort were paid predominantly through room and board, with only a small component paid in wages – how then to quantify their ‘pay’?

In this paper, we use a brand new dataset to estimate and compare wages for casual and annually hired workers in early modern southern Sweden, for the latter adding the cost of living to the cash wage to estimate a wage-equivalent, to estimate wages for unskilled male workers in early modern southern Sweden. This allows for a much more sophisticated and in-depth investigation of early modern living standards and well-being, but more importantly allows for an interrogation of some of economic history’s most important questions, in a somewhat more ‘typical’ early modern economy than the leader, England.

Most directly, we ask who was better off; those working by the day or those working on fixed annual contracts? How much would a casually employed worker need to work to make the same income, and how did this relationship change? These findings allow us to understand the early modern Swedish labor market more clearly and to get at a more realistic understanding of what the standard of living and typical income might have been. These findings further facilitate a deeper investigation into the impact of changing labor markets due to population development and the proletarianization of the Swedish workers: in what ways did the labor markets change with population and urban development? Do results support the theory of an ‘industrious revolution’, an increase in time spent in market work in order to maintain or increase consumption?

Findings indicate a substantial shift between the day wage and annual hire labor markets, with the relative wage earned by day laborers falling over the course of the early modern period, as well as their well-being per day of work as prices rose faster than wages. Findings also indicate a shift within urban labor markets, as the least skilled jobs which previously
could provide a decent support became less well remunerated, but a growing class of low-skilled (but slightly-more-skilled) workers took their place – a shift not seen in smaller towns.

**Paper 4: The distinct seasonality of early modern casual labor and the short durations of individual working years: Sweden 1500-1800**

Contemporary wage studies are typically structured on methodology popularized by Allen’s (2001) seminal paper. This approach uses the wage that an unskilled (building) laborer earns in one day, multiplies it by a (assumed) number of work days that were worked in one year, and then deflates this annual ‘income’ by the costs that a working class family would face over the course of the year. The resulting measure, the number of ‘baskets’ of annual support that a working man’s wages could cover, has been instrumental in allowing for international and intertemporal comparison, removing the barriers of currency and commodity. Further work by many economic historians in honing the contents of regional cost baskets and family composition has given even more specific levels of local living standards. But the number of days worked in a year remains more or less universally applied, and is essentially an educated guess.

However, work conditions in construction and other early modern employments are strongly dependent on weather and seasonal patterns. The ability to undertake outdoor labor in the winter weather in the dark and regularly-frozen north of Europe is drastically different than that in the Mediterranean south. This model also assumes that workers supplied as much labor as they liked, and overlooks demand-side determinants of work availability.

This paper is the first of its kind. It uses data from daily payments in the construction industry in Southern Sweden to reconstruct the seasonal availability of construction work as well as individuals’ working patterns over the course of more than three centuries. It is to my knowledge the first paper which is able to make this kind of estimate based on direct wage and payment data over so long a period. This is combined with other data which represent the availability of other types of waged labor, such as harvest employment to represent agricultural seasonality and shipping schedules to measure demand of dock or other casual urban labor.

Finding indicate that labor was highly seasonal, and would not permit most workers to work in the casual paid sector for 250 days, the number of workdays assumed in traditional estimates. Most workers spent only a few days at a particular worksite, further indicating that market frictions would limit the total working year; it is likely that workers did not work for more than 150 days annually. Collaborative evidence from London (Stephenson 2018) indicates that seasonal work and a shorter ‘typical’ working year may been a strong limiter of casual labor in other economies as well. Analysis of individual work patterns also indicates that certain groups of more regular employees were given preferential employment during the off-season, indicating that the true market for casual labor is even more limited than what the macro analysis indicates. Because of the importance of the number of work days on the outcome of real wage estimates and the likely variability between regional economies, this is an important area of further work for wage historians.

8. Discussion, conclusions, and further work
This dissertation has drawn on a vast set of new archival wage data in order to address the question of what workers in different types of work received in remuneration in early modern Sweden and how
this was impacted by the important chances and developments of the early modern period. Through these investigations the dissertation has also interrogated many of the assumption that we make as well as the ways in which we calculate and frame wages.

It becomes clear that many of our assumptions about the early modern period and what wages looked like mislead us when we employ them in trying to understand well-being and economic development. Further, using the experiences of one group to represent the development of the whole tends to give skewed results. This dissertation contributes considerable new wage and price data as well as extensive findings on the relationships between different types of wage earners in early modern Southern Sweden.

The initial data compilation in this chapter demonstrates the importance of regional-level data for understanding economic development and change. Even though Malmö and Scania are often included in historical assessments of Swedish development, it is clear that the Scanian experience is not well represented by that of Stockholm, upon which many of the national-level data series are based.

Most real wage studies throughout early modern Europe feature casual wages paid to unskilled men; because of this, men’s unskilled day wages are the most easily compared within early modern Europe. When compared this way, wages in Malmö were fairly high during the Danish period, especially during Denmark’s decades as a dominant trade power in the late sixteenth and early seventeenth centuries. Wages before the eighteenth century were either on par with or substantially above those in Stockholm. While wage levels in Stockholm stagnated during the eighteenth century, wages in Malmö continued to fall, reaching extreme low levels by the end of the century before a recovery in the nineteenth.

This high wage level during Malmö’s Danish period is a new contribution; previous understandings of Scandinavian and Sweden in this period have depended on data from Stockholm. The high wage levels, on par with those in European growth leaders, shifts somewhat our perception of the development of early modern Scandinavian well-being. Previous regional analysis, with the exception of Enflo and Missiaia (2017), have only been able to compare Scania, the county in which Malmö is located, to other regions from the middle of the eighteenth century. It is readily apparent with the new data here that there is a much more complex story further back in time. Through this it becomes clear that representing an entire country with the earnings of a certain group and place is not always appropriate.

Paper one (Gary and Radu 2018) strengthens this impression, and highlights the importance of high-level decisions on individual and local well-being; how are wages impacted by institutional structures far outside of the earners’ control? The analysis indicates that a large part of the separate wage development was due to Scania’s removal from Denmark and acquisition by Sweden following the Second Norther War. In 1658 Scania became Swedish and trade barriers were erected, along with Swedification programs to encourage residents to identify as new Swedes. Well-being as measures by men’s casual wages was declining throughout Sweden and Denmark at this time, as both countries continued to fight and both lost their European power status. However, analysis shows that there is an even greater fall in wage levels in Scania associated with the boarder changes when compared to neighboring regions.
Paper two (Gary 2018b) uses the same type of data explored in the kappa and utilized in paper one: unskilled casual construction work. This is a typical source for calculating men’s unskilled real wages, but this paper expands the inquiry to examine how women cooperate in this field. What kind of work that we think of is gendered is, in reality, flexible? And how permeable are these boundaries? It becomes clear that in many cases work is work, and what needs to be done simply must be done. This is fairly congruent with previous research from gender historians (i.e. Ågren 2014a), but has been harder to trace in a more quantitative fashion, especially over longer periods. Furthermore, these periods of work necessity permitted women to earn wages as high as men’s. Whether this was because of some function of collective bargaining, facilitated by the larger proportion of women working in these periods, or simply a function of the need for casual construction workers is hard to say. But it does continue to indicate that women and women’s work in the early modern period are more complex than what we assume both in our framing and in our methodological approaches. This paper contributes both data and strengthens theoretical approaches about women in early modern work. However, it is not able to make the leap to address household-level work patterns or income levels, beyond highlighting the flexibility of women’s work. This is an important area of further research, since it is at the household level where living standards are truly determined, and is the measurement which most real wage studies hope to approach.

Paper three (Gary and Olsson 2018) is more explicitly interrogative; do these typical measurements really measure what we think we do? When day wages are compared to annually earned wages in service, a much more typical way to earn money, do we see similar patterns? Or contradictions? The methodology used here was only recently developed by Humphries and Weisdorf (2015, 2016) and has not yet been used outside of England. Even the analysis with data from a peripheral country is an important step to understanding more normal economic development. This paper focuses not only on the differences between men’s wages in different types of work, but also explores the relationship between waged work and different markets – how much do different types of jobs represent normal wages as work and jobs change over the early modern period? Here it becomes clear that the picture is complicated as different categories of work dominate in different times and places.

Paper four (Gary 2018c) is the most interrogative, asking ‘what was a work year’ and how it changed, and how well this lines up with our methodological assumptions. The results indicate that a work year was short at about only 150 days, though it was growing longer over time, and that this does not line up very well with our assumptions. It is also not enough work to support multiple people, furthering the growing understanding that supporting the household was a family affair.

Many of these findings are not in the strictest sense ‘new’; many expand on ideas which have been intuited by others, or described more generally by qualitative data. But for many findings, this is the first time they have been consistently quantified. Interrogated, and presented together as components of a larger labor market. And even some of the findings that could be intuited are surprising: the short length of the working year, shown here numerically, is far below most estimates reached by less direct methods. Women’s high earnings in construction have aroused considerable surprise, even if high relative wages and women working in physical tasks have been seen before. High wage levels in Danish Malmö could be assumed based on Denmark’s’ concomitant prosperity, but the actual height of these wage levels, together with other recent revisionist wage studies which shift levels from Allen’s (2001) study, present an evolving image of what early modern wage divergence could have been. And while one could of course assume that restricting trade and free-flowing networks across a newly-drawn
national border would have adverse effects on the prosperity of the citizens of the region, seeing the impact numerically has a very different feeling, and makes us once again question what we and our policymakers have decided to forget from our historical experiences. Together, this dissertation demonstrates the importance of continuing to question our methods and our sources on the most basic levels, as well as the possibility of finding data and information which enable us to address questions which we have thought were not possible.

There is of course considerable work still to be done. This dissertation almost entirely skips over skilled workers of both sexes, despite their presence in the underlying data sets. As demonstrated in papers 1 and 3, the experiences of these workers could be very different, and including their development shifts what we conclude about overall development. Annually employed women, too, are left out, and are the subject of another ongoing work. The seasonality of early modern labor is likely different across Europe, and this should be addressed by developing and applying and adjustment index which accounts for regional variation. The day wage series also would benefit from extension further forward in time. But taken together this thesis is a step toward a better understanding of early modern work, wages, and income.
Primary data sources

*Lunds Landsarkiv (Lund Regional Archives)*

*Urban archives:*
Landskrona rådhusrätt och magistrat (*Landskrona city court and magistrate*)
Lunds domkyrkas arkiv (*Lund Cathedral archive*)
Lunds stadsarkiv: Rådhusrättens och magistratens arkiv (Lund city archive: City Hall Court and magistrate archive)
Ystad stadsarkiv: Rådhusrättens och magistratens arkiv (Ystad city archive: City Hall Court and magistrate archive)

*Manorial archives:*
Jordberga godsarkiv
Karsholm godsarkiv
Knutstorp godsarkiv
Maltesholm godsarkiv
Rosendal godsarkiv
Rydsgård godsarkiv
Trolle Ljungby godsarkiv
Vittskövle godsarkiv

*Malmö Stadsarkiv (Malmo City Archives)*

*Urban archives:*
Borgerskapet i Malmö 1517-1862 (*Burghers in Malmo 1517-1862*)
Malmö Hospital 1528-1923 (*Malmo Hospital 1528-1923*)
S:t Petri kyrkoarkiv (*Saint Petri church archive*)
Malmö hamndirektionen (*Malmö harbor*)

*Landsarkivet i Vadstena (Regional Archives in Vadstena)*
Kalmar rådhusrätt och magistrat 1600-1850 (*Kalmar city court and magistrate 1600-1850*)

*Stockholm Stadsarkivet (Stockholm City Archives)*
Allmänna Barnhuset (*Allmänna Orphanage*)
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The impact of border changes, trade restrictions, and institutional changes on real wages in early modern Scania

Kathryn Gary*
Lund University

Cristina Victoria Radu**
University of Southern Denmark

Abstract
In the aftermath of Brexit there has been increased speculation into what national borders mean for economic and individual wellbeing. Similar events in history can help us understand some of these potential ramifications. In the middle of the seventeenth century Malmö, a city which up until this point had been Danish and located just across the straight from the capital of Copenhagen, was ceded to Sweden at the end of the Second Northern War. Sweden immediately established barriers to trade and to human capital flow between its new territories and Denmark, going so far as to prohibit Swedish attendance to Copenhagen University and instead establishing its own university in Lund in 1666. Malmö and its surrounding region, Scania, quickly shifted from an important trade city located within sight of the capital to a distant periphery with limited trade capacity. This change in possession of Scania provides a natural experiment that can highlight the effect of institutional changes on well-being. By using rich archival sources, it is possible to develop unskilled day wage series and to construct price baskets in order to compute real wages. By using Danish wages and wages in Stockholm as control, we can test the impact of institutional changes on Scanian living standards.

Keywords: Border Changes, Real Wages, Second Nature Geography, Denmark, Sweden, Malmo, Scandinavia, Early Modern

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*Kathryn Gary, PhD student in economic history, Department of Economic History, Lund University, Lund, Sweden; E-mail: kathryn.gary@ekh.lu.se

**Cristina Victoria Radu, PhD student in economics, Department of Economics and Business, University of Southern Denmark, Odense, Denmark; E-mail: cvr@sam.sdu.dk
I. Introduction

A large body of literature addresses the impact of boarders, trade restrictions, and tariffs on the degree of integration in prices and commodities. Central to these conversations is the extent to which these macro-level policies impact regular workers whose livelihoods might be influenced, directly or indirectly, by changes in policy and institutions – how do the decisions of the elites trickle down to those with much less? Is there a disproportionate impact on skilled and unskilled workers (eg. Harrison and Hanson 1999, Wood 1995)? An additional body in new economic geography asks ‘how does location matter?’ for economic growth and wellbeing – and how does second nature geography, in particular, impact well-being?

The Scanian case is a useful experiment in addressing both of these debates because of its reassignment from Denmark-Norway to Sweden in 1658, when the southernmost regions of what is now Sweden, Scania and Blekinge, were ceded from Denmark to Sweden as a condition of the Treaty of Roskilde. The city of Malmö is located on the now-Swedish side of the Oresund straight, within sight of Copenhagen, as shown in figure 1. This change in territory meant that Malmö was very quickly transformed from a port city in the capital region to a peripheral town, now several days’ travel from its nation’s capital.

This paper will use the natural experiment of boarder redrawing to test the impact on changes in second-nature geography on the common worker by assessing wages for unskilled and skilled male workers in Denmark, Scania and Malmö, and Kalmar, a Swedish town on the old Swedish-Danish border, now much more protected within Sweden, to conduct a difference-in-difference study to investigate whether the second-nature geographical changes had an impact on the wages of workers in Scania, the primary market impacted by the changes. This analysis relies on wage-welfare ratios to estimate the ability of workers to meet their annual subsistence needs to estimate the impact on workers from these changes.

The paper will address the following research questions:

1. Was there a discernible change in nominal price levels in the affected regions following the border change? In nominal wages?
2. Was there a discernible change in real wages? Was there a difference in how real wages changed between Copenhagen and Stockholm, the controls, and Malmö and Kalmar?
3. Was there a differential effect on male unskilled workers and skilled workers’ wages?

We hypothesize that unskilled laborers in Malmö experienced a fall in real wages relative to Denmark and Stockholm due to the diminished importance of the city, while those in Kalmar may have experienced a slight increase due to protection of the changed border and building needs, though any potential increase is expected to be slight.
This paper complements ongoing work investigating wellbeing and inequality in Sweden and Scandinavia in the very long run. Preliminary findings are in line with Enflo and Missiaia (2017, 2018) and Bengtsson et al (2017) which show a decrease in relative contribution to national GDP from Malmöhus county, where Malmö city is located, as well as growing internal inequality from the late sixteenth to eighteenth century. Recent results from Enflo and Missiaia (2017, 2018) show that there was greatly diminished wealth in the Scanian province from their benchmark year of 1571 and their more complete series beginning in 1750; but how much of this can be connected with the border and institutional changes, and how much of this was felt by common working men in the region? Or, was this part of a growing impoverishment that could be felt throughout the region, including in Denmark and in Kalmar, as Scandinavia lost its footing as European power?

II. Literature and contribution
This paper draws on three strands of literature in order to investigate the impact of the Scanian border change.

a. **Border effects, language, and culture**

The impact of border changes on economic growth and the wellbeing of workers has been of interest for some time and this paper touches on several previous research areas related to borders.

One such area of interest is the case of 'border effects' which refers to the fact that two regions separated by a national border trade much less with each other than can be explained by the value of the tolls. Addressing this issue, Schultz and Wolf (2008) investigate European borders which were erected in the former Hapsburg Empire after WWI. They find that so-called border effects were visible before the borders were made official, as the ethno-linguistic makeup of the population diverged across regions and thus they conclude that differences in language and culture have an important effect on trade. On the other hand, Yi (2003) looks at the case of the border between the United States and Canada and builds a theoretical model to prove that the observed border effects can be explained by vertical specialization in a region, meaning that regions tend to specialize in one stage of the production of a type of good. He finds that regions are less likely to trade an unfinished good across national borders than across regional ones, thus explaining the difference in trade without the need for an unobserved trade barrier such as language or culture. In the case of a mostly agrarian economy like the ones we are looking at in our analysis, an example of an unfinished product that could be expected to trade less would be milk, unlike butter and cheese which would be easier to ship through Stockholm. Our study is well placed to shed some light on this debate, since in the beginning, the region of Scania shared the same culture with Denmark but not with Sweden. For example, after the annexation, in the 1670's, support among the population in Scania for the Danish army was still high. Therefore, we expect the effect of cultural differences to be small and our analysts should show how much institutional barriers to trade mattered. To find out how much two regions trade, most authors used cross sectional data on prices and find out if the prices of a certain good move together (Uebele 2011). The fact that Scania changed possession gives the opportunity to use a difference in difference approach for the price variation, similar to what was proposed for analyzing the effects on trade of border changes after the First World War (Heinemeyer, Schulze, and Wolf 2008)

b. **Border opening (closing) effect on wages (skilled vs unskilled) and change in second-nature geography (removal from capital proximity)**

Another research area related to our paper is the effect of borders on real wages. Most studies have looked at the effect of the opening of borders on wages. Some authors conclude that the effect of opening borders is a positive one (Brülhart ) while others say that the effect is negative.
for lower skilled workers (Wood 1995). This paper should bring evidence of what happens when the opposite happens, that is, when the borders are closing, transforming an important city like Malmo into a peripheral one.

There are two standpoints in the literature concerning the impact of geographical factors on the determination of wages (or well-being): on the one hand, it is emphasize the role of the first nature geography, which refers to the physical landscape (e.g. access to waterways, temperature, climate, natural resources) (e.g. Hall and Jones 1999) and on the other hand, the second nature geography which includes distance to consumer markets, knowledge spillovers etc. The latter started to slowly, but firmly win ground among the factors that explain the differences in countries or regions’ income levels. With the seminal contribution of Krugman (1991a), the so called New Economic Geography has been tested theoretically and empirically by a number of scholars. A first empirical study was performed by Hanson (1998) who used data on U.S. counties to estimate nonlinear models of spatial economy. One of the key findings of his paper is that the growth in wages in a specific location is positively correlated with changes in economic activity in neighboring locations, showing that spatial interactions are monumental in understanding the process of geographic concentration. In a later study, Hanson (2005) shows that the market access of a location has a significant positive impact on local nominal wages. Redding and Venables (2004) expand his study and uses US country data on per capita income, trade, and the relative price of manufacturing goods to estimate a structural model of economic geography. They show that access to markets and sources of supply is critical in explaining cross-country variation in per capita income.

Further, turning to Europe, similar results were found for Italy by Mion (2004), for Belgium by De Bruyne (2009), and for Germany by Brakman et al. (2004). Pires (2006) analyzed Spain, finding that wages in a region are positively determined by income and wages in the surrounding regions, as well as the support for the importance of scale economies and transport costs. For the whole of the European Union, Breinlich (2006) constructed a New Economic Geography model in which he linked income levels to a measure of access to goods markets and estimated this specification for a sample of 193 European regions in 1975–1997 showing that the later determines the former. Lopez-Rodriguez and Faiña (2007) reached similar conclusion. Our study case can add to this discussion because the removal of the Danish city of Malmö from its capital proximity in the middle of the seventeenth century, shifted it from an important trade city located within sight of the capital to a distant periphery with limited trade capacity. This offers a valuable setup to test the impact of the second order geography.
III. Scandinavia in the early modern period

Scandinavia’s early modern period was a time of expansion, war, collapse, and strong economic and political changes. Sweden was the dominant imperial power of the time, while Denmark and Norway were in a political union under the Danish crown. Following the treaty of Roskilde at the end of the Second Northern War in 1658, Scania, along with neighboring region Blekinge, were ceded from Denmark to Sweden. Fighting in both the Scanian region and in Copenhagen continued intermittently for the next decade or so, until the borders and new territories were finalized and cemented along the original lines of the 1658 treaty, and they have remained fixed through the present day.

Swedish per capita GDP estimates show an increase from the beginning of the sixteenth century followed by more-or-less stagnation and then a strong decline in the second half of the eighteenth century (Schön and Kratz, 2012), which maps fairly well with Sweden’s military history. However these macro-level estimates do not show regional divergence or patterns, and before the eighteenth century data are drawn primarily from Stockholm, which was much more urban than the rest of the country even in this period.

Enflo and Missiaia (2017, 2018) compute regional GDP for modern-day Swedish counties back to 1750, with an additional benchmark estimate in 1571. These data give a very important look at regional development and inequality, which is a vital view during a period when within-country inequality was often greater than between-country inequality. However, due to the nature of the available data, the authors are only able to provide a benchmark estimate in 1571, and then pick the series back up in 1750, and so do not cover the period of the large institutional changes that Scania and Scandinavia underwent. The regions of modern-day Sweden that were in 1571 a part of Denmark were all relatively richer in GDP per capita terms in 1571 than they were after they were assimilated completely into Sweden, in 1750.

As mentioned above, we know that the Scanian region grew relative poorer between 1571 and 1750; we also know that Swedish GDP per capita continued to decline from the 1750s. What we do not know is when Scania began to decline, if this decline was directly connected to shifting borders, and to what extent this decline could be felt by ‘everyday’ inhabitants. At the end of the eighteenth century Scanian real wages, as estimated by dividing the daily wage by the price of rye, were fairly stable, and only began to rise in the mid- to late- nineteenth century (Bengtsson and Dribe 2005) – but evidence is still lacking before this period, and with a stronger price measurement than grain prices.
Data on GDP figures before 1800 are currently missing for Denmark\(^2\), but an image of the economic development of the country can be described by the real wage development during this period (Abildgren 2017). During the years from 1487 to 1550 wages declined as the wars to keep Sweden from seceding from the Kalmar Union and the protestant Reformation raged on. In the aftermath of the reformation, the church lands confiscated by the crown provided sizable income that could fund the military endeavors of the state. Additionally, an equally large income for the state became the Sound Toll collected from ships passing between the Baltic and the North seas. At the time, most of the population in Denmark (including Scania) was practicing subsistence farming and the main exports were grain and oxen, but these only accounted for 5% of GDP (Henriksen 2007). However, the tolls meant that the state grew relatively wealthy and real wages slowly increased from 1550 to 1650.

During the period of the Northern wars, as Denmark fought for the Scanian region, wages declined. The state faced a fiscal crisis and had to sell crown lands and increase taxes in order to bear the costs of these wars. In terms of institutions, the countryside with 80% of the population, was characterized by a type of bondage system called “vorneskab” which was introduced around the thirteen century for the islands of Zealand, Lolland, Falster, and implied the binding of men to the manors where they were born. They were required by the owner of such manors to work the land of a farm that was assigned to them. Although the system was abolished in 1702, another feudal system, called adscription (“stavnsbånd” in Danish), was reintroduced three decades later, in 1733, to ensure enough supply of men for the military (Lampe and Sharp). At the start of the 18th century, the last war for retrieving Scania was fought – the Great Northern war, followed by peace the rest of the century, as the crown lost all hope of retrieving the region and pursued a policy of neutrality. More detailed wage data (Radu 2016) for the century shows strong variations during the war years followed by a stabilization and stagnation in real incomes the rest of the century. During this period the economy remained an agrarian one with most of the exports being grains to countries like England and the Netherlands.

The end of the Second Northern War was a harsh defeat for Denmark-Norway, and cemented Sweden as the power for the next century, until Sweden’s defeat by Russia at the beginning of the eighteenth century. After Scania became Swedish in 1658 the Swedish monarchy imposed trade protections to encourage Scania toward Swedification, including tariffs on trade across the sound to Copenhagen (Enflo and Missiaia 2017) and establishing Lund University in 1666 as an alternative to Copenhagen University, prohibiting Swedish attendance to the latter. As a part of a policy of integration and economic protection trade out of Scania was redirected toward Stockholm and cut off from direct distribution to Copenhagen, as had previously been its path. Grain exports were prohibited and trade was funneled through Stockholm. Scania was

\(^2\) A group of researchers at the University of Southern Denmark are currently working on a project involving the development of GDP numbers before 1800, with the help of a grant received from the Danish Research Council
abruptly shifted from a central export market to the capital to a peripheral region, in what Enflo and Missiaia (2017) call ‘relatively poorer Sweden’.

Denmark-Norway and Sweden were fairly similar in language and culture, and many of the rights and customs of those living in the new Swedish territories were preserved while the nobility was guaranteed a continuation of their previous rights. Church services were conducted in Swedish instead of Danish, but the linguistic barrier was small, and the differences little more than a dialect or accent (Kirby 1990: 283). This means that observed changes can be more easily connected to the change in institutional oversight and connection with important trade links, or to changes in second-level geography.

a. The shifts to absolutism

Even though both states went through major political and administrative changes after the change of ownership of Scania, the two countries remained remarkably similar. Both Denmark and Sweden imposed absolutism in 1660 and 1680, respectively (Lockhart 2004) so in terms of institutions, the two states that we compare in our analysis, are not very different. Even though absolutism took an anti-aristocratic character form in both countries, the circumstances that led to this major change were different. In Denmark, this event was due to a revolution led by Frederik III, over the fact that the Danish aristocracy had gained power over the central authority between 1647-1660, and was also discredited because of poor performance during the wars with Sweden in the late 1650s. Thereby, in Denmark’s form of absolutism, the central administration followed the Swedish-European system and changed its structure from being formed by the court, Danish and German chancelleries, into the so-called colleges, which involved specialized councils and ministries with delegating residents and nobility members alike. Important changes in the administration of the navy and army, as well as in the government finances were undertaken (Lampe and Sharp). Alongside this, there were changes in the aristocratic privileges of the ownership of landed estates. These were abolished under absolutism, so that a large share of the estates was obtained by non-aristocrats and by the new kings’ aristocracy eg: merchant class, sons of tenant farmers, and the bourgeoisie (Lampe and Sharp)3. Another crucial change, which was inspired from a Swedish system, was the unified tax system introduced in 1662. Through this, it was taxed the productive capacity of agricultural land in order to secure government finances. A year later, compulsory military service was introduced and the military recruitment used a hartkorn-value-based recruitment system (Kjærgaard 1994, 204–5).

By contrast, the transition to absolutism in Sweden was smoother and less reactionary than Denmark’s (Lockhart 2004). The institutions underlying the Swedish Government, the collegial administration and the “Riksdag” remained primarily unchanged. Swedish law already allowed for the monarch to consolidate and strengthen his own power, and the crown used its

3 In Lampe and Sharp taken from Løgstrup 1984, 300; Linvald 1912).
authority in this period to strengthen its land holdings in an attempt to recover after the difficult period following extracted warfare with Denmark. During the latter part of the seventeenth century Charles XI pushed back against the ‘reign of the nobility’ which had characterized the previous period, and in 1683 instituted the Reduktion, or reduction of nobles’ lands. This reduction reclaimed land from noble estates which the nobility had managed to acquire in earlier periods; however, the power of the nobility did not remain totally unchecked; nobles still retained the right to choose which lands would be returned to the crown, which gave them substantial powers to consolidate their own holdings (Gary and Olsson 2017).

An example of the differences between Danish and Swedish absolutism is visible in the tenancy rights of those who worked the land on noble estates; a mid-sixteenth century Danish law gave noble tenants the right to take measures to make their ‘property’ (gods) as useful as possible – gods, like the English ‘property, can ambiguously refer to both real estate and movable property; while the law was likely intended to refer to movable property the Danish nobles established a precedent wherein the law gave them the right to evict tenants without any form of process. Swedish nobility adopted this practice. While the Danish monarchy was able to eliminate the practice in 1660, it continued in Sweden and was explicitly ensconced into the legal system in 1723 (Gary and Olsson 2017).

b. Trade policy and its impact on Scania

During the middle ages, Scania was a very important source of income for the Danish crown. The abundance of herring in the Oresund lead to the development of the herring market which was taking place in Skanør and Falsterbo (Venge, 1987) and was located on a peninsula in the southwest of Scania. As herring was in high demand at the time, the market became famous in the whole of Europe, and the Scanian market became the most important Northern European market in the 14th century, with many merchants coming here to trade their goods and buy fish. The Danish crown imposed a tax on the salt used for the preservation of the fish, which was the second most important income for the state, after the Oresund customs, also dependent on access to Scanian land. However, at the beginning of the 15th century, the herring shoals moved farther from the land and became unfishable, and the market quickly lost its importance. After that, Scania’s main exports became mostly grain and cattle. These were both important exports, but with the loss of the herring market Scania had taken an economic hit.

After the annexation of Scania, trade with Denmark was reduced because of a series of national policies. First, the policy of ‘swedification’ of Scania meant that direct trade with Denmark was prohibited and all trade was funneled through Stockholm, in order to lessen Scania’s ties to Denmark and increase ties to Sweden. Secondly, both Denmark and Sweden were operating under a system of mercantilistic policies, and Denmark was not eager to import
cattle and grain which would compete with their own domestic production of the same products. These policies both caused an essential total re-route of Scanian trade, both changing the routes through which it would travel and the eventual destination market.

IV. Data

Day wages for Malmö and Kalmar come from primary archival sources from the south of Sweden (see Gary 2018a). Wages for Denmark and Copenhagen are based on secondary sources and compiled by Radu (2016) for the period starting from 1660 while wages for the years up to 1700 are taken from Scharling (1869) and Falbe-Hansen (1869). The graph below shows the number of observations and temporal distribution of day wages for men for Denmark and Malmö.

It is evident that the decades before 1700s are thinner with fewer observations, which is unfortunate timing. However, the observations for the period before and after Denmark’s loss of Scania to Sweden are suitable for the present analysis and still offer promising results.

Prices are constructed as ‘consumption baskets’; the cost of consumption needs for a single adult man over the course of a year (Allen 2001). Price series are based on the methodology and weights laid out in Allen (2013). Data for Stockholm come from secondary Swedish sources (Söderberg 2002; Jörberg 1972), with some adjustments to better represent a Scandinavian diet; the principle adjustment is substituting half of the allotment for meat with herring (see Morel 1988). When certain prices are not available are complimented with price data for neighboring and economically integrated regions, adjusted to Stockholm levels (herring, peas, beer, and bread based on van Zanden [no date]). Prices are extrapolated backward using either
the Swedish CPI (Edvinsson and Söderberg 2007) or an appropriate substitute good, such as tallow for beef and butter for cheese. A more thorough discussion of the price basket construction is found in Gary (2018a).

<table>
<thead>
<tr>
<th>Subsistence</th>
<th>Respectability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rye</td>
<td>170</td>
</tr>
<tr>
<td>Rye bread</td>
<td>--</td>
</tr>
<tr>
<td>Peas</td>
<td>20</td>
</tr>
<tr>
<td>Meat</td>
<td>2.5</td>
</tr>
<tr>
<td>Fish</td>
<td>2.5</td>
</tr>
<tr>
<td>Cheese</td>
<td>--</td>
</tr>
<tr>
<td>Eggs (n)</td>
<td>--</td>
</tr>
<tr>
<td>Beer (l)</td>
<td>--</td>
</tr>
<tr>
<td>Tallow</td>
<td>1.3</td>
</tr>
<tr>
<td>Cloth (m)</td>
<td>3</td>
</tr>
<tr>
<td>Candles</td>
<td>1.3</td>
</tr>
<tr>
<td>Lamp oil (l)</td>
<td>1.3</td>
</tr>
<tr>
<td>Fuel (mil BTU)</td>
<td>2</td>
</tr>
<tr>
<td>Rent</td>
<td>--</td>
</tr>
</tbody>
</table>

Table 1. The content of the subsistence and respectability baskets.
Source: Gary 2018a

Price series for Denmark are taken from multiple sources: data for the period up to 1700 is extracted from the books by Falbe-Hansen (1869) and Scharling (1869), while data from 1660 onwards is available from the Danish price history project, which has material from institutions such as the Danish government, the royal court and its property, the army, firms, churches. To enable a comparison with wages in Sweden, the same methodology was used (based on Allen 2013), using the same budget weights as those used for Sweden as seen in table 1. Similarly, prices for missing years were either extrapolated using similar goods (such as milk for cheese for example) or using the Danish CPI calculated by Abildgren (2010).
It should be noted that nominal values in this paper have been converted into skilling, which was a sub-unit of currency in both countries but is a synthetic measurement for the majority of the period as currency units changed. It is also important to know that there was quite some similarity between currency levels for much of the period discussed in this study, but it was not a perfect match, so values cannot truly be compared one-to-one. This becomes clear in the substantial differences in nominal development between the two countries.

Figure 3 presents the evolution of the consumption bundle from 1487 to 1800 for rural Denmark (Funen and Zealand). We should note that the graph for the beginning of the period is smoother because we had fewer price values available for that period, so more of the values had to be interpolated. But nevertheless, the observations should be enough to offer a picture of the long term trends. Overall, the value of the bundles approximately doubled over the 300 year period. One notable exception from the upward trend is in the 18th century, around 1730, when low prices on the export markets caused deflation. We could add that this is the moment when landlords managed to introduce adscription (the newly re-introduced feudal system), to secure a cheaper labor force.
The second graph presents the value of the consumption baskets for Malmö. The same upward trend in the value of the consumption basket can be observed, but the patterns of inflation are very different; prices in Malmö begin at a much lower level and undergo a severe inflation in the eighteenth century, a period during which Sweden was suffering from considerable financial instability (see Gary 2018a).

a. Nominal wages

Figure 5 shows the nominal wage data used in this analysis, presented here as annual averages. Unsurprisingly, nominal wages for both regions follow a more-or-less similar trend as the price series. This is particularly evident in the slow increase followed by a faster inflationary rise in the Malmö data. The Danish series is a bit more erratic, especially in the seventeenth century. This can be connected to the smaller number of observations in the Danish data. It is interesting to note that while the data from Malmö have a fairly steady upward trend, though with periods of stagnation and some decline in the seventeenth century and the end of the eighteenth, the Danish data have a much more distinct trend of nominal decline. The decline is clear entering into the eighteenth century, and continues through the middle of that century into a steep drop in the 1740s. Nominal wages recover somewhat after this fall, and increase with a similar pattern to Malmö’s wages, at a much closer level than previously.
Real wages are computed following Allen (2013). Day wages are multiplied by 250 to approximate a full year’s work. Consumption baskets are multiplied by 3.5 to represent needs of a family of four.

For the most part welfare ratios were below one, which indicates that unskilled male workers were unable to support a family at a respectability level from the wages they received. The clear trend is one of convergence between rural Danish real wages and wage levels in Malmö and Stockholm. In the end of the sixteenth century wages in Malmö are highest, and still increasing, likely as a result of the end period of Denmark’s golden age of trade (Petersen 2001) and the investment into large-scale fortification projects such as reinforcement work being done on Malmö castle, which is part of this dataset. Wages in Stockholm had been increasing through the middle of the sixteenth century, but decline substantially through the rest of the century. Rural Danish wages are slightly more volatile, but indicate a general upward increase; wage levels at the turn of the seventeenth century are certainly as high as those in Scania, and substantially above those in Stockholm.

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4See Gary 2018c for a discussion on if this is an appropriate inflator or the Scandinavian case. Gary (2018c) finds that a typical working year in this region was probably not more than 150 days in a year. However, as this analysis is intended to look at divergences in wage levels between two culturally similar regions, the differences are of more interest than the levels, and so this value should not interfere substantially with the result.

5See Humphries 2013 for a discussion on if this is an appropriate inflator for the true caloric needs of a family. Humphries asserts this is too low, and this is likely the case. In the case of this paper, however, the same argument as above applies.
Before 1630, wages in the Malmo region have levels which are consistently higher than those in rural Denmark. As the country enters the Thirty Years’ War at the beginning of the seventeenth century wages in both regions start to decrease, and converge substantially. Wages in Stockholm are also fairly low, but much more stagnant. Wages for all three regions decrease during the eighteenth century, and wages in Stockholm are now for the first time consistently higher than those in other regions; Stockholm will continue to have the highest wage levels through the rest of the study period. Only in the end of the eighteenth century do wages begin to increase again, with a steep rise in Stockholm and a more moderate increase in Malmö. It is unclear if wages in rural Denmark increase at the same period; this series ends in 1802.

The period of interest is that which spans the change in territory, when Scania is ceded from Demark to Sweden and Malmö becomes Swedish in 1658. This is a period with substantial warfare, which is quite a likely a cause for the decrease in wages in all three regions from the beginning of the seventeenth century. While the decline in wage levels can be attributed to the ongoing warfare as well as Denmark and Sweden’s loss of regional power, it is also clear that the wage decline is not uniform between regions. Malmö suffers the strongest decline, falling from the top wage levels in the early seventeenth century to the absolute bottom at the end of the eighteenth. At the same time Danish rural wages stable at a relatively higher level, in line with post-annexation wages in Malmö. This does indicate that wages in Malmö suffered more for the period of war, but can this decline be connected directly to Sweden’s annexation of Scania in 1658?

Figure 5: Respectability-level welfare ratios for unskilled male workers in Malmö, rural Denmark, Kalmar, and Stockholm 1500-1850
Source: see text. Authors’ calculations.
V. Empirical analysis

c. Difference and difference analysis

We apply a difference in difference estimation in order to compare the relative difference in wage changes before and after the border redrawing between Scania and Denmark. We use individual level data and compute welfare ratios in order to test if there was a difference in the standard of living, not necessarily how nominal wages changed. This way, the method exploits the variation produced by the border redrawing in which Malmo was ceded to Sweden. We seek to exploit that there is a differential impact of the border change on the people living in Scania, assuming that log wages would be on parallel trends for those living in Scania and those living in Denmark and Stockholm in the absence of border change. To this end, we estimate the following equation for the period 1500-1800 for the logarithm of wages:

$$\ln w_{it} = \text{Scania}_{it}\text{border}_{1658}\beta + \alpha_t + X_{it}'\gamma + \varepsilon_{it},$$

In which $\ln w_{it}$ denotes wages in logarithm; $i$ indicates individual and $t$ indicates time; $\text{Scania}_{it}$ indicates whether the individual lives in Scania; $\text{border}_{1658}$ is a dummy variable which equals 1 for the period 1658-1800; $\beta$ measures the effect of the border change on the standard of living of individuals living in Scania; $\alpha_t$ indicates the year fixed effects; $X_{it}'$ is a vector of control variables for occupation, regions, etc.

We control for fixed effects for years, occupation, and towns in order to account for differences in income level across time as well as differences across occupations and between regions. The year fixed effects will capture any event that influenced wages both in Scania and Denmark while the other fixed effects capture differences in income in between occupations or between regions.

Additional robustness checks will use the location (town, manor, etc) fixed effects instead of region fixed effects, to see if dividing the data in smaller units has an adverse effect. One problem with using smaller units is that observations can be few and far between for some categories in some years and some smaller towns disappear from our record after some time while others appear later.

Another robustness check is aimed at establishing if the decrease in wages that we see is related to other economic changes. In this case we test if the decrease in herring stocks in the Oresund during the sixteenth century, which negatively impacted the late medieval Scanian herring market, is driving results. We introduce a new dummy variable, similar to the one for the border effects but which only takes the value 1 for Scania in the years up to 1550, when the market in Scania was still an important trade destination.

Finally, in order to show that the moment when the decrease in wages under the level of the rest of Denmark was identified correctly we employ a flexible model where the data is divided into periods, each which its own dummy variables as follows:
\[
\ln w_{it} = \sum_{j=1500}^{1800} Scania_{it} \beta_{ijt} + \alpha_t + X_{it}' \gamma + \varepsilon_{it}
\]

In this equation, the \( \beta_{ijt} \) will show the difference in income between Scania and rural Denmark and help show when this income decreased under the Denmark level.

d. Results

Table 2 presents the results of our regression models. All the regressions show a negative and strongly significant impact of the annexation of Scania on real income expressed in terms of welfare ratios. The first model presented is the base model, where we have fixed effect to control for different decades, different jobs and different regions. We have included decade fixed effects instead of year fixed effects in the base model, because we have many years with only a few observations, especially for the beginning of the period. Nevertheless, in model 2 we have tested what happens when we include year fixed effects and we still get a statistically significant result. In model 3 we have tested what happens when we include city fixed effects instead of region and the results were again statistically significant. Model 4 is design to check if the decrease in income we see is determined by the downfall of the Scanian market in the start of the 16th century rather than the annexation of the region. To that end, we have added a dummy variable that has the value 1 for records of wages in Scania up to 1550. The coefficient for the new term shows that indeed, the market had a strongly positive and statistically significant effect on wages, leading to higher wages in Scania than in the rural Denmark at the time. However, the model still gives a negative significant result for the annexation of Scania, which leads us to conclude that the market is not what drove our results. Model 5 is design to test for pre-trends in the data. In order to do this, we include in the regression a term that takes the value of the average wage before annexation for the observations before 1658 and 0 for the wage observations from after the change. After including this term, we still get a negative and statistically significant result.
The dependent variable is the natural logarithm of the welfare ratios. The variable “Scania x change” represents a dummy variable which takes the value of 1 for observations from Scania in the period after the borders were changed (1658-1800); the variable “Scania x market” represents a dummy variable that has the value 1 for records of wages in Scania up to 1550. “avgwage*year<1658” is a variable that takes the value of the average welfare ratio for the period up to 1658, interacted with a dummy that has a value of 1 for the same period of time and 0 otherwise. Models include fixed effects for years, decade, occupation, region, city as indicated by “Yes” or “No”; coefficients are reported with the robust t-statistics in parentheses (*** p<0.01, ** p<0.05, * p<0.1).

Next, we made the same tests separately for the lower skilled (unskilled and lower skilled HISCLASS) and for the higher skilled workers (medium and higher skilled HISCLASS). From the results showed in table 3, we can observe a smaller effect for the unskilled workers than for the skilled workers. Beyond the base model, we don’t get significant results for the unskilled workers. This can be caused by the scarcity of observations for unskilled workers before 1700, for Denmark – the sources contain many more observations of medium skilled workers like carpenters and masons and few observations of laborers. For the skilled workers, the results are significant and negative for all models which leads to the conclusion that the annexation of Scania had a significant negative impact on the wages of skilled workers, with a predicted decrease in wages between 25% and 55%.

<table>
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<th>Log welfare ratio</th>
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<tr>
<td></td>
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</tr>
<tr>
<td>Scania x change</td>
<td>-0.598***</td>
</tr>
<tr>
<td>Scania x market</td>
<td>0.735***</td>
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<tr>
<td></td>
<td>[7.477]</td>
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<td>R-squared</td>
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<tr>
<td>t-statistics in brackets</td>
<td>*** p&lt;0.01, ** p&lt;0.05, * p&lt;0.1</td>
</tr>
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</table>

**Fixed effects for:**

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<th>Year FE</th>
<th>Hisco FE</th>
<th>Region FE</th>
<th>City FE</th>
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<td>No</td>
<td>Yes</td>
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</tbody>
</table>

Table 2.

Notes: The dependent variable is the natural logarithm of the welfare ratios. The variable “Scania x change” represents a dummy variable which takes the value of 1 for observations from Scania in the period after the borders were changed (1658-1800); the variable “Scania x market” represents a dummy variable that has the value 1 for records of wages in Scania up to 1550. “avgwage*year<1658” is a variable that takes the value of the average welfare ratio for the period up to 1658, interacted with a dummy that has a value of 1 for the same period of time and 0 otherwise. Models include fixed effects for years, decade, occupation, region, city as indicated by “Yes” or “No”; coefficients are reported with the robust t-statistics in parentheses (*** p<0.01, ** p<0.05, * p<0.1).
Table 3

Notes: The dependent variable is the natural logarithm of the welfare ratios. The data was divided according to the HISCLASS scheme into unskilled, lower skilled, medium skilled, higher skilled. The variable “Scania x change” represents a dummy variable which takes the value of 1 for observations from Scania in the period after the borders were changed (1658-1800); the variable “Scania x market” represents a dummy variable that has the value 1 for records of wages in Scania up to 1550. Models include fixed effects for years, decade, occupation, region, city as indicated by “Yes” or “No”; coefficients are reported with the robust t-statistics in parentheses (*** p<0.01, **p<0.05, *p<0.1).

The same calculations were done for rural and for urban areas and the results are presented in table 4. The wage data for Denmark had more observations for the rural areas, while that for Scania had more urban wage observations. But overall, we have both rural and urban observations for both before and after annexation in both regions. One notable exception is rural wages for Scania before 1550 – that is why the coefficient for the Scanian market is not available. Overall, we can observe that the result is negative and strongly significant for both rural and urban areas. From the value of the coefficients it is apparent that the rural areas were affected less than the urban ones. This makes sense, since the city of Malmo quickly changed from being within sight of the capital to a distant provincial town, and significantly impacted the town’s regional importance for trade.
### Table 4

Notes: The dependent variable is the natural logarithm of the welfare ratios. Urban/Rural refers to the place where the data about the job was registered. The variable “Scania x change” represents a dummy variable which takes the value of 1 for observations from Scania in the period after the borders were changed (1658-1800); the variable “Scania x market” represents a dummy variable that has the value 1 for records of wages in Scania up to 1550. Models include fixed effects for years, decade, occupation, region, city as indicated by “Yes” or “No”; coefficients are reported with the robust t-statistics in parentheses (*** p<0.01, **p<0.05, *p<0.1).

Next, a flexible model is employed in order to test that the selected cutoff date is a valid one. Instead of having a single dummy variable which takes the value 1 for Scania after 1658, we have a series of variables for each period, that take the value 1 if the observation is from Scania and from that period, in order to determine when the difference between Scania and rural Denmark becomes significant. The length of the periods was chosen in order to ensure that we have enough observations in the earlier time intervals. We can observe in the table below that the results are statistically significant for all periods analyzed which indicates that there has always been a difference in wages from Scania and rural Denmark.
In the first period, up to 1550, when the Scanian market was still the most important market in the Baltic, wages here were much higher than in the rest of Denmark. After the market lost its importance, the difference in wages between Scania and rural Denmark was still positive and significant, probably because of the proximity to Copenhagen, which was the richest region in the country of the time. After 1650, the coefficients for Scania become negative, indicating that the standard of living had decreased below that from rural Denmark after the annexation to Sweden.

In addition to the flexible model presented above, we evaluate the assumption of parallel trends, in order to avoid the problem of having a systematic downwards trend prior to treatment. To this end, we estimate a fully flexible model by interacting year fixed effects with
Scania and including these variables in the base model with decade, region and occupation fixed effects. The coefficients are plotted. The coefficients for the fully flexible model show the difference between Scania and rural Denmark for every year. A systematic downward trend up to 1580 is visible, which could probably be related to the decline of Scania as an important trading outpost after the decline of herring stocks. Afterwards there seems to be no trend. We can even note that in the years right before 1658, the welfare ratio in Scania was actually on an upward trend.

For the flexible model we obtain results which are more significant in the periods which are further away from 1658 (up to 1550 and after 1750) so, in this case, we perform a regression for a shorter time span with data only for the period 1600 to 1720, to ensure that the values further away are not driving the results. The results for the same regressions specifications as the ones presented in table 2, are exhibited in table 6.

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<td>-0.326*</td>
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Fixed effects for:

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- **Year FE**: No, Yes, No, No
- **Hisco FE**: Yes, Yes, Yes, Yes
- **Region FE**: Yes, Yes, No, Yes
- **City FE**: No, No, Yes, No
- **avgwage*year<1658**: No, No, No, Yes

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Table 6

Notes: The dependent variable is the natural logarithm of the welfare ratios. The variable “Scania x change” represents a dummy variable which takes the value of 1 for observations from Scania in the period after the borders were changed (1658-1800); the variable; “avgwage*year<1658” is a variable that takes the value of the average welfare ratio for the period 1600-1658, interacted with a dummy that has a value of 1 for the same period of time and 0 otherwise. Models include fixed effects for years, decade, occupation, region, city as indicated by “Yes” or “No”; coefficients are reported with the robust t-statistics in parentheses (*** p<0.01, **p<0.05, *p<0.1).
The results are similar to what we obtained in the previous tables, again negative and significant, showing that the territorial change did have a negative effect on wages even when analyzed on this shorter time frame.

Next, we use the same methodology, to see the effect of the annexation on the standard of living from Scania, when we take another region from Sweden, Kalmar, as reference. Kalmar is located on the old border between Sweden and Denmark, on the Swedish side. This town also suffered during the period of warfare, but did not have institutional changes like Scania. The data available for Kalmar spans a shorter time frame, from 1614 to 1720. After running the regressions, the results are also negative and significant for the base model as well as for the other models. This indicates that the standard of living in Scania also decreased when compared to Kalmar, after 1658. The predicted decrease is though smaller than the values seen when comparing to Denmark. This suggests that the factor given by the regression having Kalmar as base is the effect of the annexation determined by factors like increased trade routes, while the extra decrease seen when comparing to Denmark could also be determined by the alignment of Scania with economic trends in Sweden.

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<td>*** p&lt;0.01, **p&lt;0.05, *p&lt;0.1</td>
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Fixed effects for:

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<td>avgwage*year&lt;1650</td>
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**Table 7. Regression results for Kalmar and Denmark**

Notes: The dependent variable is the natural logarithm of the welfare ratios. The variable “Scania x change” represents a dummy variable which takes the value of 1 for observations from Scania in the period after the borders were changed (1658-1800); the variable. Models include fixed effects for years, decade, occupation, region, city as indicated by “Yes” or “No”; coefficients are reported with the robust t-statistics in parentheses (**p<0.01, *p<0.05, *p<0.1).
VI. Conclusion and discussion

The annexation of Scania in the 17th century provides a natural experiment which allow us the opportunity to investigate the impact of features such as borders and the distance to the capital have on the well-being of people. After conquest by Sweden, Scania is abruptly shifted from a region located right next to the national center of power and trade to a peripheral region far from the capital and separated by a border from its previous trading partner. In order to exploit these changes, we estimated welfare ratios based on wages and prices in Denmark, Scania, and Kalmar which were used to facilitate comparisons across borders and currencies to estimates differences in wellbeing and purchasing power between regions.

Welfare ratios indicates that in the sixteenth century Scania was better off than rural Denmark. But after the wars between Sweden and Denmark, which had strong impacts on the standards of living throughout the region, Scanian wages fell below those in rural Denmark. But was this Scanian decline more severe because of its territorial reassignment and change in second nature geography, or simply a part of the general decline throughout Scandinavia? A difference in difference approach confirms that Scania suffered particularly as a result of its annexation. The treatment variable shows a significant negative impact of the annexation on the standards of living measured through wages. Results are robust to other specifications, as well as other important market changes in the region.

In the sixteenth century Scania had hosted the most important market in the Baltic Sea, feeding the high demand for herring in Europe from the abundant stocks in the Oresund. At the same time, Crown investment in fortifications focused on urban areas in combination with Denmark’s booming export market meant that Scania was quite prosperous and that that wages were substantially higher than in rural Denmark. The collapse of all three of these features in the later part of the 16th century drove down wages to a level that was still slightly higher than in rural Denmark; wages in Scania probably remained higher due to its proximity to the capital and importance to the collection of the Oresund Tolls. The wars preceding the annexation lead to a decrease in income in both Denmark and Sweden, but after the wars were over, Scania had become a peripheral region and the wages here were negatively impacted by that, settling at a level which was lower than that of rural Denmark.

These findings lend support to the idea that locations matter beyond the relationship to physical features. Here, a prosperous region, though already in decline, was more adversely impacted by its change in second nature geography than surrounding regions which, though impacted, maintained much more continuity in institutional and proximity to national capitals and established local networks.
References


van Zanden, J. L. The prices of the most important consumer goods, and indices of wages and the cost of living in the western part of the Netherlands, 1450-1800.

Constructing equality? Women’s wages for physical labor, 1550-1749

Kathryn E. Gary

I.

Investigations of historical wages and the development of living standards in the early modern period have been increasingly popular, especially since Robert Allen’s 2001 paper on the development of real wages throughout Europe. However, these wage studies have almost universally referred to men’s wages as the drivers of economic development and determinants of living standards; they assume a male-breadwinner model in which men’s wages are the only income supporting a household. Comparatively little investigation has been done into women’s earnings or into the ways in which they participated in paid work, despite an increasing acceptance that women’s work was very likely an important source of income for making ends meet in early modern households, along with an increasing emphasis on women’s employment and income for early modern European economic development.

The implicit acceptance of a male-breadwinner model has cast its shadow over the ways in which we reconstruct historical data and statistics in the distant past, even though there has been well-circulated work which demonstrates that it was not a common household survival strategy before the nineteenth century, and even then was attainable only by certain classes. Very recently the record is being adjusted, with work such as Humphries and Weisdorf’s 2015 study which constructs long-run wage series for British women in many historical occupations, demonstrating both the availability of data comparable to that used for men as well as the complexity and variety of women’s historical work.

While there is progress being made, there is still comparatively little known about women’s earning and labor patterns in the early modern period. We still need to know more about wage levels in different settings, and about how much women actually worked and how much they were able to earn. This study fills some of these important gaps on two levels: first by examining women’s wage earning potential compared to men’s, and second by looking closely at labor markets in order to understand how these markets functioned and how women and men may have accessed paid market work in different ways. This is achieved by developing a series of women’s wages using primary payment records from the construction sector in southern Sweden, which is combined with series of female builders’ wages from Stockholm, to create a series of Swedish women’s wages from the middle of the sixteenth century through the middle of the eighteenth. The scope and detail of the data combine to provide both a macro view of wage development for women in unskilled construction in Sweden, as well as a micro level perspective on individual work patterns and labor

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1 Allen, Great Divergence
2 For example, Humphries and Sarasúa, Off the Record
3 de Moor and van Zanden, Girl power; Voigtländer and Voth, Malthusian Dynamism; Voigtländer and Voth, How the west ‘invented’
4 Burnette, Gender, Work, and Wages; de Vries, Industrious Revolution; Horrell and Humphries, Women’s labour force
5 Humphries and Weisdorf, Wages of Women in England
demand, which elucidates the mechanisms which could have influence women’s entry into the paid labor market.

Findings challenge long-held beliefs about women in work in general as well as the types of work in which women were engaged: women were often well-represented in the Swedish construction industry, and in the end of the sixteenth century female construction workers were able to earn wages more or less on par with their unskilled male coworkers, though women’s relative wages declined in the seventeenth century and women typically remained relegated to less-skilled jobs. Women’s relative remuneration appears to be largely market determined and demand-driven, with higher relative wages in periods with more construction work; there is less evidence for systematically discriminatory or custom-based wages.

II.

Women’s work in the past has been systematically less studied than men’s, especially in long-term quantitative studies. Some of this is because of the relative ease of finding data – women are often not as clear in the historical record, and their work has often been less formal, making them harder to observe and collect. However the large number of difficulties does not mean that there is no data, and as the importance of different kinds of labor in the paid market becomes more apparent the focus on women has been increasing.

When women’s work has been studied it has tended to be from a gender history perspective, often in thorough studies driven by extensive archival material which illuminate complexities and nuances of female labor, but which tend to not be integrated into mainstream quantitative analysis.

Humphries and Weisdorf’s study shifted historical data for women’s earnings into the mainstream with a comprehensive and long-term series of women’s wages for both day and annual labor from the middle of the thirteenth century through the nineteenth. Built on an impressive array of primary and secondary sources and covering a wide range of types of work, this is the first long-term investigation of women’s wages for early modern and late medieval Britain. They conclude that the ‘Golden Age of the Peasantry’ following the Black Death – typically associated with increased bargaining power and wages for unskilled laborers – likely had little benefit for women, and that women who were engaged in casual work were likely increasingly dependent on their husbands for financial support as the gender pay gap widened through industrialization. Women who could commit to full time labor with an annual contract, however – typically young single women without family commitments – were more able to support themselves through the early modern period.

The majority of gender wage gap studies in a pre-industrial context examine the gender wage gap in the long nineteenth century; this literature tends to have a British focus, and to rely on agricultural data collected from farm accounts. These studies haven’t typically produced long-term series of data, but instead look closely at a particular farm or set of farms on a more micro-level in order to gain a fuller picture of the working environment and division of labor between the sexes. Joyce Burnette expands this genre to examine a larger set of farms throughout England from 1740 to 1850, also

6Humphries and Sarasúa, Off the Record; Horrell and Humphries, Women’s labour force
7For example, Pinchbeck, Women Workers; Ogilvie, A Bitter Living; Burnette, Gender, Work, and Wages
8Humphries and Weisdorf, Wages of Women in England
9Burnette, Wages and employment of female day-laboureres
finding a decreasing female relative wage alongside a decreasing demand for female farm labor over this period; she attributes the decrease in demand for female farm labor to women’s increasing ability to find alternative employment in cottage industry, driving up the competitive wage to the point where the wage farmers would have needed to pay to hire women would have been higher than the value of women’s productivity. Hiring was a different calculation, since men’s higher physical strength would have led to their higher labor productivity in physical agricultural labor.

Several other studies have found a widening gender wage gap through the late medieval and early modern periods, following relative parity following the Black Death. Women’s unskilled wages declined relative to men’s at Winchester College in England, with initial wage parity in the early sixteenth century rapidly falling to less than half of men’s wages by the middle of the seventeenth century. The decline in women’s relative wages is also found in wage assessments – the maximum wage rates allowed for certain types of workers – for reapers and haymakers across England in the early modern era; here the decline in parity occurs later, and is not as drastic, as the actual wages from Winchester College. The wage gap in the Netherlands follows similar patterns, with a very small wage differences before the Black Death and no wage gap in observations in the first part of the sixteenth century followed by a loss of wage parity going into the eighteenth century, though this increase in inequality was more modest and occurred later than in England.

Though there is increasing empirical evidence about women’s wages and the development of gender wage gaps, there are still difficulties in explaining what factors are driving different payment rates between the sexes, especially historically. The debate typically centers on whether wage differences were due to discrimination or whether they are based on differences in women’s and men’s productivity and are thus rationally reflective of market forces.

Much of the long-term decline in women’s relative wages has been connected to the labor shortage following the Black Death. The low supply of unskilled labor in combination with continued and inflexible demand for agricultural workers allowed unskilled laborers, and theoretically women in particular, to demand higher wages; the subsequent decline in relative wages is connected to population recovery in the following centuries. However, Humphries and Weisdorf find no such effect of higher women’s relative wages following the Black Death.

Bardsley criticizes the historiography that claims that women were paid on par with men following the Black Death and that women’s wages reflected their relative labor productivity; she examines women’s relative harvest wages before and after the Black Death in England, and finds a highly segregated wage structure, wherein the best paid women could earn only as much as the lowest paid men, but average wages were far from equal even when women and men were employed on the same tasks. She also presents evidence that women’s wages may have been overestimated in some previous literature, especially when women were performing as part of a work group, in which a lump payment was made to a group leader and distributed internally. Further, many of the lowest male wages were possibly paid to boys, older men, or less physically fit men, meaning that the pay gap between fit adult women and fit adult men would have been even larger than it appears. Her overall conclusion is that gender, along with age and perceived physical ability, was an intrinsic

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10 van Zanden, The Malthusian Intermezzo
11 Ibid.
12 Ibid. Humphries and Weisdorf, Wages of Women in England
component of wage determination throughout England’s late medieval and early modern period; she stresses the likelihood that selective comparisons and the lack of strong or systematic data has led to an overestimation of women’s early modern wage parity.¹³

Burnette counters that women were not paid lower wages than men simply on the basis of sex, and argues that when differences in productivity are taken into account women were paid on par with men for manual work – wage differences are because women are not as strong as men, and so are not as productive in strength-based tasks. While men and women often completed different work, this sorting was market-motivated and led to greater economic efficiency, rather than being based on discrimination or gender roles; while there was some assumption of typical ‘male’ or ‘female’ tasks, workers and employers were almost always willing to override gendered work categories in the interest of economic efficiency.¹⁴

Burnette connects the decline of women’s relative wages in the eighteenth to nineteenth century Britain to changes in farming practices and technology: as the labor-grain price ratio shifted from low grain and high labor prices to high grain and low labor costs, farmers preferred to pay the higher male wages, which allowed a higher reliance on the heavier scythe to lead to more efficient grain collection than with the sickle, which was more easily used by women. Similarly, van Zanden¹⁵ connects the decline of wage parity to the development of large, capital intensive farms and enclosure systems; as farms grew in size and family farms disappeared, the demand for farm labor fell across the board, but fell especially for women and children.

The discussion is slightly complicated by van Neverdeen Meerkerk, who compares Dutch women and men spinning various fibers in the seventeenth century Dutch Republic. She finds that when men and women were performing the same task, typically paid for the piece, they received the same payment, but that the occupational structure was highly segmented which prevented women from performing more highly-paid tasks.¹⁶ Here there are wages driven by market forces, but segregation driven by custom which prevents women’s full economic advancement.

Swedish research takes advantage of later and more thorough data during Sweden’s first period of industrialization at the end of the nineteenth century. Schultz (1985) follows the link between changing global factor prices and women’s labor specialization in agriculture 1860-1910, and finds that the increase of dairy products, typically produced by women, relative to grain pushed up women’s relative wages and is linked to a decrease in fertility. Stanfors et al (2014) look more closely at the personal determinants of gender wage gaps in cigar manufacturing at the end of the nineteenth century, a context in which individual productivity is easily measured; here, skill and experience explain much of the pay gap. Firms that did discriminate tended to fail. Together, these argue for a market-based foundation for women’s wages in Sweden at the end of the nineteenth century.

Apart from wage development, women’s relative participation in paid work is also not well understood. Humphries and Sarasua¹⁷ propose that women participated in the paid labor market far

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¹³Bardsley, Women’s work reconsidered; Bardsley, Reply
¹⁴Burnette, Gender, Work, and Wages; Burnette, Wages and employment of female day-laboureres
¹⁵Van Zanden, The Malthusian Intermezzo
¹⁶Van Nederveen Meerkerk, Market wage or discrimination?
¹⁷Humphries and Sarasúa, Off the Record
more than what has historically been assumed, and that women were often occupied year round with paid work, though it might be comprised of several jobs across different sectors; men’s work was much the same. The absence of women from the official record of work is largely born of our own and our predecessors’ ideologies. They also argue that demand-side factors were typically a stronger influence on women’s decision to work in the early modern period than supply-side factors such as marriage or fertility through a mechanism such as the European Marriage Pattern, which has been used to connect this decline in women’s relative earning power to the decline in women’s marriage ages that was occurring in the eighteenth century.\textsuperscript{18} This is in turn theoretically connected to Becker’s theory of lower marriage ages being associated with greater specialization within marriage, and falls in line with de Vries’ theories of the Industrious Revolution and changing patterns of within-family specialization and the rise of the bread-winner model, which describes the changing gender specializations between household production and market labor attachment. In earlier periods household members were all more or less equally engaged in home production, complemented with waged work. This relationship gradually shifted over the early modern period until the male-breadwinner model was more predominant in the Victorian period.\textsuperscript{19}

This study investigates the wages rates of women, to determine if they were set by market forces, customary rates, discrimination, or some combination of these factors. It further questions how these factors functioned; what kind of market forces could be at work in wage setting and in women’s labor market involvement and how they interacted with customary aspects. Additionally it looks more closely at the extent of women’s work in the construction sector, and at the differences between men’s and women’s work. This work builds on previous studies which have investigated women’s wage rates and relative wages, as well as work patterns, by using data for a long period of time in a specific industry, where men’s and women’s wages can be compared directly for the same tasks. It additionally contributes through its foundation in robust archival data, which allows analysis to be built on actual wage payments as well as appearances at work sites and integration into the construction industry, and for a deeper analysis than is possible when wage data come from wage assessments or secondary information.

III.

Sweden was by and large a part of the European periphery during the early modern period, a rural and agricultural economy which remained so more or less until the nineteenth century – figure 1 shows the development of Swedish GDP from 1534 through 1775, and the up-and-down economic fluctuations it underwent. Scania, the region in the south of modern Sweden and the region represented by the archival data in this study, was actually a part of Denmark until 1658, after which it was ceded to Sweden along with several other territories at the end of the Second Northern War. The sixteenth and first part of the seventeenth century were periods of territorial and economic growth for Sweden as Sweden became the dominant power in the Baltic region. Sweden lost its military preeminence after its loss in the Great Northern War at the end of 1718, after which the country underwent stagnation and economic decline until the turn of the century. There was recovery and growth again during the nineteenth century, though Sweden did not experience true or

\textsuperscript{18}De Moor and van Zanden, \textit{Girl power}; van Zanden, \textit{The Malthusian Intermezzo}  
\textsuperscript{19}Becker, \textit{Human Capital}; de Vries, \textit{Industrial Revolution}; de Vries, \textit{Industrious Revolution}
substantial economic development until the beginning of the twentieth century. During the period of Sweden’s military expansion, both before and after Scania was ceded from Denmark, both Scandinavian countries were administering a project of state-building and reinforcement, first building up already-existing cities and fortifications and later, especially in the Swedish case, establishing new towns and settlements in an effort to encourage and enforce a process of ‘Swedification’ and unification. This project naturally led to considerable increases in construction projects throughout the region.

Not much is known about the casual and seasonal labor market. Sweden is generally regarded as having been characterized by the European Marriage Pattern (EMP), in which young people left home early to work for other households or estates before marriage, saved up, and married in their mid to late twenties, if they married at all – the EMP is characterized by both a later age at first marriage and a high rate of non-marriage. This labor supplied the labor needed for agriculture almost entirely, leaving very little market for casual agricultural work – an expectation reflected in the near-absence of agricultural labor in the almost 30,000 observations of paid day labor collected for this study (see section IV, below). This implies that the greater number of younger and unmarried workers are expected to have worked in service in the households of others, and not for casual labor, and that the workers we do observe would be older or married. But the data itself gives little indication of marital status. Swedish women did not change their names at marriage until the middle of the nineteenth century, so it is difficult to link married couples unless it is explicitly stated in the ledgers. Women were given a patronym, with their father’s first name attached to the suffix –dotter, or daughter. But this also gives little indication of potential familial relationships, as there was a relatively slim number of given names which were shared by many people, meaning that someone

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20 Hajnal, European marriage; Lundh, Hajnal Revisited; Lundh, Swedish Marriages; de Moor and van Zanden, Girl power
with the surname ‘Nilsdotter’ or ‘Nilsson’ could refer to several different fathers, with no indication of the age. Occasionally the data do make reference to a builder’s wife working alongside a husband (or working solo), but so too are there mentions of daughters working with their fathers or with their mothers. While it is more common to find a reference indicating a woman might be married, it is not universal, and indications of relationship or generational status of any type are far in the minority.

IV.

The primary data for this study are collected from payment records from institutional and manorial archives in the south of modern day Sweden, primarily from the cities of Malmo and Kalmar, though also from some manorial sources and smaller towns around the southernmost province, Scania, where Malmo is located. All of the data are from day laborers working in the construction industry. The primary data are connected to wages from Stockholm 1600-1719.\textsuperscript{21} Stockholm was the capital city, and a regional trade center. Malmo was an important regional city, across the Oresund Sound from the Danish capital of Copenhagen. Kalmar lies between the two, and was the smallest, though still an important town on the old Swedish-Danish border. Stockholm was of course the largest, with about 9600 inhabitants in 1571, growing substantially to 57,000 in 1699. Malmo had 3800 and 5700, and Kalmar 1500 and 2000, respectively Andersson-Palm, Folkmängden I Sverige.

Primary data is coded using the HISCO and HISCLASS systems.\textsuperscript{22} These systems allow for systematic categorizations of work tasks and the differentiation of skilled and unskilled workers. When specific tasks are mentioned, these unskilled workers were typically doing menial work such as digging out foundations or carrying stones, but some worked more specifically as assistants to masons and as mortar mixers. Several unskilled occupations were eliminated from the sample because they were systematically different from the overwhelming majority of the data and so would not give an accurate reflection of the typical wage. The main exclusions are both male and female guards, who often worked over night and received much lower wages than day laborers. Anyone who worked over night for any reason, or for a combination of night and day, is also excluded. Cart drivers, again both men and women, are excluded because their wages often reflected the ‘rent’ for the physical capital of horse and cart. Agricultural labor was uncommon and only appears sporadically, and when it does appear is it systematically different from building labor; to keep the sample as consistent as possible any agricultural day labor was also excluded from the main series. The total primary database from which these wages are taken comprises over 29,000 observations of daily wage payments; the final sample used for this study contains about 22,700 observations of payments to unskilled workers, of which about 1,900 refer to women. These observations translate to roughly 144,000 paid days of male unskilled work and 9303 days of female unskilled work. These are combined with the published data from Stockholm to create a more robust series throughout modern day Sweden.

A female worker can be identified either through a gendered occupational title, a female relationship indicator, or by her name. Women are not systematically separated from men through their titles or recorded occupations, though differences do sometimes make the gender clear: In Malmo, women

\textsuperscript{21}Jansson, Andersson Palm, and Söderberg, Dagligt bröd Johan Söderberg has also generously granted access to some of his archival notes used for the construction of the Stockholm series; some of this unpublished material is used to extend the series of women’s wages in Stockholm earlier in time.

\textsuperscript{22}van Leeuwen, Maas, and Miles, HISCO; van Leeuwen and Maas, HISCLASS
are sometimes identified as a digger’s wife (grävarens), but other times they are called simply a digger (grävare), the same title given to men. Women do also appear with the feminized title of a mortar mixer (kalkslagerska, as opposed to the male kalkslagare), but this is one of the few instances where the title itself is feminine. Often, all unskilled workers are subsumed under the title ‘hantlangare’, an unskilled worker. In many instances individuals are named, which not only makes identifying the gender of the worker straightforward but means that we can be confident that we are not misidentifying female workers as male. This misgendering could be a problem in some instances: when there is no gender identifier the worker is assumed to be male by default.

Wages are calculated by sex as the mean of all unskilled wage payments in each year. Each entry is given equal weight. This means that if a single person is identified receiving the same wage rate more than once in the same year they are counted multiple times; because not every individual is identifiable this does not give any individual more preference, and gives the strongest weight to the most typical wage. However, it is not likely that this makes a strong difference in final calculated daily wage; the primary wage data employed in this study is extremely modal, both for men and women. When there are large building projects and large groups are listed and paid in the same ledger entries, the mode is especially strong; both men and women are typically paid the same rate for doing the same work. Women and men are typically mixed together with little differentiation in these entries, indicating that their work and the hours at work were not seen as differentiable by those hiring and paying them.

Consumption baskets are constructed according to Allen’s 2013 methodology; the primary difference is the substitution of half of the meat allowance for herring, to reflect a more typical Scandinavian diet.  

V.

Figure 2 shows the women’s relative wages as a percentage of men’s in Sweden, disaggregated by source and region. The clear trend is an increase in women’s relative earnings from the end of the sixteenth and into the seventeenth century, followed by a steady decline through the seventeenth century; this is followed by a slight indication of a recovery at the beginning of the eighteenth century, but this is more tentative. What is clear is that over the course of about two working generations women’s wages declined from relative parity to as low as forty percent of men’s, during a time when Sweden was economically stagnating.

It is especially interesting that several data points from Kalmar and Stockholm indicate that women were at times able to out-earn unskilled men in a physically demanding industry. Some of the high levels of women’s relative wages can be directly connected to events that would both increase the demand for building labor and likely decrease the supply of able men. Kalmar was previously a border town between Sweden and Denmark; the Kalmar War was fought between these two

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23 Allen, Poverty Lines in History; Morrell, Studier i den Svenska livsmedelskonsumtionens Basket prices are computed separately for Stockholm and Malmö. Malmö prices are used to deflate wages from Kalmar. Price data come from Jörberg, A history of prices in Sweden; Söderberg, Prices in Stockholm, and Tomner, Forskninr i Malmö. These are extended when necessary by Swedish GDP (Schön and Krantz, The Swedish economy), and Danish GDP (Albildgren, Consumer Prices in Denmark). Herring prices are supplemented with Dutch data (van Zanden, prices of the most important consumer goods), which is more extensive and consistent and highly correlated with Swedish data.
countries from 1611-1613, and the high wage ratio of 1.2 in 1614 is likely in response to the need to rebuild coupled with a fall in the supply of men.

Peaks in women’s relative earnings in the late 1640s coincide with the years directly following a fire that devastated Kalmar in 1647; the town was rebuilt at a slightly removed location, and building labor would certainly have been in high demand, helping to explain the wage ratio of 1.33 in that year.24

The high levels of women’s wages could also be connected to gender-specialization in the unskilled (or low-skilled) construction workforce. When Kalmar was rebuilt following the fire, burgers were given tax credits for building in stone, instead of wood.25 Throughout the archival records carpenters typically work alone, without assistants. Masons on the other hand often had many people working under them. In particular, they have more specialized unskilled workers, called kalkslagare, or the feminine kalkslagerskor, who frequently appeared with the same mason regularly. This position was often held by women, especially in Kalmar. Given this pattern of professional relationships, and increase in the demand for skilled male mason labor would also drive up the demand for semi-specialized unskilled female labor. This relationship is similar to what Stephenson26 suggests for what have been considered as fully unskilled men in the London building industry; she proposes that many of these men were in fact semi- or quasi-skilled, thus leading researchers to overestimate the level of unskilled pay. In this case women’s wages, especially, are very modal – as mentioned above,

24Hedlund, Sextonhundratälets Kalmar
25Ibid.
26Stephenson, The pay of labourers
almost all unskilled workers working together receive the same or a very similar wage rate. However, there is a clear persistence of certain women who frequently appear with certain skilled men, notably masons, in years where unskilled labor is otherwise scarce.

Even given the particular circumstances that help explain some instances of very high relative wages, the decrease in women’s relative payment through the seventeenth century is dramatic, especially as it occurs over the course of only a generation or so. The following sections concerning women’s participation in the labor force aims to reveal some of the mechanisms that led to this dramatic swing in women’s relative compensation.

Women’s relative wage decline can be seen clearly in the halting of women’s nominal wage growth during the majority of the seventeenth century and into the eighteenth, while men’s nominal wages continued to grow. The total flatness of women’s nominal wages in the seventeenth century compared to men’s in figure 3 is largely a composition effect – wages in Stockholm for both women and men are very sticky in this period, while wages in Malmo are more fluid. However, there is a greater contribution from Malmo of men’s wages to the macro series during this period than women’s. There is some catchup of women’s wages in the eighteenth century, but the data is scarcer here, so the trend is not as conclusive.

VI.

Women played an important role as paid manual laborers; this was especially the case in periods when construction labor was in high demand. The importance of women in the building industry is particularly evident in Kalmar: one of the unique features of this data is that virtually every individual is named, which means that identification of each worker is essentially universal. This allows for an examination of women’s presence in construction field on an individual level. Kalmar was not a large
town; it had only about 2000 inhabitants around 1700 and the surrounding countryside was sparsely populated, but this was fairly normal for a Swedish town in the period. Unfortunately the population statistics are not detailed enough for a clear examination of the population development of the town; because of this, little is known about the supply side of labor in Kalmar or how it might have changed in different periods.

Table 1 shows the number of payments made to women as a percentage of payments to all unskilled workers in Kalmar and as a percentage of the total sample, presented with the number of all unskilled workers and number of workers in total. Clearly the 1620s and 1630s were the biggest years for construction in Kalmar, while construction work recorded in the available sources generally

<table>
<thead>
<tr>
<th>Year</th>
<th>As % of unskilled workdays</th>
<th>As % of total workdays</th>
<th>Total workdays (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1614-1620</td>
<td>68.6</td>
<td>39.0</td>
<td>4406</td>
</tr>
<tr>
<td>1621-1625</td>
<td>31.8</td>
<td>18.6</td>
<td>6903</td>
</tr>
<tr>
<td>1626-1630</td>
<td>60.8</td>
<td>52.7</td>
<td>3354</td>
</tr>
<tr>
<td>1631-1635</td>
<td>69.4</td>
<td>54.1</td>
<td>977</td>
</tr>
<tr>
<td>1636-1640</td>
<td>54.5</td>
<td>11.5</td>
<td>607</td>
</tr>
<tr>
<td>1641-1645</td>
<td>40.3</td>
<td>38.4</td>
<td>151</td>
</tr>
<tr>
<td>1646-1650</td>
<td>18.9</td>
<td>4.2</td>
<td>1601</td>
</tr>
<tr>
<td>1651-1655</td>
<td>13.2</td>
<td>6.2</td>
<td>97</td>
</tr>
<tr>
<td>1656-1660</td>
<td>0</td>
<td>0.0</td>
<td>73</td>
</tr>
<tr>
<td>1661-1665</td>
<td>0</td>
<td>0.0</td>
<td>20</td>
</tr>
<tr>
<td>1666-1670</td>
<td>0</td>
<td>0.0</td>
<td>130</td>
</tr>
<tr>
<td>1671-1675</td>
<td>17.4</td>
<td>15.2</td>
<td>438</td>
</tr>
<tr>
<td>1676-1680</td>
<td>100.0</td>
<td>52.0</td>
<td>25</td>
</tr>
<tr>
<td>1681-1685</td>
<td>27.8</td>
<td>15.4</td>
<td>33</td>
</tr>
<tr>
<td>1686-1690</td>
<td>20.0</td>
<td>16.3</td>
<td>215</td>
</tr>
<tr>
<td>1691-1695</td>
<td>5.7</td>
<td>4.1</td>
<td>49</td>
</tr>
<tr>
<td>1696-1700</td>
<td>4.1</td>
<td>4.0</td>
<td>126</td>
</tr>
<tr>
<td>1701-1705</td>
<td>0</td>
<td>0.0</td>
<td>135</td>
</tr>
<tr>
<td>1706-1710</td>
<td>0</td>
<td>0.0</td>
<td>51</td>
</tr>
</tbody>
</table>

Table 1: Women’s work days as a percentage of all workdays in Kalmar, 1614-1706. Workdays rounded to nearest full day.

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27Andersson-Palm, Folkmängden i Sverige
declined in the 1640s; this is likely due to the extensive repair work necessary after the church and other parts of the city were destroyed during the Kalmar war 1611-13. Women are a substantial part of the labor force throughout the period; they are regularly about half of the unskilled labor pool, and even when skilled (male) labor is included they are still a strong proportion of all builders. There is no doubt that female building labor was an integral feature of construction work in Kalmar.

The data here represents only one source from Kalmar – others do not survive – but there are indications that this source is a strong representation of the building sector in Kalmar. After the fire in 1648, Kalmar was rebuilt at a new location with tax relief offered to burgers who rebuilt their homes in stone. As mentioned above, female construction workers frequently assisted masons, and so we can assume that female unskilled labor for private projects was in high demand in these years along with building labor in general. Because this employment would have been in the private sector, paid by individual townspeople, it does not appear in the records of the public sources used in this study. This demand from the private sector was enough to drive reallocation of the labor supply from the public market – at least, there are significantly fewer payments to construction workers in the public record during the period when private construction would have been at its highest. The few wages that do remain continue at a high level, especially for women. This indicates that the Kalmar market is small enough that the patterns in the records analyzed here are a reasonable proxy for the construction market, and reflect workers’ reactions to supply and demand forces. This high labor demand, combined with a limited labor supply, may also help explain women’s relatively high wages in this decade, despite this decade having fewer recorded wages overall.

Figure 4: Total building demand represented by total paid working days (right axis) and women’s relative wages in Sweden (left axis) by decade.

Source: see text.
The high proportion of women working during years in which the labor demand was greatest further indicates that women responded to demand factors when entering the labor market. We can investigate women’s incentives further by examining the relationship between women’s wages and labor demand.

Figure 4 shows the development of total labor demand, measured as the number of individual wage payments made in each decade, along with women’s relative wages. It is important to note that this comparison is somewhat flawed; the data of women’s relative wages contain information from Stockholm, while the labor demand data do not. However, from figure 3 above we can see that the overall shape of women’s wage development is fairly consistent even without the inclusion of Stockholm; the series would have more gaps and a slightly higher level, but the shape would be stable.

As figure 4 shows, the relationship between building demand and women’s relative wages is strong, which indicates that either employers raise women’s wages, though not men’s, in times of high labor needs, or that women are able to enact some degree of collective bargaining when employed in larger groups. Together this is strong evidence that demand factors have a strong influence on Swedish women’s connection to the building industry, in accordance with Humphries and Sarasua’s suggestion about the motivations of preindustrial working women in general.

VII.

Evidence from Malmo also supports the idea that women tended to play a fairly regular role in construction work; while probably less common than in Kalmar, women’s paid work seems to have been fairly normal and to have gone without comment. One piece of evidence for this is the frequency with which women are not given a gendered occupational title, but are only identifiable by their name; this at least implies that women’s work was not seen as different enough to record them as doing separate work from men. Additionally, whether or not women were given a gendered title seems to have been somewhat arbitrary; Karine, wife of Niels the digger (possibly Niels Graffuer), appears in the data at least four times, and possibly a fifth, between 1589 and 1593. However, she is never named in the same way twice; she is named as Nils’ Karine (Karine Nilssis), and as Niels’ woman Karine (Niels kvinna Karine), and her occupation also changes from entry to entry. Twice she is listed as just a digger (grävare), while twice she appears as a digger’s wife (grävares kvinna). In 1592, another Karine, Karine Wogns, is paid 12 skilling for 1.5 days work on what was most likely the foundation work for Malmo castle’s east tower. She appears directly after Wogn Jensön, her husband, who receives 8 skillings for one day’s work, the same per-day rate as Karine. For both Karines, neither their occupational titles nor their wage necessarily identify them as female. It seems very likely that there are more women who similarly disappear into the data because it is impossible from the data to see that they are women.

As mentioned before, one of the strengths of the data from Kalmar is that virtually every individual is named, which can give some strong indications of women’s occupational roles that are not available in other sources. Women are typically included under the heading ‘hantlangare’, as mason assistants and unskilled workers, along with men. While female builders are often listed at the end of daily lists of workers in the Malmo data, men and women are thoroughly mixed in Kalmar, with individuals

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28Humphries and Sarasúa, Off the Record
who worked the most days listed first; either Anna Dikerska or Anna Kalkslagerska top almost every list of unskilled workers throughout the entire period.

Anna Kalkslagerska and Anna Dikerska are also notable because of their names; both women’s surnames are occupational titles, rather than the more typical patronyms that most women and many men carried. Many master men adopted the names of their professions, of course; there are many men called ‘Murmästare’ (mason) and ‘Timberman’ (carpenter), along with a few named ‘Dödgrovare’ (gravedigger), but it is in general less typical for women to have occupational names. The women’s titles are less prestigious than the men’s; ‘Kalkslagerska’ is a mortar mixer or plasterer, and ‘Dikerska’ is a digger, but the suffix ‘ska’ unambiguously indicate that these titles are female, and so were not inherited from a father or husband; instead these names must refer to these women’s identification as professional construction workers.

While the predominant source of paid day labor in early modern Sweden was construction work, there were some other sources of unskilled causal work, and women show up in these roles, as well. The vast majority of paid day labor in the archival sources that are utilized for this study are construction work, for both women and men. As mentioned previously, all other work has been excluded so as to create as consistent a series as possible; in doing this only a handful of observations with clear individual wages were dropped, but some are worth investigating on a more individual basis. Women appear alongside doing most of the tasks that have been excluded, including night guard work and cart-driving. Are the patterns from these tasks similar to what we find in building work? For the most part they are, at least in tasks which are more closely related to construction work.

In 1601 two entries for a carpenter’s wife – though probably the same woman on two different occasions – record her being paid to ‘guard the wall’ (vaktat vallen) Malmö city. This was a fairly typical job; there are ten different entries for this task in 1601 alone, a total of six of which refer to Peder Knöll or Peder Swendtzsön who are typically tasked with ‘guarding the wall against pigs and others’ (vaktat vallen för svin och annat), probably working to keep the grazing animals from entering the city walls. Peder Knöll and Peder Swendtzsön are employed for periods between eight and twelve days and earn about three to five times what our carpenter’s wife does when wages are calculated as day rates. However the carpenter’s wife worked for much longer periods, which is often associated with a lower daily rate; she is recorded for two spells of 140 and 156 days. Jacob Pedersen is the final guard in 16101; he is recorded in the same way as the carpenter’s wife, with two spells of 140 and 156 days each, and for each entry he makes the same wage. This instance illustrates to a much more extreme level than most how women’s relative wages can become closer to men’s the more closely observations are compared, and how these relationships depend on the data which is selected.

The case is more straightforward for women who drive carts in Kalmar, the only place where women are clearly observed doing this work; the two women who are employed alongside seven men are paid what is clearly the standard going rate for cart driving, twelve öre per day. In fact it is a man, Carl Bryngelsson, who is on two occasions paid less, on one occasions ten öre and on another 8.5.

Toward the later part of the eighteenth century day work in construction declines, and women become much more scarce in the building industry, and instead are more frequently observed doing work such as cleaning the city hall. These wages could be quite high, and were typically higher than...
the wages of men doing the same work, as well as often higher than the day rate paid to unskilled men in construction in the same years. These wages are the exception to the general finding in this paper as well as in other work that women were more likely to be paid less while working in segregated labor markets.²⁹

VIII.

But what does this mean for women’s economic potential or their ability to support themselves? This first question is whether or not an individual woman would have been able to earn enough within a year to support herself comfortably. Figure 5 shows the number of days of work it would have taken women and men to earn enough to support only themselves, in a single-person household. The lower bound of days refers to a basic subsistence living and the upper bound referring to a ‘respectability’, or more typical living, with a larger variety and higher quality of consumption goods. Realistically, most individuals probably made a living somewhere between the two levels, though perhaps preferred to work until their consumption was at a level closer to ‘respectability’, and so we can see these levels as something of lower and upper bounds on the expected working year.³⁰

As one would expect, the days of work a woman needed to support herself closer to what a man needed in the earlier part of the period than in the later, when relative wages were so divergent. In the 1550s women needed at least 50 working days, and could be quite comfortable with 130 days of work, while men needed about 30 and 100, respectively. The gap narrowed, with women and men

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Figure 5: Days of work needed to earn consumption baskets for women and men. Decadal averages

Source: see text.

²⁹see also the discussion in Burnette, Gender, work and wages on occupational segregation
³⁰This section follows empirical strategies laid out in Allen and Weisdorf, Was there an ‘industrious’, and basket quantities described in Allen, Poverty Lines in History
both needing between 18 or 74 workdays in the 1610s. As the gender wage gap expands it becomes increasingly more difficult for women to earn a solo ‘respectable’ living, with the days of work needed soaring as high as 213 in the 1660s, while men would have gotten by with about 120, still a reasonable number of work days to fit within a year.

The second question is whether women (or men, for that matter) were able to find enough paid jobs to accumulate the number of workdays needed to reach their income goals. The typical work year has been hard for economic historians to pin down; there is not much evidence on how much people typically worked and what evidence there is tends to be sporadic at best; the case for England, probably the country with the strongest quantitative economic history in the late medieval and early modern period, is illustrated in Allen and Weisdorf’s study. Even with the amount of work dedicated to the subject in English economic history, the recorded data are scarce.

One way to estimate some bound of typical work days is to reconstruct the work years of individuals who can be traced through the archival material.\(^{31}\)

<table>
<thead>
<tr>
<th>Table 2: summary statistics for individuals’ work days in Kalmar.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>average annual workdays</strong></td>
</tr>
<tr>
<td>mean</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>unskilled men</td>
</tr>
<tr>
<td>women</td>
</tr>
<tr>
<td>women w/o A.D.</td>
</tr>
<tr>
<td>skilled men</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>appearances (individual recorded payments, on the weekly level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>unskilled men</td>
</tr>
<tr>
<td>women</td>
</tr>
<tr>
<td>women w/o A.D.</td>
</tr>
<tr>
<td>skilled men</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of years over which individuals worked (need not be consecutive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
</tr>
<tr>
<td>----------</td>
</tr>
<tr>
<td>unskilled men</td>
</tr>
<tr>
<td>women</td>
</tr>
<tr>
<td>women w/o A.D.</td>
</tr>
<tr>
<td>skilled men</td>
</tr>
</tbody>
</table>

Source: see text.

\(^{31}\)This requires matching people based on their names; since there is not a great deal of other identifying information it must be performed manually. This in turn requires some judgement calls; there was a certain lack of originality of given names (and by extension of patronymic surnames), which was compensated by a
In Kalmar, the city which has been investigated above on a closer level, almost everyone is named and this makes it simpler to connect individuals’ working days. A closer look at the difference in individual working patterns between men and women in Kalmar, with its more-complete records, gives a better idea of how women’s work compared to men’s. Notably we find one individual, a woman called Anna Dikerska, is an abnormally tenacious worker. Weekly payment records record unskilled men and women together; this list is organized in order of days worked in the week, with those who worked the most days topping the list. This position is almost unwaveringly held by Anna Dikerska. Because she is clearly unusual as an unskilled laborer, summary statistics are presented with and without her better understand what is typical of women performing this labor.

Table 2 shows the average number of days an individual worked in a year, the average number of times an individual appears recorded as receiving payment (on a weekly basis), and the average number of years over which an individual worked, although these years need not be consecutive. Skilled men worked the most, which is to be expected, as they invested considerable amounts of resources to learn their trades and pursue a livelihood. What is less expected is that women, while fewer in number than unskilled men, appear to work more than their male counterparts in an industry that relies on physical strength and necessitates absence from the home. Median values are higher for unskilled women in all categories than for unskilled men; women are on average working more days in a year, and are returning to the workplace more often and over a longer period of time than unskilled men. While the raw mean might not be higher in all categories – unskilled men work during an average of 1.39 years, while women work during an average of 1.36 – in combination with median and max values the data shows a clear tendency toward a higher work intensity from women than from unskilled men. This possibly indicates that unskilled men had more options than women for earning an income on a casual basis, while women were more restricted in their work opportunities, but it is clear that women were a regular presence in the construction industry. It is also clear that a minority proportion of the women – as well as the men – who worked in Kalmar would have been able to earn enough to support themselves in a single-person household, and that very few would have been able to support more than themselves.

IX.

As previously stated there is a substantial lack of data on women’s historical wages, which makes an international comparison difficult. In figure 6, Swedish women’s construction wages are augmented slightly with data points in the 1750s and 1780s for women working to clean the city hall. These wages are compared with women’s causal wages in England and the wages of women working at Winchester College in England – this later series is also integrated into the longer-run series by flexibility between Swedish and Danish spellings, which means that at times it is not explicitly clear if two names are the same individual or not. At times different spellings are merely abbreviations of common suffixes; there are some entries with a very unique given name, who are clearly the same individual despite variations on the spelling of the surname. At the same time, there are names with the same spelling throughout, but due to location and century of work are clearly different people. Individuals are only considered to possibly be the same person if they worked in the same location multiple times within a two year period. It is assumed that errors of over-matching and under-matching will be more or less random and cancel out.
It is important to note that the wages from both English sources represent different types of work than those that come from Sweden; while the Swedish women are all construction workers, the women in Humphries and Weisdorf’s series are performing a large number of unskilled tasks, and women at Winchester College performed more domestic and agricultural manual labor, such as cleaning and winnowing. It is also important to put these series into context; Sweden was a largely rural and agricultural society until the end of the eighteenth century, while England was an early industrializer, with mechanization changing many industries already at the end of the eighteenth century. These important differences make a comparison less straightforward, but it is still worthwhile to understand how Sweden compared to others.

The development of men’s and women’s relative payments in Sweden is contrary to the development of English wage ratios. Humphries and Weisdorf find a declining level of relative casual wages from the middle of the sixteenth century; while there was some recovery through the seventeenth century, the decline appeared again in the middle of the eighteenth century, as the introduction of mechanized spinning drastically undercut spinners’ opportunities for income and changed the overall casual labor market for women.

At the beginning of the sixteenth century these women’s wages were on par with the unskilled men also hired by the college, but a substantial wage gap quickly developed, as men’s wages grew but women’s remained low; by the middle of the seventeenth century women were earning less than half of what men could earn. Like in Humphries and Weisdorf’s aggregate series, there was

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\(^{32}\)Humphries and Weisdorf, *Wages of Women in England*; van Zanden, *The Malthusian Intermezzo*
substantial wage recovery for women in the later seventeenth century, bringing them almost to seventy percent of men's wages, but still not enough to bring wages back to parity.

This pattern of a steep fall and decline, followed by a tentative recovery, is also the dominant trend in the Swedish wages, but the pattern begins much earlier in the English data, already at the middle of the sixteenth century; the Scandinavian trend is about fifty years behind the English development. Additionally, these developments are likely connected to different trends. Humphries and Weisdorf connect the decline in women’s relative unskilled wages in the eighteenth century to the increase in competition women faced from mechanization, while the high relative wage levels in Sweden are more likely connected to periods of high labor demand connected to destructive warfare; mechanization entered the scene relatively late in Sweden, and so is less likely to have had a strong impact during this period. The connecting theme between all of these series is women’s ability to earn more during high pressure times, but then a reversion to a lower relative wage during more typical times.

X.

This study has shown that not only did women work extensively in the early modern Swedish construction industry, but that they were able to command high wages and became regular employees while doing so. Women were responsive to demand factors, and periods of higher wages coincided with both higher periods of labor demand and higher rates of female employment. After the seventeenth century, when women’s nominal wages fell substantially while men’s generally continued to increase; at the same time larger building projects became less frequent, and men and women were increasingly employed separately.

The decline of women’s relative wages is concomitant with a decline in building demand, as well as with a decline in the relative proportion of women working in construction. This makes it unlikely that women’s relative employment is due to any sort of substitution between unskilled men and women; instead, they seem to act as compliments. Similarly, the rapid shifts in relative pay levels within the same sources, or at least the same geographical regions, also undercut a story based on customary gendered pay gaps; even if the differences in gendered pay rates are due to discrimination, the patterns of discrimination are not systematic or entrenched across time.

The combination of the potential for women to earn wages on par with their male peers in construction, a physical industry, argues against women being less productive workers than men, or at least against a payment structure based on such a relationship. At the same time, high earning periods alongside periods of decline argue against pure discrimination, though it does indicate some reversion to a discriminatory state after the building needs were over, and a cultural norm in which women were not preferred workers. When physical labor was needed women were not excluded or underpaid, especially when recorded in the payrolls directly with men – women’s relative wages are often lower when they were worked without men, indicating women yielded a certain amount of bargaining power in periods of high work demand, though it was unsustained. Women’s response to demand factors also enriches a literature which tends to focus on the supply side of women’s labor in pre-industrial Europe and urges us to continue investigating historical labor markets in deeper detail. Regardless of what is causing the changes in relative payments it is clear that women are separated into the lower class of workers; the fact that they are at times paid more or less the same
as the other unskilled men doesn’t change the fact that women were still severely limited in their working options.

These findings indicate a limited agency due to demographic pressures and labor needs, as theorized to have happened after the Black Death. However, the very rapid fall of wages from their peak indicate that this agency would have been limited – certainly difficult for women to rely on for long-term support or true independence, and not longstanding enough to establish itself as a cultural norm for several generations. This thus adds mixed support for a true ‘Girl Power’ environment of greater female economic power.

Nevertheless, women were clearly integrated workers and economic actors. Future research calls for further investigations not only into women’s wage rate, but into a more multi-dimensional investigation of women in whole labor markets, to better understand the operation of the total labor markets.
Primary data sources

**Lunds Landsarkiv (Lund Regional Archives)**

*Urban archives:*
Landskrona rådhusrätt och magistrat (*Landskrona city court and magistrate*)
Lunds domkyrkas arkiv (*Lund Cathedral archive*)
Lunds stadsarkiv: Rådhusrättens och magistratens arkiv (Lund city archive: City Hall Court and magistrate archive)
Ystad stadsarkiv: Rådhusrättens och magistratens arkiv (Ystad city archive: City Hall Court and magistrate archive)

*Manorial archives:*
Jordberga godsarkiv
Karsholm godsarkiv
Knutstorp godsarkiv
Maltesholm godsarkiv
Rosendal godsarkiv
Rydsgård godsarkiv
Trolle Ljungby godsarkiv
Vittskövle godsarkiv

**Malmö Stadsarkiv (Malmo City Archives)**

*Urban archives:*
Borgerskapet i Malmö 1517-1862 (*Burghers in Malmo 1517-1862*)
Malmö Hospital 1528-1923 (*Malmo Hospital 1528-1923*)
S:t Petri kyrkoarkiv (*Saint Petri church archive*)

**Landsarkivet i Vadstena (Regional Archives in Vadstena)**
Kalmar rådhusrätt och magistrat 1600-1850 (*Kalmar city court and magistrate 1600-1850*)

**Stockholm Stadsarkivet (Stockholm City Archives)**
Allmänna Barnhuset (*Allmänna Orphanage*)

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Who could make a living? Annual and casual male wages in southern Sweden 1500–1850

Kathryn E. Gary and Mats Olsson

I. Introduction

How did people in the past make a living, and what did they earn? Was one person’s income enough to get by, or did the whole family have to chip in? How much did these things change over time, and why?

These are some of economic history’s central questions, and have been for nearly the last century. Countless real wage series of various types of laborers and over different lengths of time, though have almost always used the same methodological approach – using the wages of day laborers to somehow impute changes in well-being on a national level, or at least for a class of workers.

Only recently has the research field come to explicitly and empirically address the limited descriptive function on this approach, with studies that addresses wages both in casual employment, as has long been the standard approach, and in annual positions, which while more standard a labor practice in early modern and medieval Europe has not been previously empirically addressed in the same way (Humphries and Weisdorf 2015, 2016). The hesitance to deal with annual wages in research has predominantly been due to the nature of employment and the difficulties inherent in measuring the actual compensation; most workers of this sort were paid predominantly through room and board, with only a small component paid in wages – how then to quantify their ‘pay’?

In this paper, we use a brand new dataset to estimate and compare wages for casual and annually hired workers in early modern southern Sweden, for the latter adding the cost of living to the cash wage to estimate a wage-equivalent, to estimate wages for unskilled male workers in early modern southern Sweden. This allows for a much more sophisticated and in-depth investigation of early modern living standards and well-being, but more importantly allows for an interrogation of some of economic history’s most important questions, in a somewhat more ‘typical’ early modern economy than the leader, England.

More directly, we ask who was better off; those working by the day or those working on fixed annual contracts? How much would a casually employed worker need to work to make the same income, and how did this relationship change? These findings allow us to understand the early modern Swedish labor market more clearly and to get at a more realistic understanding of what the standard of living and typical income might have been. These findings further facilitate a deeper investigation into the impact of changing labor markets due to population development and the proletarianization of the Swedish workers: in what ways did the labor markets change with population and urban development? Do results support the theory of an ‘industrious revolution’, an increase in time spent in market work in order to maintain or increase consumption?

Findings indicate a substantial shift between the day wage and annual hire labor markets, with the relative wage earned by day laborers falling over the course of the early modern period, as well as their well-being per day of work as prices rose faster than wages. Findings also indicate a shift within urban labor markets, as the least skilled jobs which previously could provide a decent support became less well remunerated, but a growing class of low-skilled (but more-skilled) workers took their place – a shift not seen in smaller towns.
II. Real wages in economic history

Real wage studies of course tell us something about the progression of wages and what workers could afford at certain times, and this has been a useful and important tool for understanding the back-and-forths of a population’s well-being at a more concrete or relatable level than, say, GDP.

But wages have also been used to formulate and test some of the major debates and theories in economic history, through their use alone, in comparison with other wage data, and in contrast to other statistics. Part of this is because wage data are often the most frequent survivors of history’s cull of written information. Wages were and are ubiquitous, and are paid to top level employees as well as casual farm hands. Though not all were written down, many of course were, and some of those have been found and utilized by economic historical researchers.

Another factor is that wages simply existed before other measurements became common. GDP and other macroeconomic indicators are modern inventions. Production and consumption figures, while important to independent suppliers, did not catch the interest of governing bodies in the same way that they do today.

Because of both their usefulness and their relative frequency in archival sources, wage data is at the backbone of many of economic history’s most important and perennial debates. However, wages are not straightforward. While they in some ways feel intuitive and simple to interpret, the ways in which wages are calculated, manipulated, and compared have massive impacts on what type of market functions they represent, both at the global and at the household level. So too can a focus on a particular type of data, either because of convention or difficulty in finding and using other data, present significantly different interpretations of both local and global developments.

It is difficult to overstate the importance of the differences in interpretation and results that different uses – or misuses – of wage data have led to, and how they have shaped and reshaped the meta-interpretations of early modern European economic development.

Wage studies have been the foundation for foundational theories in the development of the modern economy; high real wages in the late medieval period are the foundation of Robert Allen’s (2009) explanation of the Great Divergence and why England industrialized first – high wages and low costs of factor endowments such as coal led to employers and capitalists to invest in labor-saving capital and machinery, which in turn led to innovation and mechanization (Allen 2009).

Earlier in the early modern period the increase in day wage rates after the Black Plague is connected to both transition to economic growth in the North Sea region as well as to women’s increased engagement in paid labor and late age at marriage (de Moor and van Zanden 2010).

Wages are also the foundation of the Industrious Revolution hypothesis (de Vries 2008), which posits that English workers increased their engagement in paid work after 1650. A growing gap between nominal wages and GDP per capita indicated an increase in the amount of work being done per person, which would generate higher GDP while wage rates themselves did not change.

These theories are all based on men’s day wages. But a different story can emerge when different kinds of wages are investigated; Humphries and Weisdorf (2016), demonstrates that incomes from annually employed men much more closely match developments of GDP and other macro-level indicators in England. This is a strong indicator that the focus on casual employment has led toward some misleading understandings of relationships between wages and economic development, and that a focus on more ‘typical’ labor, such as annual contracts, might help refine our understanding of early modern lives and well-being.
III. Labor institutions in early modern Sweden

Early modern Sweden was largely a rural society with a predominantly agrarian economy. As late as in the 1860s about 70 percent of the population was occupied in agriculture, while only 10 percent was occupied in manufacturing industry and another 5-6 percent in building and construction (Schön and Krantz 2012).

There has been a long-term assumption that most annual wage labor in early modern Sweden was a life course event, performed by young people between leaving home and the time of marriage. Sweden was a rural society; still in the mid-1800s some 90 percent of the population lived in a rural environment. Almost all young people left home between the age of 15 and 20 (Dribe 2000), and the mean age at first marriage in Sweden overall was high; around 29 for men and 27 for women. In the south, age at first marriage was even higher during preceding centuries: in seven Scanian parishes from 1650–1750 men married at the age of 34.3, and women at 29.1, sinking by 1850 to around 29 for men and 27 for women in the same parishes (Lundh 2003). With the young age of leaving home and late age at marriage, the Western European marriage Pattern was well established in Sweden, which meant that there was a considerable group in their twenties living on wage labor (Harnesk 1990).

In the dominant agricultural sector this meant young people would serve as a farmhand or maid on one-year-contracts, but the pattern was similar in the towns, although more strictly formalized for men with the master – journeymen – apprentice system (Edgren 1987), while women mostly served in town households. But there were also people that were more permanently hired on annual basis, both in the towns and the countryside. Some of them were in administrative or managerial positions, often married. Some belonged to the relatively large group (10–15 percent) of the population that never was married. With the increasing proletarianization after the mid-1700s, the proportion of married annually hired wage laborers started to rise, first in agriculture with the system called statare (married farmhands) (Utterström 1957), second in towns when industry eventually expanded in the second half of the nineteenth century. But the Swedish towns had experienced a state subsidized, mercantilist wave of industrialization in the eighteenth century. It did not more than marginally impact the overall national distribution of labor between agriculture and industry, but in the towns it increased the number of skilled and unskilled workers. The heydays of these “manufactories” were in the 1750s, but from the international trade crises 1763 and onwards, the state subsidies were weakened or abolished and the whole sector was in decline (Nyström 1955, 242).

We still know very little about the size of the annual hired workforce in preindustrial Sweden, nor about their wages and standards of living. This lack of information is even greater for casual and seasonal labor. There was a growing group of rural landless and semi-landless; in some areas, including the south of Sweden, they appear to have constituted half of the population already by the end of the

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1 Economic historians have separated day labor and casual labor by the groups of people who be employed in these sectors. Annual unskilled labor is closely associated with young, unmarried young people, especially in rural areas, while casual labor is more closely associated with married adults. This model is based around the Western European Marriage Pattern (EMP). The EMP was first coined by Hajnal in his 1965 paper, in which he describes several broad and general differences in marriage and life-cycle patterns between the northwestern parts of Europe and the East and South, as well as the majority of the rest of the world. According to Hajnal (1965), there is an imaginary line across Europe from St Petersburg to Trieste; to the north and west the EMP dominates, while to the south and east a more ‘traditional’ marriage pattern is more common.

Within regions characterized by the EMP children left their parental home in their mid-teens to go work for another household, and live in as domestic servants or farm hands. During the next several years they would work to accumulate enough wealth to marry and establish their own households upon marriage, which would typically take place in the late 20s for both women and men.
eighteenth century (Lundh and Sundberg 2002) and they were definitely the majority in the whole of rural Sweden by 1850 (Winberg 1975). Poor relief systems existed, and were based on the parish responsibilities for their poor, but these were rudimentary, normally only supporting one or a few percent of the inhabitants, predominantly the disabled and the old (Skoglund 1992). So the landless must have found way of supporting themselves, but we still know very little about their actual day wages (in contrast to the administrative wages that were set every year on county level, see Jörberg 1972 and Collin 2016) or about how much they actually worked per year.

Research on Swedish labor market before the industrial revolution may be scarce but nonetheless it has influentially been characterized as a mercantilist labor regime (Lundh 2002 and 2004, 104). The idea behind this is that trade and most other economic activities were regulated, working condition and even wages was laid down in national decrees, and labor relations was built on patriarchal relationships. We will show that this institutional approach is only partly accurate as a general characteristic of the labor market. There was a great deal of variation in wages, both for annually and casually hired – wages and working conditions tended to fluctuate with changes in demand and supply. These fluctuations could be driven by long trends in population development and labor demand, but they could also be due to sudden shocks caused by events such as wars or local disasters.

More recent research on servants in eighteenth century Sweden does however give us some more insight into the relationships between those serving as annual contract workers and those working for day wages. Carolina Uppenberg (2017) investigates servants during the eighteenth century. The period was marked by a growing population, though one that was still largely bound by agriculture, with 80 percent tied to agricultural production for a living. However this was also a period of growing landlessness – as more children survived to adulthood and inheritances were increasingly split, fewer and fewer men could expect to end their period of servitude by becoming landowning farmers themselves, and instead were resigned to a lifetime of wage labor. This shift did not necessarily impact basic living standards, but it did change the incentivization for spending time as a servant. Previously, this life-cycle service as a servant on a neighboring farm was a training period for one’s own time later as a farm owner; this was especially true for young men as they would hope to inherit land. When the chance to inherit decreased so significantly, the incentive to train on another’s farm, where a servant’s freedom could be severely restricted, was profoundly reduced. This shifted the lifecycle relationship of work. Some younger men preferred to immediately enter into casual labor, and others continued as year-long servants past their marriage. Land owners also sometimes shifted to temporary labor, though this of course could be a risk during harvest time for farmers (see Kussmaul l’s (1981) discussion on farmers’ preferences for labor, also addressed in Uppenberg 2017).

Previous studies of Swedish servants have identified a general reluctance to submit oneself to annual contracts, despite the fact that this was perhaps the most secure means of earning a wage available to unskilled workers in the period (Uppenberg 2017, citing Harnesk 1990). Those who did take work as annually employed servants typically did not stay on above the minimum one-year requirement (see also Dribe 2000). The same investigation found that servants tended to work to meet their consumption needs, and would prefer to substitute their time for leisure rather than additional consumption – this is also in line with Allen and Weisdorf’s 2011 investigation of British workers.

IV. Day vs. Annual labor – compensating differentials

There were of course benefits and downsides for individuals employed in both casual day labor and to working for a fixed term on a contract. Construction work was seasonal. For building work to commence, there must be enough light and a soft enough ground to dig. Mortar could not be poured
nor bricks made when the weather was too cold; the water in both would freeze and destroy the structural integrity of the material.

Economic theory states that there must be some wage differential to induce workers to undertake seasonal work, where the risk of some degree of unemployment was high or even certain. On the counter side, there are many non-wage benefits to be considered with fulltime or contractual work, which could induce a more risk-adverse individual to take a lower paying job if they were sure that the job was stable. One could assume that this is especially true if a position covered all of an individual’s daily living needs for the year.

Other costs and benefits affect both work types: assuming a large enough market, working in construction by the day could in theory give a worker more flexibility over their own working schedule or to work for a different employer if the conditions didn’t suit them; a person working on annual contract would have no such flexibility, at least not regularly. It is fairly established that once an annual worker in service accepted a contract they were in many ways at the mercy of their employer (Kussmaul 1981; Dribe 2000). However, much of early modern Europe, especially Sweden, was highly rural, and a large enough market to support substantial amounts of paid causal work may not have existed.

Employers also had to make a calculation; in a market where timing was very important, such as in agriculture and during the harvest period, it was also important to have labor on hand at short notice. The cost of paying day laborers could be extremely high if there was competition with other farmers, and there was a risk of lost income if there were not workers available. However, supporting a fulltime servant could also be expensive, though there was perhaps some economy of scale in providing room and board. During times of high food prices, one of the first household survival tactics would be to dismiss annually-hired labor in order to save more food for the family – in this sense, the calculation of how to split between annually and causally hired labor is likely to draw more on the employers’ decisions than on the workers’.

Contemporary investigations of equalizing wage differences find mixed evidence to support its presence in the real labor market; when there is evidence the differential tends to be moderate at best (see discussion in Brown 1980). Historical evidence is more difficult to come by; we expect transaction costs due to transit and information flows to have been much higher the further back in time we go (Collin 2017). It is also quite likely that social trends or expectations, such as lifecycle employment, would have some overriding effect over workers’ assessment of work options – it is not unreasonable to assume that for many in annual service, casual labor was not a true option.

That a system largely reliant on annually employed labor persisted so late into the early modern period in Sweden, beginning to dissipate only in the late eighteenth century and lasting in practice far into the nineteenth, would indicate that the need of having labor on hand as well as the cultural norm of lifecycle service gave preference to annual service for a large proportion of Swedish labor.

V. Data and methodology

Primary data for men’s daily and annual wages come from archives around southern Sweden². This paper is concerned with the wages paid to unskilled men both in annual employment and service and to those men who work in the casual construction industry. Figure 1 shows the distribution of the different types of data. Price data is largely secondary, collected from a number of sources, including

²Data described in more depth in Gary 2018a.

All payments are transformed into a standardized currency; Sweden had several currency regimes over this period, and at several times had up to three co-existing currencies (Edvinsson 2010). Price data are also translated into a standardized currency when necessary.

Occupations are coded using the HISCO / HISCLASS system and sorted into skilled / unskilled categories (van Leeuwen, Maas, and Miles 2002; van Leeuwen and Maas 2011). This paper deals only with unskilled workers. Contextual information and author’s determination are used to categorize workers with no title, with titles that do not appear in the HISCO system, or when the categorization clearly misclassifies a worker due to changing work tasks and titles over time.

Figure 1: Distribution of observations in casual and annual employment. Note than annual workers are observations of employed and casual workers are paid work days

Source: see text
a. Casual versus annual work

The types of jobs represented in casual vs. long-term employment are different, as are the people who worked them. The rural portion of the annually employed sample are predominantly servants who lived in, working in rural manor houses. In the countryside unskilled workers were typically servants employed in positions that are commonly associated with life-cycle service, working as maids or farmhands, which is to be expected since the vast majority of the rural data comes from manorial estates. The most common titles for men include various types of manservant (dräng), most commonly dräng and stalldräng, a stable hand. Other occupations include pastoral tasks like shepherds or bull-herds (fäherde, fäherde för tjurar) or agricultural work such as threshing (tröskman).

Work in annual service was prescribed by the state; legal acts regulating the servant-master relationship were first legislated in 1644, and were revised approximately twice a century from then through the middle of the nineteenth century. These acts were read publically at least once, and sometimes twice a year, which meant that they were well understood by the population in general (Uppenberg 2017). While these acts offered some protection to servants, they also mandated that unlanded individuals be registered as servants and under the protection (or control) of a master or mistress, or they could be subject to vagrancy fines. This applied to both married and unmarried individuals; unmarried people were more likely to live in with their employers, whereas married people were more likely to live in a small cottage or croft on their masters’ land, and pay their rent with occasional work. This means that annual hires were more likely to be unmarried, while day laborers were more likely to be married, for both men and women – this is in line with similar assumptions for England made by, for example, Humphries and Weisdorf (2015). Regulations did gradually lessen through the eighteenth and nineteenth century, both allowing married people to more easily work as live-in servants in 1762 and then exempting married people from service in 1805 (Uppenberg 2017).

The urban annually employed sample are individuals who worked for municipalities. These data come predominantly from public institutions such as city councils, churches, and hospitals. These workers are clearly city servants, with many custodians /caretakers either for the city or churches (stadstjänare, [stads]vaktmästare). The sample also contains many sailors stationed in the city of Malmö and town of Kristianstad. This proportion of the labor force increased during the early modern period as Sweden underwent an important phase of state formation. This increase was necessary not only as municipalities themselves grew but as the role of formalized taxation became increasingly important as a mechanism for funding the state apparatus (Ågren 2014b). This increased employment led to a large number of low level officials tasked with carrying out the more mundane tasks of the city and taking care of the town; it is these types of workers that make up the urban annually employed sample in this dissertation. There is much less expectation that these individuals would be part of the lifetime service system; instead, these men are more likely to be married and to stay in these positions for many years. It is clear that many of these men who are annually employed in the city are not part of the life-cycle pattern of service which we observe in the rural sector; there are explicit mentions of stipends or pensions made to sailors’ widows, and some of the city custodians are employed for very long periods of time. This is a useful test of wage payments made to men who are outside of the ‘youth’ period where low wages, or compensation mainly in kind, would not necessarily be expected.

All unskilled causal laborers in this dataset are construction workers, both in the country and in urban areas. Job titles or identifiers include unskilled worker (hantlängare), a mortar mixer or mason’s assistant (kalkslagare) or a digger (grävare). A sample of only building laborers from manorial as well as urban sources is in some ways unusual in a European context; in many Western European countries, including England, there would have been a fairly large market for casual labor in the agricultural sector, especially during the harvest season. But in Southern Sweden there was a corvée labor system,
under which tenants paid part or all of their annual rent in agricultural labor, which took care of the majority of agricultural labor needs through the late eighteenth century; this means that there was very little market for paid casual labor in agriculture, even during peak seasons (see Gary 2018a for more discussion). Because of this we can operate with the understanding that the causal labor that is found in the data is likely to be more representative and capture a greater portion of the casual labor market than similar types of data in other institutional contexts.

b. The price baskets

Prices are collected for commodities from Southern Sweden, following the methodology of Allen (2001). Some adjustments are made to more accurately reflect a Scandinavian diet; the most substantial is replacing half of meat consumption with fish, based on Morrell (1989) which shows high consumption of fish in Swedish institutions. Table 1 shows the components of the consumption baskets at both the subsistence and the respectability levels. A subsistence price basket represents the cost of maintaining an adult man on only the most basic and cheapest commodities. A respectability basket represents the cost of maintaining an adult man with a large variety and higher quality of consumables. Both meet the same level of caloric requirements, with approximately 2100 calories per day. In this paper wages are always calculated for a single individual and so wage rates are always divided by the cost of a single consumption basket.

<table>
<thead>
<tr>
<th>Table 1: components of consumption baskets.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>kg bread</strong></td>
</tr>
<tr>
<td><strong>kg grains</strong></td>
</tr>
<tr>
<td><strong>kg potatoes</strong></td>
</tr>
<tr>
<td><strong>kg peas</strong></td>
</tr>
<tr>
<td><strong>kg meat</strong></td>
</tr>
<tr>
<td><strong>kg salt fish</strong></td>
</tr>
<tr>
<td><strong>liters beer</strong></td>
</tr>
<tr>
<td><strong>kg cheese + butter</strong></td>
</tr>
<tr>
<td><strong>Eggs (n)</strong></td>
</tr>
<tr>
<td><strong>liters milk</strong></td>
</tr>
<tr>
<td><strong>kg soap</strong></td>
</tr>
<tr>
<td><strong>m linen</strong></td>
</tr>
<tr>
<td><strong>kg candles</strong></td>
</tr>
<tr>
<td><strong>liters Lamp oil</strong></td>
</tr>
<tr>
<td><strong>M BTU Fuel</strong></td>
</tr>
<tr>
<td><strong>Rent</strong></td>
</tr>
</tbody>
</table>

Source: Gary 2018a

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3See Gary (2018a) for more details
c. **Day wages**

Day wages are a simple average of the individual payments for a day’s labor within the calendar year. Each paid day of labor is given equal weight; this means that the same individual is observed receiving payment eight times in one year, the individual is counted toward the average eight times. This is in order to give the strongest weight to the most typical wage, and in order to avoid treating individuals differently if some are more readily named or identified than others.

Annual income from day wages is computed using assumptions of 250 work days in a year (Allen and Weisdorf 2011). A final value of one indicates that this hypothetical wage would exactly support a family at either the subsistence or the respectability level respectively. A value of two indicates that needs could be met two times over, and a value below one indicates that the family unit would be suffering from hunger or a lack of other resources or would depend more heavily on additional household production or wage labor.

d. **Annual wages**

When workers were employed on fixed contracts, the wage payments they received often represented only a portion of their full compensation: in many cases, workers were paid a relatively small cash wage, but received full room and board, and possibly other perquisites, as a part of their contract. This is difficult to quantify since it is typically not explicitly recorded. This paper follows the methodology established in Humphries and Weisdorf (2015), by assuming that workers employed on long-term contracts received room and board approximately at the value of the respectability basket.

To estimate the total value of annual compensation, the value of the respectability basket is added to the cash wage; this sum is treated as the nominal wage for annually-employed workers. The respectability basket is selected because we believe it more fully reflects the consumption of servants. According to Uppenberg (2017), one of the few reasons that a servant could be given permission break an employment contract and seek employment elsewhere was because of an unreasonably lean diet – the Servant Acts of 1805 officially codified this. Of course servants’ complaints could be relative to the times; Fredrik Magnusson reports that farm servants on Sweden’s west coast protested against the excess of salmon they were expected to eat on a weekly basis. Myrdal (1933), in his study of the cost of living in Sweden during the nineteenth century, reports a Swedish household budget roughly in line with Allen’s 2013 budget for the earlier part of the nineteenth century. Morrell (1989) also describes consumption at a level closer to Allen’s ‘respectability’ levels in his study of diets and consumption by Swedish poor-relief hospitals from the sixteenth through the early nineteenth centuries. These institutionally provided diets had a relatively high proportion of fish and meat, above what is included in Allen’s household consumption baskets, though Morrell does find an increasing dependence on grain through the period.

e. **Differences between the construction of each wage type**

Because of the mechanical construction of each type of wage, the range of possible values for day and annual wages is different. When calculated from day wages the lower bound of annual income approaches zero, as wage values in the numerator decrease and food costs in the denominator increase. The lower bound of annual income when calculated from wages from long-term contracts is one; because the price basket is included in both the numerator and denominator, even as cash payments fall to zero, this method makes the mechanical assumption that all basic needs are met.
VI. Nominal prices and wages in Sweden

Because the annual income is constructed directly on the price series it is important to examine prices in conjunction with nominal wage levels. Figure 2 shows the development of men’s cash wages from annual service alongside the respectability basket, and the full nominal wage, which is the sum of the cash wage and the respectability basket. These are shown in both log and nominal scale.

Prices rise through the sixteenth century, are fairly stagnant through the seventeenth, and then rise at a steeper pace in the eighteenth, finally leveling off again in the nineteenth. This is largely in line with what we know about Sweden’s development from previous work such as the development of GDP (Schön and Krantz 2012).

a. Cash and nominal wages for annually employed men

It is important to understand the different components of the annual wage estimates, and especially how the mechanical construction impacts the differences between wage types. The cash portion of the wage is almost always lower than the value of in kind perquisites, except for some scattered years in the early seventeenth century (figure 2). Typically, the cash component is between about 20 and 45 percent; the average value is about 33 percent. Because the room and board component is such a large proportion of the total annual wage, the total nominal wage is obviously not substantially higher than the value of the respectability basket, and is also strongly influenced by the development of the price basket.

The cash component of the wage is in general greater during the earlier parts of the period, especially in the late sixteenth and into the seventeenth century. There is a clear decrease in the relative value of the cash component into the middle of the eighteenth century; cash payments are stagnant for several decades while price increasingly accelerate.

![Figure 2: components of men’s annual wages in SEK. Semi-log scale](chart.png)

Source: see text
b. Nominal wages for annually and casually employed men

Figure 3 shows the log-nominal development of the two wage series for men, with daily wages multiplied by 250 to approximate the annual-equivalent earnings according to conventional practice. The large-scale trends of both wage series are similar to those of the price series; increase in the sixteenth century, some stagnation in the seventeenth, a rise again in the eighteenth, and flattening out going into the nineteenth century.

The annual-equivalent income earned by casual labor is almost always higher than that of annual labor. There is a clear trend of conversion between the two types of wages beginning from the middle of the seventeenth century. There are two periods when men’s annual wages overtake day rates; the first is in the first decades of the eighteenth century – this is the period right after prices have come down after the crisis of the 1721 Great Northern War and cash wages for annually employed have come back up following the same war. The second is from the end of the eighteenth through the beginning of the nineteenth century, when the growth rate of the annual wage series increases at the same time as daily wages remain flat or even slightly decrease in nominal terms, from the end of the 1760s through the 1790s. Even though nominal casual wages recover somewhat – though haltingly – annually earned wages are still on par with or slightly stronger than casual wages through the end of the casual wage series in 1830. Casual wages are so low near the end of the period that a man’s earnings for the year could not even support his own respectability needs – this is clear as the nominal wage series dips below the nominal price series.

Figure 3: Comparison of different nominal wage types in SEK. Semi-log scale

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See Gary 2018c for a discussion of this practice as well as a revised estimate for the Swedish working year; findings indicate that 150 days is a more reasonable estimate for the Swedish case. Dividing the annual wage by 365 could also be used as a comparison, but this presents an even less direct comparison between the two wage types. This approach would increase the gap between the two wage types.
Throughout the entire period the dominant trend is one of convergence between the two wage types. Annually earned wages gained on casually earned, but this is of course largely because annually earned wages cannot fall below the respectability support level. Really, both sets of wages fall against the cost of living.

VII. Men’s real wages for casual and annual labor

In figure 4 daily-earned wages are again multiplied by 250 to represent the assumed working year as per previous studies (c.f. Allen 2001) and are deflated by the respectability basket. Both annually earned wages and daily earned wages are divided by a single man’s respectability basket – this is because the annually earned wages are so close to a single basket’s level than it does not make sense to divide them by the classically assumed family size. Instead, both sets of wages are shown in relation to how they could support the earner directly.

Despite some differences in development both wage types have a similar trend, with growth during the sixteenth century, peak wage levels in the beginning of the seventeenth, and decline through the rest of the period, especially from the 1770s and into the 1790s (figure 4). Both wages have a slight decrease around the time of the Great Northern War in the early eighteenth century, while only casual wages indicate a decrease during the Second Northern War during the mid-seventeenth century, when Denmark lost Scania to Sweden. There is some recovery going into the nineteenth century, following a low point especially for casual wages in the last years of the eighteenth century.

While these two real wages series have a similar shape of development, the levels are on a different order. As previously stated, the annual earned wages are not much above the annual cost of the basket, since the cash portion of the wages was rather low compared to the value of in-kind benefits. This wage ranges from just one basket to slightly above two baskets in some periods, keeping closer to this higher level for the majority of the seventeenth century and into the eighteenth. These wages are not necessarily expected to be high – as discussed above, the majority of people who were annually employed in the countryside would have been younger individuals, working outside of their parents’ home while saving before marriage, and working mostly for room and board (Dribe 2000). However, the especially low wage levels during the end of the eighteenth and into the nineteenth century are

Figure 4: Men’s casual vs annual real wages
surprising, both because of the very low levels themselves as well as the proportion of the sample employed in the cities during this time – this relationship merits its own discussion, which will be addressed below in section VIII-b.

Wages earned by the day are much higher until the end of the eighteenth century, and average as high as four respectability baskets in the sixteenth. However, wages earned by the day undergo a sharp decline from the beginning of the seventeenth century through the end of the period. While there is some indication of a resurgence at the beginning of the nineteenth century, this is only after daily wage rates hit their absolute bottom at the end of the eighteenth century – wages in this period are so low that even when deflating by subsistence basket prices an individual man would not have been able to earn enough to support a typical family, showing how necessary it would have been for other family
members to work or produce household goods. This decline is in line with what we know about the
general development of Sweden entering the nineteenth century based on evidence from wages and
GDP from Stockholm (Schön and Krantz 2012; Söderberg 2010; Gary 2018a) though the decline in
Malmö is earlier and lower than in Stockholm (Gary 2018a).

The high wage levels in the sixteenth century are likely connected to Denmark’s strong export sector
as well as state-led building programs that would have increased the demand for casual construction
work, especially (see Gary 2018a). The middle of the eighteenth century decline coincides with the
crises for the mercantilist industries in the cities, resulting in higher unemployment rates in the town,
and a downward pressure on workers’ wage and income (Walldén 1955, 343–47). In the end of the
eighteenth century these lower wages were compounded by a total currency change – in 1777 all old
currency was replaced with an entirely new system which led to inflation and some monetary
confusion (Edvinsson 2010). Grain prices had been rising since the second half of the century, but
rapidly rose during the grain shortages of the Napoleonic Wars. The increasing proletarianization of
the Swedish peasantry also put increasing downward pressure on unskilled wages. The end of the
eighteenth century was a difficult time for unskilled Scanian workers.

VIII. Urban-rural differences

The sections above have shown the major development trends of prices and wages in the south of
Sweden in the early modern period. But what about differences between urban and rural regions? As
mentioned above, there were different types of jobs in urban areas and in the countryside for annually
employed labor, though those employed in casual labor were paid for unskilled construction work in
all areas. In the previous comparison between casually and annually earned wages, the low annual
wages in the eighteenth century were surprising, especially given the number urban earners who were
not a part of the lifetime service who are in the sample. The following sections will disaggregate the
data to tease out some of the differences.

Figure 6: Men’s rural and urban casual wages

Source: see text
a. Casual wages

Real wages at the respectability level for urban and rural casual workers are shown in figure 6. Surprisingly, for the majority of the period there is not a substantial difference between the two wage series, and rural wages actually spend some time at higher levels than the urban counterparts. Rural wages dip and then spike in the later part of the sixteenth century, but by the seventeenth the two series have essentially converged. The sixteenth century rural variation is likely due to fewer observations in the rural market leading to higher weights on outliers, but also drives the final period of increase in the macro series.

It is possible that the similarity of wage levels is somewhat misleading; both series are deflated by the Malmö city price series, which could slightly overestimate rural prices compared to those in the city. If prices in the countryside were lower than in the cities then rural wages would be even higher, which would indicate a higher standard of living in the countryside even without any detraction of an urban penalty.

b. Rural wages – comparison with existing data

Currently, the most-used wage series for early modern wages outside of Stockholm are from Jörberg (1972), who relies on market scales to estimate wage series for agricultural workers in each of Sweden’s 24 counties. Because they are virtually the only wages available so far in the past, and because of their coverage and level of disaggregation, these are regarded as the ‘canonical’ wage series in Swedish economic historiography. However, these are not direct wage measurements: they are market scales, a cash valuation of the agricultural labor which tenants were expected to provide to their landlords as part of their tenancy agreements and rental payments. The wage levels were agreed
on annually after a process of mediation. This is the price that tenants would pay to replace day labor which they themselves were unable to perform.

There were of course different power dynamics at work when these wage levels were being determined; there were reports that the peasantry was often upset at the rates which were agreed upon, complaining that they were far too high for the actual labor market, and must instead be the price levels in the cities (Utterström 1957, 877).

Figure 7 shows real wage levels (again based on 250 work days) for the urban and rural workers in the data from this paper, as well as the same approximation for the market scale rates from Jörberg (1972). Based on the comparison, the upset tenants were correct: the market scale rates for Malmöhus County are fairly consistently above the observed wage rates in the Scanian countryside, and are often above those in the cities as well. The national average is even higher, though of course this figure incorporates more high-priced markets as well.

c. Long-term contracts

There is significantly more divergence between urban and rural workers on long term contracts (figure 8). The different types of occupations are likely the reason for such divergent wage levels throughout the earlier part of the period. While those working in the countryside were likely mostly working in husbandry in service, those in the city were more likely to be working in jobs that were not necessarily tied to lifecycle service, and more likely to be held for a longer period – many of these urban workers were city custodians, **stadstjänare**, and **tornväktare**, guards in the towers. This high wage period was also the peak of Danish state-led building and expansion – this could also have led to an upward wage pressure on state jobs. Regardless, it is clearly these urban jobs which drive the annually-employed wage increase in the seventeenth century which parallels the increase in casual wages at the same time.

More interestingly, urban unskilled wages fall below wages in the countryside in the late eighteenth and into the nineteenth century. This finding is surprising; it would have been more expected that
urban development would lead to increased wages in the cities relative to the countryside, and that urban wages would stay at least equal to, if not above, rural wage levels. But this wage inversion is taking place during a period when urbanization is just beginning to develop in Sweden, and with this budding urbanization came a growth of the public sector and of employment directly by the municipalities. It is abundantly clear in the data itself that public sector employment is increasing in this period, both in the kinds and number of positions as well as the number of employees per position. One of the dominant trends is the increase in employment of lower-skilled workers, most notable in Malmö, the largest city in the sample. These growing positions included occupations such as customs officials (tullskrivare) and city guards (stadsprofoss), both positions which required some skill or connection, but which Ågren (2014) describes as being rather lowly, often disliked by the people of the city, and not very well paid. While these positions might require some literacy skills, they were only a small step up from the bottom.

This increase in more specialized work most likely pushed down the relative responsibility and remuneration of those workers in the least-skilled occupations, the ones which are tracked in the figure above. We can expect some level of ‘de-skilling’ as roles become more specialized. And in fact this is apparent in the overall wage development; when we look at the wages of those in this growing group of low-skilled workers, we can see the clear divergence and growth in the low-skilled workers’ wages through the end of the period (figure 9). While not shown here, when cities are looked at on a more individual level it is apparent that only Malmö, the largest, is experiencing this shifting labor structure – in towns such as Ystad the older professions, mostly stadstjänare, still received slightly higher levels of remuneration. This is an indication that, as the end of the early modern period approaches, the classic ‘unskilled’ jobs which we have used to measure the working class might no longer be the most representative group. These workers still suffer a low-wage crisis period in the late eighteenth century, but recover much more quickly and rebound to higher levels than the more classically ‘unskilled’ workers in the cities, both in causal and in annual employment.

Figure 9: Comparison of men's urban wage rates
Both the cash and in kind parts of annual wages tended to be sticky, so among workers employed by church or administration in towns and by manorial estates in the countryside. An example of the relationship between annual and casual labor can be found in Kristianstad Hospital 1818, when one of the two annual male workers died in the middle of the year. A casual replacement was hired to the price of 0.583 kronor (equivalents) per day for 127 days. The administrative set agricultural day wage (see above) for the county was 0.75 kronor that year, which implies that this was not an especially high payment. In Table 2, the actual wage paid to the replacement is normalized to 250 days for the full year comparison. Even with the respectability basket, the total salary for the annual hired is clearly below the casual hired. A couple of years later the cash wages at Kristianstad Hospital were substantially improved, rising from 5 to 33 kronor per year by decree from the Royal Serafim Order Guild, that ran the hospital. We can only speculate whether this action was trigged by the salient wage gap that appeared when the replacement came in three years earlier.

Table 2. Annual and casual worker’s wages in Kristianstad Hospital 1818–1821 (kronor)

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash wage</th>
<th>Resp. basket</th>
<th>Total wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1818 Casual (250 days)</td>
<td>146</td>
<td>146</td>
<td></td>
</tr>
<tr>
<td>1818 Annual</td>
<td>5</td>
<td>91</td>
<td>96</td>
</tr>
<tr>
<td>1819 Annual</td>
<td>5</td>
<td>89</td>
<td>94</td>
</tr>
<tr>
<td>1820 Annual</td>
<td>5</td>
<td>83</td>
<td>88</td>
</tr>
<tr>
<td>1821 Annual</td>
<td>33</td>
<td>77</td>
<td>110</td>
</tr>
</tbody>
</table>

IX. Differences in labor needs – who was ‘better off’?

This paper has examined differences in the development of wages paid to different types of male workers in early modern southern Sweden, but has so far not quantified the differences in a way which describes the differences in labor needed to make an income large enough for annual support. Can we use these relationships to address who was ‘better off’ in early modern Sweden?

This question is in some ways rather elusive – it is difficult to compare directly the well-being from the two types of wages simply because the costs and benefits are inverted from one another, and give
benefits at different points throughout the period. It is especially difficult because the number of working days in the year can be so difficult to pin down.5

Recent literature has continually questioned the standard methodological approach which has, from Allen’s (2001) paper, assigned workers 250 days of work in a year. It did not typically take this long for workers to make enough to support themselves (Allen and Weisdorf 2011) and did not take so many days of work to make the same income as what a person in annual employ would make (Humphries and Weisdorf 2015, 2016). Other authors have criticized this methodological approach, correctly pointing out that working so many days during peak wage periods would have made casual laborers much wealthier than their land-owning neighbors (Hatcher 2011). From a more practical level, long working years would not have been feasible during lower-wage periods, when the caloric needs for long working years might not have been met (e.g. Humphries 2013). Together, this research points to a degree of equilibrium in annual income levels throughout early modern societies, with the typical worker preferring to substitute toward leisure or home-based labor, away from paid casual labor, especially. To this end it is not unreasonable to take annual earning and the baseline support needs as some sort of rough indicator of what individuals would strive to earn in a year. This section builds on this premise to compare the different degrees of work which each type of occupation might entail.

Some examination between the costs of nutritional support, the daily wage rate, and the annual wage level can help tease out what working patterns might have looked like in early modern Sweden. One of the most obvious relationships is how much less an individual would typically have to work in casual labor in order to make the same level of income as someone employed on an annual contract, even accounting for the price of room and board included in the annual wage. Figure 10 makes this comparison explicit; only briefly at the end of the eighteenth century would a man need to work

Figure 10: Days of casual work needed to equal an annual wage, a subsistence basket, and a respectability basket

Source: See text

5See Gary 2018c for a discussion of the working year in early modern Sweden.
something approaching 250 day year in order to make an annual salary. Otherwise a similar income level could be met with something close to 150 days of work, or a bit less.

The number of work days needed to make a respectability basket is of course fewer, since the respectability basket is included in the annual wage; before the spike in the cost of living in the late eighteenth century the respectability basket typically requires between 60 and 100 days of work. A casual worker could work fewer than 50 days, and at times as few as 25, and still meet his subsistence needs for the year. Even if an unskilled man were working to support more than just himself the workload could still be relatively moderate, especially if the family were willing to substitute toward lower-cost goods.

Despite very low labor needs in the earlier part of the period increasingly more work was needed over the course of the 350 years studied here in order to meet each respective income level. The trend is fairly steady, until the late eighteenth century when nominal casual wages stagnate and prices rise, and real wage rates for casual workers, especially, plummet. The cash wage portion of the annual wage rates also decreases during this time, but of course annual wages have a lower bound which is set at respectability subsistence. Söderberg (2010) connects this low point in real wages to an eighteenth century trend of rising grain prices, especially exacerbated at the end of the century by food shortages caused by the Napoleonic Wars.

Because of the relatively few number of working days needed to earn the equivalent of a respectability basket or annual income equivalent, we can tentatively conclude that casual workers would have had an advantage and more available leisure time for the majority of the time period studied here. However, this presupposes that these workers were able to make their own work schedules and work as much as they wanted – casual workers would definitely have been at a constant disadvantage if there were not enough work days available for them to work as much as they liked, or if the transaction costs associated with finding casual works – such as travel time or matching with an employer – were too high. They would also be at a disadvantage if they were relying on casual work against their preferences – for example if they were unable to work in full-time hire due to their own or a family member’s ill health.

The one period where we can probably conclude more comfortably that annually-hired workers were better off is during the late eighteenth century collapse of real wages due to the increase in the cost of grain. Even if living standards for annually employed fell, they were still housed and supported by their employers. The risk here though is that households (and municipalities) would cut employment when food costs rose too high. And in fact this seems to be exactly what was happening, as estates increasingly shifted peasants off their land over the eighteenth century and shifted towards casually-hired labor, and the Swedish population became increasingly landless.

X. Discussion and conclusions

This paper is in many ways an exploration of what different types of wages, with different methodological applications, can tell us about the wages histories and working conditions of the distant past. It is eminently clear that different types of wages give very different perspectives on the historical development of individual well-being. Traditional real wage construction, based on the daily wages of unskilled builders or other casual workers, give an impression of soaring real wages through the sixteenth and seventeenth century, followed by a crash in the beginning of the nineteenth century. But we need to view this development within the context of labor and hiring patterns, and consider how much were also regularly employed so much throughout the year. The number of work days needed to earn a comfortable income indicate that they quite probably were not working so much. In this case, is it more reasonable to take the annual income levels as indicative of ‘more-real’ real-wage levels in early modern Sweden? This is of course tempting as well, especially given the newly developed
methodology employed by Humphries and Weisdorf (2015, 2016). But this, too presents problems. Most simply is the construction which defines income as above subsistence level – it becomes difficult to estimate income when income is already established at relatively high levels. And it is also increasingly difficult to take this annually-earned income as a ‘typical’ way of earning a wage when employment patterns were shifting so much into the end of the early modern period. What does it mean for income and well-being if employers stop hiring when the price of subsistence becomes too high?

Bringing annually hired labor into the analyses is an important shift in the way that we are able to estimate different kinds of wages and compare methodologies, hopefully coming closer to proper estimations through the process. This is an important move forward in truly understanding the ways in which wage development occurred and shaped economic patterns throughout the entire economy. However, it also presents its own difficulties. These wage levels have much less variation than causally-earned wage levels – this is predominantly a function of adding the cash value of a consumption basket into the nominal wage itself. Because of its high relative value to the cash portion of the wage, it dominates, flattening out variations that would likely have been important to those experiencing them. These differences become increasingly problematic when individuals of different skill levels, who would have received significantly different quality levels of room and board, are compared against each other – for example, when comparing individuals at different skill levels working for a municipality, and receiving different types of perquisites. These are issues which need to be further addressed to refine this methodology into one which can be more broadly applied and more constructively comparable.
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The distinct seasonality of early modern casual labor and the short durations of individual working years: Sweden 1500-1800

Kathryn E. Gary

I. Introduction

Real wage studies have built much of the foundation of our understanding of economic history. Through them we have sketched the development of modern economies and estimated the ebbs and flows of household wealth.

However real wage studies have never been able to truly or accurately address the changes in the working year. Real wages have almost always been based on the wages of unskilled and casual laborers, often in construction but sometimes in agriculture, as well. These people are typically paid by the day, and their annual incomes are not clear or obvious – the income is directly dependent on how many days they work.

Implicitly the literature has assumed that the number of days worked is a matter of labor’s decision of how much labor to supply. This is true both in the standard contemporary methodology, as introduced by Allen (2001) and the theoretical interpretation of wage and GDP trends. Two of the most influential interpretative theories – the Industrious Revolution (de Vries 2008) and the Golden Age of the peasantry following the Black Death – assume that the unskilled working class work, on their own accord, well beyond their subsistence needs in order to increase their own standard of living. Typical real wage studies rely on a guestimate framework which assigns all workers in all regions and in all centuries a fixed number of workdays – typically 250 – but there is a lack of empirical evidence which can be used to support this.

But the actual work year, both at the individual level and for a statistical ‘typical’ worker, has remained to a large extent a black box. Some efforts have been made at estimating changes in labor seasonality or the work year using proxies, but none have been able to address it over the very long term using direct data on wages or work patterns. Teasing out this kind of information is heavily data-demanding; it requires repeated observations over a significant period of time using records which are likely to have been recorded in an inconsistent manner. It also requires direct payment records, rather than legal wage rates or recordings of a standard pay level, in order to connect directly to an individual’s repeat employment. This has not been available in many instances, either because of the high costs involved with collecting complete sets of data or because data come from less direct sources.

This paper makes use of nearly 28,000 observations representing over 151,000 paid workdays across over 300 years to investigate individual work patterns, work availability, and the changes in work seasonality over time. This sample is comprised of workers in the construction industry, and includes unskilled men and women as well as skilled building craftsmen – the industry which is often used to estimate comparative real wages through early modern Europe. Data come predominantly from Scania, the southernmost region in modern day Sweden, and especially from Malmö, the largest town in the region.

A large proportion of these data record the name and explicit occupation of the worker, which makes it possible to reconstruct individual work histories. Even when names are not included the date and work period is still included, which allows for a long-term reconstruction of industry work patterns and
seasonality. Because the overwhelming majority of this data comes from a major source of employment for casually hired individual we can hope for a fairly representative picture.

This paper seeks to understand the seasonality of the casual labor market, and through it to estimate the amount of casual labor available. The methods we use to estimate real wages directly informs the conclusions we draw about highly debated topics, including the functioning of the pre-industrial labor market, changes in strategies families and individuals used to support themselves, and household living standards in the past. The seasonality and availability of work is of utmost importance for addressing these topics.

Was there a reasonable opportunity for unskilled workers to work enough throughout the year in order to support themselves and their families? What about other sources of casual labor; were there reasonable alternatives to construction work which might make it easier to piece together a living? This study also uses information on individual’s work years to examine what labor attachment looked like from an individual level. Do work patterns line up with what seasonality implies about work availability? Do workers return to the same worksite, and so have a ‘reliable’ source of income? Finally, is it reasonable to expect the patterns found in Sweden to be universal throughout Europe?

Findings indicate that workers probably do not engage in paid labor on a purely labor-supply based schedule, but are instead also impacted by the demand for construction labor, which was highly seasonal. Seasonality was stronger further back in the past, indicating that finding long-term work may have been more difficult in earlier periods. Additionally, there is a split modality in work patterns: workers who were regularly employed were more likely to be employed the full year round, though received lower off-season wages – this left only a small amount of seasonal labor for the truly casual workers, and certainly not enough to meet either the 250 days-a-year assumptions or a subsistence level of income.

II. Related Literature

This is not the first study to take an interest in labor seasonality over the long-run; many studies have made headway, but almost all of them have relied on indirect evidence to make estimations.

Perhaps the most well-known study of labor seasonality is Ann Kussmaul’s 1993 study of the timing of early modern English servants’ marriages which finds a declining seasonality of marriages over time, indicating a decrease in seasonality of labor as well. People tended to marry in patterns that reflected their work environment, during times when their workloads were slack and their resources were greatest; this allows the use of marriage records to act as a proxy for labor seasonality in the past. In a rural environment, the busy harvest work season led to fewer marriages while the spring slow season became a popular wedding period. In a more urban or industrialized environment, the Christmas season was the most likely to be off work, followed by other religious holidays, and marriages confirm this pattern. One might expect labor seasonality to follow a similar pattern in unskilled construction, when winter temperatures and darkness kept outdoor work and brick-and-mortar work from completion.

Dribe and van de Putte (2012) use a similar approach as Kussmaul to estimate Swedish labor seasonality from 1690 to 1895, also finding a flattening out of a ‘class grain’ seasonal marriage pattern, but with increases in December marriages. The authors expect this to reflect work patterns better than a similar analysis in a Catholic country; in Catholic countries marriages were prohibited during Lent and
Advent, which would likely skew the marriage seasonality pattern away from the labor seasonality pattern.

Other indirect measures, such as changes in seasonal wage premiums, can give an indication of the degree of competition for labor within a larger labor market and so changes in seasonality – Engerman and Goldin’s (1991) study of harvest wage premiums in nineteenth century America also indicates a declining agricultural seasonality over time, adding to the robustness of quantitative, though indirect estimates of labor demand seasonality.

Other indirect work examining the number of workdays in the year has indicated that the European working year increased over the early modern period, largely as customary ‘saint Mondays’ and a large number of saints days were discarded as holidays and became regular working days. These studies are most closely associated with de Vries' (1994, 2008) work, as well as Voth’s (1998) use of court records to infer what individuals called to give testimony were doing on specific days of the week. This evidence has been used to support the theory of an ‘industrious revolution’, a period toward the end of the early modern era during which workers, fueled by a desire to purchase the new and more varied goods that became available through the consumer revolution, increased their working year in order to raise their annual income. However this theory, too, is by necessity based on indirect pieces of evidence, and the gap between traditional real wage accounts and GDP estimates. Other interpretations suggest that while the standard working year may have in fact increased, it could at times be largely out of necessity, as lower real wages required laborers to work more in order to make ends meet. This was especially likely to be the case in rural economies (Allen and Weisdorf 2011).

In recent years there has been an increased attempt to measure the seasonality of working year more precisely, and to match these estimations to the construction wage data which is used in comparative studies of real wages. At this point the focus has been predominantly on the British data which have been instrumental in the structuring of early modern wage history.

Allen and Weisdorf (2011) invert the standard real wage methodology, estimating the number of days an unskilled man would have needed to work in order to meet his living needs in a year; in other words, annual income is assumed and held constant instead of presumed work days. Results show an increasing number of work days needed in order to meet subsistence. These proxy-estimates of what Allen and Weisdorf call the ‘implied working year’ line up fairly well with the scattered available direct evidence of the length of the working year.

Robust indications of an increasing work year come from Humphries and Weisdorf (2015, 2017), who estimate annual incomes from unskilled female (2015) and male (2017) workers both in casual employment and in annual service. There is a discontinuity between the two types of wage systems, with, again, an increasing number of casual work days required to earn an income equal to annually-employed counterparts. Gary and Olsson (2018) finds a related relationship in early modern southern Sweden, where increasingly more work days are needed for causal workers to both meet their subsistence needs and to make the same wage as those employed on annual contracts. These findings all give an indication that the work year for casual workers would be increasing over time.

Current real-wage models assume not only a constant number of workdays over time, but also a constant number across space. Using the wages paid to laborers who work by the day is a standard way to estimate annual income, and, as an extension, well-being; methodologically the length of the working year which is input has a direct influence on measurement outcomes (see Allen 2001 and related studies). But very little is known about the amount of working days in a typical year, both on an industry-level and on the individual level, which presents large theoretical and empirically problems when definitionally, the number of work days is a direct determinant of annual income estimates.
Typically models assume that workers labored for 250 days in a year (Allen 2001, 2013), though some assume as many as 260 (see Humphries and Weisdorf 2015). This is based as much on the number of non-holiday working days available in a year as it is on direct data or on the amount of work needed to meet household needs. It is also influenced by modern preconceptions of work patterns, in which individuals are consistently employed for the majority of the year at the same occupation.

In a very recent work, Stephenson (2018) uses a similar approach to investigate similar questions in the London construction sector; this is the only other study to my knowledge which, like the present study, also makes a start at directly estimating the working year and what this means for casually employed builders’ work and pay which examines builders’ work years, hours, and pay in eighteenth century London. Her study covers only a few years, but has the benefit of directly addressing the data upon which many of the great economic history debates have been constructed. Her findings reflect those found in this study; the typical working year (or possible working year) was far shorter than what real wage estimates assume. However there was a substantial degree of bi-modality in work years: a split between ‘regular’ employees, who were essentially full-time, though still paid by the day, and those who were truly casual workers and worked far less than their regular peers.

III. Early modern Swedish context

The Swedish case presents an appealing test environment, with its late industrialization and slow urbanization preserving many older systems of production and work much later through the early modern period than in the growth leaders such as England and the Netherlands. Only with the Swedish industrial revolution, in the later part of the nineteenth century, was there rapid development of population and urban centers and an extensive changes in social structure (Bengtsson and Dribe 2005).

Swedish cities were small, and only about ten percent of the population lived in cities by 1800; by 1850 it was still only about twenty percent urbanized. Sweden depended predominantly on agriculture well into the nineteenth century.

Furthermore, the labor market in Swedish cities would have been more restricted than, for example, that in London. Internal migration was high across short distances, but minimal for either long distances or from rural areas into cities and towns – most who did migrate did not go more than fifteen kilometers (Dribe 2000). Strict regulations controlled internal migration. During previous centuries there had been even less mobility, as Sweden operated under a pseudo-feudal system with a rather coercive labor regime (Enflo and Missiaia 2018). Manorial consolidation led to evictions and a proletarianization of the peasant-farmer classes during the eighteenth and nineteenth centuries (Gary and Olsson 2017) which freed some labor for entry into other markets, but transition was still slow before the mid-nineteenth century (Bengtsson and Dribe 2005). This was especially the case in the peripheral south; even in 1750 over sixty percent of Sweden’s manufacturing workers were located in Stockholm, the only truly urbanized area in the country, and Scania, the ‘breadbasket’ of Sweden, industrialized at a much slower pace (Enflo and Missiaia 2018).

This means that data for urban inhabitants is hardly representative of a typical early modern Swedish labor market. Even less so is an urban construction laborer representative: Enflo and Missiaia (2017) estimate the share of GDP arising from the construction industry at only seven percent nationally in 1571, and estimate that Malmöhus county, where Malmö town is located, had about an 80 percent

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1 see Gary 2018a for a discussion of this relationship
labor force share in agriculture in 1750, above Sweden’s national average of 76 percent. Malmöhus’s agricultural share rose slightly through the 1770s, and had only declined to about 79 percent in 1800, after which it dropped more steadily to about 66 percent in 1850. This is a region which clearly remained agricultural and rural late into the early modern period.

Other regions in the European periphery were not unlike Malmö or southern Sweden during much of the early modern period, remaining predominantly rural and agricultural into the nineteenth century. Table 1 shows urbanization rates from throughout Europe during the period of this study. There are a few highly urbanized regions – the highly developed Netherlands, and later England; along with Italy and the regions which had been participants in the dynamic Indian Ocean World during the Medieval period. The majority of Europe, especially in the central and southern regions, was overwhelmingly rural, as was Sweden. This means that Sweden was dependent on the natural economy and constrained by low-technological paradigm quite late. The patterns which can be observed in the Swedish data as late as the eighteenth century likely reflect realities of rural European life in a more distant past.

| Table 1: Percentage of population in urban centers in select European countries. 1500-1850 |
|-----------------------------------------------|-------|-------|-------|-------|-------|
| Country          | 1500 | 1600 | 1700 | 1800 | 1850 |
| England and Wales| 3.1  | 5.8  | 13.3 | 20.3 | 40.8 |
| Netherlands      | 15.8 | 24.3 | 33.6 | 28.8 | 29.5 |
| France           | 4.2  | 5.9  | 9.2  | 8.8  | 14.5 |
| Italy            | 12.4 | 15.1 | 13.2 | 14.6 | 20.3 |
| Poland           | 0.0  | 0.4  | 0.5  | 2.4  | 9.3  |
| Austria / Bohemia| 1.7  | 2.1  | 3.9  | 5.2  | 6.7  |
| Germany          | 3.2  | 4.1  | 4.8  | 5.5  | 10.8 |
| Sweden           | 0.0 (1570) | 0.4 (1690) |

Source: all but Sweden: Broadberry and Gupta 2006, table 4. Sweden: Urbanization rates are based on towns with 10,000 inhabitants or more

IV. Data

The data used to calculate real wage estimates for southern Sweden (Gary 2018a) offer a unique opportunity to also examine the patterns of the working year, both for individuals and for the casual labor market on a macro level, using data from Malmö, the largest city in the south, together with wage data from Kalmar, a smaller southern town, in order to refine our understanding of what a working year might look like in the early modern periphery.

The primary data used to investigate the seasonality and work year in casual labor industry come from payments for construction labor carried out in southern Sweden between 1500 and 1800. Data come from archival sources in the south of Sweden from between 1500 and 1799. All records refer to direct payment to individuals, or to a small number of workers, which means that it is relatively straightforward to connect paid days of work to the month in which it was performed. The source
dataset contains over 28,000 observations, which represent approximately 151,000 individual paid workdays. Approximately 8.5 percent of the total sample does not include a specific enough date to narrow the work period to the month, and so cannot be used in the seasonal analysis, which lowers the number of observations to nearly 25,500, covering almost 102,400 workdays. The majority of these incomplete observations come from the first part of the sixteenth century. Of the observations with seasonal data, 5,557 are skilled builders and 19,919 are unskilled – 9 and 5,557 of these refer to women, respectively. Figure 1 shows the distribution of work days throughout the period.

Additional data sources which are not as long in duration or complete enough to answer the research questions themselves are also introduced to explore potential additional sources of income for casual laborers. It is fairly well acknowledged that casual workers, both men and women, pieced together work from several sources (Humphries and Sarasúa 2012), and so it would not be surprising to find that identifiable individual workers did not work enough in one industry to meet their yearly cash needs. It isn’t possible to link individuals directly across data sets, but by analyzing any similarities or differences in seasonal work patterns, or in other indicators of financial access or stress, it can be possible to piece together a larger picture of work opportunities or constrains.

These sources represent other sources of urban work such as employment at Malmö’s city harbor, as well as work in the countryside in agriculture on rural manor estates (Olsson 2002). Data on auctions,
an important financial instrument for many classes (Abbas 2014), give some additional insight into periods of financial stress for Malmö’s inhabitants.

V. The seasonality of construction labor

Figure 2 shows the monthly distribution of paid work days for unskilled men working in the casual construction industry in southern Sweden, including both Kalmar and Malmö towns as well as casual building work on more rural manors, over the entire period of study. The unit of measurement is paid work days, not observations, because it is not uncommon for observations to record more than one workday or more than one worker at a time. The pattern is overwhelmingly seasonal, with peak labor periods in June, July, and August – almost twenty percent of paid days of labor are in July, with an average of about three percent in December through March.

Using the same wage data utilized in this study, Gary and Olsson (2018) estimate that an unskilled man working 200 days in construction would have typically earned enough to support his household in Scania. But this estimate, as well as the assumption of 250 work days in the standard model, is built on a labor market in which workers could choose to work as much as they wanted – but was the labor market able to accommodate workers labor needs?

Assuming a work week of six days, 200 days of labor would require full-time employment for 33.3 weeks, or 8.3 months. A five day work week, which is less common though not unusual in Malmö, would require ten full months’ employment. If we take April to November, the eight months remaining after those months with the fewest percentage of workdays are removed, as the ‘standard’ work year, this figure implies that only a small minority of workers who were employed at this worksite would have been able to access enough work days to equal 200 per annum. If only about five percent of paid work is done in November but there is so much work in the summer that twenty percent of all work
days are undertaken in July, then only about one quarter of those employed during the peak summer months could hope for a job by the end of the fall. Even fewer would have been employed at the end of the spring. The winter workforce was cut to a minimum, and work would have been very scarce within the construction industry.

VI. Seasonality over time

It is clear from above that the work year in construction was strongly seasonal, but was employment consistently seasonal for entire 300 years? Indirect estimates of labor seasonality have found a declining seasonal trend in more recent centuries. These studies have been primarily focused on the influence of agricultural seasonality, since agriculture was of course the dominant employer as well as the structure around which society was focused, and have relied on wage and marriage timing data in order to infer changes in actual work patterns.

Here we can directly assess the changes in seasonal labor distribution. Figure 3 groups seasonal payment information into fifty year periods from 1500 through 1799 for skilled and unskilled workers. The amount of day labor recorded is highest in the late sixteenth and early seventeenth centuries – this can be connected to GDP growth as well as the general program of state-building and fortification which was ongoing in both Sweden and Denmark during this period (Enflo and Missiaia 2018b; see also Gary 2018a) as well as the inclusion of data from Kalmar city from the seventeenth century,

![Figure 3: distribution of unskilled and skilled workdays by month in fifty year periods](source)

Source: Author’s calculations

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2Kussmaul 1981; Dribe and van der Putte 2012; Engerman and Goldin 1997. Engerman and Goldin also investigate the complementarity of manufacturing employment seasonality in 19th century America, but find that the two were likely both influenced individually through sectoral shifts and the decreasing reliance on climate in both industries.
augmenting the sample during this time. Paid labor then decreases substantially in the second part of the seventeenth century – a period of stagnation entering into economic decline in the early eighteenth century.

Unfortunately the data in the first half of the sixteenth century are the least likely to include a time specification beyond the year – about 35 percent of these observations cannot be included in the seasonality analysis because of this missing information. Missing seasonal information in other periods ranges between about three and 16 percent.

The second part of the figure shows the distribution of work for every month throughout each period. The decline in seasonality for both skilled and unskilled male workers is suggestive – from peaks of 25 to 35 percent of construction labor carried out in the summer months in the first two periods, to under fifteen percent in the later periods. Also important is the shift to more work being done in the late winter and early spring, which is less apparent in the earliest periods.

While the predominant trends for skilled and unskilled men are the same, there are some differences that indicate somewhat different labor patterns. Skilled workers tend to have their labor peaks slightly before their unskilled coworkers, especially in later periods when skilled workers, in particular, are working earlier in the season. This could be connected to a changing in the structure of the labor market, or perhaps to a greater need (or ability) to prepare when building projects are smaller.

This indicates a changing dependence on seasonal conditions for labor, as found in previous though less direct studies. With a less seasonal work pattern, a larger number of individual workers would be able to work more days in the year – this is a mechanical function of a flatter distribution. When only those workers who are employed are examined, this can give the impression of increased industriousness; that is, it looks like people started working more. But this doesn’t necessarily mean that there was more work being done, or remunerated, in the economy at large. A flatter distribution means instead that a smaller number of workers could work longer, but that fewer individuals could access work. Figure 1, which shows the distribution of the data used in this study, clearly shows changes in the extensively of work throughout the 300 years which the data covers. This relationship is important to keep close to mind when assessing changes in industriousness in the very long term.

VII. Personal work patterns

Was seasonality universally applied? Which workers were able to continue their work into the winter months? Approximately 11,600 observations in the primary dataset include individuals’ names; these represent approximately 2,900 individuals who can be linked together, and their working year isolated. Figure 4 shows the distribution of individuals’ workdays within a given year; they clearly tend to be very few. Sixty percent of all workers work ten days or fewer on a particular worksite; the mean number of workdays is 18, and the median 8. Skilled workers do work a bit more than unskilled workers with a mean of 28 and a median of 10, which is reasonable since they likely are leading projects. However this is still not a very large number of days.

It is difficult to know exactly what the share of employment in unskilled labor is for the worksites which are examined in this study; this is made even more difficult by the different amounts of labor occurring at each work site from year to year. The extent of work carried out throughout each year varies even between records from the same source; some years record work in all twelve months while another year may have work only during peak periods. This of course makes it difficult to compare individual
work patterns directly across the entire period – it is reasonable to expect that workers would spend more days working in a year when there was more total work.

Figure 4: distribution of unskilled (left) and skilled (right) workers annual days of work in the entire sample, 1500-1799

One way to test if work patterns might be different between years or sites with different degrees of labor intensity is to limit the sample to years in which greater or lesser amounts of work are being undertaken. The great majority of data in this dataset comes from Malmö city; in the records from Malmö which are included in this dataset, the year’s workload ranges from a handful of workdays to a bit more than 6,500. Table 2 shows the relationship between work years of 100, 400, 1000, 2000, and 4000 work days and individuals’ work years. Results are shown for both all years with more than n work days and for years with a number of workdays between two levels.

Results are extremely robust to different degrees of work intensity; table 2 shows that the median unskilled worker works only ten days in a year, whether there were 100 or 4000 available days of work. The mean is also consistent at about 22. The rather high standard deviation of approximately 35 recalls the long right tail of the distribution, but also indicates that an unskilled worker who is as far as two standard deviations from the mean would only be working approximately 92 days in a given year. The same exercise looking only at skilled workers is virtually identical, with medians of 10 in all but one case, when it is 11, and means of about 23. In Kalmar, the second largest market, the numbers are even lower: for the same set of specifications the median is 5 to 6, the mean 11 to 14, and the standard deviation 19 to 21 – a worker within two standard deviations works only 56 days in Kalmar.

This was tested at several specifications, including limiting the sample to those who worked more than one full day – this had the effect of shifting the median value in some cases to 11, but made no substantial difference. The same was true when individuals’ workdays were examined by period, with the median number of annual work days at 10 or 11.

This is not very many days of work. It is certainly not enough to meet standard methodological assumptions, nor is it enough to meet the substantially lower estimation of 200 necessary workdays for Scanians’ comfortable support in Gary and Olsson (2018). The relatively short working year for any given individual fits with the seasonality of construction labor discussed previously, and the evidence from actual working years gives an even stronger impression of a very casual degree of labor attachment for individual workers.
The robustness of individuals’ work patterns to different levels of work intensity also indicates that individual attachment to a single work source was uncommon. This is supported by the year-to-year persistence of individual workers. About 85 percent of workers cannot be linked together over more than one year, and almost fifteen percent can be seen across two and five years. Only 20 individuals are identifiable for more than 5 years’ of work, with the longest-connected individual, Anna Dikerska, appearing across 14 individual years working in Kalmar. The nature of the data means that there is probably more persistence of work habits, but that the data does not survive – to record it. For example, while Anna Dikerska appears in fourteen individual years, there are missing years during this period; Anna works from 1619 to 1637, a period of 19 years. Regardless, the evidence does indicate a flexible employment if workers are reliant on the paid labor market for their subsistence.

Table 2: median and mean number of individuals’ workdays in Malmö city, by number of paid workdays in the year

<table>
<thead>
<tr>
<th>All years with more than</th>
<th>median</th>
<th>mean</th>
<th>s.d.</th>
<th>Obs (individual workers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 &lt; n</td>
<td>10</td>
<td>21.7</td>
<td>34.5</td>
<td>1,188</td>
</tr>
<tr>
<td>400 &lt; n</td>
<td>10</td>
<td>22.4</td>
<td>35.2</td>
<td>1,129</td>
</tr>
<tr>
<td>1000 &lt; n</td>
<td>10</td>
<td>22.6</td>
<td>35.6</td>
<td>1,908</td>
</tr>
<tr>
<td>2000 &lt; n</td>
<td>10</td>
<td>22.7</td>
<td>36.1</td>
<td>1,060</td>
</tr>
<tr>
<td>4000 &lt; n</td>
<td>10</td>
<td>22.8</td>
<td>36.1</td>
<td>1,058</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>constrained</th>
<th>median</th>
<th>mean</th>
<th>s.d.</th>
<th>Obs (individual workers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 &lt; n &lt;= 400</td>
<td>10</td>
<td>22.1</td>
<td>35.4</td>
<td>1,115</td>
</tr>
<tr>
<td>400 &lt; n &lt;= 1000</td>
<td>10</td>
<td>22.7</td>
<td>35.7</td>
<td>1,087</td>
</tr>
<tr>
<td>1000 &lt; n &lt;= 2000</td>
<td>10</td>
<td>22.6</td>
<td>35.7</td>
<td>1,060</td>
</tr>
<tr>
<td>2000 &lt; n &lt;= 4000</td>
<td>10</td>
<td>22.8</td>
<td>36.1</td>
<td>1,060</td>
</tr>
<tr>
<td>4000 &lt; n</td>
<td>10</td>
<td>22.8</td>
<td>36.1</td>
<td>1,058</td>
</tr>
</tbody>
</table>

However, even if we assume that individual workers spread their working time between several different forms or sites of casual labor, the confines of seasonal work availability across industries still paint a picture of limited work years, out of sync with our traditional understanding of early modern work. The short individual work years also indicate significant transaction costs in finding work, and it does not seem unlikely that there would have been many potential work days lost to job-seeking.

VIII. Seasonality in other industries

The overall seasonality pattern of construction work is important not only because of how much time it allows each individual to work for pay within the construction industry itself, but also because of how it impacts individuals’ ability to work in other industries. Due to the constraints of the preindustrial economy, especially in a region far enough to the north for seasonal differences in daylight to dramatically impact the working day, certain seasons offer more opportunity for work.

Data for work patterns on this level are hard to compile, of course, especially over such a long period. But some data are available both for direct estimations of historical work days and for some industries which can allow an approximation of what associated labor’s seasonality could have looked like.

a. agricultural labor
The most obvious competing labor is of course in agriculture. Agricultural labor was the backbone of any pre-industrial European society, and this is especially the case for Sweden, which remained predominantly agricultural well into the nineteenth century. As mentioned previously, migration was fairly low in the pre-industrial period and so it does not seem likely that there would have been a significant number of people who would have gone between city and countryside in order to seek out seasonal labor. But it is still important to understand if the labor patterns in the cities are representative of those throughout the region of if they only reflect the small number of laborers who are directly tied to seasonal urban labor.

Figure 5: Annual days of labor at Årup and Dybeck manors

Source: Olsson 2002
Sweden had a rather coercive labor system in which labor rent was a regular part of many tenancy agreements. In combination with the labor from live-in servants on annual contracts, this system took care of the majority of agricultural labor needs until the later part of the eighteenth century, which means that it is difficult to find records of agricultural day labor during the majority of the period covered by construction work in this period. Records of paid agricultural day labor make an appearance in the late eighteenth century but only become more common in the nineteenth. Figure 5 shows the number of day laborers working at Årup manor and Dybeck manor, both fairly typical manors in Scania, in the middle of the nineteenth century. While this is later than the construction data the seasonal patterns are likely to be fairly representative; if anything they would be less seasonal and so underestimate the similarity due to a decrease in agricultural seasonality in eighteenth and nineteenth century Scania (Dribe and van der Putte 2012).

Figure 4 demonstrates a very similar seasonality pattern in agriculture as found in construction, especially for men, with peak labor needs typically during high summer. Årup relies on a large amount of female labor which has sharp peaks in September during the potato harvest – women were employed to harvest and men to drive the filled carts. But women’s work is also in relatively high demand in the summer months, alongside men’s and construction labor. Of course not all labor patterns are identical; Dybeck manor has a similar seasonal pattern to Årup but with lower degrees of seasonal variability. Women have the same pattern in Dybeck as in Årup, with a strong spike in September, but do not make us as large a portion of Dybeck’s daily laborers as Årup. But the overall picture is one that makes clear the difficulties in finding complimentary employment between construction and agriculture very apparent.

b. Other urban labor

Comparing seasonality between construction labor and other casual labor within the city is also difficult; there simply are not cohesive records from most institutions or from private individuals. But some proxy comparisons can be made.

Malmö city was an important port town in the early modern period, and casual labor in the harbor is an intuitive comparison to construction work. It must have been quite some task to load barrels of grain from storage warehouses onto the out-bound ships, remove incoming cargo, and take care of all the menial labor needed to keep the harbor running. However there is no clear record of this type of work.

Data from Malmö’s harbor in the beginning of the nineteenth century captures work ongoing at the harbor; 1810 is examined in detail here. In figure 6a it is clear that the work at the harbor followed a seasonal pattern almost identical to that in construction, though with a (very) slightly lower July peak and somewhat flatter level of winter work. Recorded payments refer primarily to what is probably construction work along with summer-time dredging of the harbor. There are three primary tasks which appear in the records: general or unspecified labor, which is labelled as ‘various work’ (diverse arbeta) and is probably construction or upkeep related; dredging the harbor from a barge in the water; and carpentry work. The men (and one boy) who work on the barge and as carpenters in the summer are employed essentially year round; they are the only workers who appear in the records during the winter, performing unspecified diverse arbeta. In mid-May they move to the barge, with several soldiers to help, and in mid-June some of the men begin explicitly working as carpenters.

Throughout the summer the regular employees are assisted by soldiers, who are paid at a slightly lower rate than the regulars’ summer rates, though still above the regulars’ winter rates. These are an interesting group because of how they are recorded; while every other worker is explicitly listed, the soldiers are grouped together as a unit, for example as ‘8 soldiers’ (8 st soldater), performing either
diverse arbete or listed as ‘the workers at the harbor’ (Arbetarene vid Hamnen). The bulk of this extra summer work was done by non-regular workers (figure 6b); this picture is likely one which is reflected through much of the early modern casual labor market, where a core number of workers were retained throughout the larger part of the year, leaving the seasonal swells to others who would have to seek alternative work through much of the rest of the year.

Soldiers in 1810 would not have been actively engaged in military exercises, and so would have been both available, and likely looking, for casual labor to supplement their rather low annual income. Soldiers were hired and paid by municipalities and freeholders as part of their tax responsibilities; soldiers could also receive a small croft as part of this support, but neither land nor wage were
particularly luxurious, and so soldiers would likely have needed to supplement their incomes with day labor in either agriculture or in the cities.

It is difficult to say what this meant for the labor market and the frictions associated with hiring. By the way the soldiers are listed in the records, unnamed and grouped together into one line while every other worker is individually listed, it would appear that those in charge or hiring labor at the harbor simply contacted the local regiment and asked for a certain number of workers to be provided. Perhaps the workers were the same from week to week, but it is also possible they changed rather often: in many weeks, while individuals are recorded working for 5 or 6 days, there are different line entries, each for eight to ten soldiers, for each workday in that week. This indicates a certain lack of attachment to the worksite for any individual soldier, and in turn only a small number of work days throughout the year. However, it is of course possible that other worksites also had similar relationships to regiments and used the soldiers as readily-available day labor.

There is also some degree of pay difference between the regularly employed and the casual and soldier workers. In figure 7 there is a clear difference in the average day wage by month paid to ‘regulars’ and the more casual workers. The most industrious worker was actually a boy, gossem Anders (the boy Anders), who is paid a lower rate than the adult workers. He is excluded from the wage analysis, though his inclusion does not change the results. Only in October and November do the non-regular workers slightly out-earn the regular workers – this is due to some extra carpenter labor during these months combined with fewer lower-earning casual workers, and possibly some urgency to finish a project before December. Otherwise the regular workers enjoy a wage premium, even when they are doing general work which is probably unskilled. The premium would probably have been even higher in the summer. During the summer months a great number of the regular employees, including gossem Anders, were working on a barge dredging the harbor. For this work they seem to have received both a day wage, which is represented in figure 7, as well as a piece rate for the number of loads removed from the harbor in the week, which is more difficult to quantify and is not included in the graph. It is fairly clear that, at least at the harbor in 1810, regular employees have access both to more work and to better paid work as a general rule.
c. Auctions as indicators of financial hardship

Supplementary data also suggest a seasonal pattern of financial hardship. Auctions were an important financial instrument for preindustrial Swedes, and were frequently used as a tool to liquidate resources during times of economic hardship. Figure xxx shows the monthly average of auctions held in Malmö city between 1840 and 1870. This is some years following the end of the period studied in this paper; formalized auction houses were not common before the middle of the nineteenth century (Abas 2014). However it is not unreasonable to assume that the patterns of seasonal hardship represented in auction patterns were similar to the patterns of the past; if anything, we might expect the patterns to be somewhat muted compared to previous periods, given the tendency for a decreased seasonality of work over the very long run in Sweden and elsewhere. The auction data come from Malmö city, so it is most likely that they represent a variety of types of worker. The nineteenth century saw an increase in the number of landless and poor, which might have increased the need of the worst-off to liquidate in difficult periods.

![Figure 8: Monthly average number of auctions in Malmö, 1840-1870](image)

Source: Abbas 2014

Figure 8 (from Abbas, 2014) shows a decided peak in the number of auctions just following the winter season, and a peak again during and just after the harvest period. These are two periods when it is quite intuitive that households would feel a particular financial strain; the first after depleting winter resources and needing new capital to enter into the planting season, and the second when the success or failure of the harvest, and any need to purchase extra supplies for the winter months, would become apparent. This second association is also indicated by the sharp rise in auctions going into this period, following a gradual lull through the summer months.

Both of these peaks are periods when cash would have been both vital and either in short supply following the winter, or when work in the following months would have been hard to get. In the previous section we saw some indication that winter and off-season work could be more likely to go to workers who worked more throughout the year. If this pattern were a general one, it would mean
that those who were less connected to a particular employer would emerge from the winter months heavily strapped for cash. Needing to auction off possessions after a long winter fits with the seasonal lack of work. So too does a need for cash before the winter truly begins – this indicates a certain understanding that work will be scarce, and not enough to cover extra heating or food costs.

IX. What does all this mean for a man’s typical full work year?

So what does this say about a ‘typical’ work year? It is abundantly clear from the preceding sections that a typical work year in any one place was quite short, and unlikely to supply a full year’s worth of work; workers who relied on the market for their primary support clearly would have gone between several different employers over the course of the work season, which makes it difficult to estimate the length of a ‘typical’ worker’s full work year directly from the wage data. However it does seem clear that relying on alternative paid work in the offseason would not have been a reliable strategy because of the consistency of seasonality throughout alternative sources of paid work. While there may have been substantial flexibility in places of work, there appears to be less flexibility in the timing of work. This section puts together the evidence from the preceding sections in order to estimate a benchmark number of work days which could be applied to an adjusted Allen-style (2001) framework to give a more accurate picture of Swedish income development in the early modern period than current assumptions would imply.

The seasonality of work is a big constraint to universal fulltime employment for those who rely on casual labor for subsistence. Obviously not everyone employed at the major construction worksites can rely on fulltime employment. Peak work occurs in July, when about 20 percent of all paid work days occur. In winter months there are as few as two percent of work days monthly, giving a half-way point of nine percent. It’s not unreasonable to assume that in months with an above-the-mean number of work days that most work-seekers would be able to find paid work. Five months, from May to September, have nine percent of more of all paid workdays; including October, with 8.2 percent, gives five to six months (see figure 2 above). With a six day work week this translates to between 120 and 144 days of paid work.

The workers at the upper end of the distribution of annual work days can also give some insight into what a ‘full’ year of work could have been. Some workers did work quite long years, and a few even as much as 200 days in the same place. But the numbers are small; 180 individuals worked more than 50 days in a given place in one year, 58 more than 100, and only 11 more than 200. These distributions are also all left-skewed, with means higher than medians, and there is no clear grouping that would indicate a ‘typical’ pattern within this worker group. Because of the skewness the mean number of work days rises quite substantially when the sample is limited, which unfortunately means that any limiting criteria is unfortunately rather arbitrary.

Test thresholds of 50 and 100 workdays are chosen as levels which clearly represent a strong commitment or association with a particular workplace, but are not so high as to only include the most extreme outliers who cannot be considered representative.

Workers who worked 50 days or more in the same place in a year worked a mean of 97 and a median of 82 days, and those who worked more than 100 days worked a mean of 153 and a median of 132. This does show a tendency toward higher worksite attachment for those who work might have a stronger relationship with a particular worksite or market, and it is possible that this represented the strong majority of annual income for these workers, and we can take these values as somewhat of a benchmark for what a full year could look like for those who carried out most or all of their paid work.
at a single location. However these workers are not necessarily typical workers, apart from being more attached to a particular market: both of these groups are more skilled than the general sample; 28 percent of fifty and 26 percent of hundred day or more workers are skilled, compared to about 13 percent skilled in the general sample.

Two types of comparisons between wages and prices have inferred a working year based on either what was needed to reach subsistence or what was needed to earn the same wage as an annual workers (Allen and Weisdorf 2011; Humphries and Weisdorf 2015; Humphries and Weisdorf 2017). Instead of assuming a fixed number of days, it is assumed instead that casual employees would work enough to meet consumption goals, after which they would prefer leisure or non-market work. Obviously these are not direct estimates of a working year, but this type of inferential estimates can provide a more plausible metric of what the labor market could have looked like, especially if there is even a small amount of market equilibrium between different types of work.

Figure 9 shows the number of days of casual work needed for unskilled men and women to meet the level of income that they could receive if they were employed on an annual contract instead. It also shows the number of casual work days an unskilled man needed to make enough to support himself at the ‘respectability’ level of subsistence, defined as the costs of food, other consumables and rent needed to support one man for a year. The ‘respectability’ level simply indicates that the goods included in the calculation represent a comfortable lifestyle, rather than simply the basics needed to survive (see Allen 2012). The data are from Gary (2018a) and Gary and Olsson (2918); wages for causal labor are based on the same data which are used here to estimate labor seasonality.

There is a fairly clear trend toward more work days needed in order to meet an annual wage; the large increase in the late eighteenth and early nineteenth century is particularly apparent. These years

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**Figure 9: Days of casual work needed to equal an annual wage, and a respectability basket**

![Graph showing days of casual work needed for men and women to meet annual wage and respectability basket](source)

Source: Gary 2018a; Gary and Olsson 2018
featured particularly low wages and high prices, most likely related to Sweden’s continued (and not entirely successful) military engagement during this period. After the end of the Finish War ended in 1909 the relationship returned to levels closer to its previous trajectory.

The average number of work days needed to earn the equivalent of an annual income through the entire period is about 150 days of work, though of course increasing over time. This is surprisingly in line with the rough estimates from both the seasonality patterns in construction and the individual work patterns of the highly-attached workers, though it is on the high end of those ‘guestimates’. A work year of 150 days is also marginally above the number of work days which are needed to earn one respectability basket. This is a reasonable benchmark estimate for a typical Scanian work year. The figure fits well within the earning needs of an individual supporting themselves. It is slightly above what is suggested directly for a ‘full year’ by the highly industrious workers directly in the sample of paid construction workers, but it is reasonable to pin a benchmark a few days above these levels which are taken directly from data in which both median and mean are so below what a full year’s support must have been. In some ways this does make 150 days a conservatively high estimate, though still one much below what previous literature have assumed.

This estimate of a working year of about 150 days is substantially below the standard assumption of 250. It is also below the estimate in Gary and Olsson (2018) which estimates 200 days of work for a man to support a family (at a level between a bare subsistence and a respectability level). One hundred and fifty days of work is enough for one man to support himself very comfortably, but is not enough for a man to support a wife and children as the sole earner; substantial contributions from other household members would have been essential. This is additional confirmation of previous findings for both Sweden and other parts of Europe that the male breadwinner model is not a realistic representation of early modern household economies.

X. Is labor seasonality universal?

Sweden is a northern country, with strong seasonal changes in temperature and, especially, in hours of daylight. This has a big impact on the amount of work which can be carried out outside and the periods in which it can be executed. The restrictions are of course strongest on agriculture, but we have seen above that construction also follows a strong seasonal pattern.

The seasonal constraint on construction work were temperature and daylight – construction labor, in particular masonic or brickwork, could not be carried out in the winter or during particularly cold periods. If the brick or mortar froze before it was completely dried and set the ice crystals inside would destroy the structural integrity, and anything using these materials would be fragile and unsafe. Even if it were possible to reliably predict mild temperatures through the winter season the shorter length of the day would greatly restrict winter working hours. In the preindustrial period it would have been costly and difficult to illuminate a workspace during dark hours.

It is not unreasonable that the seasonality of construction and other non-agricultural work would have been less pronounced in regions with warmer and brighter winters and less seasonal change. In the Mediterranean and in southern Europe there was quite probably a longer building season, which could have led to a very different system of labor organization.

Fragmentary evidence backs this hypothesis up. Hamilton (1936) describes a Valencian construction work year that is much longer than what the data from Sweden would suggest. Cold weather did impact the working year, but this came typically in October, when production could go into overdrive to compensate for the soon-ending season. Hamilton comments also on the holiday days which take
away from the working year, highlighting that the most lost were in December, between the 24th and 28th – but this itself highlights the normalcy of continued labor throughout December.

In the first part of twentieth century Sweden construction was still seasonally constrained, with a strong impact on the bargaining power and, subsequently, wages of masons relative to those who worked in manufacturing, indoors year-round. Swenson (1991) connects the construction wage premium in Stockholm and Copenhagen to the average winter temperature, comparing it to much lower (or negative) construction wage premia in cities such as Rome, where the winter temperature was substantially higher.

However, Sweden, and southern Sweden in particular, was not dissimilar to much of eastern and central Europe, in either seasonal patterns or in social and labor structure. While the lower seasonality of the Mediterranean may have led to a different building season there, the larger portion of Europe would have felt the constraint of the winter months much more severely – though likely still with some variation. Stephenson, in her recent working paper (2018) suggests that building laborers in London’s eighteenth century constructions sites worked for about 180 days in a year – some number more than what the Swedish data suggest, but also substantially below the number which has been used since Allen (2001) developed his model. The variation is not out of line with the differences which would arise from a different climactic pattern.

Further research is needed to understand the extent of climactic impact on early modern construction work, but it is not extreme to assume that the typical working year would have varied quiet substantially between regions with different seasonal weather patterns. Given more concrete data from specific locations it could be very possible to construct a model which could adjust for the potential working year in order to control for regional variations, and help estimate a more nuanced view of early modern work and wage patterns.

XI. Conclusions

This paper has used a new data set in a novel way, by measuring the seasonal pattern of paid work in construction, the industry typically used to measure and calculate real wages in early modern Europe. It is the first to be able to take such a direct measurement of labor seasonality in the early modern period. It has shown that the Swedish construction industry was highly seasonal, and is increasingly seasonal the further back in time. Individual work patterns show a low attachment to any particular work site and a low recurrence of work done in the same place; this indicates frictions in the labor markets and likely high levels of inefficiency involved in matching workers and employer.

How do we understand the low number of annual workdays, both by nature of a seasonal industry as well as the empirical working patterns observed for individuals? It is clear from the evidence presented here that there was substantially more work done in the summer than in the winter, and that the overwhelmingly seasonal nature of several different industries would have made it quite difficult to string together predictable work throughout the year. When people did perform paid work it was necessary to spread it between several different worksites and, likely, types of work, but it appears that individuals still engaged in less paid work that what we assume a work year looks like from our modern perspective, likely not more than 150 days a year for men. The financial hardships associated with this can be seen in the patterns of small-scale auctions, which peaked in periods when people could be expected to feel especially strapped for liquid cash.
This study does have limitations – it relies predominantly on a single industry, and on data from only a few, albeit major, sources. It is possible that smaller institutions or individuals took advantage of the months between the winter when it was too cold to work and the peak seasons, somewhat evening the seasonality of the total labor market. More importantly, the construction industry was not a dominant economic factor, as discussed earlier in this paper. While it represents a large body of literature on early modern wages, it does not represent a large proportion of the early modern economy.

Putting all of these pieces of evidence together, it becomes clear that we cannot properly understand past experiences when our assumptions too strongly reflect a modern labor market. It further suggests that we cannot treat the inhabitants of the past uniformly: differences in labor seasonality, both temporally and geographically, strongly influence both the number of workers who would have been able to find work and the amount of time they would have been able to work. These are not minor differences, especially when we compare the development of wages and well-being between regions over long periods of time. Future research is needed to refine our approaches and to deepen our understanding of what our early modern predecessors did to support themselves over the years. In the meantime, we must work to remember that “the past is a foreign country”, and to not let our own perspectives too heavily lead our interpretations.

Archival sources

References


Gary 2018a


Gary and Olsson 2018


