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The real urban wage in an agricultural economy without landless farmers: Serbia, 1862–1910†

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This article presents the first estimates of the welfare ratio for Serbia using nineteenth- and early twentieth-century data on the wages of skilled and unskilled workers (including the part paid in kind) and the prices of goods in 'subsistence' and 'respectability' consumption baskets. It finds stagnation in the unskilled wage, and a modest increase in the skilled wage. The article introduces several adjustments to conventional methodology in order to make it more relevant for predominantly agricultural societies.

This article presents the first estimates of the real urban wage for nineteenth-century and pre-First World War Serbia, following the work that has been done on historical real wages in a number of countries, and using the methodology developed by Robert C. Allen as a starting point.[1] The objective of real wage studies has been to assess the living standards of populations for the period before national accounts became available. Since estimates of the real wage are practically non-existent for the nineteenth-century Balkans,[2] and since the economic structure of several countries—Serbia, Bulgaria, and Greece—was similar (small peasant farms with almost no landless farmers and backward agricultural technology), the results can be used as an approximation of the real wage in the region and, by extension, of its real income. Some demographic and social features of these economies diverge from the assumptions that, in this type of study, are often based on western experience. We therefore introduce several modifications to the methodology and explain their broader rationale, in the expectation that they may prove useful for other similar studies.

We find that the urban wage of unskilled workers exceeded the level needed to ensure bare subsistence of the family by approximately 65 per cent on average over the period 1862–1910. Its level, however, shows no increase: at the end of the period, it was almost exactly the same as at the beginning. The stagnation of the unskilled real wage is found under a number of different assumptions regarding

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[1] Allen, 'Great divergence'; idem, 'Real wages in Europe and Asia'; idem, *British industrial revolution.*

[2] See, however, Pamuk, 'Urban real wages'.

the size of household, the value of food and drink provided by employers in kind to workmen, and the number of days worked annually. We believe that this result confirms the absence of modern economic growth in Serbia in the second half of the nineteenth century and all the way up to the First World War, thus highlighting the economic divergence between south-eastern and western Europe. Thus, while the objectives of this study are narrow and empirical, it provides one of the observations necessary for a better understanding of European and global divergence of living standards during the nineteenth century.

The rest of the article is structured as follows. Section I gives a brief overview of the economic and political situation in Serbia during the period under study. Section II presents a summary of key features of Allen's methodology and describes the data we use. In light of the specific social structure of Balkan countries, section III introduces several adjustments to Allen's methodology. Section IV provides our results and discusses them in relation to contemporaneous economic and political developments in Serbia. It also includes a comparison with the results for selected other countries, which can be seen as providing external validation of our results. Section V concludes the article by highlighting some issues inherent in this type of work and giving some suggestions regarding future research.

I. Structural features of Serbia's economy in the second half of the nineteenth century

One of the specific features of south-east European countries in the nineteenth century was the prevalence of small-scale landholdings cultivated by peasant-owners. It is important to note that such countries had neither the features that have become traditionally associated with the development of capitalism in the west and especially in England (the ternary class division into landlords, tenant farmers, and peasants) nor of east European countries that had landed nobility and until rather late in the nineteenth century preserved elements of serfdom or corvée labour (Russia, Poland, and Hungary).

There are several important structural or long-term features of Serbia during the period under study. They are, first, an overwhelmingly agricultural population; second, land that was mostly owned by peasants; third, communal (either extended family or kin-group) landholdings that were gradually replaced by clear private ownership of land; fourth, modest human capital; fifth, a lack of agricultural credit; and sixth, unclear property rights. We now discuss each of these in turn.

Serbia was an agricultural economy with strong population growth, but not necessarily with a diminishing arable land-to-labour ratio, as argued by Palairet, since arable land sometimes increased at a faster rate than the population.[3] Despite high infant mortality, the average annual population growth rate between 1880 and 1910 was 1.7 per cent.[4] Between 80 and 90 per cent of the labour force was employed in agriculture, the rest being divided between a very tiny manufacturing sector, handicrafts, some services (mainly commerce), and

[3] Palairet, *Balkan economies*. For example, between 1900 and 1910, the cultivated land increased by 24%, compared to a 16% increase in population; data from Ministarstvo Finansija, *Statistički godišnjak Kraljevine Srbije*.
[4] Ministarstvo Finansija, *Statistički godišnjak Kraljevine Srbije za 1910*.

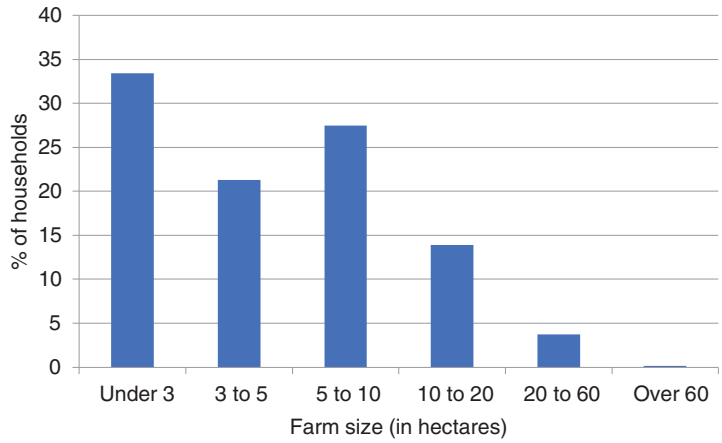

Figure 1. *Distribution of households according to farm size, 1897*
[Colour figure can be viewed at wileyonlinelibrary.com]
Source: Data from the 1897 agrarian census reported in Ministarstvo Finansija, *Statistički godišnjak Kraljevine Srbije za 1900*.

government administration (including the military).[5] It was a relatively simple social structure in which government officials constituted the upper class.[6] Even on the eve of the First World War, Serbia's exports consisted almost entirely of agricultural goods (livestock, cereals, and fruits).

Serbian farmers, almost to a man (it was a male-dominated society), owned their own land thanks to the extensive and egalitarian land reform that took place as the country gained independence from the Ottomans. Large Ottoman (Muslim) estates were taken over or bought and the land that was already being tilled by (Christian) peasants became their formal property. The agrarian reform began in 1833 and was complete by 1862, when our data begin. Farms were very small.[7] Figure 1, based on the agrarian census of 1897, shows that 55 per cent of households owned farms smaller than five hectares. The average farm size was just over seven hectares, and large properties (other than municipal or state land) were practically non-existent. The census reports only 86 farms, out of 300,000, with more than 100 hectares. There were almost no landless peasants. The inalienable homestead, introduced in stages from 1837 to 1873, consisted of a building, three-and-half hectares of arable land, two oxen, five sheep or rams, and the necessary agricultural implements. It could not be sold to pay off a private debt (and, after some further legislation, not even to pay overdue taxes).[8] It was a bulwark against rural poverty, and therefore hunger was rare.

The period studied here is also characterized by the gradual dissolution of the traditional multi-generational farmer households (*zadruga*) which were replaced by the more 'modern' family landholdings. Since *zadrugas* typically produced most

[5] The share of the rural population in 1889 was estimated at 88%; see Ministarstvo Finansija, *Državopis*, vol. XI (1889), p. XIX.
[6] See Marković, *Srbija na istoku*, chs. VIII and IX.
[7] The small size was not necessarily a limitation on the efficiency of production as such because, with the technology then available to the farmers, it is doubtful whether they could have cultivated plots that were much larger.
[8] Zebić, *La* Serbie *agricole et sa democratie*, p. 37.

of the goods (food, wine, clothing) for own consumption and only infrequently engaged in exchange, their break-up also led to a greater marketization of production and to the emergence of wage labour.[9]

According to Lewis's classic modernization scenario,[10] the bulk of urban labour is provided by landless farmers who migrate to cities: their wages are fixed at the level of the best rural alternative (which is close to subsistence) and are upwardly sticky. In the case of Serbia, however, wage labourers owned land and, in some cases, were still engaged in multi-generational households providing in kind for most of their needs. This had significant implications for farmers' willingness to supply labour on an urban open market. Unlike in the landless setting, where the potential wage earner has practically no choice, here for the farmer the opportunity cost of taking an urban job is the amount of net income he could make working on his own land.

Low human capital is a long-lasting feature of the nineteenth-century Serbian population. The population was largely illiterate at the time of independence: the literacy rate in 1830 was less than 5 per cent.[11] The first schools appeared gradually, but with few pupils and often unqualified teachers. In 1858, only about 12,000 pupils were trained, who would hardly have been able to write or carry out elementary calculations by the end of their studies.[12] Expert knowledge, primarily regarding agriculture, was almost non-existent. Throughout the nineteenth century, livestock breeding was carried out using primitive extensive grazing, with no manure system, and with antiquated and low-productivity breeds. Farming was no more advanced: the maintenance of soil fertility (through crop rotation, fertilizing, fallowing, or the three-field system) was introduced slowly or not at all, while better tools (such as iron ploughs instead of wooden ones) were also adopted very slowly.

This backward agricultural sector had difficulty in increasing output and providing the rising population with enough food, and in addition generating export surpluses. Yet some improvements did occur. Knowledge of agricultural techniques spread as literacy grew. Literacy reached the overall rate of 17 per cent in 1900, while in rural areas it was 12 per cent. For men and boys more than six years old, however, rural literacy was 28 per cent.[13] In addition, the state set up various institutions whose aim was to improve agricultural techniques: secondary schools for the education of agricultural experts (two farming schools, one cattle-breeding school, and one vineyard-orchard school), established an experimental farm in Topčider near Belgrade, set up a cattle-breeding institute, and created eight agricultural centres and 55 fruit and vineyard nurseries, among other things.[14] All

[9] The Serbian *zadruga* is similar to the better-known Russian *obshchina* or *mir*. In both, several (in the Russian case, sometimes dozens) multi-generational peasant households held the land in common ownership. The land could not be alienated by individual members. They could leave *zadruga* but were then ostracized by the family, and could take only personal property with them. Note that *zadruga*'s common land ownership should be distinguished from the 'commons' used mostly for pasture which, as in England prior to the enclosures, were open to all farmers living in the area. The Serbian terms are very clear on that: there was *zadružna zemlja* (*zadruga*-owned land), and *opštinska zemlja* ('association'- or 'municipality'-owned land).

[10] Lewis, 'Economic development'.

[11] See Ilić, *Pismenost u Srbiji u 19. veku*, pp. 63–80.

[12] Trgovčević, 'Obrazovanje kao činilac modernizacije', p . 21.

[13] Calculated from *Popis stanovništva u Kraljevini Srbiji 31. decembra 1900*, vol. 2.

[14] Statistički *godišnjak Kraljevine Srbije za 1906*, pp. 261–7.

of this offered peasants more productive livestock breeds and types of crops and fruit.

During the nineteenth century, the Serbian state, often controlled by political parties that represented farmers' interests, undertook numerous measures to protect peasants from the risks brought about by a capitalist economy.[15] The goal was to preserve the small peasant estate and to create a society of 'free' peasantry.[16] There were several government measures that completely cut off the peasantry from the regular financial markets: the ban on the sale of a part of one's property (the homestead) to pay off debts to private individuals, banks, or the state, and the prohibition of the alienation of farms under 3.5 hectares; the statutory limitation of the interest rate to 12 per cent per annum;[17] and the inability of the rural population to borrow by issuing promissory notes. Lack of credit hindered technological modernization (land improvement, purchase of new tools, quality improvement of cattle, use of more fertile and better-quality plantings, and so on). Taken together, these policies prevented the emergence of larger and more efficient farms although, on the positive side, they ensured that landlessness remained a marginal phenomenon.[18]

Compared with the west European experience of a century or a century-and-a-half earlier, it seems clear that these policies prevented faster capitalistic development of both agriculture and industry as well as faster urbanization. In 1910, the urbanization rate in Serbia was 13.2 per cent. In Europe, only Russia and Finland were less urbanized.[19] Many politicians and commentators remained strongly attached to the idea of an agriculture-based non-capitalist economy. The idea found support among right-wing patriarchal politicians, among nationalist and left-wing parties that thought of *zadrugas* and peasant free-holdings as being a distinct Slavic, Orthodox, and more 'humane' organization of production, and even among early anarchists and marxists who saw the communal forms of ownership as capable of providing a shortcut to socialism.[20]

The absence of a modern cadastral system also presented a problem. The Ottoman system based on simple issuance of title deeds remained unchanged, although it was increasingly obsolete and unreliable. The boundaries of properties were not precisely determined and this led to innumerable court disputes. Peasants often seized state or municipal land illegally, attempting afterwards to legalize their actions. However, their ownership rights remained controversial for a long time

[15] Until 1888, all adult males who paid any amount of direct taxes had the right to vote. With the new constitution in 1888, a tax census of 15 dinars per year was introduced, which still meant that the franchise was over 80% of the adult male population. This was a very high percentage compared to the then-advanced European countries; see Antonić, 'Demokratija u Srbiji'. Not surprisingly, parties with populist and pro-peasant programmes tended to win elections and form governments.

[16] Mijatović, 'Zaštita seljaka od finansijskih rizika'.

[17] As a consequence, loans at usurious rates of up to 100% per year were not rare; see Čalić, *Socijalna istorija Srbije 1815–1941*, p. 71.

[18] Unable to sell the land they owned or to borrow against it, peasants did not want to leave it either. So they remained there, tied to a piece of land, in words of one contemporary (cited in Čalić, *Socijalna istorija Srbije*, p. 41), 'neither able to live nor to die'. On the other hand, some economic historians (Vučo, *Položaj seljaštva I*) estimate that the homestead law prevented the pauperization of between 10% and 15% of peasants.

[19] Čalić, *Socijalna istorija Srbije*, p. 183.

[20] SvetozarMarković, one of the earliest and most influential Serbian socialists, held this view—which, incidentally was shared, in relation to Russia, by some Russian marxists and indeed discussed by Marx in his famous 1881 letter to Vera Zasulich.

and farms, even those larger than 3.5 hectares, were taken out of circulation: they could neither be sold nor bought, nor could money be borrowed using the land as collateral.[21]

II. Data and methodology

As mentioned in the introduction, our approach essentially follows Allen's,[22] but on several issues, discussed in the next section, departs from it due to the differences in the social and demographic structure of Serbia in comparison to what is typically assumed by Allen and the economic historians who follow him. As is common in the literature, we calculate wages for two types of labourers: a construction worker and an 'ordinary' unskilled worker, and use two baskets of goods: a 'respectability basket' and a much more austere 'bare-bones' or subsistence basket. The bare-bones basket would ensure mere survival and is based on nutritional norms. The baskets are 'self-weighted': the weight of each good is given by the physical quantity of that good multiplied by its price. Assuming that the worker is the only member of a typical four-member household working outside the home for a monetary wage, the nominal wage is compared to the baskets of goods (consumption) for all members of the household. That family basket is, again following the literature, equal to three adult baskets—under the assumption that the needs of children (in terms of food and calories) are half of those of the adults. Finally, 5 per cent is added on top of that as an estimate of housing costs. The wage divided by the value of such a basket is called the 'welfare ratio', with 1 (when using the bare-bones basket) indicating that the wage earned by a worker was just sufficient to keep a family of four members at the level of the physiological minimum. All higher ratios, of course, provided more than that.

Calculations following this approach have been carried out for a number of west European cities,[23] but were later expanded to the US,[24] and in several influential papers by Pamuk to the area controlled by the Ottoman Empire, including south-east Europe, modern-day Turkey, and the Middle East.[25] More recently, the welfare ratios have also been estimated for the Habsburg Empire,[26] China's Yangtze delta in the nineteenth century,[27] British-ruled India,[28] Mexico,[29] Dutch-controlled Java,[30] northern and southern Italy before the First World War,[31] pre-Meiji Japan,[32] and Tsarist Russia.[33] This work has informed discussion about the great divergence

[21] 'Only a minority in the countryside … has title deeds for their possessions, and even then they are often incorrect and unreliable. Disputes over land are multiplying from year to year, and no one can stand in the way of enclosures of municipal meadows. Moreover, the state property is taken up abruptly, and it has in some ways created a state of lawlessness in the whole country'; *Težak*, 26 June 1894, p. 225.
[22] For an early formulation, see Allen, 'Great divergence'.
[23] Ibid.
[24] Lindert and Williamson, 'American incomes'.
[25] Özmucur and Pamuk, 'Real wages'; Pamuk, 'Urban real wages'; idem, 'Black Death'.
[26] Cvrček, 'Wages'.
[27] Li and van Zanden, 'Before the great divergence'; Allen, Bassino, Ma, Moll-Murata, and van Zanden, 'Wages'.
[28] Allen, 'Wages, prices, and living standards'; Broadberry and Gupta, 'Early modern great divergence'.
[29] Challu and Gomez-Galvariatto, 'Mexico's real wages'.
[30] de Zwart and van Zanden, 'Labor'.
[31] Federico, Nuvolari, and Vasta, 'Origins'.
[32] Bassino and Ma, 'Japanese unskilled wages'.
[33] Allen and Khaustova, 'Russian real wages'.

between Europe and Asia, its timing, and the reasons why the industrial revolution began in northern Europe and not in eastern China.[34]

How can Serbian data be fitted into what is required by Allen's methodology? For our purposes, the important thing is that statistical monitoring of economic and other phenomena started in 1862, when the Ministry of Finance's economic department was ordered to begin the regular collection and publication of statistics. The precise method of data collection was prescribed: members of the local courts were ordered by the Announcement of 27 June 1862, No. 791, to record the average prices of products and wages in their localities.[35] The reported prices had to be based on the actual prices observed in the sale and purchase of goods (and not on estimates); they had to be related to goods of average quality, and to be recorded once a week when the market was at its peak; monthly prices were derived from the weekly ones.[36] The Ministry of Finance then calculated average monthly and annual prices for Serbia as a whole as the unweighted average of reported local prices and wages and published them in statistical yearbooks.

In the beginning, in 1862, the prices of 48 products and three types of wages were recorded, while at the end of our period in 1910, there were 94 products and four types of wages. Annual wages were reported for three or four types of workers (the number varies between the years).[37] They are 'ordinary worker' (*običan radnik*), digger, mower, and construction worker. For the unskilled worker, we use the reported wage of an 'ordinary worker' which is practically indistinguishable from that of a digger. For the skilled worker, we use the wage of a construction worker.

After the 1876–8 war with the Ottoman Empire, Serbia expanded territorially to the south-east and in 1880 the original list of 21 towns was enlarged by five more. The number of cities covered by the statistics continued to increase, reaching 42 in 1910. The increase in the number of cities has no appreciable effect on the consistency of the series since the newly added cities did not differ from the old ones (as can be ascertained by comparing some prices from the two groups) and the small geographical size of the country ensured reasonable market integration. The 'cities' were mostly small towns or townships, however. The largest city in 1884 was Belgrade, with 35,500 inhabitants, and only two cities had more than 10,000 but fewer than 17,000 inhabitants. Two townships included in the list had less than 1,000 inhabitants, and the average size of the towns in this list was just 6,600.[38] Since even in these 'towns' much of the population was engaged in agriculture, it could be said that most of our sample consists of semi-urban settlements; that is, of a transitional type of settlement between the village and the real city.[39]

[34] The approach has its critics too, most notably Maddison, *Contours*, pp. 317–19. See also the discussion between Allen ('Spinning their wheels'; 'Real wages once more') on the one hand, and Humphries and Weisdorf ('Unreal wages?') and Stephenson ('"Real" wages?') on the other, regarding the level of English real wages before and during the early stages of the industrial revolution.

[35] The only reference in literature to these data (and, more exactly, to the construction worker wage only) is in Palairet, 'Real wages'.

[36] Ministarstvo Finansija, *Državopis*, vol. I (1863), p. 21.

[37] There are also wages of plough workers but they include the services of animals as well and thus cannot be used for labour compensation only. The disadvantage of using a mower's wage is its strongly seasonal character.

[38] Ministarstvo Finansija, *Državopis*, vol. XI (1889), pp. 238–41.

[39] For 1862, we only have the data on prices and wages for the second half of the year, since recording began mid-year. Therefore, the entire calculation for 1862 is valid, strictly speaking, only for the second half of the year, although the difference is unlikely to be significant.

When creating the statistical base for this article, for the period 1862–80 we faced the problem of converting prices and wages from the *kuruş* (colloquially called the Turkish groschen, to distinguish it from the Austrian groschen) into dinars. The Turkish groschen was used for transactions and was thus reported in state statistics before the introduction of the dinar as Serbian legal tender in 1879. At that time, the value of the dinar was fixed at 5 groschen (*kuruş*). After 1879, the statisticians recalculated the price and wage data for the earlier periods by dividing the groschen prices by 5; that is, by using the official exchange rate. However, according to the silver content of the dinar and the groschen, one dinar was worth only 4.5 groschen.[40] (The dinar was officially worth 4.5 grams of silver vs. one gram of silver for the groschen.[41]) By using the 5:1 ratio, the Serbian authorities artificially reduced the value of the Turkish groschen in order to drive it out of circulation. So we have two alternative dinar and groschen exchange rates: the official one of 5:1, and the silver one of 4.5:1. We have chosen to use the latter because we consider it more accurate in strictly economic terms. We have thus recalculated all prices and wages expressed in Turkish groschen (for the period 1862–80) as nominal dinars using the exchange rate of 4.5:1.

The next problem relates to weights. Until 1884, the measure of weight used in Serbian statistics was the old measure known as the *oka*, which was equal to 1.282 kg. We have recalculated all quantities in *oka* as kilograms.

The subsistence and respectability baskets include nine and 12 products respectively: beans, meat, butter, soap, linen, candles, lamp oil, and fuel (for both), maize for the subsistence basket only, and bread (instead of maize) for the respectability basket; in addition, the respectability basket includes cheese, eggs, and beer. As already explained, we use two wage series, which means that there are in total 15 prices per year (13 goods and two wages).

The data on prices for maize, bread, beans, meat, butter, eggs, and soap are taken directly from the national statistics.[42] For maize, which was the most commonly used grain in Serbia, we used the retail price of maize flour. For meat, we used pork because it was the most common meat in Serbia. Instead of the yellow cheese included in Allen's basket, we included so-called white cheese, which was practically exclusively used in Serbia in the nineteenth century and whose price is included in state statistics. Since its calorific content is about half that of yellow cheese, we almost doubled its amount (to 9.75 kg instead of 5). Instead of beer, we included wine, which was far more common in Serbia. We used the ratio of 1 litre of wine = 2.67 litres of beer, as Allen has suggested for countries where wine was more commonly consumed.[43] In the official statistical sources, there is no price series for candles and lamp oil, but there is a price series for animal fat (tallow). Since in Serbia candles and oil for lamps were mainly made of tallow, we calculated the prices of candles and lamp oil by using the reported prices of animal fat and adjusting them by the observed ratio between the price of animal fat and the average

[40] Following the rules of the Latin Monetary Union, the value of a dinar was fixed at 4.5 grams of silver, the same as the French franc.

[41] Pamuk, Monetary *history*, p. 191.

[42] We used the following official statistical sources: Ministarstvo Finansija, *Državopis*, vols. I–XIX; idem, *Statistički godišnjak Kraljevine Srbije*, vols. 1893–1910; and idem, *Statistika cena poljoprivrednih proizvoda 1890–1905*. All were published by the Ministry of Finance.

[43] Allen, 'Great divergence', p. 421.

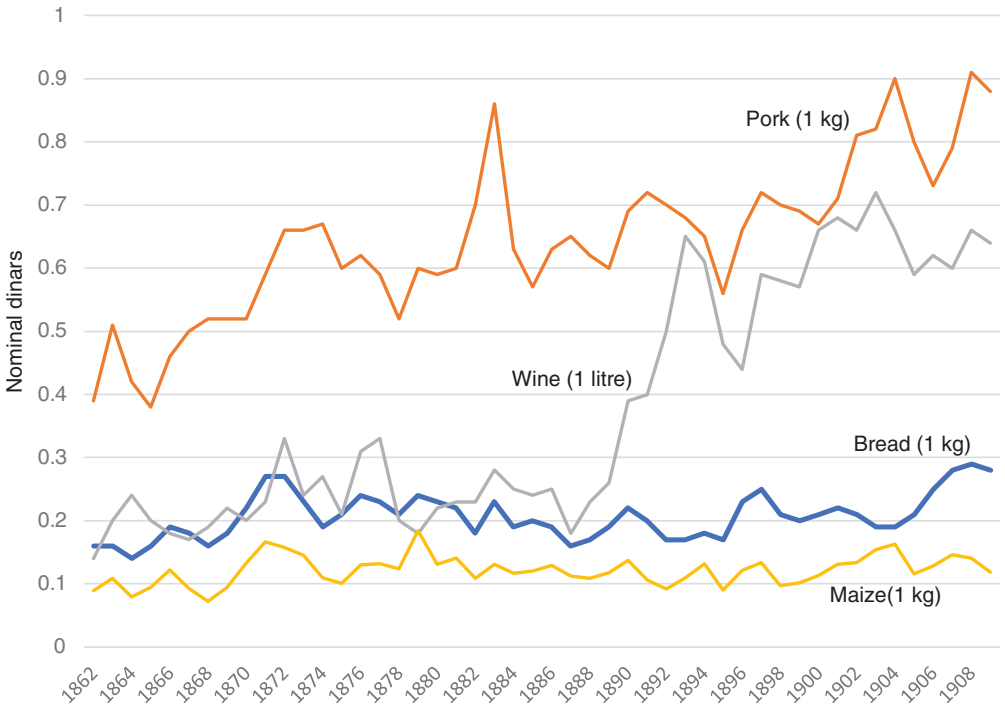

Figure 2. *Price of bread, maize flour, wine, and pork, 1862–1910 (nominal dinars) [Colour figure can be viewed at wileyonlinelibrary.com]*

Sources: Calculated from the official publications listed in n. 42; see section II for further details.

of prices of candles or lamp oil found in other sources, mostly in newspapers. We had similar difficulties with linen cloth. Serbian statistics monitored the price of flax in kilograms, which we converted, using expert estimates, into square metres (the unit in Allen's basket). We obtained the prices that are very close to the reported prices in square metres available in contemporary newspapers. Finally, the 5 million BTU of fuel in the respectability basket (or alternatively 2 million BTU in the subsistence basket) came from the energy value of charcoal and its prices from national statistics.

Figure 2 shows, for illustrative purposes, the recorded prices of four important items: maize flour, bread, pork, and wine. The price of bread and maize is practically constant in nominal terms throughout. This was achieved through direct price controls by local authorities at times. The price of pork shows an increasing trend driven by the rising international (that is, export) prices. The price of wine is very interesting as it clearly shows the effects of phylloxera, which appeared in Serbia in the early 1880s and by 1897 destroyed most of its vineyards.

Table 1 shows the quantities of goods included in the respectability and subsistence baskets. The average cost of the respectability basket is three times that of the subsistence basket. Thus, as a rule of thumb, the welfare ratio calculated using the respectability basket would be about one-third of the welfare ratio obtained using the subsistence basket.

Table 1. *Annual quantities of goods included in respectability and subsistence baskets*

Good (units)	*Respectability basket*	*Subsistence basket*
Bread (kg)	182	
Maize, flour (kg)		165
Beans (kg)	40	20
Pork (kg)	26	5
Butter (kg)	5.2	3
Cheese (kg)	9.75	–
Eggs (10)	52	–
Wine (litres)	68.25	–
Soap (kg)	2.6	1.3
Linen (square m)	5	3
Candles (kg)	2.6	1.3
Tallow (litres)	2.6	1.3
Charcoal (kg)	170	68
Average annual cost over the period 1862–1910 (nominal dinars)	*123*	*41*

Sources: Bare-bones subsistence basket from Allen, Murphy, and Schneider, 'Colonial origins', p. 873, tab, 1, p. 873; respectability basket for Europe from Allen et al., 'Wages', p. 25, tab. 5. For the conversion rates of charcoal/BTUs, wine/beer, and yellow/white cheese, see section II.

We use two types of workers' wages—for ordinary or unskilled workers, and for skilled construction workers or masons. These are the two occupations and skill types used in similar calculations elsewhere, both because of the availability of the data, and because they are clearly differentiated categories. Serbian statisticians' definitions are as follows: ordinary wages are earned by 'ordinary wage-workers like diggers', or 'ordinary farmer's helpers',[44] while for skilled construction workers or masons it is said that they are 'masters or apprentices who build themselves, not their helpers'.[45] Annual data for the two consumption baskets and two types of wages are provided in appendix I.

The published wage data do not include food allowances, as is explicitly stated in the official statistics. In Serbia, however, workers and masons usually received food from their employers. This was done so that workers would not waste time going back and forth between the work site and home. We addressed this problem in two ways. First, we added to the reported wage for each year the nominal value of the food component of the subsistence basket augmented for the wine from the respectability basket. Second, we looked at a large number of reports from villages, districts, and counties (the three administrative tiers) regarding wages in their areas. These reports were published between 1870 and 1898 in the agricultural paper *Težak*.[46] Around nine-tenths of the reports state that wages include food (and often wine and brandy as well), while about one-tenth of the reports provide only wages without food and alcohol. We also have a number of reports (20) which indicate wages with and without food. Most food and drink values range from 0.2 to 0.6 dinars per day, and half of them lie between 0.2 and 0.4 dinars. The average value

[44] 'Farmer's helpers' are included in the statisticians' instructions to the enumerators as to what an 'ordinary worker's wage' means. It should be kept in mind that these are semi-urban settlements where the 'ordinary wage' of an urban digger is unlikely to be different from that of a farmer's helper.

[45] Ministarstvo Finansija, *Državopis*, vol. II, p. 115.

[46] The information published in *Težak* was provided by agricultural experts, teachers, priests, and farmers.

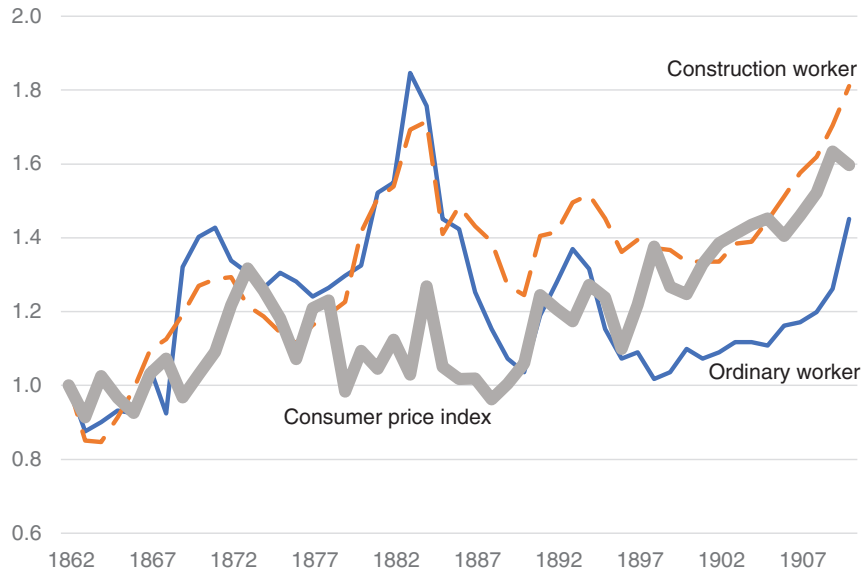

Figure 3. *Nominal wages and prices, 1862–1910 (1862 = 1)*
[Colour figure can be viewed at wileyonlinelibrary.com]

Notes and sources: See app. I. The consumer price index is proxied by the cost of the respectability basket. Wages are nominal wages as given in the sources (that is, without the addition of food and drinks provided by the employer).

of the food and drink allowance is 0.38 dinars per day.[47] We added this amount to the published wages. We decided to keep this nominal amount for all the years because the actual data on implicit food values are dispersed across the years, are very scarce (so anchoring the value in any one year and deflating/inflating to other years would produce very different results depending on the anchor year), and do not seem to vary systematically with the year when they were reported.

The statistical database was created as follows. In total we needed 735 prices for the entire database (49 years x 15 variables per year). We took 671 data points (or more than 90 per cent) from the official statistics. The missing 64 data points were filled in as follows: eight from contemporary newspapers and 56 through interpolation in the case of four products (eggs, soap, flax, and coal) for which the prices were not available in all years.

Figure 3 shows the movement of the nominal wages of unskilled and skilled workers and prices (proxied by the value of the respectability basket). It is apparent that the price level remained broadly unchanged until the middle of the period (1888). Price growth then picked up at an average rate of about 2 per cent per year and continued until the end of the period. The reasons for this increase were mostly to be found in higher taxes (the introduction of excise duties and various city taxes), monetary expansion from the 1890s onwards, and the depreciation of silver (which was the monetary standard in Serbia) in the world compared to gold

[47] Note that this is a relatively high amount: the average daily unskilled wage was 1.35 dinars. However, it is likely that the cost (and quantity) of daily alcohol provided by the employer was substantial. Alcohol was often regarded as being as valuable and necessary as food.

in the late nineteenth and early twentieth centuries. The movement of wages will be discussed later.

III. Modifications to Allen's methodology

In addition to including the non-monetary component of the wage, there are two additional modifications that we thought were necessary for the type of economy we are dealing with here. These are the assumed annual number of days of work and the average household size.

We address first the annual number of days of work. The common assumption in the literature, based largely on the west European experience, is that people worked for 250 days a year.[48] This number is, we believe, excessive for Serbia. There are frequent references in contemporary magazines and newspapers to how little villagers worked and how many days were spent ('wasted') on various holidays, celebrations of the saints, and the like—a feature that was also common in pre-industrialized western Europe.[49] Furthermore, the very nature of agriculture contributes to the fact that the number of working days was limited: agricultural work is highly seasonal and in the late autumn and winter, under a temperate continental climate, there is hardly any work to do. The same applies to construction. This is, of course, different from western Europe which was more industrialized and where work depended less on climatic conditions.[50]

We did not, however, find claims by some authors that peasants were working only half-a-year or less credible.[51] It seems that the number given ('less than half-a-year') is very approximate and was put forward for seemingly moralistic reasons intended to shame peasants. Instead we rely on the results of the rural survey conducted between 1910 and 1912 by Mihailo Avramović, the founder of the Serbian agrarian cooperative movement.[52] According to the survey, 41 per cent of the days went unused (either because of laziness, holidays, drinking,[53] or ill health), 45 per cent of days were spent farming their own land, and 14 per cent of days were spent 'outside the estate' or 'at home'. Most of this latter category probably represents work, either through wage-earning,[54] or on their own property but outside agriculture (for example, artisanal work). We thus estimate that farmers were working for slightly more than half a year and round off the number of working days at 200, which is consistent with the assumptions often made for pre-industrial western Europe.[55]

[48] See, for example, Allen, *British industrial revolution*, p. 38.
[49] See de Vries, Industrious *revolution.*
[50] In a table showing the independent estimates of the days of work for England between 1560 and 1771, Allen and Weisdorf, 'Was there an industrious revolution?', p. 718, tab. 1, give values ranging from 257 to 286, slightly increasing over time.
[51] For example, 'farmers do not spend even one-half of 365 days working'; *Težak*, 5 Aug. 1890, p. 1.
[52] Avramovič, Naše *seljačko gazdinstvo*, p. 29.
[53] In 1869, an author writes: 'In the summer at the peak of the seasonal field work, one can see in villages and even more so in towns, farmers who drink in inns or sleep the whole day, and at night they go hunting. Even when you offer them 20 groschen wage, they just make fun of you'; *Težak*, 10 May 1869, p. 12.
[54] This is confirmed by Avramović, *Naše seljačko gazdinstvo*, p. 35, when he lists 'personal earnings' which must include wages among the income of farms.
[55] This is the number considered by Persson and Sharp, *Economic history*, p. 75, to have been quite common for European pre-industrial societies. Ridolfi, 'Six centuries', p. 597, also assumes a year of 200 working days for

The second adjustment to Allen's methodology concerns the number of family members whose needs are supposed to be covered by the wage earned by one member. As explained earlier, Allen assumes an average household size of four, which, on account of economies of scale in consumption and the lower food requirements of children, translates into three adult equivalent units.[56] For Serbia in the nineteenth century, however, a household size of four is unrealistically low. Data from population censuses in Serbia show that the average household size varied between six and seven.[57] In accordance with this, we assume that the relevant number of family members that had to be maintained by a single wage-earner was six.[58] Using Allen's implicit scale of 1 for the first household member, and 0.667 for each additional member, yields 4⅓ equivalent units (adult baskets). For housing needs, we, like Allen, add 5 per cent of the total basket cost, and thus obtain a total of 4.55 equivalent units.

We believe that this modification gives a more realistic insight into what a subsistence wage in Serbia in the latter part of the nineteenth century was supposed to cover. Of course, when we compare the Serbian real wage with that for other countries, the assumption of greater household size and fewer workdays pushes Serbian welfare ratios down. However, we believe this does not bias the results, but, on the contrary, presents a more realistic picture of the actual standard of living. If wage-earners work fewer days and have more household members whose needs their wage ought to cover, then obviously the welfare ratio and the standard of living will be lower compared to the alternative case (more workdays and a smaller household size). More generally, this raises the problem of how to carry out valid comparisons between different economies. We argue that the use of a nationally-representative household size and days of work is necessary if our objective is to use Allen's methodology to get an estimate of the country's real per capita income. The blind application of the west European household size and annual days of work (at least as originally conceived by Allen) may, under the guise of equivalency, lead to very misleading results for countries where either or both of these assumptions do not hold.[59]

In addition, in an economy where farmers have their own landholdings as back-up, and where landlessness is minimal, the question can be legitimately raised as to whether the monetary wage (and the related welfare ratio) that is observed for only a fraction of the total population can be implicitly used as a proxy for the welfare

seventeenth- and eighteenth-century France. Stephenson, 'Working days', finds that London construction workers in the early eighteenth century worked 180 days.

[56] The use of the average family size of four is questioned even in the English context. Humphries, 'Lure of aggregates', argues that four is an unrealistically low estimate. Schneider, 'Real wages', introduces a further adjustment by exploring how family size changes over the life cycle as the children are born, but also as many of them die at a relatively young age, or leave the family. Our data from the national statistical sources, however, are simple averages at a given point in time.

[57] See also Vuletić, 'Koliko duša živi u jednoj kući?'.

[58] There is an additional issue which we cannot address here due to the lack of data. The use of a single wage earner (generally male) assumes both that other members of the household (mostly women and children) do not work outside the home, and, perhaps even more importantly, ignores entirely their work contribution which consists not only of household tasks (which are not included in modern national accounts either) but also work on the estate. The issue has recently been addressed by Humphries, 'Lure of aggregates', and Humphries and Weisdorf, 'Unreal wages?'.

[59] This is similar to the issue faced by international price-level comparisons: baskets cannot be blindly made the same for all regions or countries without losing local representativeness; see Deaton, 'Price indexes'.

of the rural population which does not have much contact with the urban and monetized economy. Technically, the approach is valid if rural and urban markets are well integrated and the observed urban wage reflects the net marginal product of farmers working on their own farms. If the urban wage were less than the return from their own farm (per unit of labour), and if landless peasants were few, we would not observe any supply of workers. If the urban wage were substantially higher than the return on their own farm, we would probably observe a significant inflow of rural labour into industrial occupations. However, in Serbia, as indicated earlier, we observe neither: we see the urban market and the rural sector (it is not even always correct to speak of the 'rural market') interacting at the edges, and being connected as the same people offered their services to work either in construction or on the farm, usually in the town square. Such semi-rural towns were fully integrated with neighbouring rural areas in the social, economic, and political sense. The integration between the two was further helped by the fact that occasional local labour shortages were eased by workers from other parts of the country or by temporary migrants. They came from the more mountainous areas of Serbia (for example, Užice, Zlatibor mountain, or Vlasina), Austria-Hungary (mostly from among the Serbs living there), Bosnia (which until 1878 was under Ottoman control and after that under Austro-Hungarian control), or Bulgaria.[60]

IV. Results: discussion and comparison with other countries

In the base-case scenario for both the construction worker and the ordinary worker we use the assumption of 200 working days per year and six household members, and we add to the reported money wage the estimated value of the daily food allowance provided by the employer. The results (with respect to the subsistence basket) are shown in figure 4.

Two different periods can be observed in the evolution of the welfare ratios for both skilled and unskilled labour: the first period lasting until the late 1880s in which both show an upward trend, and the second period of decline for ordinary workers and stagnation for construction workers. For the unskilled worker the welfare ratio thus ended in 1910 at the same level as in the 1860s. The upward and then downward movement of unskilled wages differs from the two usual estimates of the dynamics of the Serbian economy over the same period: some authors believe that Serbia experienced moderate growth,[61] while Palairet argues that real per capita income declined throughout.[62]

The period of generally increasing wages between 1862 and the late 1880s is composed of two sub-periods of attempted modernization (the latter through significant foreign borrowing) separated by a short war. The first increase in real wages from the mid-1860s to 1870 coincides with the reign of Prince Mihailo Obrenović, an enlightened monarch who was keen to modernize the country. In the economic sphere, the most important measure of his government was the creation of the Directorate of Funds (Uprava fondova) in 1862. The Directorate of Funds was a credit organization with very large initial capital of around 17 million

[60] Based on numerous articles published in *Težak*.
[61] Lampe and Jackson, *Balkan economic history*.
[62] Palairet, *Balkan economies*; Pamuk, 'Economic growth'.

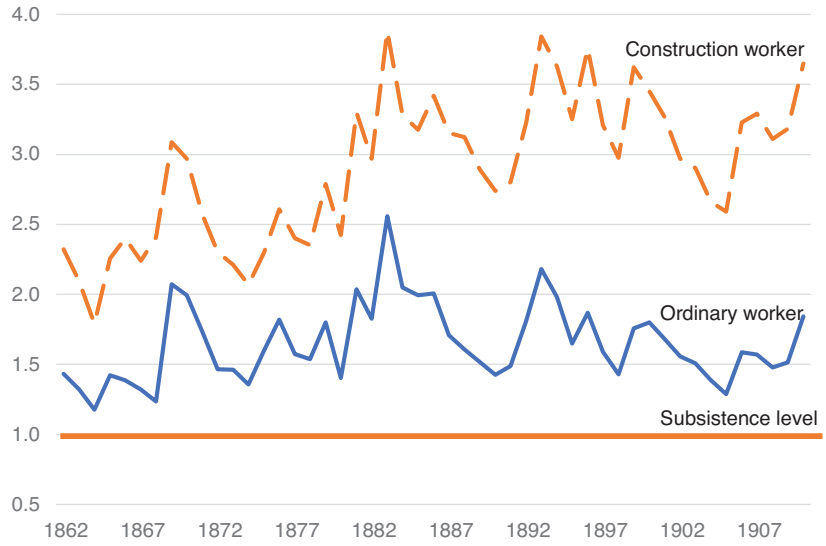

Figure 4. *Welfare ratio (using the subsistence basket), urban Serbia, 1862–1910 [Colour figure can be viewed at wileyonlinelibrary.com]*

Note: Using the assumptions of 200 working days per year and a household size of six, and inclusive of the daily food and wine allowance provided by the employer.
Sources: As for fig. 2.

dinars, which was $1\frac{1}{2}$ times the state budget in that year. It was also seen as a social institution whose role was to help peasants with financial difficulties. The Directorate's loans went principally to large-scale peasants and traders.[63] This encouraged economic activity, increased exports (by 123 per cent from 1861 to 1870, mostly due to the Hungarian demand for corn and wheat),[64] and led to higher wages.[65]

However, in the following years, real wages stagnated because of the Serbian-Turkish Wars of 1876–8 which slowed down economic activity and created difficulties in the countryside, where the military requisitioned food from peasants. When the economy began its recovery from the wars in 1881, wages experienced significant growth (16 per cent for skilled workers, and 21 per cent for unskilled).

The year 1881 saw the start of a relatively short period (lasting until 1888) of considerable foreign borrowing by Serbia. The aim was to jump-start the process of 'modernization'.[66] This brought a lot of foreign money into the country and allowed for the highest wage level recorded during the entire 1862–1910 period.

[63] D. Pavlović, 'Predlog za uređenje težačkog kredita u Srbiji', *Težak*, 30 May 1870.
[64] Komlos, *Habsburg monarchy*, pp. 75–8.
[65] However, loans for agriculture from the Directorate of Funds quickly dried up because the borrowers failed to repay many loans, leading a minister of the economy to lament the fact that the Directorate was 'in a sad state' because its 'capital that is being loaned out … is paid back only with difficulty and in a disorderly fashion'; V. Djordjević, 'Moje ministrovanje', *Otadžbina*, vol. 24 (1890), p. 547. Using the legal system to force repayments or seize assets was out of the question because of the huge number of non-performing loans. Not surprisingly, private banks did not lend to agriculture, considering business too risky because of the inalienable homestead and unclear property rights.
[66] Former finance minister Vladimir Jovanović, *Izabrani spisi*, p. 469, described the plan as follows: 'Since Serbia is not rich in capital, it was thought that the loans made from foreign capital will virtually "rain millions of gold

The period of the long-term decline in the unskilled wage began in 1888, when net foreign borrowing stopped as Serbia experienced difficulties with debt servicing. Fiscal pressure also increased significantly in order to repay foreign loans. Thus the budget revenues almost doubled in 10 years, increasing from 22.9 million dinars in 1880 to 44.9 million in 1890.[67] In real terms, the increase was even greater as our data from both the respectability and subsistence baskets show a mild price deflation. Tax per capita and tax revenues as a share of GDP (even if we do not yet have data for the latter) almost certainly increased. Also, during the 1880s cheap American wheat appeared in the European markets. Serbian wheat now had to compete with American wheat, leading to a stagnation of total exports, as well as worsening terms of trade.

The next local peak of real wages was in 1893–4. The reason for this growth was an abundance of money that the National Bank had issued in previous years (currency in circulation doubled in the previous three years to cover the budget deficit) without a corresponding increase in the price level.

Another important episode, with a negative impact on real wages, was the multi-year trade war (the so-called 'pig war') between Austria-Hungary and Serbia. The war began in 1905 when Austria-Hungary introduced special sanitary controls whose objective was to reduce Serbian exports and exert political pressure on the new Serbian government, which was seen by Vienna as pro-Russian. The result was an 80 per cent decrease in Serbia's exports to Austria-Hungary, a country that was then by far the largest foreign trade partner of Serbia. In fact, no less than 89.8 per cent of total Serbian exports in 1905 went to Austria-Hungary.[68] Serbia tried, and mostly managed, to re-orient its exports to the markets of other countries, such as Germany, Belgium, and France. At the same time, faster growth in industry began through a policy of import substitution, driven by the increase in customs duties on Austro-Hungarian industrial goods which until then were dominant in the Serbian market.

The ordinary worker's welfare ratio was, except for approximately the decade of the 1880s, always between one and two times the subsistence level, with an overall average of 1.65 (figure 4). This means that an unskilled worker's wage was above the level that is just sufficient to cover the elementary needs of himself and his family. The improvement that began in the early 1880s was relatively short-lived and by the end of the century the welfare ratio dropped back to where it was at the beginning of the period. It stayed at that level until 1910 when our data end. Thus the welfare ratio of an ordinary worker did not show any sustained improvement over the half-century.

It is useful to check the extent to which our conclusions regarding the wage level and its evolution are dependent on the assumptions made in the base-case scenario. Table 2 shows the welfare ratios in the first 10 years of the period (1862–71) and in the last 10 years (1901–10) when the number of working days and the value of food received in kind vary. The absolute level of the welfare ratio obviously changes according to the number of days worked, while the shift-change

coins over the population", multiply its production resources, increase revenues, and improve tax and financial strength [of the economy]. In that hope, a number of foreign loans for Serbia have been raised'.

[67] Mijatović, Istorija *državnih finansija Srbije*.

[68] Ministarstvo Finansija, *Statistički godišnjak Kraljevine Srbije za 1907 i 1908*, p. 506.

Table 2. *Unskilled and skilled workers' subsistence welfare ratio under different assumptions*

	1	*2*	*3*	*4*	*5*	*6*
	(Base case)					
Value of food received in kind	*Food components of the subsistence basket* plus *wine from the respectability basket*			*Based on documentary evidence (food and drink = 0.38 dinar)*		
Annual no. of days of work	*180*	*200*	*250*	*180*	*200*	*250*
Unskilled wage						
Average welfare ratio, 1862–71	1.36	1.51	1.89	1.64	1.87	2.28
Average welfare ratio, 1901–10	1.39	1.54	1.93	1.54	1.71	2.14
Improvement of the welfare ratio	+2%	+2%	+2%	−6%	−6%	−6%
Skilled wage						
Average welfare ratio, 1862–71	2.17	2.41	3.02	2.45	2.73	3.41
Average welfare ratio, 1901–10	2.78	3.09	3.86	2.93	3.26	4.07
Improvement of the welfare ratio	+28%	+28%	+28%	+19	+19%	+19%

Sources: Calculated from the official publications listed in n. 42; see section II for further details.

(in the number of days) leaves the relative ratios between the end-period and the beginning-period wages the same (columns 1–3). When we use the price of food and wine as calculated in baskets, the end-period welfare ratio for the unskilled worker is practically the same as at the beginning. When we use the same nominal amount for the in-kind wage, the welfare ratio at the end is some 6 per cent lower than at the beginning—probably, as mentioned earlier, reflecting a bias in favour of the early years (columns 4–6). Our base-case scenario (column 2) yields a relatively low, although not the lowest, welfare ratio compared to the other scenarios. Under the most optimistic scenario when the workyear is assumed to be 250 days and the value of the food allowance is relatively high, the end-point welfare ratio for an ordinary worker is 2.14 (see column 6) rather than 1.54 as in the base-case scenario.

Although the construction worker's welfare ratio moves partly in tandem with that of the ordinary worker, it does show some improvement. At the end of the period, in the base-case scenario, the construction worker's welfare ratio is 3.1 while at the beginning of the period it was 2.4 (see table 2). Under all scenarios, the skilled worker's wage is higher at the end of the period (by between 19 and 28 per cent) than at the beginning. There is thus an increasing gap between the two wages. While until 1890 the ratio between the skilled and unskilled wage was almost fixed at 1.5 to 1, from around 1890 the construction worker's welfare ratio—and thus his real wage—gradually increased and became twice as high as that of an ordinary worker.[69] This can be seen in table 2 (base-case scenario) by calculating the ratio between skilled and unskilled labour at the end of the period (3.09/1.54 = 2) and at the beginning (2.41/1.51 = 1.6).

Why did the wages of construction workers rise compared to the wages of unskilled workers? This was probably related to significant increases in construction activities throughout the second half of the nineteenth century, the growth of cities, new state offices and military buildings, and infrastructural investments, including

[69] The same lack of real wage growth for unskilled labour and the increase in the skilled wage between the 1860s and the 1910s is reported for Istanbul by Özmucur and Pamuk, 'Real wages', p. 301, tab. 1, and p. 306, fig. 1. While the unskilled wage there shows some fluctuations, its decennial 1900–10 level was lower than in 1850–9. The wage of skilled workers, however, displayed a constant increase.

Table 3. *Unskilled and skilled workers' welfare ratio based on the respectability basket*

Average welfare ratio	*Unskilled wage*	*Skilled wage*
Average welfare ratio, 1862–71	0.55	0.88
Average welfare ratio, 1901–10	0.44	0.88
Improvement of the welfare ratio	−20%	0%

Sources: As for tab. 2.

the construction of the first railroad in Serbia (started in 1881 and completed in 1884). It probably also reflects a slow increase in more skilled workers which, as argued earlier, characterized the Serbian economy throughout the nineteenth century.[70]

Table 3 displays the welfare ratios using the respectability basket (shown only for the base-case scenario of 200 working days, and with employer-provided food and wine). The cost of the respectability basket has clearly outstripped the rise in the unskilled wage so that at the end of the period the wage of an ordinary worker was some 20 per cent lower than at the beginning, while the wage of a construction worker was the same as at the beginning. We can thus propose the following stylized facts. First, the unskilled wage moved with the subsistence basket and stayed at the level of about 1.5 to 1.6 times the subsistence basket (using the base-case assumptions). Second, the skilled wage premium (in relation to the unskilled wage) increased from about 1.5 to 2, but that increase just maintained the purchasing power of the skilled wage in terms of the respectability basket. Third, the implication is not only that the cost of the respectability basket rose much more than the cost of the subsistence basket, but that the two wages seemed to have been 'indexed' to different baskets: the wage of an ordinary worker to the subsistence basket, and the wage of a skilled worker to the respectability basket. We are agnostic as to whether this was an accidental development or whether there may be grounds to believe that in slowly developing economies the two different wages (skilled and unskilled) are implicitly indexed to different baskets; in other words, that socially acceptable needs are differentiated depending on the kind of workers in question.

This possible implicit indexing is illustrated in figure 5 where we calculate the welfare ratios of the unskilled worker with respect to subsistence, and the welfare ratio of the skilled wage with respect to the respectability basket. If we index the ordinary worker's wage to the subsistence basket, the coefficient of variation during the entire period is 0.17; if we index the construction worker's wage to the respectability basket, the coefficient of variation is even smaller, at 0.14. So both varied very little if indexed to their putative correct baskets.

We turn next to what can be said about Serbian real wages in the international context and how our results compare with those for other countries. A useful starting point is the perception of Serbia's workers' relative income position among

[70] In that respect Serbia lagged behind similar Balkan countries such as Bulgaria which, moreover, achieved their independence much later. (The latter point is relevant because improved education in continental Europe was often a state-led project with strong nationalist and even militaristic undertones; see, for example, Hobsbawm, *Age of revolution*, and, more specifically for eastern Europe, Gellner, *Nations*.) Around 1900, Bulgaria's literacy rate was just under 30% (see Daskalova, 'Developments', p. 64) while literacy in Serbia was, as mentioned earlier, only 17%.

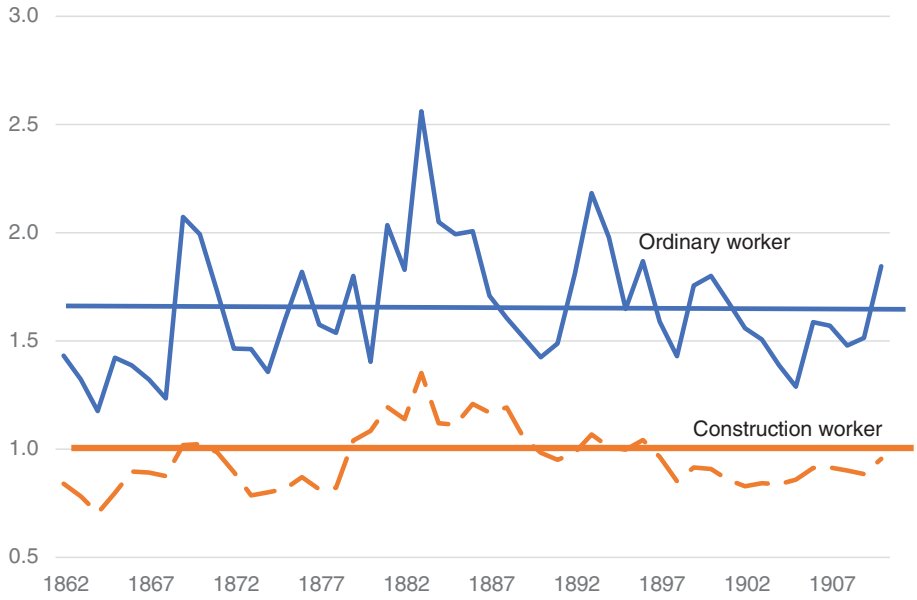

Figure 5. *Ordinary worker's wage in relation to the subsistence basket, and construction worker's wage in relation to the respectability basket*
[Colour figure can be viewed at wileyonlinelibrary.com]
Sources: As for fig. 2.

Serbian writers who had lived in more developed parts of Europe. In his book *Srbija na Istoku* (*Serbia in the East*), published in 1872, Svetozar Marković, a pre-eminent Serbian socialist who studied in Switzerland, wrote the following:

> Earnings of a *zadruga* farmer before the Serbian revolution [in the early 1800s] and probably today as well hardly exceed the earnings of an average worker in Europe. I do not take here the money value of earnings but the quantity of essential goods that each of them can buy with his labour. And today's Serbian peasant, if he does not live worse, surely does not live better than the working people in the West.[71]

We can now, almost 150 years after Marković's speculation, address that question empirically. All data in table 4 except for Serbia come from Allen et al., a study that compares European and Asian real wages.[72] We also contrast Serbian wages under our preferred assumptions and what they would be if Allen's standard assumptions were used. Allen et al. find not only that north European wages were higher than Chinese or Japanese wages around 1860–70, but also that in the next half-century they tended to increase at a greater rate. This is especially clear in the case of Leipzig (and presumably German) real wages which recorded the highest rate of growth. For China, Allen et al. conclude that 'The standard of living in China remained low and on a par with the regions of Europe untouched by the industrial revolution'.[73]

[71] Marković, *Srbija na istoku*, p. 32. Note here Marković's very modern idea of using a basket of 'essential goods' to compare wages internationally.
[72] Allen et al., 'Wages'.
[73] Ibid., p. 27.

Table 4. *Unskilled worker's subsistence-based welfare ratio*

	1860–70	*1900–10*	*Average decennial increase (%)*
London	4.7	8	11
Oxford	4.3	6	7
Amsterdam	2.7	6	17
Leipzig	2.4	6.2	21
Milan	1	2.1	16
Kyoto/Tokyo	1	2	15
Beijing	1	1	0
Urban Serbia (our preferred assumptions)[a]	1.51	1.54	0.5
Urban Serbia (Allen's assumptions)[b]	2.72	2.78	0.5

Notes: a Our assumptions are household size = 6 and 200 days of work per year.
b Allen's assumptions are taken to be household size = 4 and 250 days of work per year.
Sources: Urban Serbia: see section III (base-case scenario with 200 working days). Other cities from Allen et al., 'Wages', tabs. 5 and 6.

This is what we find. The Serbian unskilled real wage, which around 1860–70 was low but higher than the equivalent wages in Milan and Kyoto/Tokyo, remained at that low level for the next 50 years while real wages in Milan and Kyoto/Tokyo doubled or more than doubled. Like the Chinese real wage, the Serbian unskilled real wage registered no growth. The finding of almost no growth obtains whether we use Allen's standard assumptions or the ones that we consider more suitable for the Serbian context. However, the levels are substantially different: with Allen's assumptions, the Serbian unskilled welfare ratio is almost twice as high as with our assumptions. It is driven up in almost equal measure by the assumption of lower household size as by the assumption of the greater number of days of work. The result shows the central role played by the assumptions that one makes.[74]

In any case, the gap between, on the one hand, northern Europe as well as southern Europe (represented here by Milan), and on the other hand, Serbia and probably the rest of south-eastern Europe widened considerably. So if Marković was not far off the mark in his assessment of the position of Serbia's working people in comparison to at least some European countries in the early nineteenth century, he was too optimistic in his assessment of the situation in 1860–70. Serbia's economic backwardness (compared to industrializing nations), which would deepen in the ensuing decades, was already entrenched.

V. Conclusions and some reflection on the methodological issues

In this article, we have applied to pre-First World War Serbia the approach pioneered by Allen, and adopted by many other writers, to the measurement of historical real wages and real incomes. To adjust Allen's methodology for the contemporary circumstances of Serbia, we have used three modifications: in the total wage, we have included its non-cash component; we have argued that the average number of days worked annually was 200 rather than 250; and we

[74] A recent paper by Losa and Zarauz, 'Spanish subsistence', makes a similar point by abandoning some of the canonical assumptions and showing how this results in a different dating of the divergence between Spain and north-western Europe.

have used the average household size of six members rather than four. These departures from the 'canonic' literature are important not only for this study, but more generally.

The inclusion of the non-cash component of wage is not controversial. In principle this should always be done, provided of course the relevant information is available.

The number of days of work and the average household size, however, raise the issue of what the methodology we use is really intended to achieve. Welfare ratios serve as proxies for the welfare not only of workers, but of the entire population. If we were interested in the welfare of workers, there would be no need to include the cost of the family consumption basket; for a worker alone, the cost of his or her basket would have been sufficient. For this reason, we believe that in principle, studies should use countries' average household sizes and not automatically adopt the average west European household size of four. Similarly, using a country-specific number of days of work yields more accurate results than the use of the west European average (which is indeed quite contested for western Europe as well). If people do not work much and have many family members, their real per capita income will be lower than in the opposite case (even if their own real wage per unit of effort may not be). Real cross-country comparability is achieved by using country-specific (that is, different) assumptions, and not by using pre-determined assumptions regarding the demographic structure, hours of work, or any other relevant parameter.

In addition, one should also include the monetary contribution as well as the imputed value of goods and services produced by other members of the households (which we were unable to do here due to the lack of data). All of these adjustments imply that the purpose of the welfare ratios is to proxy the standard of living of a population, not the real wage of a worker.

The results obtained using this modified methodology suggest that Serbia, and probably most of south-eastern Europe, diverged from western Europe's standard of living during the second half of the nineteenth century and the first decade of the twentieth century. Taking London as a comparator, the ratio between the welfare ratio in London and that in urban Serbia widened from about 3 to 1 in the 1860s to more than 5 to 1 just prior to the First World War. These results are not surprising in the light of what we know from other sources regarding the slow or even non-existent growth of agricultural Balkan economies in the nineteenth century. In fact, our data show that the welfare ratio of unskilled workers was the same in the first decade of the twentieth century as it was at the beginning of the period (the 1860s). However, the welfare ratio of skilled construction workers was 20 to 30 per cent higher at the end than at the beginning of the period, which does reflect some modest progress. (In terms of the respectability basket, however, it was unchanged.)

We also noted that the ordinary worker's wage seemed to move more closely with the cost of the subsistence basket, while the construction (skilled) worker's wage seemed to vary with the cost of the respectability basket. This has led us to hypothesize that—perhaps driven by custom—the wages of the two kinds of workers were implicitly 'indexed' to different baskets which represented what was socially regarded as 'due' to ordinary and more qualified workers respectively. This may not be the case in a growing economy that in principle should pull everybody up, but may be present in stagnant economies like Serbia's in the nineteenth century. It

is a hypothesis, we believe, worth investigating in other contexts, and, if true, could imply that wage-setting rules, especially in traditional societies, might follow not only economic criteria, but also broader ones of 'social norms'.

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Footnote references

Allen, R. C., 'The great divergence in European wages and prices from the middle ages to the First World War', *Explorations in Economic History*, 38 (2001), pp. 411–47.
Allen, R. C., 'Real wages in Europe and Asia: a first look at the long-term patterns', in R. C. Allen, T. Bengtsson, and M. Dribe, eds, *Living standards in the past: new perspectives on well-being in Asia and Europe* (Oxford, 2005), pp. 111–30.
Allen, R. C., 'Wages, prices, and living standards in China, Japan, and Europe, 1738–1925', Univ. of Oxford, Department of Economics, economics ser. working papers, 316 (2007).
Allen, R. C., *The British industrial revolution in global perspective* (Cambridge, 2009).
Allen, R. C., 'Absolute poverty: when necessity displaces desire', *American Economic Review*, 107 (2017), pp. 3690–721.
Allen, R. C., 'Spinning their wheels: a reply to Jane Humphries and Benjamin Schneider', Univ. of Oxford discussion papers in economic and social history, 166 (2018).
Allen, R. C., 'Real wages once more: a response to Judy Stephenson', *Economic History Review*, 72 (2019), pp. 738–54.
Allen R. C., Bassino, J.-P., Ma, D., Moll-Murata, C., and van Zanden, J. L., 'Wages, prices, and living standards in China, 1738–1925: in comparison with Europe, Japan, and India', *Economic History Review*, 64 (2011), pp. 8–36.
Allen, R. C. and Khaustova, E., 'Russian real wages before and after 1917', New York Univ. Abu Dhabi working paper 0003 (2017), https://nyuad.nyu.edu/content/dam/nyuad/academics/divisions/social-science/working-papers/2017/0003.pdf (accessed on 11 Feb. 2020).
Allen, R. C., Murphy, T. E., and Schneider, E. B., 'The colonial origins of the divergence in the Americas: a labor market approach', *Journal of Economic History*, 72 (2012), pp. 863–94.
Allen, R. C. and Weisdorf, J. L., 'Was there an industrious revolution before the industrial revolution? An empirical exercise for England, *c*. 1300–1830', *Economic History Review*, 64 (2011), pp. 715–29.
Antonić, S., 'Demokratija u Srbiji uoči Prvog svetskog rata', *Sociološki pregled*, XLVIII, 4 (2014), pp. 421–58.
Avramovič, M., *Naše seljačko gazdinstvo* (Belgrade, 1928).
Bassino, J.-P. and Ma, D., 'Japanese unskilled wages in international perspective, 1741–1913', in A. J. Field, G. Clark, and W. A. Sundstrom, eds., *Research in economic history*, vol. 23 (Bingley, 2006), pp. 229–49.
Broadberry, S. and Gupta, B., 'The early modern great divergence: wages, prices and economic development in Europe and Asia, 1500–1800', *Economic History Review*, LIX (2006), pp. 2–31.
[Čalić, 2004]Čalić, M.-J., *Socijalna istorija Srbije 1815–1941* (Belgrade, 2004).
Challú, A. E. and Gómez-Galvarriato, A., 'Mexico's real wages in the age of the great divergence, 1730–1930', *Revista de Historia Económica*, 33 (2015), pp. 83–122.
Cvrček, T., 'Wages, prices, and living standards in the Habsburg Empire, 1827–1910', *Journal of Economic History*, 73 (2013), pp. 1–37.
Daskalova, K., 'Developments in Bulgarian education: from the Ottoman Empire to the nation-state and beyond, 1800–1940s', *Espacio, Tiempo y Educación*, 4, 1 (2017), pp. 1–29.
Deaton, A., 'Price indexes, inequality, and the measurement of world poverty', *American Economic Review*, 100, 1 (2010), pp. 5–34.
Federico, G., Nuvalori, A., and Vasta, M., 'The origins of the Italian regional divide: evidence from real wages, 1861–1913', *Journal of Economic History*, 79 (2019), pp. 63–98.
Gellner, E., *Nations and nationalism* (1983).
Hobsbawm, E., *The age of revolution, 1789–1848* (New York, 1996).
Humphries, J., 'The lure of aggregates and the pitfalls of the patriarchal perspective: a critique of the high-wage economy interpretation of the British industrial revolution', Univ. of Oxford discussion papers in economic and social history, 91 (2011).
Humphries, J. and Weisdorf, J. L., 'Unreal wages? A new empirical foundation for the study of living standards and economic growth in England, 1260–1860', Univ. of Oxford discussion papers in economic and social history, 147 (2016).
Ilić, M., *Pismenost u Srbiji u 19. veku* (Belgrade, 2003).
Jovanović, V., *Izabrani spisi* (Belgrade, 2011).
Komlos, J., *The Habsburg monarchy as a customs union* (Princeton, NJ, 1983).
Lampe, R. and Jackson, M. R., *Balkan economic history, 1550–1950: from imperial borderlands to developing nations* (Bloomington, Ind., 1982).

Lewis, W. A., 'Economic development with unlimited supplies of labour', *Manchester School*, 22 (1954), pp. 139–91.
Li, B. and van Zanden, J. L., 'Before the great divergence? Comparing the Yangzi delta and the Netherlands at the beginning of the nineteenth century', *Journal of Economic History*, 72 (2012), pp. 956–89.
Lindert, P. H. and Williamson, J. G., 'American incomes before and after the Revolution', National Bureau of Economic Research working paper 17211 (2014), http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.352.5624&rep=rep1&type=pdf (accessed 18 Dec. 2018).
Losa, E. L. and Zarauz, S. P., 'Spanish subsistence wages and the little divergence in Europe, 1500–1800', *European Review of Economic History* (forthcoming).
Maddison, A., *Contours of the world economy 1–2030 AD: essays in macro-economic history* (Oxford, 2007).
Marković, S., *Srbija na istoku* (Belgrade, 2016).
Mijatović, B., 'Zaštita seljaka od finansijskih rizika u nekadašnjoj Srbiji', *Glas SANU*, Odeljenje društvenih nauka, 27 (1995), pp. 113–40.
Mijatović, B., *Istorija državnih finansije Srbije 1876–1895* (Belgrade, 2020).
[Özmucur and Pamuk, 2002]Özmucur, S. and Pamuk, Ş., 'Real wages and standards of living in the Ottoman Empire, 1489–1914', *Journal of Economic History*, 62 (2002), pp. 293–321.
Palairet, M., 'Real wages and earnings in long-run decline: Serbia and Yugoslavia since 1862', in P. Scholliers and V. Zamagni, eds., *Labour's reward: real wages and economic change in 19th- and 20th-century Europe* (Aldershot, 1995), pp. 76–86.
Palairet, M., *The Balkan economies c. 1800–1914: evolution without development* (Cambridge, 1997).
Pamuk, Ş., 'Urban real wages around the eastern Mediterranean in comparative perspective, 1100–2000', in A. J. Field, G. Clark, and W. A. Sundstrom, eds., *Research in Economic History*, vol. 23 (Bingley, 2006), pp. 209–28.
Pamuk, Ş., 'The Black Death and the origins of the "great divergence" across Europe, 1300–1600', *European Review of Economic History*, 11 (2007), pp. 289–317.
Pamuk, Ş., *A monetary history of the Ottoman Empire* (Cambridge, 2009).
Pamuk, Ş., 'Economic growth in southeastern Europe and eastern Mediterranean, 1820–1914', *Economic Alternatives*, 3 (2016), pp. 249–64.
Persson, K. G. and Sharp, P., *An economic history of Europe: knowledge, institutions and growth, 600 to the present* (2nd edn., Cambridge, 2015).
Ridolfi, L., 'Six centuries of real wages in France from Louis IX to Napoleon III: 1250–1860', *Journal of Economic History*, 79 (2019), pp. 589–627.
Schneider, E., 'Real wages and the family: adjusting real wages to changing demography in pre-modern England', Univ. of Oxford discussion papers in economic and social history, 99 (2012).
Stephenson, J. Z., '"Real" wages? Contractors, workers, and pay in London building trades, 1650–1800', *Economic History Review*, 71 (2018), pp. 106–32.
Stephenson, J. Z., 'Working days in a London construction team in the eighteenth century: evidence from St Paul's Cathedral', *Economic History Review*, 73 (2020), pp. 409–30.
Trgovčević, L., 'Obrazovanje kao činilac modernizacije u Srbiji u XIX veku', in L. Perović, ed., *Srbija u modernizacijskim procesima 20. veka* (Belgrade, 1994), pp. 217–32.
Vučo, N., *Položaj seljaštva I: Eksproprijacija zemlje u XIX veku* (Belgrade, 1955).
de Vries, J., *The industrious devolution: consumer behavior and the household economy, 1650 to the present* (Cambridge, 2008).
Vuletić, A., 'Koliko duša živi u jednoj kući? Broj članova seoskog domaćinstva u Srbiji 1834–1910', *Srpske studije*, 3 (2012), pp. 219–44.
Zebić, M., *La Serbie agricole et sa démocratie* (Paris, 1917).
de Zwart, P. and van Zanden, J. L., 'Labor, wages, and living standards in Java, 1680–1914', *European Review of Economic History*, 19 (2015), pp. 215–34.

Official publications

1. Ministarstvo Finansija, *Državopis*, vols. I–XIX (Belgrade, 1863–92).
2. Ministarstvo Finansija, *Statistički godišnjak Kraljevine Srbije*, vols. 1893–1910 (Belgrade, 1895–1912).
3. Ministarstvo Finansija, *Statistika cena poljoprivrednih proizvoda*, vols. 1890–1905 (Belgrade, 1897–1906).
4. *Popis stanovništva u Kraljevini Srbiji 31. decembra 1900*, vol. 2 (Belgrade, 1905).

Appendix I: Respectability and subsistence baskets, and wages, 1862–1910 (in nominal dinars)

			Wages without employer-provided food and drinks (dinars per day; annual average)	
Year	*Cost of the respectability basket (dinars per annum)*	*Cost of the subsistence basket (dinars per annum)*	*Ordinary (unskilled) worker*	*Skilled construction worker*
1862	104	38	1.11	1.87
1863	95	35	0.97	1.59
1864	107	42	1.00	1.58
1865	100	35	1.04	1.71
1866	96	36	1.03	1.85
1867	107	43	1.16	2.05
1868	111	40	1.03	2.11
1869	100	33	1.47	2.23
1870	107	37	1.56	2.38
1871	113	43	1.58	2.41
1872	126	49	1.49	2.42
1873	137	49	1.45	2.28
1874	131	50	1.40	2.22
1875	123	44	1.45	2.14
1876	111	37	1.42	2.09
1877	126	43	1.38	2.18
1878	128	45	1.40	2.23
1879	102	38	1.44	2.30
1880	114	51	1.47	2.65
1881	109	39	1.69	2.82
1882	117	45	1.72	2.88
1883	107	37	2.05	3.17
1884	132	45	1.95	3.21
1885	109	38	1.61	2.64
1886	106	37	1.58	2.78
1887	106	39	1.39	2.68
1888	100	38	1.28	2.60
1889	104	38	1.19	2.38
1890	110	39	1.15	2.33
1891	129	44	1.32	2.63
1892	125	38	1.42	2.65
1893	122	34	1.52	2.80
1894	132	37	1.46	2.84
1895	129	39	1.28	2.72
1896	114	32	1.19	2.55
1897	127	38	1.21	2.61
1898	143	41	1.13	2.57
1899	132	33	1.15	2.56
1900	130	34	1.22	2.50
1901	138	36	1.19	2.50
1902	144	40	1.21	2.50
1903	146	42	1.24	2.59
1904	149	47	1.24	2.60
1905	151	50	1.23	2.71
1906	146	41	1.29	2.83
1907	152	42	1.30	2.95
1908	158	46	1.33	3.03
1909	170	47	1.40	3.19
1910	166	43	1.61	3.39
Average	*123*	*41*	*1.35*	*2.50*

Sources: Calculated from the official publications listed in n. 42; see section II for further details.

Supporting information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Supporting Figure S1
Supporting Figure S2
Supporting Figure S3
Supporting Figure S4
Supporting Figure S5