# How Not to Measure the Standard of Living: The Male Breadwinner Family and the Little Divergence

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*Summary*: While real wages are good measures of production costs, they are not good measures of the standard of living because wages of the male head constitute only about half of household income. Focusing on male wages causes us to estimate a Northwest premium that is approximately three times too large.

*Keywords*: real wages, standard of living, welfare ratios, Little Divergence, male breadwinner, women's work

While male wages are interesting in themselves, and as measures of input costs, they are problematic measures of the standard of living. There is a long history of using real wages to measure changes in the standard of living during the English Industrial Revolution.[1] Starting with Allen and following Allen's method, many economic historians have used 'welfare ratios' to compare living standards across countries.[2] Such comparisons showed that real wages in Northwest Europe pulled ahead of the rest of Europe, a phenomenon known as the Little Divergence.[3]

In spite of, or perhaps because of, its popularity, Allen's welfare ratio method has been criticized. Most criticisms have focused on the quality and representativeness of the wages or prices used to construct the welfare ratios. Stephenson questions whether the wage rates in the London series reflect actual amounts paid to the workers.[4] Rota and Weisdorf suggest that, since daily wages include a premium for the risk of unemployment, we should base our welfare ratios on annual earnings of 'stable' workers.[5] A number of economic historians have noted that construction wages from a large city may not be representative of wages in the country as a whole.[6] On the consumption side, Humphries notes that the bare-bones basket does not include enough calories for a pregnant or lactating woman, and Malinowski notes that consumption

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[1] Gilboy 'Cost of living', Flinn 'Trends in real wages', Lindert and Williamson 'English workers' living standards', Feinstein 'Pessimism perpetuated'.

[2] Allen 'Great Divergence', Cvrcek 'Wages, prices', De Zwart and Van Zanden 'Labor, wages', Ericsson and Molinder 'Economic growth', Malinowski 'Little Divergence revisited', Mijatovic and Milanovic 'Real urban wage', Panza and Williamson 'Living costs', Ridolfi 'Six centuries'. Using a similar method, but not calling the results welfare ratios or subsistence ratios, are Gary and Olsson 'Men at work' and Rota and Weisdorf 'Italy'.

[3] De Pleijt and Van Zanden 'Accounting'.

[4] Stephenson, '"Real" wages'.

[5] Rota and Weisdorf 'Italy'. However, since farm servants were typically unmarried youths, 'stable rural workers' may not be representative either.

[6] Malanima 'When did England', Malinowski 'Little Divergence revisited', Ridolfi 'Six centuries'.

baskets heavily weighted towards beer and bread favor the Northwest.[7] Allen's assumptions of 250 days of work per year and a family size of four have also been criticized.[8]

This paper will address a different issue. I take issue, not with how the real wage series are constructed, but with how they are interpreted. While real wages are measures of production costs, they are not measures of the standard of living. The problem is that the term 'high-wage economy' is used to refer to two different things and the same time: input costs incurred by the employer, and the standard of living of the family. These two things coincide only if we assume a male breadwinner family.

Real wages constructed using Allen's method are appropriate for measuring production costs. Allen argues that England's high wages, relative to the cost of energy, spurred innovation.[9] This is an argument about the cost of labor to the employer, not about the standard of living.[10] Similarly, Martinez-Galarraga and Prat use real wages to examine the adoption of the spinning jenny in Catalonia.[11] Both of these are appropriate uses of real wages.

The problem occurs when real wages are equated with living standards. In addition to his claim that English wages were high relative to the cost of energy, Allen also claims that 'British wages were high relative to the cost of consumer goods, . . . so living standards were higher in

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[7] Humphries 'The lure of aggregates', Malinowski 'Little Divergence revisited'.

[8] Humphries 'The lure of aggregates', Schneider 'Real wages', Hatcher 'Seven centuries', Boter 'Living standards', Stephenson 'Working days', Horrell, Humphries and Weisdorf 'Family standard of living'.

[9] Allen *British industrial revolution*.

[10] Humphries and Schneider, in 'Spinning', criticize Allen's argument on the basis that the daily wages for spinning were low, and thus high wages did not spur the adoption of the spinning jenny. While Humphries and Schneider spend a great deal of time trying to estimate how many pounds per day a worker could spin, this is irrelevant to Allen's question. The employer only cares about the cost per pound, not about how long it takes the spinner to produce that amount of thread. To demonstrate that England was a high-wage economy, we need evidence that the price per pound of yarn was higher in England than in other countries; neither Allen nor Humphries and Schneider present evidence on that question.

[11] Martinez-Galarraga and Prat 'Wages, prices'.

Britain than elsewhere.'[12] Allen designed the welfare ratio to show whether a family had enough income to meet its subsistence needs, and in doing so he assumed that a family's standard of living depended only on the money income of the male head. While Allen admits the possibility of other sources of income, he assumes that these sources were marginal, both in the sense of providing only small amounts of income, and in the sense of being used only when male income was deficient.[13] Even those who critique the accuracy of welfare ratios generally do not question the premise that male wages and prices are sufficient data for measuring the standard of living. However, this premise is based on the false assumption that families lived entirely on the income of the male head.

The assumption of the male breadwinner certainly has been widely criticized. Saito noted the 'implicit assumption of the real wage approach . . . that the standard of living of people at the bottom can be approximated by their wage earnings' is problematic outside of Europe, and 'For proto-industrial peasants in Tokugawa Japan, in particular, wage incomes represented only a portion of their household earnings.'[14] Studying twentieth-century Uganda, de Haas notes that the male wage "does not proxy well for household income, especially in conditions where men do not work full-time, where non-wage sources of income form a crucial component of household livelihoods, and where women and children generate sizable wage- and non-wage incomes.[15] In nineteenth-century Europe as well household income was not entirely dependent on male wages. Pinchbeck quotes an English observer from 1785 who notes that a male labourer might contribute only half of family income: 'I have known instances of the wife's management of the

[12] Allen *British industrial revolution*, p. 33.
[13] Allen *British industrial revolution*, p. 40.
[14] Saito 'Growth and inequality', p. 400.
[15] de Haas 'Measuring', p. 608.

live stock, together with the earnings of herself and her children in haytime, and harvest, etc., produce nearly as much money in the course of the year, as her husband by all his labour during the same time.'[16] More systematic research has also shown that the male breadwinner family was rare in Europe. Boter demonstrates that at the beginning of the twentieth century Dutch agricultural labourers earned almost half of their household income from agricultural production on small plots of land they rented.[17] Agren et. al. track verbs in Swedish documents and find that women participated in most types of work activities. They conclude that 'both women and men were actively involved in all forms of work' and that the 'two-supporter model' was more common than the male breadwinner model.[18] Similarly, Whittle and Hailwood find that women were engaged in a broad range of work activities, and provided about 44 percent of work done in early modern England.[19] Assuming a family lived on the wages of the male head simply mis-represents how people lived.

In spite of these criticisms, much of the literature continues to assume a male breadwinner family. Mijatovic and Milanovic suggest that a four-person family is too small for Serbia, and they 'assume that the relevant number of family members that had to be maintained by a single wage-earner was six.'[20] While questioning family size, they do not question the assumption that the entire family was supported by the male head. Work by women and children is assumed to be unusual. Malinowski suggests that subsistence ratios below one, indicating that the wage of the male head cannot support a four-person family, 'may indicate that the family was

[16] Pinchbeck, *Women Workers*, p. 21.
[17] Boter 'Living standards'.
[18] Agren et.al., *Making a living*, p. 3, 80.
[19] Whittle and Hailwood 'Gender division of labour'.
[20] Mijatovic and Milanovic 'Real urban wage', p. 436.

forced to supplement its income with labour input of the wife and the children.'[21] This statement implies that the wife and children contributed only when the male wage was inadequate. Thus the welfare ratio literature in general has failed to keep up with the finding that the male breadwinner household was historically unusual.

Some economic historians take seriously the contributions of women and children to the household income. An early example is Horrell and Humphries, who estimate that women and children contributed around 20 percent of household income among the poorest English households during the Industrial Revolution.[22] More recently, Horrell, Humphries, and Weisdorf estimate the number of days per year likely worked by the wife and children, and add income from such work to the household income.[23] They conclude that a family could not reach subsistence if it relied only on the wages of the male head. Similarly, Boter includes the wages of women and children in her estimates of Dutch family incomes c. 1900 because 'household income was diversified and the husband's (wage) labour was rarely the only source of income'.[24]

In addition to the many problems already pointed out, there is also the problem that cash income did not constitute the entire family income. It has been three decades since Humphries estimated the value of the commons, but estimates of income from keeping animals or collecting fuel or wild foods are never included in estimates of household income.[25] Horrell, Humphries and Weisdorf include the in-kind portion of wages paid as board and lodging, but they do not include goods produced by the family for its own consumption.[26] Thus they underestimate the

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[21] Malinowski 'Little Divergence revisited', p. 348.
[22] Horrell and Humphries 'Women's labor force participation'.
[23] Horrell, Humphries, and Weisdorf 'Family standard of living'.
[24] Boter 'Living standards', p. 1052.
[25] Humphries 'Enclosures'.
[26] Horrell, Humphries, and Weisdorf 'Family standard of living'.

wife's contribution to the family. Boter estimates the value of food grown on a family's land as well as the wage incomes of all family members.[27] This gets us much closer to the true value of the family's consumption, but still excludes that value of other products, such as clothing, produced by the family for its own use.

The contribution of this paper is to demonstrate empirically that focusing only on male wages distorts our understanding of the geographical patterns of living standards. While male wages were substantially higher in Northwest Europe than elsewhere, the difference in household income per person was much smaller than that suggested by male wages. Focusing on male wages causes us to estimate a regional gap that is approximately three times too large. I demonstrate that including full household income reduces the advantage of the Northwest over the rest of Europe. I argue that focusing on male cash earnings not only ignores significant parts of family income, but also introduces systematic biases that favor Northwest Europe over other European regions. While the real wage of the head of household is significantly higher in Northwest Europe, the household's standard of living was not. This difference occurs because households in Northwest Europe were substantially more reliant on the income of the male head. Humphries conjectured that 'Perhaps British families were just as "exceptional" as were British male wage levels', and my results support this conjecture.[28] I provide evidence that, because families in Northwest Europe were more reliant on male income, the Northwest's advantage in male wages did not translate into the same advantage in living standards.

The data I use to demonstrate these facts is a cross-sectional sample of household budgets collected by Frédéric Le Play and his colleagues in the middle of the nineteenth century. Each

[27] Boter 'Living standards'.

[28] Humphries 'Lure of aggregates', p. 711.

budget includes not only cash income, but also the value of household production and the value of common rights. The data set is small, and was not randomly selected, but the purpose of this paper is not to measure the standard of living, but only to demonstrate that the real male wage is not such a measure.

So how do we understand the Little Divergence? Men in Northwest Europe did earn higher real wages, which may have encouraged employers to use machinery, but since the rest of the family contributed less the family's standard of living wasn't much higher. Thus, the Little Divergence was a wage divergence more than a divergence of living standards. The two are not the same because Northwest Europe was more likely to adopt the male breadwinner family.

**Data**

The data used in this study is collected from Frédéric Le Play's *Les Ouvriers Européens*. The book was first published in 1855, but I use the edition published in 1877-79.[29] Data was collected by Le Play and his associates between 1844 and 1862.[30] Le Play (b. 1806) was a professor of metallurgy at the *Ecole des Mines*, and as part of his job visited mines in Russia in the 1830s. As a result of this trip he became interested in collecting data on families, and gathered around him a group of people with similar interests (*Le Société Internationale des Etudes Pratiques d'Economic Sociale*). Le Play was a fan of patriarchy, so if his ideology influenced his data the bias should be towards emphasizing the importance of the male head. *Les Ouvriers Européens* includes detailed descriptions of 45 families. I drop the two families that are

[29] Volumes 2–4, 1877; volumes 5-6, 1878, volume 1, 1879.

[30] Besides Le Play, the following people were listed as authors on various chapters: A. De Saint-Léger; S. Coronel; F. Allen; T. Smith; A. Daux; A. Saglio; Ubaldino Peruzzi; Ratier; A. Paillette; Sergio Suazez; E. Delbet; A. Duchatellier; A. Focillon; A. Cochin; J. Dauby; E. Landsberg; De Barive; P. A. Toussaint; Pélisson; Courteille; J. Gautier; T. Chale.

not really from Europe (Morocco and Syria), leaving me with a data set of 43 families. The household head is always male, and the minimum family size is three people (head, wife, and child).[31] In 31 households only the nuclear family is present. In eight households there are one or more other adults, such as the parent or sibling of the head, or a servant. There are also four households with more than one married couple.

Descriptions of each household are very extensive. Every production activity has its own account, which specifies inputs and outputs. For example, the Norwegian family, among other activities, kept a pig. The account for this activity is presented in Table 1. Revenues include the value of pork consumed by the family as well as that sold in the market, and expenses include the purchase of the pig, the interest on the investment, labor, and vegetables used to feed it. The family's profit from keeping the pig was 40.61 francs.

Le Play does a much better job than other sources of including goods and services that do not go through the market. In all parts of the budget Le Play distinguishes between receipts and expenditures that are made in cash (*en argent*) and those that are made in kind (*en nature*). Note that in Table 1 pork that the family eats itself is included in the 'in kind' column, while pork sold is included in the 'cash' column. Work by family members and vegetables grown in the garden were not purchased by the family, so they are included as 'in kind' inputs. The result is a

[31] *Les Ouvriers Européens* does not include any single-parent households, which Humphries 'Lure of aggregates' suggests were probably one-fifth of households.

**Table 1** Norwegian Family's Profit from Keeping a Pig

| | In Kind | Cash |
|---|---|---|
| **Income** | | |
| Bacon, 16 kg. at 1.42fr | | 22.72 |
| Pork, 74 kg. at 0.885fr | 58.21 | 7.28 |
| Manure (sold) | | 3.00 |
| Total Income | 58.21 | 33.00 |
| **Expenses** | | |
| Purchase of pig weighing 50 kg. | | 33.00 |
| Interest on the value of the pig | 1.50 | |
| Feed: Vegetables from the garden | 12.60 | |
| Work of the wife and son | 3.50 | |
| Total Expenses | 17.60 | 33.00 |
| **Profit** | 40.61 | 0.00 |

*Source*: Le Play, *Les ouvriers européens*, vol. 2, p. 75.

reasonably complete account of goods that the family produced and consumed itself, as well as goods purchased in the market. The only type of work Le Play did not value at all was housework (*travaux de ménage*), which included cooking, cleaning (*soins de proprété*), child care, and sometimes laundry.[32] In this paper I will distinguish between market work and non-market work. 'Market work' includes all cash income plus wages paid in the form of food or grain. The remaining in-kind income is mostly goods the family produced for itself, but also includes some gifts. Ignoring unvalued housework, on average 29 percent of household income was non-market production. The percent of income from non-market production was lowest in the Northwest (8%) and highest in Russia (60%). No household received its entire income in either form; the extremes were 89% non-market in a family of Russian serfs, and 2% non-market in the family of a watchmaker in Geneva.[33]

[32] Le Play specifically states that this work provides no income: 'Aucun salaire ne peut être appliqué á ces travaux'.

[33] Le Play values corvée labor as non-market production and includes it in total household income, but, since I am interested in measuring the standard of living, I excluded it entirely from household income.

Le Play separates incomes from labor, return on capital, and profit. There is a fourth category called 'subventions' which includes common rights, publicly provided goods such as education, and gifts of various kinds. Income from capital and subventions was relatively small; on average only six percent of household income was from interest on capital, and only eight percent was from subventions. Fifteen percent was attributed to profit, and 71 percent to labor. In my analysis I combine the labor and profit categories, assigning profit from various activities to the family members engaged in that activity. For example, the profit of 40.61 francs that the Norwegian family made from the pig was assigned to the mother and son; since the mother spent 20 days taking care of domestic animals and the son 5 days, I assigned 80 percent of the profit to the mother and 20 percent of the profit to the son.

I use two different definitions of the head's daily wage. Wage1 is the daily wage reported by Le Play.[34] Le Play typically assigns different wage rates to different types of work, but he also identifies one type of work as the principal employment of the worker. This wage, however, does not include any profits from self-employment, which Le Play reports separately as profits. For example, Le Play assigned the Dutch fisherman a daily wage of 2.06 francs, giving him a labor income of 494.40 francs for his 240 days spent fishing. However, Le Play assigned a profit of 1364.84 to the fishing activity of the head and his son, so if we assign half the profit to the household head then his earnings are 1176.82 for 240 days, or about 4.90 francs per day. Wage2 is calculated by dividing the total earnings of the head, including any profits from his work, by his total days of work. If multiple family members contributed to an activity, the profits from those activities are divided among the family members according to the number of days they

[34] For piece-rate workers Le Play often distinguishes between the wage the worker would make on time-rates and the extra profit obtained from working on piece-rates. In this case I include the total piece-rate wage.

spent in that activity. Wage2 is generally higher than Wage1 because it includes income that Le Play categorizes as profits. In some cases Wage2 is lower than Wage1 because it averages in secondary activities of the head that had lower daily wages than his principle occupation.

I classify the location of each household by region and by town size. Each location is classified as urban, rural, or intermediate, with the intermediate category including suburbs and moderately sized regional towns. I also divide the observations into six regions, though I focus on the difference between Northwest Europe and everywhere else. Northwest Europe includes England, Belgium, and the Netherlands. Northern Europe includes Germany and Scandinavia. The sample includes 17 observations from France, so I make France its own region. Russia is sufficiently different from other observations that I make Russia its own region as well. The South includes Spain and Italy, while the East includes Austria, Bulgaria, Hungary, Slovakia, Slovenia, and Switzerland.

**Real Wages of the Household Head**

To calculate real wages I need a price index what will convert Le Play's daily wages, in francs, into real wages.[35] Since my sample includes both urban and rural observations, it is important that I have a price index that reflects price differences between rural and urban areas, so it would not be appropriate to use prices from the nearest city to construct the price index. To make sure I am getting prices from the location where the family lives, I base my price index on the prices reported by Le Play in the family budget.

[35] Le Play reports all wages and prices in francs. He does not say what method he used to convert prices from local currencies into francs.

Unfortunately no one good appears in all 43 budgets. Every household purchases some type of grain, but they don't all purchase the same kind.[36] The most common items are potatoes and salt, but even these are not purchased by every household. Instead of defining a consumer basket and calculating the cost of that basket, I use a regression to estimate the price level for a location based on an unbalanced sample of goods. I created a data set including all specific goods that appear in at least four different budgets (79 different goods), and regress the log price of each good on dummies for the item and dummies for the location. Using the coefficients on the location dummies I then construct a price index for that location. The price index is measured relative to Sweden (which is the first household reported in the book).

Nominal wages, the price index, and real wages are reported by region in Table 2. Nominal wages were clearly highest in the Northwest, and lowest in Russia. The nominal wage in the Northwest was more than twice as high as the average for the rest of Europe. The price index was also highest in the Northwest and lowest in Russia. Deflating the nominal wage by the price index yields the real wage. Since both wages and prices were low in Russia, the real wage in Russia was not unusually low; it's lower than average but higher than in France. For the Northwest, however, high prices only reduce the wage advantage of the region; real wages in the Northwest were 63 to 78 percent higher than in the rest of Europe.

Urbanization matters as well as region, so Table 3 presents regressions that include dummies for urban or intermediate location as well as for the Northwest region. Unsurprisingly, both nominal wages and prices were higher in urban areas. More surprisingly, real wages were not significantly higher in urban areas; the high urban wages are needed to compensate workers for high prices. Towns of intermediate size were not significantly different from rural areas in by

[36] In addition to purchasing different types of grain (wheat, rye, barley, oats, buckwheat, maize), budgets also differ in whether they report the purchase of bread, flour, or grain.

any measure. Even controlling for urbanization, the Northwest still had higher wages, by 50 to 60 log points.

**Table 2** Average Wage of Male Head by Region

| | Nominal Wage1 | Nominal Wage2 | Price Index | Real Wage1 | Real Wage2 | N |
|---|---|---|---|---|---|---|
| Northwest | 4.93 | 5.60 | 226.2 | 2.15 | 2.62 | 6 |
| France | 2.55 | 2.86 | 205.7 | 1.19 | 1.33 | 17 |
| North | 2.07 | 2.01 | 129.6 | 1.59 | 1.54 | 6 |
| East | 1.91 | 1.94 | 124.5 | 1.48 | 1.48 | 6 |
| South | 1.78 | 3.44 | 145.2 | 1.16 | 2.10 | 3 |
| Russia | 0.99 | 1.09 | 73.0 | 1.34 | 1.50 | 5 |
| All Europe | 2.49 | 2.83 | 166.9 | 1.44 | 1.63 | 43 |
| Ratio NW/other | 2.35 | 2.35 | 1.44 | 1.63 | 1.78 | |

*Source*: Le Play, *Les ouvriers européens*.
*Notes:* Nominal wages are in francs per day. Price index = 100 for Sweden.

**Table 3** Wage of Male Head

| | ln Wage1 | ln Wage2 | Price Index | ln Real Wage1 | ln Real Wage2 |
|---|---|---|---|---|---|
| Northwest | 0.841*** | 0.923*** | 51.40* | 0.520** | 0.602*** |
| | (0.258) | (0.254) | (25.44) | (0.211) | (0.211) |
| Intermediate | 0.007 | 0.057 | 5.95 | –0.040 | 0.010 |
| | (0.238) | (0.235) | (23.50) | (0.195) | (0.195) |
| Urban | 0.665** | 0.719*** | 81.24*** | 0.165 | 0.219 |
| | (0.261) | (0.257) | (25.71) | (0.213) | (0.213) |
| Constant | 0.349* | 0.403* | 132.16*** | 0.148 | 0.203 |
| | (0.207) | (0.204) | (20.36) | (0.169) | (0.169) |
| $R^2$ | 0.407 | 0.443 | 0.378 | 0.187 | 0.230 |

*Source*: Le Play, *Les ouvriers européens*.
*Notes:* * = significant at 10%, ** = significant at 5%, *** = significant at 1%

**Table 4** Real Annual Earnings of Male Head of Household

| | Market earnings | Total earnings |
|---|---|---|
| Northwest | 804 | 825 |
| France | 391 | 431 |
| North | 478 | 498 |
| East | 358 | 428 |
| South | 361 | 530 |
| Russia | 282 | 436 |
| All Europe | 441 | 502 |
| Ratio NW/other | 2.10 | 1.83 |

*Source*: Le Play, *Les ouvriers européens*.

The Northwest is also distinctive if we examine the annual income of the male head of household rather than his daily wage. Table 4 gives the real market annual income and real total annual income (market plus non-market) of the male head by region. This table reproduces the finding that men earned more in the Northwest than elsewhere. Real annual earnings of the male head of household were 83 percent higher in the Northwest than elsewhere. If we focus only on market income men earned more than twice as much in the Northwest.

I have examined four different measures of male real earnings (two measures of the daily wage, and two of annual earnings), and all four reproduce the Little Divergence: male wages were substantially higher in Northwest Europe than elsewhere. While there was some variation among the other regions, none came close to the wages of the Northwest.

**Household Income**

While my data on the earnings of the household head has told a consistent story, expanding our study to household income does not. The Northwest did not have the same advantage in total household income per capita that we observe in the wage of the male head. In this section I examine total household income per person, including the income of other family members and non-market as well as market earnings. For the time being I follow Le Play in assigning no value to housework (*travaux de ménage)*; in the final section I explore whether the results change when I value this work. The first two columns of Table 5 present the real value of household income; the first column presents only market income, and the second column presents total income, including non-market production. While real household market income in the Northwest was 83 percent above the average of other regions, when we include non-market

**Table 5** Real Household Income

| | Real annual household market income | Real annual household total income | Real annual household market income per CE | Real annual household total income per CE |
|---|---|---|---|---|
| Northwest | 1242 | 1335 | 274 | 295 |
| France | 718 | 952 | 173 | 221 |
| North | 693 | 972 | 156 | 218 |
| East | 508 | 774 | 166 | 233 |
| South | 708 | 1232 | 138 | 231 |
| Russia | 717 | 1894 | 112 | 281 |
| All Europe | 757 | 1112 | 174 | 240 |
| Ratio NW/other | 1.83 | 1.24 | 1.74 | 1.27 |

*Source*: Le Play, *Les ouvriers européens*.

**Table 6** Average Household Size by Region

| | Number of People | Consumption Equivalents |
|---|---|---|
| Northwest | 5.8 | 4.2 |
| France | 6.1 | 4.4 |
| North | 5.3 | 4.4 |
| East | 5.2 | 3.7 |
| South | 7.3 | 5.8 |
| Russia | 8.4 | 6.4 |
| All Europe | 6.2 | 4.6 |

*Source*: Le Play, *Les ouvriers européens*.

income household income in the Northwest was only 24 percent higher. Thus if we measure only market income, we are overestimating the advantage of the Northwest by a factor of 3.5.

The adequacy of household income of course depends on the size of the household. I could calculate household income per capita, but children do not require the same resources as adults, so the composition of the household matters. Following Humphries and Schneider I use FAO estimates of calorie requirements to assign a consumption equivalent to each member of the family.[37] Men aged 20-29 are assigned a value of one, and other household members, according

[37] Humphries 'Lure of aggregates'; Schneider 'Real wages'; Food and Agriculture Organization, *Human energy requirements*.

to their age and sex, are assigned a value equal to the number of calories they require divided by the calories consumed by a man in his twenties. All women and most men and boys consume less than a man in his twenties, so household size in consumption equivalents is less than household size measured in number of people. Table 6 presents average family size by region, measured in both number of people and consumption equivalents. The average family size was 6.2 people, and 4.6 consumption equivalents.[38] Families in Russia and the South were above average in size. To measure the household's standard of living I use the household's total real income divided by the size of the family measured in consumption equivalents. The result, real household income per consumption equivalent, is my measure of the standard of living.

Columns three and four of Table 5 present real household income per consumption equivalent. Controlling for household size changes the relative position of some of the regions, but has only a small effect the Northwest premium. The Northwest premium in market income shrinks from 83 percent to 74 percent. For total household income the Northwest premium rises slightly, from 24 percent to 27 percent. While controlling for household size has only small effects, including non-market production has large effects on the Northwest premium. Real household *market* income per consumption equivalent was 74 percent higher in the Northwest than elsewhere in Europe, but real *total* household income per consumption equivalent was only 27 percent higher. Ignoring non-market income causes us to overestimate the advantage of the Northwest by a factor of 2.7.

The importance of non-market income is robust to controlling for urban location. Table 7 presents regressions of income and income per consumption equivalents on location type and household size. Again we see that including non-market production is important. Consistent

[38] Since Le Play's sample is not representative, these averages cannot be taken as measures of family size in Europe as a whole.

**Table 7** Correlates of the Household Standard of Living

| | ln Real Household Market Income | ln Real Household Total Income | ln Real Household Market Income per CE | ln Real Household Total Income per CE |
|---|---|---|---|---|
| Northwest | 0.570** | 0.254 | 0.560** | 0.244 |
| | (0.263) | (0.208) | (0.265) | (0.213) |
| Intermediate | –0.168 | –0.122 | –0.175 | –0.129 |
| | (0.242) | (0.191) | (0.243) | (0.196) |
| Urban | 0.060 | –0.147 | 0.071 | –0.135 |
| | (0.268) | (0.212) | (0.270) | (0.217) |
| Consumption Equivalents | 0.014 | 0.275* | –0.360* | –0.099 |
| | (0.206) | (0.163) | (0.207) | (0.167) |
| Consumption Equivalents Sqrd | 0.008 | –0.007 | 0.023 | 0.008 |
| | (0.016) | (0.012) | (0.016) | (0.013) |
| Constant | 6.157*** | 5.821*** | 6.044*** | 5.707*** |
| | (0.620) | (0.491) | (0.625) | (0.502) |
| $R^2$ | 0.232 | 0.434 | 0.256 | 0.053 |

*Source*: Le Play, *Les ouvriers européens*.
*Notes:* * = significant at 10%, ** = significant at 5%, *** = significant at 1%

with the results for real wages in Table 3, living in an urban or intermediate location was not significantly related to real household income. If only market income is included, the Northwest region has a statistically significant advantage over other regions. However, if non-market income is included, the coefficient on the Northwest region is not statistically significant. Ignoring goods produced by the household for its own use causes us to mis-measure the geographical pattern of the standard of living.

## Contributions of the Head

The reason that the economic history literature overestimates the Northwest's advantage in living standards is that it assumes a male breadwinner family, and families in Northwest Europe came closest to that ideal. While no households lived entirely on the income of the head,

**Table 8** Percent of Family Income Earned by Male Head

| | Head's market income as % of total household income | Head's market income as % of household market income | Head's total income as % of total household income |
|---|---|---|---|
| Northwest | 76.2 | 83.2 | 77.5 |
| France | 47.4 | 61.6 | 52.7 |
| North | 51.5 | 73.2 | 53.7 |
| East | 49.8 | 69.8 | 57.8 |
| South | 30.2 | 47.0 | 45.8 |
| Russia | 20.2 | 40.7 | 27.9 |
| Full Sample | 48.0 | 63.9 | 53.7 |
| Ratio NW/other | 1.76 | 1.37 | 1.56 |

*Source*: Le Play, *Les ouvriers européens*.

the male head of household contributed a greater fraction of the household income in Northwest Europe than elsewhere.

I measure the contribution of the head in three different ways. The first measure is the head's market income divided by the total household income. The second measure is the head's market income divided by the household's market income only. The third measure is the head's total income divided by the household's total income. Table 8 presents these measures for each region. It is immediately obvious how far away households were from the male breadwinner myth. On average the head of household contributed only about half of total household income. Male contributions, however, varied by region. Once again the Northwest region is an outlier, with male heads contributing 78 percent of total household income, compared to 54 percent for Europe as a whole and only 28 percent in Russia.

While the contributions of other family members to household income are often considered marginal, they were neither quantitatively small nor the result of low male earnings. The correlation between the real earnings of the household head and the real earnings of all other members of the household was 0.06. Thus there is no evidence that income earned by women and children was a response to low income of the household head.

**Table 9** Portion of Household Income Earned by the Head

| | Head's market income as % of total household income | Head's market income as % of total household income | Head's total income as % of total household income | Head's total income as % of total household income |
|---|---|---|---|---|
| Northwest | 0.263*** | 0.277*** | 0.219*** | 0.223*** |
| | (0.073) | (0.067) | (0.059) | (0.057) |
| Intermediate | 0.049 | 0.005 | 0.067 | 0.043 |
| | (0.067) | (0.062) | (0.054) | (0.053) |
| Urban | 0.207*** | 0.155** | 0.180*** | 0.150** |
| | (0.075) | (0.069) | (0.060) | (0.059) |
| Consumption Equivalents | –0.076 | –0.048 | –0.066 | –0.044 |
| | (0.057) | (0.053) | (0.046) | (0.046) |
| Consumption Equivalents Sqr | 0.0009 | 0.0010 | –0.0001 | –0.0003 |
| | (0.0043) | (0.0039) | (0.0035) | (0.0034) |
| Family Type 2 | | –0.166** | | –0.089 |
| | | (0.066) | | (0.056) |
| Family Type 3 | | –0.291*** | | –0.202** |
| | | (0.098) | | (0.084) |
| Constant | 0.683*** | 0.642*** | 0.724*** | 0.682*** |
| | (0.173) | (0.161) | (0.140) | (0.138) |
| $R^2$ | 0.634 | 0.725 | 0.693 | 0.741 |

*Source*: Le Play, *Les ouvriers européens*.
*Notes:* * = significant at 10%, ** = significant at 5%, *** = significant at 1%
Family Type 2 means the family includes single adults who are not members of the nuclear family. Family Type 3 means the family includes more than one married couple.

The Northwest is still distinctive after we control for family size and urbanization. Table 9 controls for urbanization, family size, and family type. Nuclear families including only the head, his wife, and his children, are the omitted category. Type 2 families include other single adults, such as the parent or sibling of the head, and Type 3 families include more than one married couple. The results reveal that families in urban areas were more reliant on the head's income. While family size measured in consumption equivalents is not related to the head's contribution, families including more than one married couple are associated with a smaller percentage contribution of the head. This makes sense because households with more adults have more earners, but household with more young children do not. One of the reasons that the

contribution of the male head is so low in Russia is that three of the five families in that region included multiple married couples. Even controlling for family type and urbanization, however, Northwest Europe was still different from elsewhere. The portion of household income contributed by the head was 22 percentage points higher in Northwest Europe than elsewhere in Europe.

Boter reports that, in a sample of 25 Dutch families from 1910, the wages of the male head provided 54 percent of household income.[39] However, this calculation did not attribute to the male head his contribution to food produced on the family's land, which provided on average 25 percent of household income. If we attribute to the head a third of the value of food produced by the family, then his contribution to household income was about 62 percent. This is higher than the overall average in my sample, but lower than the average I find for the Northwest region.

**Adding Housework**

Thus far the non-market income of the household has not included the value of housework (*travaux de ménage*), which Le Play did not value. This type of work included cooking, cleaning, child care, and sometimes laundry. Most of this work was done by women. Table 10 shows the average number days of unvalued housework done by various categories of individuals. The wife of the head did the most housework, on average 123 days per year, or 42 percent of the wife's total work.[40] Other adult women in the household, and teenage girls, also

[39] Boter 'Living standards', p. 1064. My sample includes only one family from the Netherlands, the family of a fisherman, and Boter constructs estimates for families engaged in agricultural labor and textile factories.

[40] There was substantial variation; the standard deviation is 50.

**Table 10** Days of Unvalued Housework

| | Average Days Per Year | No. of Observations |
|---|---|---|
| Head | 1.1 | 43 |
| Wife of Head | 123.2 | 43 |
| Boys 6-12 | 5.1 | 37 |
| Girls 6-12 | 4.3 | 34 |
| Boys 13-19 | 6.6 | 21 |
| Girls 13-19 | 51.4 | 17 |
| Other Men | 0.4 | 20 |
| Other Women | 60.4 | 16 |

*Source*: Le Play, *Les ouvriers européens*.

did significant amounts of housework. Adult men did very little; in the few cases where the household head had unvalued housework days they were for shopping (*achats de provisions*).

While Le Play reports the number of days of housework done by each individual, he does not provide a wage for this work. To include it in total household income, I must assign it a value. I use two different methods for valuing this work. The first method is the opportunity cost method; I value housework at the average wage assigned to all other work done by that individual. The second method is to assign a constant real value to all days of housework. Based on the average wage assigned for laundry when it was valued, I assign a constant real value of 0.50 francs (in Swedish prices) to each day of housework done in the sample.

Table 11 shows the average household income per capita with and without the value of housework. The first two columns are income without housework, as in Table 5. The last two columns add housework to family income, using the two different methods of valuing housework. While adding the value of housework increases per capita household income, it does not change the regional pattern. Total household income in the Northwest was 27 percent higher than elsewhere if housework is not included, and 26 or 28 percent higher if housework is included, depending on the method used to value housework. All of these gaps are small

**Table 11** Household Income Including Housework

| | Real Household Market Income per CE | Real Household Total Income per CE | Real Household Income with Housework1 per CE | Real Household Income with Housework2 per CE |
|---|---|---|---|---|
| Northwest | 274 | 295 | 316 | 317 |
| France | 173 | 221 | 236 | 242 |
| North | 156 | 218 | 233 | 235 |
| East | 166 | 233 | 251 | 253 |
| South | 138 | 231 | 243 | 247 |
| Russia | 112 | 281 | 304 | 305 |
| Europe | 174 | 240 | 257 | 261 |
| Ratio NW/other | 1.74 | 1.27 | 1.28 | 1.26 |

*Source*: Le Play, *Les ouvriers européens*.
*Notes:* Housework1 values days of housework by opportunity cost (average wage of the worker in other work). Housework2 values days of housework at a constant value of 0.5 francs per day in Swedish prices.

**Table 12** Percentage of Total Household Income Contributed by Male Head

| | No Housework | Housework1 | Housework2 |
|---|---|---|---|
| Northwest | 77.5 | 72.8 | 70.7 |
| France | 52.7 | 49.0 | 47.1 |
| North | 53.7 | 50.1 | 49.4 |
| East | 57.8 | 53.2 | 52.5 |
| South | 45.8 | 43.4 | 42.8 |
| Russia | 27.9 | 25.8 | 25.4 |
| Europe | 53.7 | 50.0 | 48.7 |
| Ratio NW/other | 1.56 | 1.57 | 1.57 |

*Source*: Le Play, *Les ouvriers européens*.

compared to the difference made by including non-market production. Thus my conclusion that focusing on male earnings overestimates the Little Divergence is not driven by housework; it comes from including non-market production, goods that the household produces for its own consumption.

Similarly, adding the value of housework to household income decreases the percentage of household income contributed by the male head, but does not change the relationship between Northwest Europe and elsewhere (Table 12). The conclusion that most European families were not heavily dependent on the wage of head, and the conclusion that families in the Northwest

were more dependent than elsewhere, do not depend on the inclusion of housework. Adding the value of cooking, cleaning and childcare to family income does not have much impact on the Little Divergence; this is in marked contrast to the addition of non-market production, which substantially changes the gap between the Northwest and the rest of Europe.

**Conclusion**

I conclude that the real male wage, whether called a real wage or a welfare ratio, is not an adequate measure of the standard of living. In Le Play's sample the real male wage was 78 percent higher in the Northwest than elsewhere in Europe. However, if we include the value of non-market production, two-thirds of the Northwest premium disappears, and the premium becomes statistically insignificant. Failure to include non-market production causes us to mismeasure the standard of living. The reason that the real male wage overstates the Little Divergence is that families in the Northwest were more dependent on the earnings of the male head; while on average the male head provided only about half of household income, in the Northwest he provided three-fourths of household income. While real male wages may be used to measure input costs for employers, they should not be used to measure the standard of living.

While all my data are from the nineteenth century, I conclude that focusing entirely male wages also distorts changes over time because the dependence on wage earnings also changed over time. At an earlier date families in the Northwest would have been even less dependent on male wages. Horrell and Humphries demonstrate that the probability of a working-class wife earning wages declined during the first half of the nineteenth century.[41] Kitsikopoulos's reconstruction of the budget of a 13th-century English family estimates that the husband, wife,

[41] Horrell and Humphries, 'Women's labor force participation'.

and son worked a total of 523 days during the year, but of this only 80 days (15 percent) were wage labor. The income from wages provided only 11 percent of the family's total income.[42] By contrast, among the four English families in Le Play's sample, on average wage labor provided 83 percent of family income. Clearly focusing on wage income to the exclusion of other types of income will also bias our measures of change over time in the standard of living.[43]

[42] Based on Kitsikopoulos's 'Standards of living' family budget, using Farmer 'Prices and wages' to price food not sold, and using similar families from Le Play to estimate the percentage of the food budget provided by garden vegetables, wild plants, game, eggs, fish, and honey.

[43] See also Hatcher 'Unreal wages'.

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