Functional income distribution in Uruguay (1870 – 1908). A methodological note

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Resumen

En este documento se describe la metodología y las fuentes utilizadas para la estimación de series de distribución funcional del ingreso de Uruguay, de frecuencia anual, para el período 1870-1908. El ingreso se descompone, en términos funcionales, en salarios (remuneración de asalariados), rentas de la tierra, ingresos mixtos capital-trabajo y beneficios. Dada la extensión del período objeto de estudio y la diversidad de fuentes disponibles, se describe en primer lugar la metodología utilizada para estimar cada componente del ingreso en 1880-1908 y, en segundo lugar, el método de estimación para 1870-1880. Los resultados obtenidos indican que los principales cambios en la distribución funcional durante el período se observan, como era de esperarse, entre beneficios y salarios. Hasta el estallido de la crisis de 1890, se aprecia una clara tendencia al alza en la participación de los beneficios en el ingreso, cuya contrapartida fue una tendencia decreciente en la participación de los salarios. Tras la crisis, las tendencias se revirtieron. A partir de 1894, ambas participaciones muestran una tendencia estable hasta el final del periodo, aunque se observan variaciones significativas año a año. Las rentas de la tierra representaron el 20% del ingreso hasta 1883; en 1884-1887 su participación en el ingreso se redujo, tras lo cual se estabilizó alrededor de 16% hasta fines del período de análisis. Los ingresos mixtos mantuvieron una participación en el ingreso relativamente estable en torno a 7%.

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Abstract

We describe the methodology and sources used to estimate the functional income distribution series in Uruguay for the period prior to the 1908 census. We show the estimates and splices made to obtain continuous series with an annual frequency for the period 1870−1908. Income is decomposed, in functional terms, into wages, land rents, mixed capital-labour incomes, and profits. Given the extended time frame and diversity of available sources, we first describe the methodology used to estimate each income component in 1880-1908, followed by the estimation method for 1870-1880. The results indicate that the main changes in the distribution are observed between profits and wages. Until the outbreak of the crisis in 1890, there was a clear upward trend in the profit share, the counterpart of which was a decline in the wage share. After the crisis, the trends reversed. From 1894 onwards, both shares showed a stable trend until the end of the period, although significant variations in their levels can be observed. Land revenue represented 20% of income until 1883; its share of income fell in 1884-1887, after which it stabilised at approximately 16%. Mixed incomes maintained a relatively stable income share of around 7%.

1. Introduction

This paper describes the methodology and sources used to estimate continuous series of functional income distribution for Uruguay, from 1870 to 1908. For this purpose, income is decomposed, in functional terms, into wages, mixed capital-labour income (self-employed income), profits, and land rents. This decomposition of income is consistent with the methodology of the System of National Accounts (BROU, 1965). The Compensation of Employees (wages, W) includes nominal wages and social security contributions paid by employers. The Gross Operating Surplus (*GOS*) includes payments to produced capital (profits, P), payments to the productive factor land (rents, R), and income of the self-employed (mixed capital–labour income, S). The Taxes net of Subsidies were excluded from the analysis; for this, we considered as aggregate income variable the Gross Value Added (GVA) expressed at factor cost. In algebraic terms:

$$GVA_{fc} = GVA_{mp} - (Taxes_{production} - Subsidies_{production})$$

$$GVA_{fc} = W + GOS$$

$$GVA_{fc} = W + P + R + S$$

The estimates presented in this paper are part of a broader project that aims to estimate and analyse the evolution of the functional distribution of income for the period 1870–2019. Broadly speaking, the overall project seeks to deepen the understanding of how the distributional struggle between wages, profits, and land rents affects macroeconomic performance in the long run, analysing the relationship between the functional income distribution and the growth process of Uruguay since the First Globalisation. Therefore, the estimates presented in this study are part of the general project database. Due to the extension of the period 1870 – 2019 and the diversity of estimation strategies and sources used, this paper presents only the estimates for the 19th century, prior to the 1908 population census.[1] For the same reason, a historical analysis of the estimated series was not developed in this paper.

The rest of the paper is organised by income component. The auxiliary series constructed for the estimation of each income component is described in the corresponding period-variable section. The remainder of this paper is organised as follows. First, we present the estimation methodology for 1880 – 1908. In this section, we present the income series, the methodology used to estimate the wage share, the method by which the land rent share and the capital-labour mixed income share were estimated, and the deduction of the profit share. Second, we present an approximation to the functional income distribution for 1870 – 1880. The methodological differences applied in each period justify presenting the estimations in different sections. Third, the main results obtained are briefly summarised. Finally, concluding remarks are presented.

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[1] The methodology and sources used for the estimates corresponding to 1908 – 2019 are presented in Marmissolle and Willebald (2023).

2. Estimation methodology: 1880 - 1908

In this section, we detail the methodology followed for the estimation of each variable over the period 1880 – 1908. We organise the section by income component, and the auxiliary series used to estimate each income component are described in the corresponding subsection.

To analyse the income distribution between wages, profits, land rents, and mixed income, it is necessary to remove from the total income generated in the year by the economy, that part which corresponds to taxes and subsidies on production. This implies, in other words, not considering GVA at market prices as the denominator of the different income components, but measuring it at the factor cost. The difference between one expression of GVA and the other is, precisely, the taxes net of subsidies over production.

In Uruguay there have been important efforts to estimate historical series of the main macroeconomic aggregates (Bertino & Tajam, 1999; Bértola et al., 1998; Bértola, 2016; Bonino et al., 2012; Román & Willebald, 2021). The most recent historical research, Román & Willebald (2021), presents GVA estimates at both market prices and factor costs for 1870 – 2015; this series[2] is our total income.

The remainder of this section is organised as follows.

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- 2.4. Profits

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[2] Updated by the authors incorporating the GVA estimates for the services provided by Román et al. (2023).

2.1. Wages

To estimate the wage share in 1880-1908, we first estimated the employee compensation for each economic activity. Employee compensation was estimated for (1) agriculture; (2) manufacturing industry,[3] construction, and utilities (electricity, gas, and water supply -EGW-), (3) wholesale and retail trade, (4) services and (5) public administration. At the time, the employer's contributions (of 2%) corresponded only to the "Caja Civil", which operated since 1904 and only with the workers of the Public Administration (Garcia Repetto, 2011). The overall amount of employer's contributions was therefore estimated as 2% of the total wages paid year by year (in 1904 – 1908) by the Public Administration.

2.1.1. Public Administration

The payroll of public administration servants was estimated from the employee compensation data reported by Martínez Rodríguez (2019) and Siniscalchi & Willebald (2018), and from the sectoral Gross Value Added (GVA) estimated by Marmissolle & Willebald (2021).

The employee compensation reported by Martínez Rodríguez (2019) covers 1880 – 1890 and 1893, while Siniscalchi and Willebald (2018) report the data for 1908. To obtain a continuous series from 1880 to 1908, these benchmarks were interpolated using the evolution of the sectoral GVA estimated by Marmissolle and Willebald (2021) (by definition, mainly composed of wages[4]) and rescaled to adjust for differences between the evolution of the series and the levels of the benchmark years. The employee compensation series obtained for public administration was then used to aggregate the other sectors to obtain the wage share of the economy.

2.1.2. Agriculture

Agriculture is the only economic sector for which there are previous analyses of the functional income distribution during the First Globalisation; among these, stand out the studies of Álvarez (2015) and Willebald (2015).

The estimates made for this sector in the present paper use the results of Willebald (2015) as the main reference. These results were updated based on the new data on GVA of the sector and the whole economy (Román & Willebald, 2021), and a continuous series was constructed based on them for the period 1880–1908 using the newly available sources presented in Narbondo (2022).

The sectoral employee compensation and wage share for 1874, 1883, 1893, and 1903 were taken from Willebald (2015). The wage share in the sectoral GVA for 1908 was estimated by replicating the study of Siniscalchi and Willebald (2018) using census data.

The sectoral wage share of the mentioned benchmarks was interpolated using the evolution of the ratio of the Agricultural Wage Mass Index (WMI) to agricultural GVA and adjusting for differences in series levels between the years of each interpolation. The

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[3] Following Siniscalchi & Willebald (2017, 2018), the extractive industries were included within industrial manufacturing.

[4] It is to be highlighted that the historical data show that wages represented 94.8% of the total GVA of the Public Administration at the end of the 19th century (Marmissolle & Willebald, 2021).

GVA of the sector was obtained from Román and Willebald (2021). The WMI was constructed from an occupation index and a sectoral average wage index (AWI), based on 1908. The occupation index was constructed based on data from Narbondo (2022). We counted the evolution of the number of permanent employees in livestock (labourers and foremen, domestic service, and administrators) and seasonal workers (shearers, other shearing workers), and permanent employees in crops (vineyard workers, other wage earners, farmers).[5] The AWI was constructed as a Paasche Index, with variable weights, considering the evolution of the annual wage of permanent agricultural workers (taking as a weight the number of permanent workers mentioned above) and the daily wage of seasonal agricultural workers (taking as a weight the number of shearers and other shearing workers).

Once the continuous series of sectoral wage shares was estimated for 1880-1908, the wage mass was calculated by multiplying it by the agricultural GVA. The wage mass series obtained for the sector was then used to aggregate the other sectors to obtain the total wage share of income.

2.1.3. Manufacturing Industry, Construction, Utilities, Wholesale and retail trade, and Services

For these economic sectors, the estimates are based on two main sources: the 1908 census data and the *Patentes de Giro* (PdG) records. Employee compensation for each economic sector in 1908 was retropolated to 1880 using a WMI. This index was constructed from an occupation level indicator and an AWI for each industry. The procedure followed for these estimates is described below, starting with a brief analysis and discussion of the main source used.

2.1.3.1. Using Patentes de Giro to estimate the evolution of the number of workers and employees

The *Patente de Giro* was a tax imposed on industrial and service activities in the national territory. Because of the way in which the information on the collection of the tax was compiled, it is possible to elaborate a database of annual frequency, with disaggregation both at the regional level and by activity and sub-sector. It is important to highlight that, given the characteristics of this administrative record, its use allows focusing only on the secondary and tertiary sectors of the economy (Presa, 2022).

Based on the hypothesis that the estimated tax revenue for each province (*departamento*, Uruguayan regions) and each economic activity is a good approximation of the regional performance of the secondary and tertiary sectors of the economy, Presa (2022) built a database that combines the number of establishments and workers subject to the PdG with the amount of tax to be paid by them. A substantial contribution of Presa (2022) is precisely the incorporation of the amount paid by taxpayers to approximate the level of activity of the sectors subject to the tax, compared to previous research that has used PdGs as a source to approximate a measure of economic activity (Acevedo, 1934a; Castro Scavone & Willebald, 2022; Millot & Bertino, 1991, 1996; Vaillant, 1873).

Given that our interest is to proxy the evolution of the level of occupation and not the evolution of the level of activity, we only consider the number of PdGs (industrial, trade,

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[5] To calculate the occupation index, we took the weights of permanent and seasonal workers of 1908, reported by Marmissolle & Willebald (2023).

and service establishments and self-employed workers) and not the amounts paid by them. Furthermore, given the source's problems in covering some regions in the countryside (especially those located on the border with Brazil), data with departmental disaggregation were not used for this study.

<u>*2.1.3.2. What were the Patentes de Giro?*</u>

Possibly, the most detailed analysis of PdG in Uruguay and its analysis as a valuable source for historical research is Presa (2022). As the author points out, the PdG were a tax on the economic activity that was operative from the creation of the Estado Oriental del Uruguay (in the 1830s) to 1961.[6] The object to be taxed by the PdG (and its amount) was established year-by-year through a set of laws and decrees.[7] The entities taxed by the PdG were very diverse; the tax was imposed both on the activity of large trade and productive establishments and on the activity of self-employed entrepreneurs (Presa, 2022).

The tax, paid *ex ante*, authorised the firm to operate during the year of the license. As an administrative register and official source, data on PdG were always reported in a relatively structured and consistent way throughout the years (Presa, 2022). Regarding its "weaknesses" as a source and some possible criticisms that can be made of it, it is worth noting firstly that it is probable that the PdG has problems when measuring the size of the establishments, and therefore their activity; in this respect, it is important to note that in this research the amounts paid, and therefore the size of the establishments, are not taken into account, so that the possible underestimation of this size is not a problem. Another possible criticism of the source, as with any tax source, relates to the degree of tax evasion. Although the level of evasion is unknown, it is unlikely to be a relevant issue for the purposes of this study.[8] As Presa points out, there are two reasons for thinking so: *"The first is that (the payment of "Patentes de giro") did not represent an onerous amount to make too much effort to evade the tax (in whole or in part). The second is that the laws provided several coercive mechanisms to avoid evasion: displaying the patents in a visible place, instructing inspectors each year, and leaving their control in hands of provincial authorities."* (Presa, 2022, p. 44; own translation).

Firms that operated in more than one economic sector paid taxes on their two most important activities (although in different amounts). During the study period, taxable establishments were classified into one of (around) 17 fixed categories. Assignment to each category was guided by the scale of the economic activity of the firm and by political purposes (i.e. the government's intention to promote or discourage certain activities) (Presa, 2022). It should be noted that for the purposes of this research, this categorisation is not relevant, given that only the number of PdGs related to each economic sector is counted and not the amounts paid by each establishment or self-employed worker.

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[6] In facts, this type of taxes was implemented in other countries of Latin America also.

[7] *"Estas leyes establecían las actividades gravadas en "categorías" o "clases" según el monto que deberían pagar, así como las actividades que estaban exoneradas del impuesto. Estas categorías establecían pagos por establecimiento que van desde $5 a $2000. También se promulgaban leyes o decretos reglamentando la forma de recaudación del impuesto y las penalizaciones en caso de su evasión."* (Presa, 2022, p. 43).

[8] Even if evasion were high, it should not be a relevant problem for using this source in the way that it is used in this paper –as a factor of annual employment variation– as long as the propensity to evade has remained more or less constant in the period.

Some arguments could be developed to justify the use of PdG to estimate the series of Employment and Wage Earners for 1880 – 1908. These arguments can be divided into: (1) historical arguments and (basically qualitative) analysis of sources of that period, and (2) literature supporting the assumption of the absence of relevant labour-saving technical change during the period.

2.1.3.3.1. Historical arguments and analysis of sources of the period

There are relatively good agricultural statistics and good statistics for public administration; both sectors have been extensively covered by economic historiography, and there are estimates of employment levels for both. For both sectors, the procedure for estimating functional income distribution was relatively simple.

For other economic activities (Manufacturing Industry, Construction, Utilities, Wholesale and retail trade, and Services), there are no sources that allow direct estimates of functional distribution or employment levels. The only National Census prior to 1908 (corresponding to 1860 [9]) does not report information that allows for a direct approximation of employment levels. Among the provincial censuses carried out at the end of the 19th century, only that of Montevideo (1889) stands out for its relatively high-quality information. Countryside censuses, which do not cover all departments, report scarce information with significant problems.

Regarding the analyses and comments on the economic situation in contemporary sources, it is interesting to note that it is not uncommon to find that when referring to economic activity, they mention information from the PdG. One aspect that has already been pointed out, but should be emphasised again, is that the PdG tax the activity of industrial, trade, and service establishments, but they also tax the activity of those who have liberal professions and self-employed workers (generally in low-skilled occupations). In other words, it is true that the number of PdGs reflects the evolution of the number of establishments, but also, within this number, the source incorporates the evolution of a large number of non-wage-earning workers. This, by itself, does not validate the source, because it is likely that at the time, the data referring to PdG were used because of the lack of more adequate information on occupations; however, it does give more confidence to the hypothesis that the evolution of the PdG reflects the evolution of the levels of occupation. The following are some references of contemporaneous analysts and qualified informants that enable this interpretation:

- Escardó (1873) points out that "_En Montevideo hay lo siguiente: abogados con estudio, abogados extranjeros, escribanías, procuradores, abaniquerias, afinador de pianos, albañiles, alfarerias, almacenes de zuelas, mercachifles, músicos ambulantes, pulperías_" (Escardó, 1873, p. 24)[10]. It is clear from this list that the author is simultaneously talking about firms and trades/professions. The information reported by the source was extracted from the records of _Patentes de Giro_.

- An official publication by Lopez Lomba (1884) (the Principal Officer of the Ministry of Justice, Religion and Public Education) talks about professions,

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[9] Published as "Registro Estadístico de la República Oriental del Uruguay, 1860". Imprenta de la República. Montevideo.

[10] The names of occupations and establishments mentioned in this quote were taken randomly from a much more exhaustive list presented in the original publication.

industries, and trade establishments, with information extracted from the PdG. Like the previous publication, it considers both businesses and trades/professions, including *almacenes, boticas, mercachifles, colchonerías, doradores, vidrieros ambulantes, pedicuros, pinturerías, agrimensores, dentistas,* and *talabarterías,* among many others. And it refers to the evolution of the economic activity with the same source, discussing the influence of the protectionist laws and opportunities for immigrants (Lopez Lomba, 1984, p. 14).

• The information reported by the 1860 National Census (Ministerio de Hacienda, 1863) does not allow an analysis similar to that possible with the 1908 census, but it still provides extremely useful information and, as it is an official publication and census data, it is a relevant source for any research on mid-19th century. The census, when referring to economic activity and employment, considers information on PdG, and using this data it reports the "*Número de establecimientos de comercio, artes, oficios y otras industrias que existían en el espresado* (sic) *departamento en el año de 1860*" (Ministerio de Hacienda, 1863, pp. 95–104). As the other two publications mentioned, the 1860 census reports together trade, industrial and service establishments, and trades/professions.

Considering the evolution of the number of business licences issued, which jointly reflects the evolution of the number of establishments, professions, and self-employed workers, to estimate the evolution of occupations, implicitly implies the assumption that the size of establishments (in terms of employees) remains constant (or relatively fixed) over the period under consideration.

The proposed process for estimating occupation series assumes a high correlation between the number of establishments and self-employed workers (total and in each sector) that pay PdG and the number of workers (total and in each sector). This assumption requires supposing that the number of establishments is a good reflection of the level of employment over the period, which in turn implies that there were no relevant changes in the employment-firm size ratio over the period. The underlying assumption is that the size of establishments (in terms of workers) on average remains relatively constant over the period. The available sources do not allow for a good test of this assumption, although some of them report supporting data. A good example is Acevedo (1934b), who compared the Montevideo censuses of 1889 and 1908. In this respect, he points out that "*Comparing the Montevideo censuses of 1889 and 1908, the Department of Statistics observed the following progress: the number of establishments rose from 5152 to 7037. Wages from $7,274,357 to $11,807,827. Employees from 30,050 to 41,233.*" (Acevedo, 1934b, p. 477; own translation). It should be noted that these figures are "*very low according to the general impression of the surveyed industrial and commercial entrepreneurs*" (Acevedo, 1934b, p. 476; own translation). From Acevedo (1934b), it can be deduced that the number of employed per establishment in Montevideo was 5.83 in 1889 and 5.85 in 1908. In other words, in the only case in which a reasonable comparison can be made between establishments and employed in different years of the period of analysis, the assumption of a "relatively stable size" is fulfilled.

As Montevideo constituted the most dynamic regional economy of the period (Martinez-Galarraga et al., 2020), the absence of labour-saving technical change in the capital would allow to assume a similar behaviour in the provinces of the rest of the country.

The number of workers in production and trade establishments (i.e. their size in terms of employees), and mainly its evolution over time, is directly linked to the technology of production and the change in this technology.[11] Assuming that an indicator that reflects the evolution of establishments (and of self-employed workers and professionals), such as the PdG, is a good indicator of the evolution of occupations, implies the assumption that labour-saving technical change in the economic sectors considered (all except the agricultural sector and public administration) was not significant during this period.

There are no productivity estimates to corroborate this assumption (in fact, one of the contributions of our estimates is the possibility of calculating labour productivity indicators), but we can mention previous research that has analysed technical change in the period, which indirectly supports the assumption of a "relatively stable size" of productive establishments.

First, we must point out that the period 1880 – 1908 was framed within the process known as First Globalisation, in which, as a result of the Second Industrial Revolution, northwestern Europe, the United States, and Japan rapidly industrialised and extended their commercial, financial, and political relations with the rest of the world (Hobsbawm, 2013). In this scenario, Uruguay was included in the growing world trade as an exporter of primary products (mainly livestock) (Bertino et al., 2001; Oddone, 2010). The capitalism of the First Globalisation, whose dynamism was led by the newly industrialised powers, was characterised by an extensive process of accumulation and growth (Boyer, 2016; Ormaechea et al., 2021), based mainly on the accumulation of productive factors and not on labour-saving technological change (which only several decades later would become the main source of growth in developed capitalist economies). In other words, the most dynamic economies of the period did not experience a particularly relevant process of growth intensive in labour-saving technological change. Uruguay, which experienced a strong growth led by its agro-export sector (Oddone, 2010), could not have had a growth more intensive in labour-saving technical change than the leading countries, except in the most dynamic sector of its economy.

Finally, it is worth noting that looking at the productivity per employed person estimated in this work, it is observed that there was no clear trend in its evolution from 1880 to 1908.

2.1.3.4. Estimation Methodology

As mentioned previously, the estimates made for these economic sectors are based on the 1908 census data and PdG records. The 1908 compensation of employees for each industry estimated by Marmissolle & Willebald (2023) was retropolated to 1880 using a Wage Mass Index (WMI) based on 1908, constructed from an indicator of the level of employment and a Wage Index (AWI) for each industry.

We worked at the economic sector level using the disaggregation of the International Standard Industrial Classification (ISIC) second revision (1985), adapted for Uruguay. Each activity reported in the PdG records (a total of 126,470 records, of which 122,609

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[11] From a neoclassical perspective, labour demand in a firm depends on market wages and the marginal labour productivity; this productivity, in turn, depends on the available production technology (Mas-Colell et al., 1995).

correspond to 1880 – 1908) was assigned to a code following that classification, and then aggregated into the nine main categories presented in ISIC, allowing the addition of data from new sources to the Presa (2022) database. [12] The nine main categories are: agriculture (ISIC1); mining (ISIC2); manufacturing (ISIC3); electricity, gas, and water supply (ISIC4); construction (ISIC5); trade, restaurants, and hotels (ISIC6); transport, storage, and communications (ISIC7); financial services (ISIC8); and personal services (ISIC9). The following aggregate sectors were considered for estimating employee compensation from the PdG:

- ISIC3+ISIC4+ISIC5 = Secondary activities

- ISIC6 = Trade

- ISIC7+ISIC8+ISIC9 = Services

Employees' compensation for 1908 (Marmissolle & Willebald, 2023) for each aggregate sector was retropolated using the WMI constructed for each case. These WMI, based on 1908, were obtained as the product of an Average Wage Index and an Occupation Index (calculated based on the change in the number of wage earners), estimated for each aggregate sector. The procedure for each estimate is described below.

2.1.3.4.1. Evolution of the number of employees and wage-earning workers

Based on the 1908 social table estimated by Siniscalchi and Willebald (2017, 2018) from census data, the number of employees and wage earners in 1880–1908 was estimated using a two-stage retropolation process. First, the trend of each series was estimated, and second, a cyclical component of annual variation was added to that trend, extracted from the PdG series corresponding to each set of industries.

To estimate the trend in the number of employees and wage earners in each set of industries, we used the evolution of the urban Working Age Population (WAP) (given that ISIC3 to ISIC9 activities are essentially urban).

To estimate the urban WAP, we calculated the rate of urbanisation in 1860 and 1908 based on the respective censuses and estimates/corrections made by Rial & Klaczko (1981) and Rial (1983). The percentage of urban population obtained, corresponding to the population residing in urban centres with more than 2,000 inhabitants, was linearly interpolated between these years.

The age structure of the population is taken from the projections of Pellegrino (s/f), who estimated the population structure by age for 1887, 1892, 1897, 1902, 1907, and 1912. WAP was defined as the population aged 15 years and over, and the percentage of this group in the population was calculated based on the data reported by Pellegrino (s/f). Between benchmarks, it was linearly interpolated; from 1887 backward, it was retropolated using a moving average of order two. WAP was estimated by applying the percentage of those over 15 years of age to the total population.

Finally, the urbanisation rate for each year was applied to the estimated WAP series to obtain the urban WAP. The evolution of this variable was applied to the employees and wage earners in each set of sectors in 1908 (census data), in order to obtain the trend series of the number of workers.

To the estimated trend of wage earners for each set of sectors, we apply an annual

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[12] The Presa (2022) database covers 1884 – 1890 and 1893 – 1899. We add data for 1858 – 1860, 1880, 1881, 1900 – 1903, 1905 – 1908, and partial data for 1868, 1869, 1872 y 1873.

cyclical movement. This cyclical movement was obtained from the annual variation rate of the number of PdGs in each set of sectors (secondary activities, wholesale and retail trade, and services).

In other words, the series of employed and wage earners were obtained using a two-step procedure. First, the 1908 census data were retropolated using the trend series (WAP). Then, on this trend series, we applied the variation given by the annual evolution of the PdG.[13]

2.1.3.4.2. Sectoral Average Wage Index (AWI)

The wages reported by the sources were always expressed in current pesos and monthly. To report wages on a monthly basis in those cases where they are expressed in daily wages, it was assumed that labourers per day work, on average, 240 daily wages per year [14] (20 daily wages per month). In cases where sources report wages in other currencies than the Uruguayan peso (Italian lira, French francs, Spanish pesetas), these were converted to Uruguayan pesos using the exchange rates from the Federico and Tena Junguito (2018) database.

Although the general procedure used to estimate each sectoral AWI is essentially the same, the different availability of sources required to adapt the methodology in each case. The procedure followed for each set of industries is detailed below.

2.1.3.4.2.1. Trade

The AWI used for the estimation of the WMI is an average of two preliminary estimates; both use the same wage benchmarks but differ in the series used to interpolate the reference years. In one case, we used the AWI of Bértola et al. (1999),[15] which reflects the evolution of the wages of unskilled workers; in the other, we used the AWI of Marmissolle & Willebald (2021),[16] which reflects the evolution of wages paid by public administration. In both cases, interpolations were made by applying the evolution of the mentioned movement series (and adjusting for level differences) to the same benchmarks: 1884, 1885, 1888, 1889, 1896, 1907.

For the construction of the AWI of the wholesale and retail trade sector in the referenced benchmarks, we considered the evolution of the wages of those crafts/professions that could be clearly assigned to the ISIC6 sector, for which the

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[13] In the period 1880 - 1908 there are some years for which there were no disaggregated records of PdG (1882, 1883, 1891, 1892, 1902-1904). To complete the series, the missing data were linearly interpolated.

[14] This number of yearly working days corresponds to the average number of rainless days for the years 1907 - 1909 (close to the 1908 census), reported in the 1909 Statistical Yearbook. It should be noted that the number of monthly/yearly working days is only used to convert wages to the same units (monthly wages), and therefore does not affect the calculated wage indexes. Evidently, the month intensity of daily workers differs (much) by economic activity, but there is not available information on this issue in Uruguay. For this reason, we consider the amount of worked days assuming that the occupations correspond to tasks that are done outdoors and depend on weather conditions to be carried out.

[15] This general AWI, published with year-base 1913 (and rescaled for these estimates), reflects the evolution of the wages of unskilled workers. Depending on the year, its calculation included the wages of unskilled workers in the public sector (taken from data of the Budget laws), the wages of unskilled workers in construction (taken from the archive of a multinational firm —Liebig Extract of Meat Company— installed in the littoral of the country, in the frontier with Argentina), and a Labour Cost Index of the Construction sector. For further details, see Bértola et al. (1999).

[16] This AWI reflects the evolution of civil servants' nominal compensation. It is derived as an implicit AWI from the GVA series of Public Administration, the number of civil servants and government-contracted workers, and the total payroll paid.

sources reviewed reported consistent data in all benchmarks. We considered the wages of watch and clock assemblers (*relojeros),* cooks *(cocineros)* (men[17]), confectionery makers *(confiteros)* and waiters *(mozos de café).* The sources from which the wages of these crafts/professions in the years mentioned are taken are: Statistical Yearbooks of 1888 and 1889, Gran Guía Estadística Sudamericana, Unión Industrial (1907), D' Elía and Miraldi (1984).

2.1.3.4.2.2. Secondary activities

In this set, the AWI estimated for the ISIC3 and ISIC5 sectors were grouped together. The AWI obtained is the weighted average of the AWI for both sectors; the weighting used corresponds to the weight of each sector in the structure of the PdG in 1884. The AWI of both sectors were taken based on 1884 (then rescaled to splice with 1908); the weighting of 1884 was taken because by the second half of the decade it is possible that the structure of activities reflected in the PdGs had been distorted by the speculative boom prior to the crisis of 1890 (Presa, 2022). The benchmarks used for both sectors were 1885, 1888, 1889, 1896, and 1907. The time series used to interpolate between these years and 1908, in both sectors, was the AWI Bértola et al. (1999). To retropolate the benchmark from 1885 to 1880, we used the evolution of the AWI of the state's economic function, calculated by Martínez-Rodríguez (2019).[18]

To create the AWI benchmarks in the ISIC5 sector, we considered the evolution of wages of those trades/professions that could be clearly assigned to the sector and for which the sources reviewed report consistent data in all the benchmarks. The wages of bricklayers (*albañiles oficiales*), building labourers (*albañiles peones*), and building painters (*pintores)* were considered. The sources from which we took the wages of these trades/professions in the years mentioned are: Statistical Yearbooks of 1888 and 1889, Gran Guía Estadística Sudamericana, Unión Industrial (1907), Acevedo (1934a), and Zubillaga & Balbis (1985).

In the ISIC3 sector, to create the AWI benchmarks, we considered the evolution of wages for those occupations/professions that could be clearly assigned to the sector and for which the sources reviewed report consistent data in all the benchmarks. We considered the wages of chairs manufacturers *(fabricantes de sillas),* bread bakers *(panaderos),* pastry makers *(pasteleros),* kneaders *(amasadores),* brewers *(cerveceros),* cigarette makers *(cigarreros),* dressmakers *(modistas),* garment hand sewer *(costureras),* tailors *(sastres),* hat makers *(sombreros),* saddler and harness makers *(talabarteros),* saddlers *(lomilleros),* shoe-makers *(zapateros),* shoe-makers and shoe repairers *(alpargateros),* carpenters *(carpinteros),* sawyers *(aserradores),* basket makers *(cesteros),* barrel makers *(toneleros),* brush makers *(escoberos),* cabinetmakers *(ebanistas),* bookbinders *(encuadernadores),* printing machine operators *(maquinistas de imprenta),* type-setters *(tipografos),* firework workers *(pirotécnicos),* potter and porcelain workers *(alfareros),* brick and tile moulder *(ladrilleros),* marble setters *(marmolistas),* sheet-metal workers *(caldereros),* steam boiler workers *(foguistas),*

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[17] The wages of male cooks, associated in the sources with employees in restaurant kitchens, were assigned to ISIC6. The wages of female cooks, associated in the sources with domestic service activities, were assigned to ISIC9.

[18] The AWI of the economic function of the state reflects the evolution of wages paid to state workers whose tasks are linked to the following activities: public work, communication and transport, tax collection, customs, statistics and measures, boards, and markets. The sources used for its calculation are the budget laws, tax revenue records, and the *Reseña del Crédito Público.* For more information, see Martínez-Rodríguez's (2019) statistical appendix.

blacksmiths *(herreros oficiales),* blacksmith labourers *(herreros peones),* mechanics *(mecánicos),* turners *(torneros),* metal platers and coaters *(doradores),* tinsmiths *(hojalateros),* carriage makers *(fabricantes de carruaje - oficiales)*, and carriage manufacturing labourers *(fabricantes de carruaje - obreros)*. For 1885, an adjusted estimate was taken, in which we excluded some wages reported by the sources that were extremely high in that year. [19] The sources from which the wages for these trades/professions in the above-mentioned benchmarks were taken are: Statistical Yearbooks of 1888 and 1889, Gran Guía Estadística Sudamericana, Bordoni (1885), Acevedo (1934a), Unión Industrial (1907), D' Elía & Miraldi (1984), Zubillaga & Balbis (1985).

2.1.3.4.2.3. Services

This set includes the AWI estimated for the ISIC7, ISIC8, and ISIC9 sectors. The AWI obtained is the weighted average of the AWI for each sector; the weighting used corresponds to the weight of each sector in the structure of the PdG in 1884. The AWI were taken based on 1884 (then rescaled to splice with 1908); the 1884 weighting was taken for the same reason explained previously; that is, in the second half of the decade, it is possible that the structure of activities reflected in the PdG had been altered by the speculative boom prior to the crisis of 1890 (Presa, 2022). The benchmarks used for these sectors, time series used, and sources of information differed in each case. This is detailed below.

The benchmarks used for the ISIC7 sector were 1888, 1889, 1896, and 1907. The time series used to interpolate between these years and 1908 was the AWI of the civil servants of Marmissolle and Willebald (2021). To retropolate the benchmark from 1888 to 1880, we used the evolution of the AWI of the Services subsector for which most data were available (ISIC9, described below). In the ISIC7 sector, to create the AWI benchmarks, we considered the evolution of wages for those trades/professions that could be clearly assigned to the sector and for which the sources reviewed report consistent data in all the benchmarks. The wages of animal-drawn vehicle drivers *(cocheros),* drivers *(conductores),* stagecoach drivers *(mayorales de diligencias),* ship's engine room workers (first, second and third category) *(maquinistas de a bordo - primera, segunda* and *tercera categoría*), sailors *(marineros),* petty officers *(contramaestres),* warehouse workers *(carretilleros)* and charcoal burners *(carboneros)* were considered. The sources from which we took the wages of these trades/professions in the mentioned years are: Statistical Yearbooks of 1888 and 1889, Gran Guía Estadística Sudamericana, Acevedo (1934a), D'Elía and Miraldi (1984).

The benchmarks used for the ISIC8 sector were 1888, 1889, and 1896. The time series used to interpolate between these years and 1908 was the AWI of civil servants from Marmissolle and Willebald (2021). To retropolate the benchmark from 1888 to 1880, we used the evolution of the AWI of the Services subsector for which most data were available (ISIC9, described below). In the ISIC8 sector, to create the AWI benchmarks, we considered the evolution of wages for the only trade/profession that could be clearly assigned to the sector and for which the sources reviewed report consistent data in all the benchmarks: bookkeepers *(tenedores de libros)*. The sources from which the wages of these trades/professions in the years mentioned are taken are: Statistical Yearbooks of 1888 and 1889, Gran Guía Estadística Sudamericana, D'Elía & Miraldi (1984).

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[19] These outliers correspond to: *sastres*, *talabarteros*, *zapateros* and *hojalateros*.

The benchmarks used for ISIC9 were 1884, 1885, 1888, 1889, 1896, and 1907. The time series used to interpolate between these years and 1908 was the Marmissolle and Willebald (2021) AWI for civil servants. To retropolate the benchmark from 1884 to 1880, we used the evolution of the AWI of the state's economic function (Martínez Rodríguez, 2019). For the AWI of 1884 and 1885, an adjusted estimate was taken, in which some wages reported by sources that were extremely high for those years were excluded from the database.[20] In the ISIC9 sector, to create the AWI benchmarks, we considered the evolution of wages of those trades/professions that could be clearly assigned to the sector and for which the sources reviewed report consistent data in all the benchmarks. The wages considered were those of schoolteachers (*maestros de escuela),* locksmiths *(cerrajeros),* mattress repairer *(colchoneros),* glaziers *(vidrieros),* garment dyers *(tintoreros),* cooks *(women) (cocineras),* gardeners *(jardineros),* lackeys *(lacayos),* nursemaids *(niñeras),* wet nurses *(nodrizas),* janitors *(porteros),* domestic servants *(women) (sirvientas),* domestic servants *(men) (sirvientes),* hairdressers *(peluqueros),* and photographers *(fotógrafos).* The sources from which the wages of these trades/professions in the years mentioned are taken are: Statistical Yearbooks of 1888 and 1889, Gran Guía Estadística Sudamericana, Lopez Lomba (1884), Pesce (1885), Bordoni (1885), Acevedo (1934a), D'Elía & Miraldi (1984).

2.2. Land Rents

Land rents, although not reported by the National Accounts System, have been analysed in several previous studies. Among them, the contributions of Álvarez and Willebald (2013), Willebald (2015), Oyhantçabal and Sanguinetti (2017), Siniscalchi and Willebald (2017, 2018), De Rosa et al. (2018), Oyhantçabal (2019), and Marmissolle & Willebald (2023) stand out. To build a complete series of land rent share in income for 1880 – 1908, we take the aforementioned estimates, update the shares with the new GVA time series available (Román & Willebald, 2021), and replicate their methodologies to cover the entire period of analysis.

To estimate the land rent share of income in 1874 – 1912, the estimates made by Willebald (2015) were corrected and updated using newly available information derived from Siniscalchi and Willebald (2017, 2018), De Rosa et al. (2018), Román & Willebald (2021) and Narbondo (2022). The land revenue estimates are based on the benchmark years of Willebald (2015), 1874, 1883, 1893, 1893, 1903, and 1912, and on the evolution of rental prices for hectares of land used for crop and livestock production. The land rent share of income was calculated by taking Román & Willebald's (2021) sectoral GVA as the denominator and land revenue as the numerator.

In the benchmark years, to obtain the land revenues, we took the ratio between land revenues[21] and the sectoral Gross Operating Surplus (GES) reported in the statistical appendix of Willebald (2015) and multiplied it by the sectoral GES obtained by subtracting from the GVA estimated by Román and Willebald (2021) the Compensation of Employees calculated for the sector (methodology described above). A new benchmark was constructed in 1908, and land revenues were calculated as a percentage of agricultural GVA in that year using the profit/land revenue structure of the sector's GES,

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[20] We excluded, for these years, the wages of cooks, nursemaids, and hairdressers.
[21] These estimates are based on data about land prices by province (*departamento*), rental prices, livestock area and area destined to cultives. The sources of these data are Jacob (1969), Balbis (1995), Moraes (2001) and Bertino et al. (2005). For more details, see Appendix I of Willebald (2015).

which arises from the interpolation of the 1903 and 1912 structures estimated by Willebald (2015). Land revenues were then estimated by applying this ratio to the sectoral GES, obtained after subtracting the compensation of employees from the sectoral GVA (Román & Willebald, 2021) expressed at factor cost.

The benchmarks were linked using the product of sectoral land rent share and agricultural GVA. In the benchmark years, this share is obtained by dividing land revenues by the GVA of the sector. Between these years, the estimated agricultural GES was multiplied by the ratio of land revenue to the agricultural GES. This ratio, in turn, was estimated by taking the data described in this section and interpolating it using the evolution of the rental price series (smoothed by taking the moving average of order four), and differences in level between the continuous series and the benchmarks were rescaled by smoothing them in each year. The series of rental prices of agricultural land was calculated based on 1908 and was obtained using data on rental prices of livestock and crop land estimated by Narbondo (2022) based on data from Balbis (1995), Millot & Bertino (1996), and Castro Scavone et al. (2013).

2.3. Self-employed income (mixed income)

According to the System of National Accounts, self-employed workers are those who own (individually or jointly) the firms in which they work. People who work in unincorporated companies are classified as self-employed if they do not have salaried employment as their main source of income. Following Marmissolle and Willebald (2023), in this paper we consider capital-labour mixed income as a proxy of the income obtained by the self-employed, since it is not possible to decompose it into income corresponding to labour activity (wages) and income corresponding to the return on capital (profits).

Although there are very few previous studies on the estimation of mixed-income share, there are good references for estimating this share in recent years; in particular, the estimates made by the Central Bank of Uruguay[22] (BCU) and those of De Rosa et al. (2018) are noteworthy.

Unlike wage and land rent share, the estimate of the self-employed share of income was not a central objective of our research. However, having an idea of the magnitude of this income share is highly functional to the rest of the estimates made; it allows, for example, international comparisons of functional income distribution.[23] Many estimates of the income distribution between wages and profits, depending on the periods of analysis and the sources used in each country, include the mixed income within wages, within profits, as a third component or decompose it between wages and profits by taking some methodological decisions. Therefore, estimating this share is a valuable tool for international comparisons of other income components. Moreover, decomposing mixed income from profit share provides an accurate view of the evolution of the latter. In recent decades, for example, the evolution of "pure" profit share is opposite to that of "gross" profit share (i.e. if mixed income is included) (Marmissolle & Willebald, 2023). Given the (instrumental) objective for which the estimation was carried out, it is important to point out that, although the aim was to obtain a series with the highest accuracy possible given the available sources, the series obtained should be understood

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[22] Primary distribution of income account (1997-2005), and GDP by the income method (2012 and 2017).
[23] See Bengtsson and Waldenstrom's (2018) analysis of how mixed income is considered in the economic history literature and the relevance of having an approximation of the magnitude of this income share.

as a first approximation to mixed incomes in the period.

The methodology employed consists of retropolating the estimates of Marmissolle & Willebald (2023), which covers the period 1908 – 2019, using a procedure analogous to that described for the estimation of the wage share. Broadly speaking, in that paper, the methodology consisted of using the few official estimates made by the Central Bank of Uruguay and interpolating and retropolating them using data from "reliable" sources: Continuous Household Surveys, Population Censuses, other censuses, tax records and indicators of the evolution of wages. The methodology used for the estimation of the period 1880 – 1908 is detailed below.

The Marmissolle & Willebald (2023) estimates of mixed income (and its share of income) for 1908 were retropolated using a methodology analogous to that used for the wage share. For this, we used the evolution of the ratio between the Value Index of self-employment income (IVs, estimated by us) and the current GVA estimated by Román and Willebald (2021). The IVs was estimated by multiplying the Average Income Index by a Volume Index (VI) of self-employed. Since there are no available sources that report the income of the self-employed and its evolution, the Average Income Index used is the AWI implicit in the historical compensation of employee estimates (methodology described above). We took the evolution of the estimated wage mass (converted to index, WMI) and subtracted from it the evolution of the series of employed workers in all the estimated economic sectors (converted to index, VI).

The VI of the self-employed reflects the evolution of the number of self-employed workers, which was estimated as the sum of the self-employed workers in each economic sector. Given the characteristics of the activity in Public Administration, in the Communications sector and in Electricity, Gas and Water Supply, the number of own-account (self-employed) workers in these sectors was assumed to be zero. From 1880 to 1908, following the methodology used for wage share estimation, the remaining sectors of activity were aggregated into four main sectors: the agricultural sector, secondary sector, wholesale and retail trade, and services. Broadly speaking, the estimate for the agricultural sector was made using information on farm size, whereas the self-employed in the other sectors were estimated based on the PdG. The methodology used for each sector is described in detail below.

2.3.1. Self-employed workers: Agriculture

The number of mixed-income earners in the agricultural sector, defined as farm owners who work in the sector, was estimated by replicating Marmissolle and Willebald (2023)'s methodology. It was obtained by multiplying the series of non-wage labourers by the proportion of landholdings of less than 50 hectares out of the total number of agricultural landholdings. Given the characteristics of agricultural production in this period, it is understood that landholdings of up to 50 ha are smallholdings in which economic exploitation is not predominantly capitalist.[24] Therefore, it is reasonable to assume that they do not have the capacity to hire employees, or in other words, that they would be self-employed.

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[24] Millot & Bertino (1996) consider that landholdings of up to 100 hectares are smallholdings, and that only larger ones could have capitalist elements (Millot & Bertino, 1996, tbl. III.3). Barrán & Nahum (1977), using information from the 1908 census, point out that landholdings of less than 10 hectares are "minimum property" and landholdings of 10 to 100 hectares are "small agricultural property". They consider as rural middle class (farmers and cattle breeders) only owners of land larger than 100 hectares.

The series of non-wage labourers was obtained by subtracting the wage earners from the estimated series of agricultural labourers (methodology described above).

We have data on the size of farms (and, therefore, on the number of farms of less than 50 hectares in relation to the total number of farms) for 1900 and 1908. For the latter year, we have the number of agricultural establishments by farm size, as reported by the agricultural census and surveyed by Castro Scavone (2023). For 1900 we have the estimates of Castro Scavone (2023), although the "small" farms were aggregated in the category of 0 to 100 hectares; to obtain the number of farms of 50 hectares, we applied to the data of 0 to 100 hectares the ratio between the category '0 to 50' and '0 to 100' from the agricultural census of 1908. Once these two benchmarks were obtained, the data between them were obtained by linear interpolation. To retropolate from 1900 to 1880, we used a moving average of order four. The latter implies the assumption that there was no significant change in the proportion of small farms (less than 50 hectares) in relation to the total number of farms during these 20 years.

2.3.2. Self-employed workers: Secondary sector, Trade and Services

The estimation of the number of mixed-income earners for each of these aggregate sectors is based on the census data for 1908. The classification used is, as in the estimation of wage earners (detailed above): secondary sector (ISIC3, ISIC4 and ISIC5 sectors), wholesale and retail trade (ISIC6 sector) and services (ISIC7, ISIC8 and ISIC9 sectors). As in the case of total employed workers, the 1908 census data were retropolated using a two-stage procedure based on a trend estimate (corresponding to the trend of employed workers in each aggregate sector) and on a cyclical component (given by the evolution of the PdGs).

The trend applied for each set of sectors is the same as that detailed in the wage share estimation, which reflects the evolution of urban WAP.

The cyclical adjustments derived from the PdG evolution were built from the self-employed workers reported in the 1908 census for each aggregate sector, retropolated to 1880, using the evolution of the PdG corresponding to self-employed workers. We have information on the PdG for self-employed workers in each sector for the period 1880-1908, except for 1880, 1882, 1883, 1891, 1892, and 1904. These years without data were completed using linear interpolation, and, in the case of 1880, we applied the evolution of 1880-1881 observed for the total number of PdGs in each sector. The patents considered for the estimation of mixed-income earners were those classified in the database as referring to unipersonal firms, as they appeared in sources corresponding to trade, liberal professions, and itinerant work.

2.4. Profits

As this is the last income share and as is usual in most of the literature, the profit share was calculated as a residual over the entire period 1880 – 1908.

3. Estimation Methodology: 1870 – 1880

Once the 1880 – 1908 estimates were made, the analysis period was extended to 1870. The estimates for the decade of 1870 are described in this third section, separated from the estimates for 1880–1908, given that for this first decade, there is extremely scarce available data; therefore, we had to use an estimation strategy different from that mentioned for 1880–1908.

The procedure for estimating each income share is described below.

3.1. Wage Share and Self-employed Share: 1870 - 1880

Both income shares were calculated by dividing each type of income estimated for each year by the GVA at factor cost. As for the period 1880 - 1908, we used the GVA at factor cost series of Román and Willebald (2021). Owing to the lack of wage data for the 1870s, the compensation of employees and self-employed income were estimated by retropolating the estimate for 1880 using the evolution of employment and the Average Wage Index of Bértola et al. (1999).

Employment was estimated by activity sector, as follows:

- Public Administration: we consider the number of civil servants used by Marmissolle and Willebald (2021) to estimate the sectoral GVA. This series is that estimated in Azar et al. (2009), with updates by the authors.

- Agricultural sector: in the previous section, we described the procedure used for the estimate of employment, which, taking as a starting point the estimates of Willebald (2015), covered from 1874 onwards. To retropolate the data from 1874 to 1870, we used the evolution of the series of workers in the crop and livestock sectors reported by Narbondo (2022).

- Secondary sector (ISIC 3, 4, and 5), Wholesale and retail trade (ISIC 6), and Services (ISIC 7, 8, and 9): employment in each sector estimated for 1880 was retropolated to 1870 using the evolution of the urban Working Age Population (WAP) (given that ISIC3 to ISIC9 activities are essentially urban). The methodology used to estimate urban WAP is described in Section 2.1.3.4.1.

3.2. Land rent Share: 1870 - 1874

Section 2.2.1. describes the procedure followed for the estimation of land rent share from 1874 onwards, which basically consisted of adjusting and updating the Willebald (2015) estimates using newly available information derived from the studies of Siniscalchi and Willebald (2017, 2018), De Rosa et al. (2018), Román and Willebald (2021) and Narbondo (2022).

To move the estimate made for 1874 to 1870, we took the land revenues corresponding to 1874 and retropolated it using the evolution of the sectoral GVA estimated by Román and Willebald (2021), thus, assuming that the dynamics of the land rent coincides with the dynamic of the total sector).

3.4. Profit Share: 1870 - 1880

Since this is the last income share and as is usual in most of the literature (and as was done for the rest of the period of analysis), the profit share was calculated as a residual.

4. Main Results

The main results are presented in this section.[25] As mentioned at the beginning, the aim of this paper is not to discuss the results but to present how we made the estimates,

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[25] Estimated series are available upon request.

so we do not present any analysis of the series obtained, except for a very brief description of how the functional distribution evolved from 1870 to 1908.

First, it should be noted that to estimate the functional income distribution series, it was necessary to propose estimates for many auxiliary series.

Among the series and databases obtained, it is important to highlight the following.

- Wage Share.
- Employment by economic sector.
- Workers by economic sector.
- Self-employment by the economic sector.
- Average Wage Index, total, and by industry.
- Wage Mass Index.
- Self-employed share.
- Land revenues and land rent share.
- Profit Share.

The results obtained in the estimates of the income distribution between wages, mixed income, profits, and land rents for the period 1870 – 1908 are shown in Figure 1.

Figure 1.
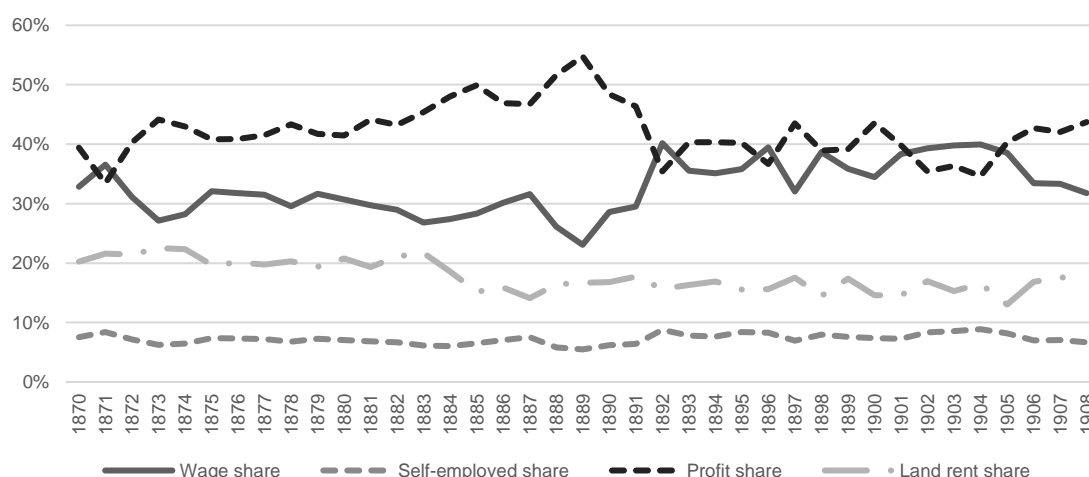Functional income distribution, 1870 – 1908
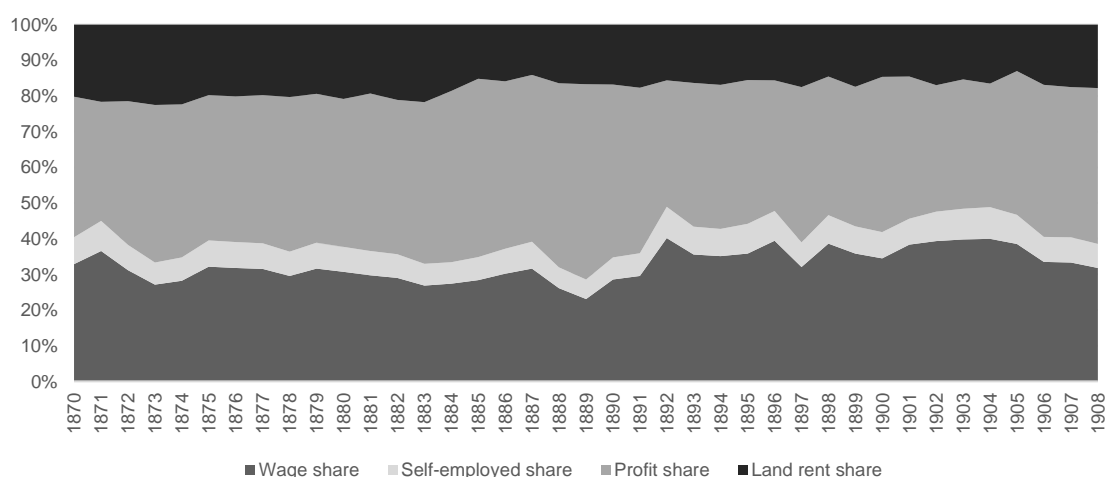
Source: our own data.

On the surface, it can be observed that there is a certain stability in the functional income distribution during the period; however, as can be seen in Figure 2, this "stability" hides significant changes in the different income shares.

Mixed incomes maintained a relatively stable income share of around 7%. Land revenue captured 20% of income until 1883; its share of income fell in 1884-1887, after which it stabilised at approximately 16%. The main changes in the distribution are observed between profits and wages. Until the outbreak of the crisis in 1890, there was a clear upward trend in profit share, the counterpart of which was a fall in wage share. After the crisis, the trends reversed. From 1894 onwards, both shares showed a stable trend until the end of the period, although significant variations in their levels can be observed.

Figure 2.
Evolution of the income shares, 1870 – 1908

Source: our own data.

Even if functional income distribution and inequality do not necessarily move "in the same direction" (especially in present-day complex economies), the link between both concepts is clear. Functional distribution is the first step in the process of income distribution in a society. It would then be interesting to compare the ratio between land rents (the income received by the wealthiest sectors of society) and wages (received by the bottom income earners and the largest part of the population). With this ratio, we observe an evolution very similar to that of the Gini Index (Lezama & Willebald, 2020). At least during the first globalisation (1870-1914), functional distribution seems to be a good tool to make more complex analyses of inequality.

Figure 3.
Functional income distribution and inequality during the first globalisation
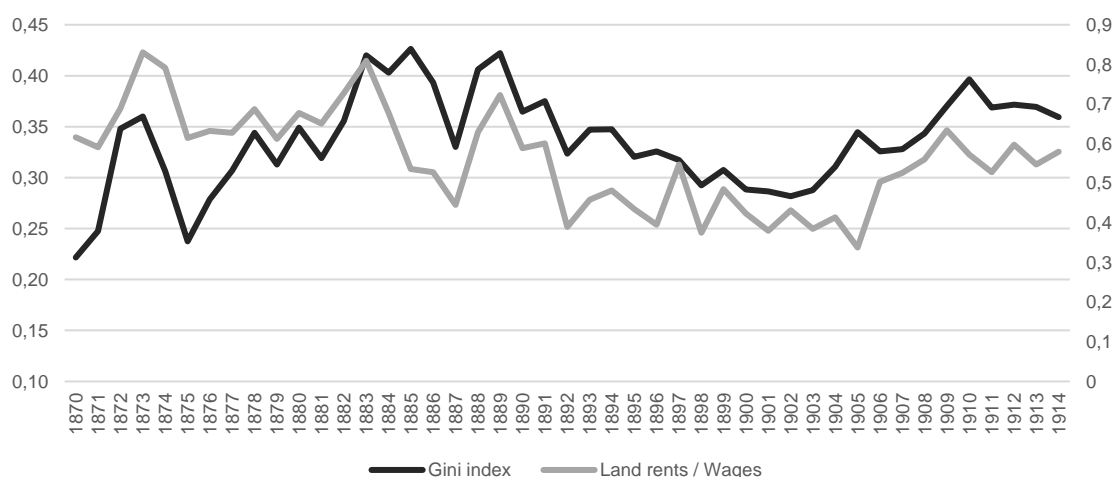
Source: Lezama & Willebald (2020) and our own data.
Left axis: Gini Index. Right axis: Land rent/Wage ratio.

5. Concluding remarks

This paper describes the methodology and sources used to estimate the series of functional income distribution in Uruguay from 1870 to 1908. We show the estimates made to obtain a continuous series with annual frequency for the mentioned period. We

decomposed the income (defined as the GVA at factor cost) in functional terms into wage share (total compensation of employees on GVA), land rent share (total land revenues on GVA), mixed income capital-labour share (self-employed income on GVA), and profit share (profits on GVA).

The period 1870 – 1908 stands out for the scarcity of sources and the novelty of the methodology used. To estimate the wage share in 1880 – 1908, we estimated the compensation of employees for each sector (Agriculture, Secondary Activities - Manufacturing; Electricity, Gas, and Water Supply; Construction-, Wholesale and Retail Trade, Services, and Public Administration). Fewer sources were available for 1870–1880; therefore, the estimate for 1880 was retropolated using occupation and wage data. To estimate land revenues and land rent share, we take the data reported by previous studies, update the estimates using a new GVA time series, and replicate their methodologies to cover the entire period. The estimation of mixed income (and its share of income) made for 1908 (Marmissolle & Willebald, 2023) was retropolated using a methodology analogous to that used for labour share, using the evolution of the ratio between the Value Index of self-employment income (obtained by multiplying the Average Income Index by a Volume Index of the self-employed workers) and the current GVA. Profit share was calculated as the residual value.

The results show that the main changes in the distribution are observed between profits and wages. Until the outbreak of the 1890 crisis, there was a clear upward trend in the profit share, the counterpart of which was a fall in the wage share. After the crisis, the trends reversed. From 1894 onwards, both shares showed a stable trend until the end of the period. Mixed incomes maintained a relatively stable income share of around 7%. Land revenue captured 20% of income until 1883; after a fall in 1884 – 1887, its share of income stabilised at around 16%.

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