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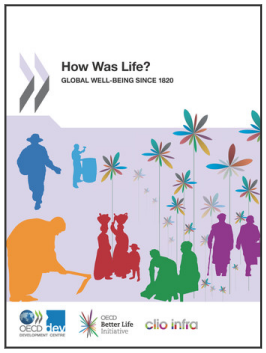

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How Was Life?
Global Well-being Since 1820

Chapter 4

Real wages since 1820

by
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Wages are an important element of well-being, as they directly affect material living conditions. This chapter describes trends in real wages since 1820 for a wide set of countries derived with a standardized method that allows for comparisons over time and space. The main indicator is based on the real wage of an unskilled male labourer in the building industry. Its derivation is based on data on nominal wages adjusted by the price of a subsistence basket of goods. Strengths and weaknesses of this method are discussed. It is found that during the first half of the 19th century, real wages in large parts of the world were barely above subsistence, except for parts of Western Europe and in particular in the Western Offshoots. As in the case of GDP per capita, cross-country differences in real wages increased rapidly since 1820, and diminished in the late 20th century.

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Introduction

Today, many people depend on paid employment for their household income and their means of subsistence. Recognising this, earlier OECD studies have emphasised the importance of working conditions, job security, remuneration and the quantity of work for individual well-being (OECD, 2011). In this chapter, we focus on one of these elements, namely, the remuneration of work. Wages are an important element of well-being, as they directly affect material living conditions. Earning a high wage allows people to improve their diet, expand their consumption possibilities and enjoy more leisure time, while low wages may result in poor and monotonous diets and an increased work effort in order to survive. Indirectly, a socially acceptable wage level may improve well-being by reducing inequality and enhancing one's self-respect, while also providing the means necessary to increase human capital through education. Furthermore, in light of the rise of paid employment (as opposed to self-employment), wages have increased in importance over time.

Real wages (the division of wages by prices) have thus long been a crucial variable in (historical) socio-economic research. They are at the centre of a great debate surrounding the development of the standard of living during the Industrial Revolution in England, the rise in economic inequality between Western Europe and Asia (the so-called "Great Divergence"), and the relation between skills and income. Acknowledging the great explanatory potential of wages and prices, historians have been collecting these data for a number of European countries from the Middle Ages until the early 20th century. As a result there is a relatively large volume of data available for Europe (as well as Japan and the United States) until the First World War, while other time periods and parts of the world, even though covered much less, are also receiving increasing attention.

A second problem, besides lack of data, is the lack of standardisation in the methodology for calculating comparable real wages even as late as the 1990s (Scholliers and Zamagni, 1995). Recently, however, a methodology pioneered by Robert Allen has been developed that allows the calculation of internationally comparable real wages over the long run (Allen, 2001; Allen et al., 2011). Armed with this new methodology, scholars have expanded real wage comparisons to include countries like India, China, Turkey, and different parts of the Americas and Africa.

The focus of these recent historical studies has been on the period before the 20th century, while at the same time economists comparing wages across the globe tend not to go back before the 1980s (e.g. Freeman and Oostendorp, 2001; Harsch and Kleinert, 2011). In this chapter we wish to bridge the gap between these efforts by historians and economists by creating a new, consistent global dataset of prices and wages for the 19th and 20th centuries. The next section will discuss the concepts and methodology employed; this is followed by discussion of historical sources and comparability issues. Then we describe the main trends in the wage data and finally the relationship with GDP per capita.

Description of the concepts used

In most historical studies, the real wage – the purchasing power – of an unskilled male labourer in the building industry is calculated to gauge trends in well-being within one country. These studies deflate the nominal wage of a building labourer (the cash he picked up at the end of the working day or week) with his estimated living expenses (via a consumer price index). The building industry was one of the most important industries in the pre-industrial world, and the nature of the work had not changed much since medieval times. Evidence on building labourers in Britain during the industrial revolution suggests that the wages of building labourers are indicative of trends in average earnings (Allen, 2001). Consumer price indices (CPIs) are calculated on the basis of a basket of goods that reflects the actual consumption pattern of these workers. Calculating a CPI over time gives rise to a number of problems, as changes in relative prices between complementary goods and the introduction of new goods (e.g. due to technological progress or international trade) can cause the overstatement or understatement of true price increases. Additional problems arise if one wants to make international comparisons of real wages, as diets and consumption patterns can differ radically across the globe.

In order to deal with these issues, it was proposed to devise a basket of goods based on a standard amount of caloric and protein intake (Allen, 2001; Allen et al., 2011). Each basket provides a minimum of 1940 kcal and at least 40 grams of protein per day, mainly from the cheapest carbohydrate available in the area. In many parts of Asia this was rice, in Africa maize or cassava, and in Northern Europe oats. Furthermore, the basket contains some additional basic food products, as well as small quantities of clothing and fuel (see Table 4.1).[1] For this chapter we calculate how many daily subsistence baskets (the annual basket in Table 4.1 divided by 365) the daily wage of an unskilled male building labourer can buy. This therefore expresses the absolute level of the real wage based on a minimum subsistence basket.

Real wages calculated in this way not only allow comparisons over time and space, but also constitute an absolute measure of welfare, as this relates to the number of times an unskilled building labourer is able to purchase the minimum required subsistence basket

Table 4.1. **Content of subsistence baskets in selected regions and countries**

	Unit	Northern Europe[1]	China[2]	India[3]	Africa[4]	Latin America[5]
Main staple	kg	155-178	171-179	164-209	185-413	132-165
Beans/peas	kg	20.0	20.0	20.0	..	45.0
Meat/fish	kg	3.0	3.0	3.0	3.0	3.0
Butter/oil/ghee	kg	3.0	3.0	3.0	3.0	3.0
Sugar	kg	..	..	2.0	2.0	2.0
Soap	kg	1.3	1.3	..	1.3	1.3
Linen/cotton	m	3.0	3.0	3.0	3.0	3.0
Candles	kg	1.3	1.3	..	1.3	1.3
Lamp oil	litre	1.3	1.3	..	1.3	1.3
Fuel	mbtu	3.0	3.0	..	3.0	3.0

Notes:
1. Allen et al. (2011) 155 kg. oats for northwestern Europe, rye for northeastern Europe.
2. Allen et al. (2011): 171 kg rice in Suzhou and Canton; 179 kg sorghum in Beijing.
3. Allen (2007b): 164 kg rice or 209 kg. millet.
4. Frankema and Van Waijenburg (2012): maize, millet, cassava, rice, wheat: depending on country and time.
5. Arroyo Abad et al. (2012): 165 kg maize in Mexico, Peru, Bolivia and Colombia; 132 kg. wheat in Argentina and Chile.
Source: Clio-Infra, *www.clio-infra.eu*.

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which, in turn, reflects something like the poverty line, defined by the World Bank as one dollar a day.[2] Hence, using this methodology, if one has a price series for the products included in the basket, as well as nominal wage data, it is possible to make statements about the development of wages relative to a poverty line (the subsistence basket) over time and space.

It is important to note that the baskets defined in this way are implicit purchasing power parities. The fundamental difference, however, is that the standard purchasing power parities (PPPs) are calculated using the weights of GDP rather than of consumption, meaning that they also include non-consumption components. Second, PPPs are often available for only one (or at best a few) benchmark years. The other years are connected with this benchmark using a CPI/GDP deflator. Given the fast change in consumer baskets in the 20th century, which included many more (and more luxurious) products that are often relatively more expensive than the main staples, CPI and GDP deflators will increase faster than subsistence baskets and, hence, the real wages calculated using this basket will probably increase more over time than those calculated with conventional CPIs. Since the aim here is to include indicators of welfare, we opted for real wages based on a subsistence basket and calculated these for each country and each year separately (see Table 4.2). This choice does, however, have some obvious limitations, which will be discussed in the section on comparability and data limitations.

Historical sources

The wage and price series shown in this chapter are taken from three sources: A) a variety of studies on historical real wages that appeared in academic journals and books; B) the British Colonial Blue Books (circa 1840-1912); and C) the October Enquiries of the International Labour Organisation (1924-2008). These data were then converted into subsistence ratios, which indicate how many times the daily wage of a male unskilled construction labourer can buy the daily subsistence basket. This methodology has the advantage of providing an absolute yardstick to compare welfare across countries and time periods and, hence, is conceptually close (but not identical) to purchasing power parities. Finally, in order to fill gaps in the data, interpolations were made D) on the basis of real wages indices from the (older) literature.

A. To start, for much of the 19th century data we draw on economic histories. Much European data came from Allen's pioneering study (2001) on European wages and prices from the late Middle Ages to the First World War.[3] Data for Istanbul came from the study by Ozmucur and Pamuk (2002), which was based on over 6 000 account books from the soup kitchens of pious foundations and the Topkapı Palace. In addition, we took data for Japan from Bassino and Ma (2005), for several Southeast Asian countries from Van der Eng and Bassino (2013), for India from Allen (2007), for China from Allen et al. (2011), for Argentina, Bolivia, Chile, Colombia, Mexico and Peru from Arroyo Abad et al. (2012), for the United States from Allen et al. (2012), and for Indonesia from De Zwart and Van Zanden (2014). These studies each draw on a variety of sources that are too extensive to discuss here.

B. The Colonial Blue Books (1840-1912) contain data that were collected by the colonial administrators in the various colonies of the British Empire and sent each year to the Colonial Office in London, in response to questionnaires sent out by the latter. Frankema and Van Waijenburg (2012) worked with these data for nine British African colonies, with the earliest observation dating from 1870. We extended their series, where possible, to 1850, and added estimates for South Africa (De Zwart, 2011). In addition, we added

data from several non-African colonies, especially in Oceania, Latin America and the Caribbean. Data from the Blue Books are not ideal, since price data do not always reflect retail prices (but prices for produce) and wages are not always representative for the majority of the population, but these are currently the only figures available for many of Europe's former colonial possessions.

C. Since 1924, the International Labour Organisation (ILO) has conducted an annual survey, called the October Inquiry, to obtain data on wages and prices worldwide.[4] Every year the ILO has sent two questionnaires (one relating to wages and hours of work, the other to retail prices) to national statistical agencies, which were to complete the questionnaires with the information already available to them (and thus not to conduct specific surveys in order to supply the data).[5] Hence, while the price data are roughly consistent, the wage information returned for the various countries could differ significantly; while some reported average wages per hour from an establishment survey, others reported legislated minimum or maximum wage rates for certain occupations, and others returned minimum wage rates based on collective agreements, etc. (see Freeman and Oostendorp, 2001). These wage data thus require some form of standardisation before they can be used. Since 1983, this work has been performed by Freeman and Oostendorp (2001), Harsch and Kleinert (2011), and Oostendorp (2012). In addition, the number of countries included expanded from 15 in 1924 to over 50 in the 1950s, after which the number of countries has fluctuated (after 1983 it sometimes contains data on over 130 countries!).

D. Real wage series for various countries in the 19th and 20th centuries are also available from other (older) literature (e.g. Mitchell, 2007; Williamson 1998; Scholliers and Zamagni, 1995) as well as from some more recent literature on wages and prices (e.g. Van Leeuwen, 2004; 2007). In addition, in a few cases we included special reports, such as on the period 1950-1970 in China for which little data are available (e.g. Survey on cities and counties in Guangxi, 1985; Yulin City Gazetteer, 1993). The lack of standardisation in the methodology makes direct comparisons on the basis of these data impossible. However, in order to deal with gaps in the data, those real wage series are used for interpolation in a few cases.

Hence, whereas most data after 1924 from the ILO are reported by official statistical agencies, the pre-1924 data are often from colonial reports, collective agreements, and more localised data from private institutions such as orphanages. Yet in both cases the data had to be reworked to become consistent. In addition, it may be asked how representative the pre-1924 data are for the economy as a whole (see the next section on comparability issues). The 20th century might be viewed as high-quality data, while the 19th century is often based on semi-official data that are often representative of only a part of the population and, hence, assumed to be of moderate quality (see Table 4.2). In general, however, all the series, even those in the later 20th century, rely to some extent on interpolations.

Data quality

After the price and wage data were collected, they needed to be standardised. This required first dealing with wage and price ranges. If ranges were reported, we took the logarithmic average of the wages, while for the prices we took the simple geometric mean. Second, standardisation required a modification of the territorial unit, since many of the data were given at the regional level, often with multiple cities/regions for one country. This modification was performed by taking averages across regions in one country. It is important to stress that virtually all our data stem from urban areas. This can make some difference. For example, in France in 1930 the hourly wage rate of a cabinet maker in Paris

Table 4.2. **Quality of data on prices and wages by region and benchmark year, 1820-2008**

	Western Europe (WE)	Eastern Europe (EE)	Western Offshoots (WO)	Latin America and Caribbean (LA)	Sub-Saharan Africa (SSA)	Middle East and North Africa (MENA)	East Asia (EA)	South and South-East Asia (SSEA)
1820	3	3	3	3	3	3	3	3
1870	3	3	3	3	3	3	3	3
1913	2	3	3	3	3	3	3	3
1950	2	3	3	3	3	3	3	3
1973	2	2	2	2	2	2	2	2
2008	2	2	2	2	2	2	2	2

Note: 1. High quality; 2. Moderate quality; 3. Low quality; and 4. Estimates.
See the section on "Data Quality" in Chapter 1 for a description of the quality criteria.
Source: Clio-Infra, *www.clio-infra.eu*.

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was 6.75 francs, versus 5.32 francs in the provincial cities. However, this qualification is less applicable to the case of the building labourers used in this chapter. The wage rate in Paris in 1930 for these labourers was, at 4.17 francs an hour, identical to the rate in provincial cities. Similar observations can be made for the developing economies. Third, arriving at a consistent dataset required a conversion into common units. As already mentioned, for prices this problem is less severe, since most prices are standard retail price data. However, wages can be reported in average rates, minimum or maximum rates, or earnings. Considering only the ILO data, it appears that 70% of the data concern average wage rates or comparable data, minimum rates and maximum rates account for 15% and 0.7% respectively, while earnings comprise the remaining 14% of observations. We followed the procedure of Freeman and Oostendorp (2001) and converted all data into average rates, because this reduces the error margin. This conversion was done using a regression analysis in which we regressed the wage on dummy variables, indicating country, industry, pay concept and time. This was necessary only for the period prior to 1984, since data from the later period were obtained from Oostendorp (2011), and were already converted into average rates. Finally, we converted all wages into daily rates; wages from the ILO were reported as hourly rates, and we have assumed an eight-hour working day for all countries throughout the entire time period. While it is clear that this assumption does not hold, consistent data on working hours per country per year have not yet been gathered. Future research may help to adjust our calculated real wage rates by providing information on working hours.

It is important to note that converting the resulting wage and price data into real wages following the method outlined above has several limitations. First, while this methodology works well for comparing the purchasing power of wages in pre-modern societies, this simple consumption basket will not be very accurate in places where real wages are relatively high, as people will certainly switch to a more luxurious consumption basket. A simple comparison of our price index with the CPI index suffices to show this. In the Netherlands between 1930 and 2000, our minimum consumption price index increased about 10 times, while the CPI increased 14 times. Hence, if one is interested in the development of purchasing power in e.g. the Netherlands alone between 1950 and 2010, other, more complex price indices might be more appropriate, as this would include a wide variety of new (and luxurious) goods. These could be obtained easily from statistical

agencies. However, international comparison, and comparison over long time periods, requires the simplification and standardisation of estimates and calculations.

Second, how representative are wage labourers for the general working populace? Allen (2001) found the wage of an unskilled labourer in the building industry to be fairly representative for total wage development in the early modern period. This may have changed in the modern period and may differ per country. It has been argued that since the start of the 20th century in certain, especially developed countries, what has driven economic development is skills. In this case one might expect that it would be skilled wages rather than unskilled wages that mainly reflected general wage development. Table 4.3 reports the population-weighted wages of building labourers and craftsmen in the world. We can see that the skill premium over the past 60 years underwent a major decline, suggesting that the supply of skills in this field outpaced the demand. On the one hand, this was caused by the educational revolution during this period and, on the other, by the increasing development of technology in our societies, which has led to a reduction of the role of skilled building labour in favour of skilled people in services and mechanical engineering. More research into this issue is necessary. Yet for now we suggest that, when comparing wages globally, the most meaningful baseline is unskilled male wages in the building industry.

Table 4.3. **Labourers' and craftsmen's real wages and skill premium, 1930s-2000s**

Number of subsistence baskets that a daily wage buys, population-weighted global averages

	Labourers	Craftsmen	Skill premium
1930s	13.4	27.3	104%
1940s	13.8	21.6	57%
1950s	16.8	26.3	57%
1960s	20.1	30.2	50%
1970s	26.4	38.9	47%
1980s	30.9	43.8	42%
1990s	35.3	54.6	55%
2000s	43.0	59.2	38%

Note: For an assessment of data quality, see Table 4.2.
Source: Clio-Infra, *www.clio-infra.eu*.

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Third, in many pre-industrial developing economies, wage income is often only a small part of total household income. Only a part of the labour force was engaged in full-time wage employment. However, it is clear that the share of the population in paid employment has increased over the past 200 years.[6] But even in the 21st century the share of wage employment clearly can differ by region. Whilst in Europe around 80% of the working population is in wage labour, in Sub-Saharan Africa this holds for only about 20/30% (World Bank Development Report, Chap. 1, 2013). It is important to keep these limitations in mind when reviewing these data.

Main highlights of wage trends

It is clear that in general real wages have increased substantially over the past two centuries (Tables 4.4, 4.5 and 4.6, as well as Figure 4.1). While all regions show growth, real wages increased significantly more in Western Europe, the Western Offshoots and the Middle East and North Africa than in other regions; global inequality in terms of unskilled labourers' wages thus increased over these two centuries.

Table 4.4. **Regional averages of real wages of building labourers, 1820s-2000s**

Number of subsistence baskets that a daily wage buys, decadal averages

	Western Europe (WE)	Eastern Europe (EE)	Western Offshoots (WO)	Latin America and Caribbean (LA)	East Asia (EA)	South and South-East Asia (SSEA)	Middle East and North Africa (MENA)	Sub-Saharan Africa (SSA)	World
1820s	12.6	7.2	..	5.7	3.3	4.1	6.5	2.9	5.7
1830s	11.2	6.5	..	7.0	2.8	5.2	3.8	3.1	5.6
1840s	11.2	4.9	..	4.0	2.8	4.2	3.7	3.4	5.2
1850s	11.0	6.3	..	7.3	2.0	4.4	3.8	3.3	5.3
1860s	11.5	8.1	43.9	6.6	2.8	4.7	5.2	3.1	6.3
1870s	12.5	8.1	50.2	7.6	3.8	4.1	5.1	3.4	7.2
1880s	14.7	9.8	62.6	9.0	4.3	4.5	5.0	4.1	9.0
1890s	17.8	9.6	63.7	9.5	4.9	4.2	4.4	4.7	9.9
1900s	19.0	13.1	..	10.3	4.8	3.6	4.7	4.9	11.1
1910s	16.9	20.4	77.2	10.6	4.3	3.7	4.6	4.4	12.5
1920s	18.7	7.7	68.9	..	3.9	4.1	..	6.3	11.2
1930s	24.8	9.9	74.1	12.4	4.0	5.3	8.1	7.6	13.4
1940s	26.2	9.6	75.8	14.4	5.2	4.3	13.4	6.2	13.8
1950s	21.3	10.7	98.9	18.5	6.5	6.3	19.3	7.9	16.8
1960s	31.8	15.0	103.9	20.9	11.1	5.2	16.4	8.1	20.1
1970s	49.4	25.1	145.5	21.3	19.4	4.7	20.1	6.1	26.4
1980s	64.8	27.8	143.7	26.0	26.3	7.8	41.3	8.0	30.9
1990s	105.2	29.2	168.1	29.9	26.9	8.5	46.2	11.0	35.3
2000s	163.3	38.6	169.8	26.5	36.6	10.0	71.6	18.3	43.0

Note: For an assessment of data quality, see Table 4.2.
Source: Clio-Infra, *www.clio-infra.eu*.

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Table 4.5. **Regional averages of real wages of building craftsmen, 1920s-2000s**

Number of subsistence baskets that a daily wage buys, decadal averages

	Western Europe (WE)	Eastern Europe (EE)	Western Offshoots (WO)	Latin America and Caribbean (LA)	East Asia (EA)	South and South-East Asia (SSEA)	Middle East and North Africa (MENA)	Sub-Saharan Africa (SSA)	World
1920s	35.4	12.9	105.2	..	..	..	..	..	..
1930s	40.6	17.0	124.1	26.3	..	14.3	28.8	16.4	27.3
1940s	36.3	14.2	117.3	24.6	..	8.6	15.3	12.4	21.6
1950s	31.8	14.3	135.2	31.7	13.4	12.4	34.2	13.0	26.3
1960s	48.1	19.5	144.0	30.2	18.7	10.0	27.2	12.6	30.2
1970s	67.8	31.0	202.2	33.0	32.2	8.6	31.5	10.4	38.9
1980s	88.4	32.7	191.3	36.7	42.2	10.7	64.1	12.7	43.8
1990s	144.6	33.7	202.9	37.8	67.4	11.8	70.4	17.1	54.6
2000s	191.9	41.6	205.9	36.3	70.6	14.1	93.1	23.6	59.2

Note: For an assessment of data quality see Table 4.2.
Source: Clio-Infra, *www.clio-infra.eu*.

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Table 4.6. **Real wages of building labourers in selected countries, 1820s-2000s**

Number of subsistence baskets that a daily wage buys, decadal averages

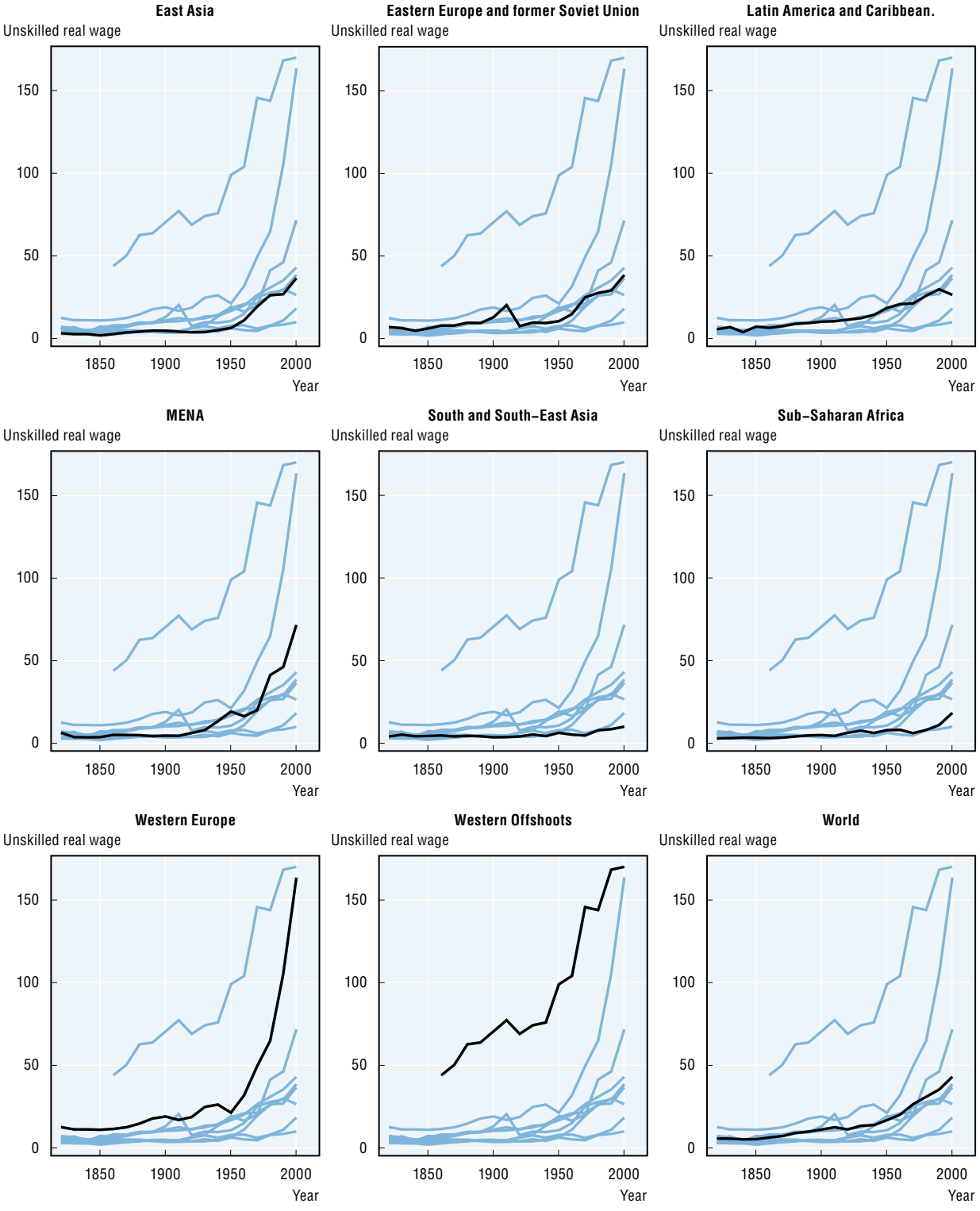
	Western Europe (WE)							Eastern Europe (EE)		Western Offshoots (WO)			Latin America and Caribbean (LA)			Middle East and North Africa (MENA)		Sub-Saharan Africa (SSA)			East Asia (EA)		South and South-East Asia (SSEA)		
	GBR	NLD	FRA	DEU	ITA	ESP	SWE	POL	RUS	AUS	CAN	USA	MEX	BRA	ARG	EGY	TUR	KEN	NGA	ZAF	CHN	JPN	IND	IDN	THA
1820s	16	16	17	10	4	17	..	9	..	..	..	..	..	..	13	..	7	..	..	..	3	4	..	4	..
1830s	17	12	14	9	4	15	..	8	..	..	..	..	..	..	18	..	4	..	..	..	3	3	..	6	..
1840s	16	11	15	10	4	17	..	6	..	..	..	..	..	..	10	..	4	..	..	..	3	4	..	5	..
1850s	17	11	14	11	3	18	..	8	..	..	..	..	..	..	23	..	4	..	..	5	2	3	..	5	..
1860s	17	10	16	12	4	16	..	10	..	33	..	..	..	..	23	..	6	..	..	4	..	3	..	5	..
1870s	21	12	16	13	4	16	..	10	..	37	..	..	..	..	..	..	6	..	4	5	3	..	3	5	..
1880s	25	15	21	16	6	15	..	12	..	50	..	..	..	..	..	..	5	..	4	7	4	7	4	5	..
1890s	28	20	28	20	7	15	..	12	..	52	..	..	..	..	..	..	5	..	5	7	5	7	4	5	..
1900s	28	23	29	22	8	16	..	16	..	..	..	..	..	..	..	..	5	4	6	9	5	9	4	5	..
1910s	23	26	27	27	9	22	24	25	..	65	..	..	..	..	..	..	6	5	5	..	4	7	4	4	5
1920s	30	31	13	22	13	14	32	9	..	70	41	73	..	..	..	..	..	7	4	..	3	10	4	4	6
1930s	37	38	19	27	15	18	45	13	..	60	56	77	..	11	28	..	7	7	5	15	3	9	5	5	9
1940s	41	27	15	..	10	..	42	..	..	58	52	76	9	10	42	..	..	7	4	13	..	8	4	3	..
1950s	36	23	12	23	13	9	23	9	..	68	76	103	7	..	56	..	..	8	5	20	5	7	7	4	8
1960s	49	24	..	41	25	16	80	..	..	59	85	153	18	..	37	..	..	11	5	..	11	13	4	4	12
1970s	62	46	31	72	43	26	100	..	..	97	192	179	23	12	46	..	25	11	5	..	18	27	3	6	..
1980s	78	68	..	124	89	..	96	..	..	108	161	175	21	..	36	..	..	8	5	..	26	30	7	12	13
1990s	120	..	..	140	112	..	..	..	19	140	126	185	8	..	..	8	28	7	11	17	22	40	10	13	24
2000s	167	..	..	..	114	..	..	..	23	171	120	209	11	..	..	17	30	..	..	..	..	45	7	8	20

Note: For an assessment of data quality see Table 4.2.
Source: Clio-Infra, *www.clio-infra.eu*

StatLink http://dx.doi.org/10.1787/888933096882

Figure 4.1. **Regional averages of real wages of building labourers, 1820s-2000s**

Number of subsistence baskets that a daily wage buys, decadal averages



Note: For an assessment of data quality see Table 4.2.
Source: Clio-Infra, *www.clio-infra.eu*.

StatLink http://dx.doi.org/10.1787/888933095628

Even though the starting position of all the main regions was more comparable in 1820 than in 2010, there were still big differences even then. Three rough groups can be distinguished: Sub-Saharan Africa, East Asia and Southeast Asia, which make up the poorest regions with real wages of around 3.5 times the subsistence basket; the Middle East and North Africa, Latin America and Eastern Europe, with real wages at around a factor of 6.5; and Western Europe and the Western Offshoots, which are clearly ahead with real wages of between a factor of 12 and 20. This gap also implied a completely different style of living: a male labourer's wage in Western Europe was able to pay about 12 times his daily minimum consumption. This meant a possibility for increased investment in education, as well as in healthcare and industrial products, which became a driving force in the consumer revolution.

The main remarkable feature was, however, the very high real wages of the Western Offshoots. Allen et al. (2012), who also find high subsistence ratios for the USA, argued that the wages in the (former) colonies were determined by the wages of the colonial power. In the case of Australia, New Zealand, Canada and the United States this means that wages were driven upwards by high wages in the United Kingdom. A second explanation might be relative prices: the price of staples – the main part of the consumption basket – was relatively low in these land-rich countries. If this is true, then the global convergence of staple prices in the 20th century may account for part of the catch-up by the European countries with the Western Offshoots.

Another remarkable development was the rapid increase in real wages in the Middle East and North Africa after the 1940s. From that point on real wages in the MENA countries grew much faster, mainly due to oil revenues, than those in Eastern Europe and Latin America, three regions that had been comparable in the 19th century. In the final group of countries, the ones that were poorest around the start of the 19th century, it is clear that only East Asia started to perform well, mainly driven by China's economic boom since the reform period of the 1970s. For Sub-Saharan Africa and Southeast Asia, however, we find that until the second half of the 20th century wages were relatively low, allowing the purchase of only between 5 and 14 times the daily consumption basket. Since a worker also has to eat during days he does not work, this barely leaves the ability to sustain a family.

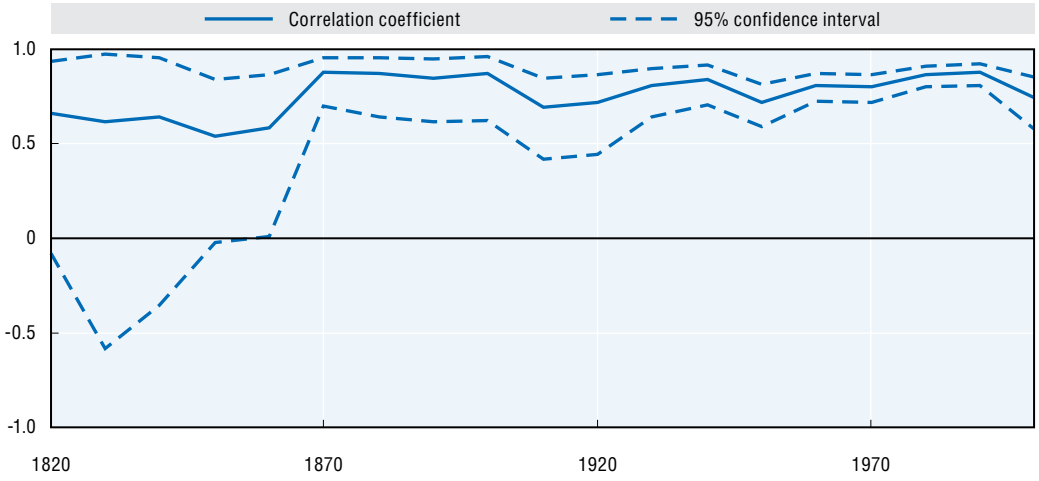
Correlation with GDP per capita

Whereas in the richest macro region (Western Europe and the Western Offshoots) there seems to have been some convergence, there has been divergence with the other regions. Nevertheless, overall wages in the world have increased about eight times from the 1820s to the 2000s, which is comparable with an approximate ten-fold increase in per capita GDP. This suggests a relatively strong correlation between real wages and per capita GDP. The relation between GDP and real wages, however, is still subject to discussion. Some studies suggest a close correlation between real wages and GDP (Bairoch, 1995; Stolz et al., 2012: 14), while others have emphasised the complex relationship between the two (Van Zanden, 1999, 2003, 2005; Ozmucur and Pamuk, 2002). The data in Figure 4.2 show a relatively close correlation between real wages and GDP per capita, which does not change much over time.

A discussion of these factors goes well beyond the scope of this chapter. Nevertheless, a few general observations can be made. As pointed out by Broadberry et al. (2013; 2014), growth in real wages will be lower than growth in GDP per capita if either the labour share in income goes down and the labour supply goes up, or if the CPI increases

Figure 4.2. **Correlation between real wages of building labourers and GDP per capita, 1820s-2000s**

Pearson correlation coefficient and upper/lower bounds of 95% confidence interval per decade



Note: For an assessment of data quality see Table 4.2.
Source: Clio-Infra, *www.clio-infra.eu*.

StatLink http://dx.doi.org/10.1787/888933095647

relative to the GDP deflator. We know from our previous discussion that the latter is not the case. In fact, our price index grew slower than most conventional indices due to our focus on a subsistence basket. Yet the labour supply has increased considerably over the past decades due mainly to the increased participation of women in the labour market (e.g. Rubery et al., 1998), while there has been a considerable reduction in the labour share in income especially from the mid-1980s onwards (e.g. EC, 2007; IMF, 2007; Guerriero, 2012). Overall this resulted in a slower growth in wage compensation than in per capita GDP.

Priorities for future research

Wages and prices are crucial sources of information about the development of well-being. Decent wages provide not only the satisfaction of having a well-paid job, but also the material income necessary for survival and, above survival, a comfortable existence. This report therefore tried to fill the lacuna that existed in the historical and economic record on wages and prices by creating a coherent dataset on them for as many countries as possible from the 19th century until the present.

Future research should focus on expanding the data for countries that were not included in our sources, or for those countries for which the series remain patchy. In addition, further evidence on wages for other occupations (skilled labour) and women's wages would also enhance our knowledge about trends in well-being as well as provide more information about the development of inequality and the demand for (and supply of) skilled workers across the world.

Notes

1. In earlier studies, the cost of the basket was multiplied by 3.15 in order to give a rough proxy for the budget of a nuclear family of four (two adults, plus two children each counting for one-half adult) including rent per adult (the additional 15%). Dividing the annual nominal wage of an unskilled

building labourer by the cost of subsistence makes it possible to examine whether, and to what extent, workers across the globe could afford the (subsistence) expenditures for themselves and their families. In this chapter we have adjusted this methodology slightly, as the constitution of the family has differed enormously over time and space (also see Chapter 2 on the demographic transition). The estimates presented here can, if necessary, be converted into subsistence ratios as used in the economic-historical literature by dividing the numbers by ((3.15*365)/250), 250 being the assumed number of working days per year; see Allen et al. 2011.

2. A comparison between the subsistence ratio and the more famous World Bank poverty line of $1.25 per day (in 2005 prices; or $1 per day in 1990 prices) show that these correspond (Allen, 2012).
3. This includes various cities in England, the Netherlands, Belgium, France, Italy, Spain, Germany, Austria and Poland. His data builds on studies by the famous International Scientific Committee on Price History in the 1930s and 1940s.
4. Published for 1924 to 1945: International Labour Review; for 1934-57: *Yearbook of Labour Statistics;* 1951-63: *Statistical Supplement to the International Labour Review;* for 1964+ *Bulletin of Labour Statistics*; after 1983 data online.
5. Also see *http://laborsta.ilo.org/applv8/data/labocte.html*.
6. For more information on the rise of wage labour across the globe see the Global Collaboratory on the History of Labour Relations: *https://collab.iisg.nl/web/labourrelations*.

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