

The evolution of private wealth in a peripheral, natural resource-based economy: Uruguay, 1860–1940

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Resumen

En este artículo reconstruimos la riqueza privada y el ingreso nacional de Uruguay para el período 1860–1940. A partir de un marco metodológico en la tradición de Piketty–Zucman, documentamos los niveles y puntos de inflexión de la relación riqueza–ingreso (y), la composición de la riqueza privada (tierras agrícolas, vivienda y otros activos), una descomposición contable que distingue los componentes inducidos por el ahorro (s/y) de las ganancias reales de capital (q), y la evolución de la participación del capital (β) y de la tasa de retorno implícita $r = \beta/q$. El β de Uruguay comienza el período próximo al límite inferior definido por Estados Unidos y Suecia, aumenta después de la década de 1880 hasta acercarse al core europeo y disminuye desde la década de 1910 hasta la de 1930. A lo largo de todo el período, la cartera de activos permanece persistentemente concentrada en la tierra: las tierras agrícolas (incluido el ganado) predominan inicialmente y su participación disminuye solo gradualmente, en contraste con el desplazamiento hacia la vivienda y otros activos observado en las economías centrales. La descomposición muestra que las fases de aumento de la riqueza real están asociadas con efectos positivos de s/y y q , mientras que las contracciones reflejan, principalmente, pérdidas en la valorización del capital. Planteamos, entonces, como hipótesis –y la evidencia es consistente con ello– que el agotamiento del modelo agroexportador fue el principal factor detrás de la caída de β durante el período de entreguerras (cierre de la frontera agraria, limitaciones tecnológicas de las pasturas naturales, shocks externos adversos y liquidación de existencias), mientras que las iniciativas fiscales y regulatorias (por ejemplo, una mayor tributación de las grandes propiedades rurales) constituyeron posibles canales auxiliares. Al ofrecer una reconstrucción transparente centrada en Uruguay, dentro de un contexto comparativo acotado, el artículo amplía la base empírica para comprender la dinámica de largo plazo de la riqueza, los retornos y la desigualdad en economías periféricas intensivas en tierra.

Palabras clave

riqueza, ahorros, ganancias de capital, Uruguay

Clasificación JEL

N36, D31, E01, E21.

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Abstract

We reconstruct long-run private wealth and national income for Uruguay, 1860–1940, by re-estimating Ochoa’s benchmark inventories with harmonized concepts and prices. Using a Piketty–Zucman-style framework, we document levels and turning points of the wealth–income ratio (y/w), the composition of private wealth (agricultural land, housing, other assets), an accounting decomposition separating the saving-induced terms (s/w) from real capital gains (q), and the evolution of the capital share (α) and implied return $r = \alpha / (y/w)$. Uruguay’s y/w begins near the lower envelope traced by the United States and Sweden, rises after the 1880s toward the European core, and declines from the 1910s into the 1930s. Throughout, the portfolio remains persistently land-heavy –agricultural land (including livestock) dominates early on and falls only gradually– contrasting with the shift toward housing and other assets in core economies. The decomposition shows that phases of increase of real wealth are associated with positive s/w and q effects, while contractions reflect mainly capital losses. We hypothesize –and the evidence is consistent with the claim– that the exhaustion of the agro-export model was the primary driver of the interwar decline in y/w (closure of the agrarian frontier, technological limits of natural pastures, adverse external shocks, and stock liquidation), with fiscal and regulatory initiatives (e.g., higher taxation of large landholdings) as plausible auxiliary channels. By providing a transparent, Uruguay-first account within a bounded cross-country context, the paper expands the empirical basis for understanding the long-run dynamics of wealth, returns, and inequality in peripheral, land-intensive economies.

Keywords

wealth, savings, capital gains, Uruguay

JEL Classification

N36, D31, E01, E21.

1. Introduction

Understanding the relative importance of wealth versus income in an economy and the dynamics of their relationship over time remains a critical economic inquiry. Recent decades have evidenced an increasing concentration of wealth, raising concerns about wealth inequality and its impact on the overall distribution of economic resources within society (Alvaredo et al. 2013; Saez and Zucman 2016; Wolff 2017).

Piketty and Zucman (2014) provide a pivotal analysis of wealth–income ratios across industrialized economies throughout the 19th, 20th, and 21st centuries. Their findings illustrate a U-shaped trajectory: ratios declined after World War I (WWI), remained low in the mid-century, and have reverted to pre-WWI levels since the 1970s. This trend suggests a recent rise in the importance of wealth relative to income, in contrast to the post-war period characterized by high growth and low inequality (Piketty 2014). Initially focusing on developed countries, their work now encompasses developing nations, offering a comprehensive study of global wealth dynamics (Alvaredo et al. 2018).

Their model links the stock of capital (K or W) to the flow of income (Y), where the capital includes return-bearing assets such as housing, land, machinery, financial assets, intellectual property, and, historically, human beings during periods of legalized slavery. The relative importance of these assets has evolved, reflecting shifts in the economic landscape. For example, the significance of land assets has diminished (Atkinson and Harrison 1978). This dynamic nature of assets introduces complications to the relationship between wealth and income, which Piketty's research seeks to elucidate.

Growth theory and the Harrod-Domar-Solow formula indicate that at steady state, the capital-output ratio equals the saving rate (s) divided by the economic growth rate (g); thus, $\beta = s/g$. This formula facilitates the definition of a long-term equilibrium β that varies across nations. Piketty (2014) and Piketty and Zucman (2014) trace the evolution of this ratio by examining changes in s and g throughout the 19th, 20th, and 21st centuries in the core economies.

The rise in wealth–income ratios in developed countries from the 1970s onwards is primarily attributed to a recovery effect compensating for early 20th century capital losses (Piketty and Zucman 2014). Evidence from the United States (US), the United Kingdom (UK), Germany, France (Piketty 2014; Piketty and Zucman 2014; Saez and Zucman

2016), and Sweden (Waldenström 2017) over the period 1870–2010 supports this claim. The analysis reveals a U-shaped pattern for the UK, Germany, and France, with contemporary private wealth-national income ratios returning, at the end of the century, to levels between 1870 and 1910. Although less pronounced in the US and Sweden, the trajectory suggests a similar trend. This U-shaped trajectory has significant implications for understanding wealth–income dynamics.

The divergent outcomes of wars seem plausible (continental countries vs. the US and Sweden), likely operating through political rather than military channels. Piketty (2014) states that wartime capital destruction played a minor role in wealth compression. Instead, government regulation and increased taxation of wealth, property, and high incomes were immediate mechanisms to achieve the compression until the late 1960s. Removing these policies from the 1980s onward contributed to an asset price recovery, which has influenced wealth–income ratios to this day.

The 19th century wealth–income ratios of the US and Sweden were similar but for different reasons: while low land prices explain the US evolution, insufficient domestic savings might explain Sweden's (Waldenström 2017). This saving shortfall –Swedes were simply too poor to save– sets Sweden apart from other European countries and invites examination of the historical and institutional factors driving wealth accumulation.

Uruguay, a small open economy specialized in natural resource exploitation and characterized by an early process of economic modernization, provides a promising case for comparative analysis of the first half of the 20th century. Like Sweden, Uruguay industrialized late (Bértola 1991), remained predominantly agrarian until the late 1930s (Moraes 2008), did not participate in either World War, and implemented egalitarian social policies (Filgueira 1995), further enhancing its relevance for this research.

Additionally, Uruguay was part of a group of non-European countries that developed during the expansion of the Atlantic economy from the mid-19th century to the early 20th century (Foreman-Peck 1995), alongside the US, Canada, Argentina, Australia, and New Zealand, collectively known as “settler economies”. These countries, also referred to as “temperate economies” (Lewis 1983), benefited from the Second Industrial Revolution, which brought advancements such as railways, refrigeration, and reduced shipping costs. Their moderate climates and fertile soils made them well-suited for producing wool, meat, wheat, and corn. As a result, these countries experienced rapid economic

expansion, and by the eve of WWI, they had achieved income per capita levels comparable to those of core economies (Willebald 2007).

By 1880, the agrarian frontier was exhausted, and with the enclosure of fields (*alambramiento de los campos*), labor became more abundant and urbanized (Jacob 1969; Barrán and Nahum 1973). By 1910, the export-led paradigm began to show signs of weakness. In the early 1920s, the primary sector's performance declined due to a lack of innovation beyond natural pastures (Moraes 2008). Over the subsequent decades, performance deteriorated further due to international trade conditions –Great Depression, World War II (WWII)–, while the overall economy fluctuated significantly due to internal and external factors.¹

The state played a central role in Uruguay's long-term development. In the second decade of the 20th century, extensive social and public welfare programs were introduced as part of a broader nation-state-building and modernization process known as *Batllismo*. The social base of this political movement was the urban middle class, primarily concentrated in the capital (Montevideo), which faced opposition from the National Party, which represented conservative popular forces associated with the land-owning elite (Barrán 1979; Filgueira 1995).

Following the 1930 crisis, Uruguay initiated inward development characterized by significant state intervention and a protected, growing, and modestly diversifying industry (Bértola 1991). Domestic demand increased rapidly due to public-sector expansion, real wage improvements, and new labor-market regulations, mainly through bargaining arrangements (Notaro et al. 2014). The 1930s to 1950s witnessed a significant expansion of the welfare system, marked by the extension of women's suffrage, the institutionalization of salary negotiation, and the introduction of universal pension systems. This period was marked by a middle-class and egalitarian political culture (Filgueira 1995).

Our study focuses on the period before WWII for three main reasons. First, we utilize a seldom-used data source from the mid-20th century (Ochoa 1948), which surveys "national wealth" from 1860 to 1940, gathered from several primary sources. For earlier

¹ The high volatility of investment (Román and Vázquez 2013), the fluctuations of terms of trade (Bértola and Lorenzo 2004) and the instability of the financial sector (Presa 2021) would explain the cyclical evolution of the Uruguayan economy in the long-run.

periods, data on wealth distribution are available for the late 18th and early 19th centuries (Moraes et al. 2022; Riella 2023), primarily for a region around Montevideo. There is a lack of data compatible with Ochoa's source for the second half of the 20th century, requiring extensive reconstruction. However, data from the 21st century are available in De Rosa (2022) and Gandelman and Lluberas (2022). Second, despite long-term approximations, most literature focuses on two sub-periods: 1870 to immediate decades to WWI and since the 1970s onward. Our analysis centers on the first sub-period. Lastly, the period from 1860 to 1940 offers significant analytical value as it encompasses the rise, peak, and decline of the "agro-export led model" or "primary-export specialization" (Bértola and Ocampo 2012), providing an opportunity to explore its implications for asset accumulation and the evolution of capital values.

Due to the accumulation pattern of that model, driven by natural resource exploitation and international demand, propped up by technical advancements and institutional improvements alongside the consolidation of the national state, we propose three working hypotheses concerning the level and evolution of the private wealth–income ratio and the composition of private wealth in 1860-1940.

During this period, in comparative perspective, the long-run record from the industrial core shows high pre-1910 wealth–income ratios that undergo compression between WWI and mid-century, operating mainly through asset-price and policy/fiscal channels (Piketty and Zucman 2014; Piketty 2014; Saez and Zucman 2016). Within our 1860-1940 window, this appears as relatively elevated β in France, Germany, and the UK before 1914, followed by marked declines through the interwar years. By contrast, the US and Sweden exhibit lower 19th century β for different structural reasons –cheap land in the US versus limited domestic saving in Sweden– and a tighter early-20th century compression. Taken together, these patterns suggest that in land-abundant, late-industrializing contexts, β would be especially sensitive to land valuation, external demand, and the growth–saving mix, and that sustained declines in β around the interwar period are plausibly associated with structural slowdowns in the dominant growth model, with fiscal/regulatory shifts potentially reinforcing the adjustment.

During the 19th century, Uruguay experienced a period of prosperous economic growth, driven mainly by livestock production. According to contemporaneous experts, "no country in the world can be compared to Uruguay on this matter." Indeed, the "development of public wealth in the River Plate's Republics is as fast and relatable as

in the US" (Vaillant 1873: 164,175, our translation, original manuscript in French). That period of expansion was accompanied, as in other recently settled European economies, by a deterioration in the distribution of personal income (Williamson 1999, 2002; O'Rourke et al. 1996). There is broad agreement in the literature that this deterioration was driven primarily by the uneven evolution of factor returns (Bértola 2005), through a process that combined weak wage growth with increasing land rents (Willebald 2015).

Accordingly, we posit three premises for 1860-1940:

1- Level. Uruguay's livestock-based prosperity and integration into expanding commodity markets implied a relatively high wealth-income ratio in international perspective by the late 19th and early 20th centuries (Vaillant 1873).

2- Composition. The private-wealth portfolio would prove land-heavy relative to the industrial core, with agricultural land and related assets dominant in Uruguay (Moraes 2008), whereas financial and housing assets were more prominent in developed economies (Piketty and Zucman 2014; Waldenström 2017).

Both hypotheses are consistent with the experience of settler/temperate economies and Uruguay's institutional trajectory –enclosure, more clearly defined property rights, and access to external markets (Jacob 1969; Barrán and Nahum 1973; Bertino et al. 2005).

3- Mechanism of decline in β . A decline in β , if it occurs after the 1910s, should mainly result from the exhaustion of the agro-export model –technological limits of natural pastures, decline of the terms of trade, the effects on the process of capital accumulation, and (by the late 1920s) liquidation of bovine stocks– (Moraes 2008). As a plausible, non-exclusive mechanism, rising property/real-estate taxation (inheritance) and related regulation could reinforce the decline by affecting saving and valuation (Bertino et al. 2005; Finch 1980; Martínez Lamas 1930; García Repetto 2006).²

Following this introduction, the paper is organized into five sections. Section 2 explains the procedures used to deal with the original data, the corrections and adjustments proposed, and the supplementary data we created to enable comparison with records

² In line with national historiography, we do not consider inheritance taxation as “anti-capital” mechanisms (for an extensive discussion about this, see Quijano 1972), but such measures aimed to modernize the state and do not fundamentally challenge capitalist relations of property or accumulation.

from other countries. Section 3 presents the series of wealth in Uruguay from 1870 to 1940 and analyzes the evolution of the wealth–income ratio, including an essay and historical explanation of their development. Section 4 features exercises in decomposing wealth accumulation and Section 5 presents some considerations about capital returns and income inequality.³ Finally, Section 6 presents our final comments.

2. Concepts, accounting identities and data

This paper employs the concepts of national income and wealth as delineated in the System of National Accounts (SNA 2008; ESA 2010; WIL 2024) as its starting point. Wealth is quantified by constructing a balance sheet at a specific point in time, which documents the market value of assets owned and liabilities owed by an institutional unit or group of units. For a designated resident sector i (such as the personal, corporate, or government sector), wealth (or net worth) is characterized as the aggregate of non-financial assets and financial assets, less liabilities.

$$W_i = A_i^{NF} + A_i^F - L_i \quad (1)$$

At the country level, national wealth can be defined by two related but different measures. The first one follows what Piketty and Zucman (2014) name the "market value of wealth," which sums personal and government net wealth:

$$W_N^M = W_P + W_G \quad (2)$$

In this definition, corporate capital is primarily reflected in the market value of equity holdings owned by households and the government. This approach differs from the SNA standards –referred to as the "book value of wealth"– which defines it as the sum of non-financial assets across all resident sectors (personal, corporations, government) plus net foreign wealth:

$$W_N^B = A_P^{NF} + A_C^{NF} + A_G^{NF} - NFW \quad (3)$$

³ For reasons of space, we do not report the data in this working paper; they are available to readers upon request.

Given that net foreign wealth equals the sum of financial assets net of liabilities of the three resident sectors:

$$NFW = A_P^F - L_P + A_C^F - L_C + A_G^F - L_G \quad (4)$$

The key distinction between these two definitions lies in corporate wealth (or residual corporate wealth), which represents the difference between the book value of corporate equity and its market value. In particular, adding corporate wealth to the market value of national wealth aligns it with the book value definition. As a result, both definitions converge when corporate wealth equals zero or, equivalently, when the well-known Tobin's Q (Tobin 1969) equals one.

Conceptually and empirically, both options have their merits and limitations, which depend on how markets function, the knowledge we have of the reality we are describing, and the availability of information itself (see a discussion in Artola et al. 2021).

From a methodological perspective, wealth stocks and their subcomponents can be measured using different approaches. As a general rule, the SNA recommends calculating wealth based on observed quantities and market prices (a census-like method) and resorting to alternative methods only when this is not feasible. In this paper, we follow this guideline and compute most wealth aggregates using this approach. All our estimates for financial assets and liabilities, as well as agricultural land and housing wealth, are based on the census method, given the nature of our data sources.

We compute the book value of national wealth for the period 1860–1940 by aggregating all types of non-financial assets in the Uruguayan economy and adding net foreign wealth. The estimate is performed regardless of the sector owning them, and we decompose these assets into the following groups: housing, buildings and construction, machinery and equipment, transport equipment, and natural resources (farmland, subsoil assets, forestry, gardens, etc.). For residential property, we differentiate between the value of the building and the value of the underlying land.

As Piketty and Zucman (2014) indicate, the recent focus on national wealth means a return to older practices. Until the early 20th century, economists and statisticians prioritized computing national wealth over national income and output, which were relatively unknown concepts (Goldsmith 1985; Kuznets 1955). Although these historical

balance sheets are imperfect, their methodologies are well-documented and typically maintain internal consistency. Estimating national wealth around 1900 was often more accessible than it is today due to simpler property structures, fewer financial intermediaries, and less complex cross-border transactions (Alvaredo et al. 2018).

The long-standing tradition of studying national wealth declined after WWII. This shift occurred partly because economists redirected their focus from structural analysis to short-term fluctuations in output after the Great Depression. It was also due to the volatile asset prices between the two world wars, which made it difficult to calculate current market wealth values and compare them with past estimates. Uruguay followed these practices, maintaining a tradition of such calculations from the 1860s through the late 1940s, similar to many developed countries.

Our primary source of information is the data presented by Ochoa (1948), which compiles estimates of national wealth by category from various national historiographical studies (see Table 1). The earliest national wealth estimation study was conducted by Adolphe Vaillant (1873), and it combined the current value of land for housing and farming, working capital, and other goods. Vaillant's sources were taxpayer statements to the *Contribución Directa*, which he argued were underestimated; he corrected these declared values to more closely approximate reality (Bertino and Tajam 1999).

Table 1. National Wealth in Uruguay: years, total and sources (in current Uruguayan million pesos)

Year	Wealth	Sources
1860	248	Acevedo (1934) "Anales" and "Manual de Historia Uruguay" (1936) and DGE (1860)
1876	355	Acevedo (1934) "Anales"
1880	588	Acevedo (1934) "Anales"
1893	698	Acevedo (1936) "Manual de Historia Uruguay"
1900	1,084	Acevedo (1903) Notas y Apuntes
1910	1,906	Maeso (1910) "El Uruguay a través de un siglo"
1925	2,522	BROU, Dpto de investigaciones Económicas
1928	2,753	BROU, Dpto de investigaciones Económicas

1931	3,416	BROU, Dpto de investigaciones Económicas
1934	2,959	Ruiz Díaz (1936) "Los barómetros Económicos del Uruguay"
1936	2,815	Comisión Honoraria de Estudio del Censo Industrial de 1936
1940	3,278	Bellan (1940) Diario La Mañana 23/9/1940

Notes. Figures are expressed in current Uruguayan pesos; this table reports benchmark years only as listed, with no deflation or smoothing. The column "Source" records the primary statistical/archival provenance. Minor discrepancies may arise from rounding and from consolidating heterogeneous sub-sources.

Source. Ochoa (1948); authors' compilation from the primary sources cited therein.

From 1893 onwards, the database includes agricultural capital investment, private railways, and coins. From 1925 onwards, "other assets" include legal banking reserves and the value of products, machinery, and agricultural assets. Table 1 presents the sources and values of national wealth (private and public) in current pesos, as Ochoa (1948:802) outlined. Given discrepancies and missing data in the series reported, we made some corrections to the original series.

First, separate data for land (*tierras*) and dwellings (*fincas*) for 1876, 1893, 1900, and 1910 had to be estimated, as the source provided only the total real estate wealth (*riqueza inmobiliaria*). We estimated both components by linearly interpolating shares between contiguous data points and rescaling the result.

Second, given discrepancies in the calculation of totals for some years (1876, 1925, 1936, 1940), we opted to consider the sum of the available items and adjusted the values accordingly.⁴

Third, we subtracted items corresponding to public wealth (the government's wealth) to obtain private wealth and re-estimated the total wealth. The excluded items were: state's industrial companies (*dominio industrial del Estado*), ports (*puertos de Montevideo, Salto, Paysandú, Fray Bentos, Colonia, La Paloma*), bridges and roads (*puentes y carreteras*), state's real estate (*inmuebles del Estado*), state's railways (*ferrocarriles del*

⁴ The actual sums are the followings: 1876: 355,000,091; 1925: 2,520,809,643 1936: 2,815,454,000; 1940: 3,274,000,000.

Estado), posts and telegraphs, national printing, and others (*Correos y Telégrafos, Imprenta Nacional y Otros*).⁵

Fourth, several items in the source are often not considered in wealth calculations or are based solely on survey data for a few years, thereby distorting the series. Therefore, the excluded items were: working capital (*capitales de giro*); transit and import trade (*comercio de importación y tránsito*); certain types of banking deposits (*ahorro nacional*); and agricultural production (*productos agrícolas*).

Fifth, we propose a correction that has yet to be analyzed in the local historiography. For the year 1860, Ochoa (1948) states (own translation): *"To approximate the values declared by taxpayers to the real ones, the values have been tripled, which, according to Mr. Adolfo Vaillant, had to be done to be closer to reality. According to the original compilation, the amount of National Wealth would be \$103,501,914"* (footnote (1), Table: 803-804).

Similarly, for 1880, Ochoa states (own translation): *"In the valuation corresponding to 1880, following the recommendations of Mr. Adolfo Vaillant, the values declared by taxpayers for Direct Contribution have also been tripled"* (footnote (3), Table: 803-804).

However, the tripling of the input has led to substantial and unpredictable fluctuations that are challenging to rationalize (see Appendix A). Revisiting Vaillant's (1873) original study, we found the source of the confusion. Vaillant notes (own translation): *"In support of these observations, we will quote Mr. Tomás Villalba, State Accountant General, who, in a note dated February 5, 1857, stated that the declarations were inaccurate, capital decline was long term, and some provinces had a **third**⁶ or at least a quarter of owners not declaring or paying the contribution"* (Vaillant 1873: 171). To determine the "real" value, Vaillant suggests multiplying by 1.5, not by three as Ochoa (1948) did. Vaillant correctly calculates a few pages later: *"We believe that we can increase that figure by*

⁵ Despite having this information for a few years, we cannot estimate the public wealth due to the lack of consistency in the source to estimate the removed items for the entire period. As an example, the expansion of the state during the period was exceptional, particularly the acquisition of state-owned companies and their assets from foreign companies. Those properties as those build by the state during the construction boom of the 1920s are not reflected in Ochoa's data.

⁶ In the original word "third" is highlighted because the author will use this ratio later.

50% more to obtain the real value, concluding that the actual value of real estate and buildings in Montevideo was closer to \$111,211,005" (Vaillant, 1873: 173).

Thus, we propose dividing the total amount of real estate wealth (land and dwellings) by 3 and multiplying by 1.5 for both years, initially corrected by Ochoa (1948).

Finally, we regrouped the categories used in Ochoa (1948), as shown in Table 2, to align with the analytical categories of Piketty and Zucman (2014), allowing us to compare the composition of wealth.

Table 2. Category Grouping According to Wealth Classification Sources

Original classification Ochoa (1948)	Classification to match Piketty's criteria
<i>Tierras</i> (farmland)	Land
<i>Fincas</i> (rural estates)	Housing
<i>Riqueza ganadera</i> (livestock)	Agricultural assets
<i>Capital industrial y metálico</i> (industrial and metallic capital)	Other assets
<i>Capital agrícola</i> (agricultural capital)	Agricultural assets
<i>Ferrocarriles particulares</i> (private railways)	Other assets
<i>Mobiliario y alimentos</i> (furnishing and nourishment)	Other assets
<i>Encaje en bancos</i> (private bank cash reserve requirements)	Other assets
<i>Encaje en BROU</i> (state bank cash reserve requirements)	Other assets
<i>Moneda metálica</i> (metallic money)	Other assets
<i>Capital industrial y comercial</i> (industrial and commercial capital)	Other assets
<i>Capital comercial</i> (commercial capital)	Other assets
<i>Capital industrial</i> (industrial capital)	Other assets
<i>Stock comercial e instalaciones</i> (commercial stock and facilities)	Other assets
<i>Instalaciones industriales</i> (industrial facilities)	Other assets
<i>Maquinarias e implementos agrícolas</i> (agricultural machinery and equipment)	Agricultural assets
<i>Metálico Plata y Vellón</i> (silver)	Other assets
<i>Otros Bienes</i> (other goods)	Other assets

Sources. Authors' elaboration based on Ochoa (1948) and Piketty and Zucman (2014).

Net Foreign Assets are the assets held by Uruguayan residents in foreign countries minus the value of assets held by non-residents in Uruguay. Our estimate covers the whole 1860–1940 period and is expressed at market value. To calculate Uruguay's Net Foreign Assets, we rely on a variety of sources and methods.

Our initial point is that international indebtedness is equivalent to Net Foreign Assets, expressed with the opposite sign, and we follow Prados de la Escosura (2010)'s methodology to obtain this data. He assumes that Spain's international indebtedness in 1850 amounted to the foreign liabilities of the public sector, and then accumulates the current account plus the variation in foreign exchange reserves. This method is based on the accounting identity according to which the aggregate of the current account, the capital and financial account, plus the variation in reserves equals zero. We adapt this method to our information availability.

We have estimates of the international movements of financial assets and foreign capital stocks (Díaz, 2023) related to public debt, railways, and other⁷ forms of foreign direct investment, covering the period from 1864 to 1913. From 1914 onwards, we accumulated the capital and financial account (without international reserves) according to the estimates presented in Presa and Willebald (2026).

According to the standard items (see Table 2), the composition of wealth is calculated for gross wealth because it is impossible to classify net foreign liabilities by those categories.

For several of our exercises, having annual data is essential. However, interpolation between known values is not a trivial matter in this case and would warrant a dedicated section. Due to space constraints, we have decided to move this discussion to the end of the document and present it concisely (see Appendix B). The annual data for the components of wealth are derived by temporally interpolating the known data based on the movement of value variables (price $\times$ volume), provided that their nature is representative of the variable in question. Once estimates for each of the four categories are obtained, they are aggregated to derive the total (gross) wealth figure.

⁷ Waterworks, telegraphs, telephones, gas, tramways, canals and dry docks, electricity, banks and discount companies, land, mining, industrial and commercial enterprises.

3. Levels and long-run trends of private wealth

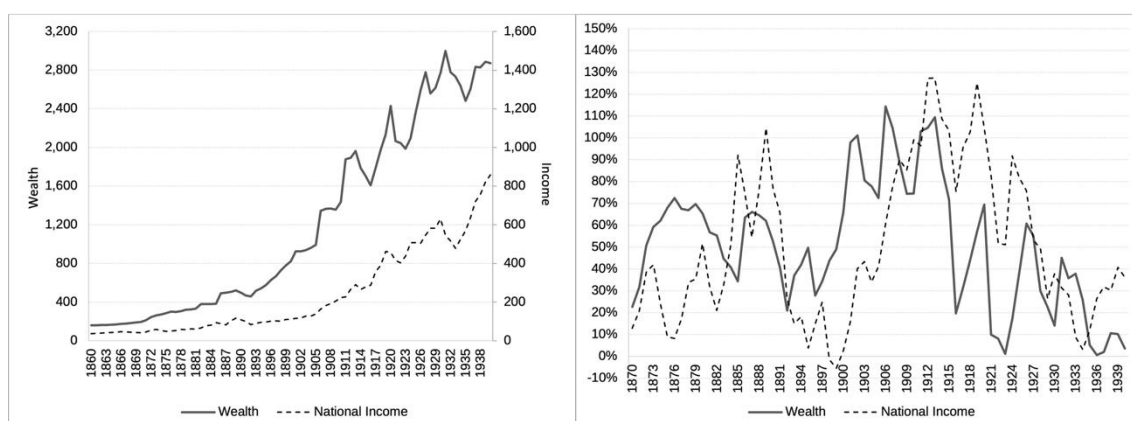
3.1. Private wealth and national income.

In Figure 1 (Panel A), we represent the evolution of net private wealth (W) and National Income (Y) in current prices between 1860 and 1940. Until now, data on national income, or gross national disposable income (GNDI), were unavailable; we provide a novel estimate (see Appendix C for methodological details).

Figure 1. Private wealth and national income in Uruguay, 1860–1940.

Panel A: levels, millions \$

Panel B: growth rates (10-years), %



Sources. Authors' calculations.

The relationship between total private wealth and National Income from 1860 to 1940 was high⁸, although National Income increased more rapidly than wealth. From 1860 to 1940, wealth multiplied by 18 and National Income by 24, representing cumulative annual growth rates of 3.7% and 4%, respectively (in current prices). Consequently, the β coefficient exhibited a declining trajectory, but the process was irregular, alternating between periods of increasing and decreasing trends. Comparing decadal growth rates (Panel B), wealth displayed long periods of higher dynamism (predominantly above 20 percentage points): 1874–1882, 1893–1907, and 1933–1934. These periods were characterized by severe economic crises (mainly at the beginning): the "*año terrible*" of 1875, with a depression lasting until 1882–1883; the international Baring Crisis of 1890–

⁸ Coefficient of lineal correlation: 0.96.

1892; and the Great Depression. These crises affected income flows more intensively than the economy's assets, which is an expected result because the wealth constitutes, by definition (it is a stock), a more stable variable.⁹

Finally, as both variables are highly correlated, the analysis of the series shows a notable pattern. The trajectory of the rate of change in wealth precedes that of the corresponding income rate by approximately five years,¹⁰ suggesting that the expansion of total income generally requires an expansion in productive capacity.

3.2. Wealth-income ratio

The β levels of Uruguay (Figure 2) initially followed a trajectory comparable to that of the US and Sweden. After the 1880s, it shifted, reaching the ratios of the core countries. Initially, like the US, Uruguay had a relatively small ratio due to low land prices and high private net saving rates –13% of national income in the US and 11% in Uruguay in the 1870–1880s (Appendix D)– contrasting with Sweden's low ratio –just 2% on average in the same period (Waldenström, 2017)– driven by insufficient domestic savings.

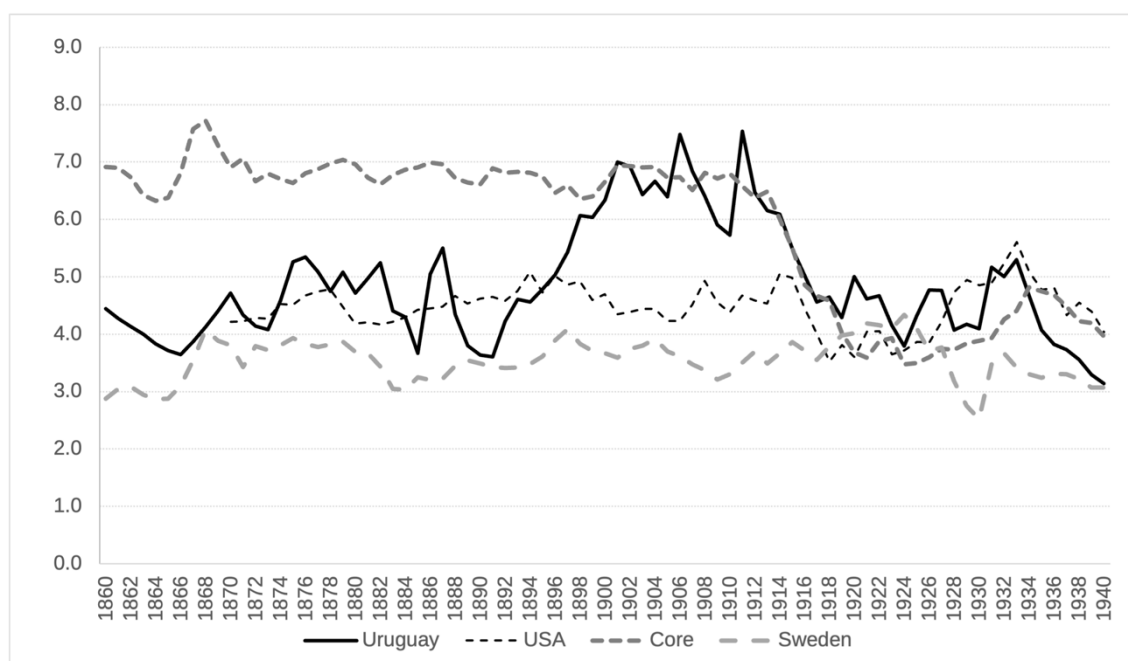
However, following the 1880s, the ratio increased significantly, reaching levels observed in the core economies, which resulted from the combination of factors, markets, and institutional conditions.

In the 1880s, the Uruguayan economy closed its agrarian land frontier with the definitive fencing of fields (enclosure) (Barrán and Nahum 1973), as consolidated as an exporter economy with abundant natural resources (land), renewable but limited in quantity. This process was accompanied by a set of institutions that guaranteed property rights (rural code, creation of a system of brands and signals for livestock) and the progressive strengthening of the state (Bertino et al. 2005), thereby providing an increasing margin of security for land valorization. Finally, the growing "capitalization" of the economy was driven by increased participation in international commodity markets, with the recovery of export prices (Bonino et al. 2015) and a modest diversification of agrarian production.

⁹ As the coefficient of variation of wealth was 0.81 that corresponding to income was 0.94.

¹⁰ The coefficient of correlation between both variables was 0.34 for contemporary values; when we shift the variation of national income by five-year period, the coefficient increases until 0.55.

Figure 2. Private wealth–income ratio (β): Uruguay vs. Core, Sweden, and the US, 1860–1940



Notes. Core is the sum of UK, France and Germany. We converted Y and W corresponding to France and Germany into UK pounds and then aggregated the three countries annually. Then we estimate β as the ratio of aggregated W to aggregated Y. 1860–1869 corresponds to UK's data.

Sources. Uruguay: authors' calculations. Core (UK, France, Germany), USA: Piketty and Zucman (2014). Sweden: Waldenström (2017).

The value of agricultural land multiplied by five between 1876 and 1910 and by four between 1893 and 1910. As we have already noted, contemporary sources recognized Uruguay's wealth, ranking it among the wealthiest countries globally and attributing it extraordinary growth potential (Vaillant 1873).

The β ratio showed an upward trend from 1891 to 1901–1902, i.e., the coefficient began to rise once the severe 1890 crisis had been overcome. The Baring crisis of 1890, one of the most significant financial crises of the last 200 years and with its epicenter in Buenos Aires, impacted Uruguay through the bankruptcy of Banco Nacional in 1891 (Millot and Bertino 1996; Flores 2011).¹¹ The crisis in Uruguay was characterized by speculative activities, primarily urban and centered in Montevideo (Buzzetti 1969). The

¹¹ For a detailed overview of Baring's crisis on financial and trade conditions and its adverse effects on foreign investment, exports, and imports, see Díaz (2023).

creation of companies and new businesses, financed by local and Argentine sources, focused investments in Montevideo, a location that accounted for around 40% of the total population and 50% of GDP (Martínez-Galarraga et al. 2020). The result was a sustained decrease in β from 1887 (5.5) to 1891 (3.6), which combined higher national income (+22%) with lower private wealth (-20%). In other words, it was a process with strong speculative characteristics that favored rent generation, but not wealth creation –perhaps even at the expense of assets.

Since the beginning of the 20th century, the evolution of β ratios has become more homogeneous among economies, with Uruguay converging on this shared trajectory. As in the US and Sweden, the War destruction effect plays no part here, at least not directly. According to the literature, other factors may help explain the decreasing trend in β in the 20th century. At the beginning of this century, livestock production, especially beef cattle, was encouraged by the establishment of meatpacking plants (fundamentally foreign capital) (Finch 2005), which made it possible to incorporate a typical commodity of temperate climate countries in the southern hemisphere, particularly from the *Río de la Plata*, into the British meat consumption market. With the increase in demand and prices during WWI, the meatpacking industry boomed, reaching its peak in cattle stock. However, Uruguayan livestock farming could not adequately respond to the sharp increase in demand. Conjunctural factors, such as adverse weather conditions between 1911 and 1916,¹² and structural factors, such as the natural prairie's nutritional capacity, contributed to this weak response (Bertino et al. 2005).

When markets normalized post-war, and the prices of primary products began to fall, the declining trend in exports was offset by an increase in cattle slaughter, which by 1930 could be described as a "*liquidación del stock bovino*" (liquidation of bovine stock) (Moraes 2008). It is often misunderstood that "liquidation" refers to the high extraction of animals for slaughter. However, this term can also be used to describe what occurred in the 1920s, particularly in the latter half of the decade, when there was a significant increase in the slaughter of breeding cows and young animals (heifers) (Bertino et al. 2005). This process may explain the decline in the β coefficient during the period (from 4.8 in 1926 to 4.1 in 1930) that constituted a genuine destruction of assets.

¹² There was a severe drought in the summer of 1911, rainfall well above average in 1914-1915, and another major drought in 1916 accompanied by a locust invasion.

Literature also suggests that political factors, such as government regulation, wealth taxation, and anti-capital mechanisms¹³ may have helped explain the decreasing trend observed in European countries until the 1960s. These concepts can also be applied to a peripheral economy, such as Uruguay, with caution.

Following WWI, Uruguay experienced intense political conflict between forces advocating for structural economic changes (*Batllismo*) and conservative agrarian groups defending the status quo (represented by the *Blanco* Party) (Barrán and Nahum 1979; Caetano 1992, 2010). The *Batllismo* movement marked a pivotal point in Uruguayan history, characterized by notable social reforms, although economic reforms were less successful. Nationalization and state ownership policies were significant legacies, while productive diversification remained limited, with livestock as the main economic activity (Bertino et al. 2005). As suggested by Azar et al. (2009), Bertino et al. (2005), and Bértola (2000), Uruguayan society created a social system that the economy struggled to support.¹⁴

The reformist spirit of *Batllismo* was evident in economic policies, particularly increased taxation on land and agricultural income (Bertino and Bertoni 2003; Finch 2005; Martínez Lamas 1930; García-Repetto 2006). Uruguayan historiography generally agrees on the failure of *Batllismo*'s fiscal reforms and their link to the "crisis of the first *Batllismo*" (Barrán and Nahum 1987; Finch 2005; Bértola 2000; Bertino and Bertoni 2003). The landowner class felt that the tax burden was excessive during the 1920s, and they made that clear, serving as one of the supporting forces behind the first coup d'état in 1933 (Finch 2005).

Efforts to reorient taxation began during José Batlle y Ordóñez's first government (1903–1907), but significant changes were slow to materialize (Barrán and Nahum 1987). Real

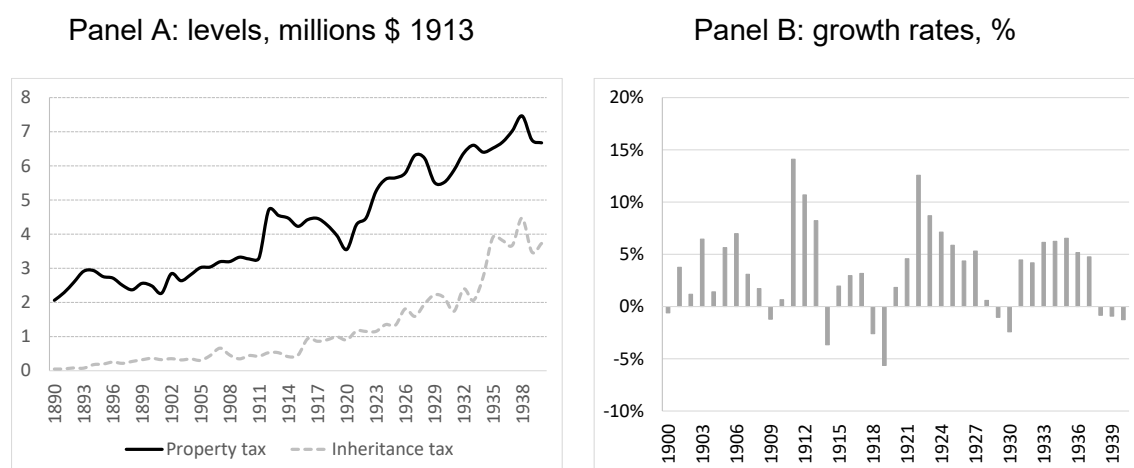
¹³ We use the label "anti-capital" as a shorthand borrowed from the European literature to denote policy packages that compress private wealth through valuation or saving channels (regulation, taxation). In the Uruguayan case, inheritance ("heritage") and property taxation is not regarded in the national historiography as an anti-capitalist device; at most it forms part of fiscal modernization with limited and contested effects on accumulation. We mention it solely as a plausible channel for the decline in β ; at present, we have no direct evidence that would justify characterizing it as "anti-capital" in this context. Part of the national historiography shows that the fiscal reforms held by the *Batllismo* were negotiated with the landowner associations (Quijano 1972).

¹⁴ The "feasibility of the strategy depended on its ability to generate genuine support and reproduction. Despite the changes in the Uruguayan economy in the first three decades of the 20th century, the accumulation regime of the late 19th century persisted. Even without considering the political and social restrictions, it can be argued that if the capitalist reproduction system still relied on the primary export sector's performance, the feasibility of the strategy was questioned" (authors own translation, original in Spanish) (Bertino et al. 2005: 417).

estate taxation (*contribución inmobiliaria*) was a national tax, with the base, rate, and liquidation method determined by law. Two jurisdictions were established: on one hand, Montevideo, the capital city, and on the other hand, the other 18 provinces. Property valuation for taxation began in Montevideo in 1905, but did not extend to rural areas until 1916.¹⁵ For its part, the inheritance tax accounted for a relatively small, though steadily increasing, share of capital taxation throughout the period; it represented only 12.5% at the beginning of the twentieth century, and had risen to 35% by 1939–1940.

These policies faced strong resistance from conservative classes, leading to significant political consequences known as the "*alto de Viera*" (Caetano 1992).¹⁶ The evolution of tax collection reflects the social tensions around capital taxation. In Figure 3, we represent the evolution of both types of tax collection and the corresponding annual growth rates of the total capital taxes (in real terms).

Figure 3. Capital tax collections: property and inheritance ("heritage") taxes (millions of 1913 pesos), and annual growth rates (3-years averages), Uruguay, 1890–1940



Notes. Series reports nominal receipts from property and inheritance ("heritage") and property taxes, aggregated for Uruguay, expressed in constant 1913 pesos using the CPI from Bértola (1999) (base 1913=100) and INE. Annual coverage is 1890–1940. Definitions and coverage follow the underlying Histeco-IECON series; other capital-related levies (e.g., stamp or financial transactions taxes) are not included.

Sources. Histeco-IECON Database; Bértola et al. (1999); INE.

¹⁵ Taxation was based on assessed property values that typically differed substantially from market values, and any revision of those assessments faced opposition from property owners.

¹⁶ Feliciano Viera was president of the Republic in 1915–1919. In 1916, he publicly promised to stop *Batllismo*'s social and economic reforms, a fact identified as the "*alto de Viera*"

Property and heritage taxes were the main burdens on capital, and their collection increased by 265% in real terms (1900–1940); that is, a slightly higher rate than the 226% growth of national income during the period, which emphasizes their significance. However, growth was not continuous, but rather alternated between periods of expansion and decline, likely reflecting the prevailing political economy conditions of each period.

Although not conclusive, this evidence highlights two key points. First, political movements in the early 20th century successfully implemented capital taxes in Uruguay. Second, the landowner class's social and political reaction to these policies aimed to prevent further reforms. Therefore, the decrease in β is not unexpected but likely reflects the behavior of asset-owning classes.

4. Decomposition of wealth accumulation

Following Piketty and Zucman (2014), we decompose the evolution of the wealth–income ratio into two multiplicative components (volume and relative price effects) using the following accounting equation:

$$\beta_{nt+1} = \frac{(1+g_{wst})(1+q_t)}{(1+g_t)} \beta_{nt} \quad (5)$$

Where:

$$(1 + g_{wst}) = 1 + \frac{s_t}{\beta_{nt}} : \text{saving-induced wealth growth rate.} \quad (6)$$

$$(1 + q_t): \text{capital-gains-induced wealth growth rate} \quad (7)$$

$$(1 + g_t) = \frac{Y_{t+1}}{Y_t}: \text{growth rate of national income.} \quad (8)$$

From (1), we can deduce an expression for the growth rate of wealth:

$$\frac{\beta_{nt+1}}{\beta_{nt}} = \frac{(1+g_{wst})(1+q_t)}{(1+g_t)} \quad (9)$$

$$\frac{\frac{K_{t+1}}{Y_{t+1}}}{\frac{K_t}{Y_t}} = \frac{(1+g_{wst})(1+q_t)}{(1+g_t)} \quad (10)$$

$$(1 + g_k) = (1 + g_{wst})(1 + q_t) \quad (11)$$

And, considering equation (6),¹⁷ we can rewrite equation (11) as follows:

$$(1 + g_k) = \left(1 + \frac{s_t}{\beta_{nt}}\right)(1 + q_t) \quad (12)$$

With this equation, we can calculate the influence of volume (*s-effect*) and price (*q-effect*) on increasing total real wealth. The real growth rate of private wealth derives from the wealth series expressed in constant prices. We consider the four economic aggregates used as reference in the analysis of the evolution of the composition of wealth. Due to the nature of the assets, adequate index numbers were used as deflators: Land Price Index (Bértola et al. 1999) for the land, an implicit deflator of livestock for agricultural assets (Bértola 1998; Bertino and Tajam 1999), the implicit deflator of real estate property for housing and an implicit deflator of “material production” (primary and secondary activities) for other assets (Bértola et al. 2024a) (Appendix B).

To estimate private saving rates, we follow Piketty and Zucman (2014), who consider net-of-depreciation national saving rates, defined as the ratio of savings to national income (both of which correspond to private agents). For this, we use a recent estimation of historical national accounts, calculated according to the expenditure method (Bértola et al. 2024a), which provides consumption and investment variables, and we estimated depreciation data based on Román and Willebald (2015) (Appendix D).

The evolutions of rates and components are presented in Table 3.

Over the entire period, the annual growth rate of wealth was 1.1% (Panel A), entirely driven by the saving component (2%), while the price effect was adverse (-0.9%). As we observed in Figure 1, the decadal growth rate increased until the end of the 19th century. Then it moved in a decreasing trajectory until the 1930s (i.e., the increase of wealth accelerated in the 19th century and decelerated in the 20th century). Specifically, real wealth growth occurred in the 19th century (2.4% in 1860–1900), while the 20th century saw a slight decrease (-0.2%), with different trends by components in both subperiods.

¹⁷ The formula $\beta = s/g$ was initially derived by Harrod (1939) and Domar (1947) using fixed coefficient production functions. In this model, β is entirely determined by technology. Solow (1956) later developed the formula with a flexible production function $Y = F(K, L)$, incorporating capital-labor substitution. In this model, β becomes endogenous, allowing for balanced growth.

Table 3. Decomposition of real private-wealth growth: Uruguay, 1860–1940 (annual averages by subperiod).

	Market-value private wealth- income ratios (%)		Real growth rate of private wealth (%)	Savings-induced wealth growth rate (%)	Capital gains–induced wealth growth rate (%)
Panel A					
1860–1900	4.44	6.34	2.4%	1.7%	0.7%
1900–1940	6.34	3.14	-0.2%	2.3%	-2.4%
1860–1940	4.44	3.14	1.1%	2.0%	-0.9%
Panel B					
1860–1876	4.44	5.35	4.2%	0.1%	4.2%
1891–1902	3.60	6.92	4.8%	2.2%	2.6%
1920–1931	5.01	5.17	2.7%	2.9%	-0.2%
Panel C					
1876–1891	5.35	3.60	-1.4%	3.2%	-4.5%
1902–1920	6.92	5.01	-1.5%	1.6%	-3.0%
1931–1940	5.17	3.14	-1.5%	3.1%	-4.4%

Sources. Authors' calculations.

As in the 19th century, both components –savings and capital-induced gains– showed positive rates (1.7% and 0.7%, respectively). The evolution changed significantly in the 20th century, with the saving component maintaining a positive rate (2.3%) and the second component exhibiting capital losses (-2.4%). This indicates that the relative stability of real wealth in the 20th century (which declined just 0.2% per year) resulted from the opposing forces of these components.

A closer examination reveals three long-term cycles of real wealth evolution (Figure 4): 1860–1891, 1891–1920, and 1920–1940. These are "growing cycles" since the level of real wealth at the end of each cycle surpasses that of the previous one. Within this long-run trajectory, three increasing phases (Panel B) can be identified: 1860–1876, 1891–1902, and 1920–1931, and three decreasing phases (Panel C): 1876–1891, 1902–1920, and 1931–1940.

Figure 4. Wealth in Uruguay, 1860–1940. In 1913 million pesos.



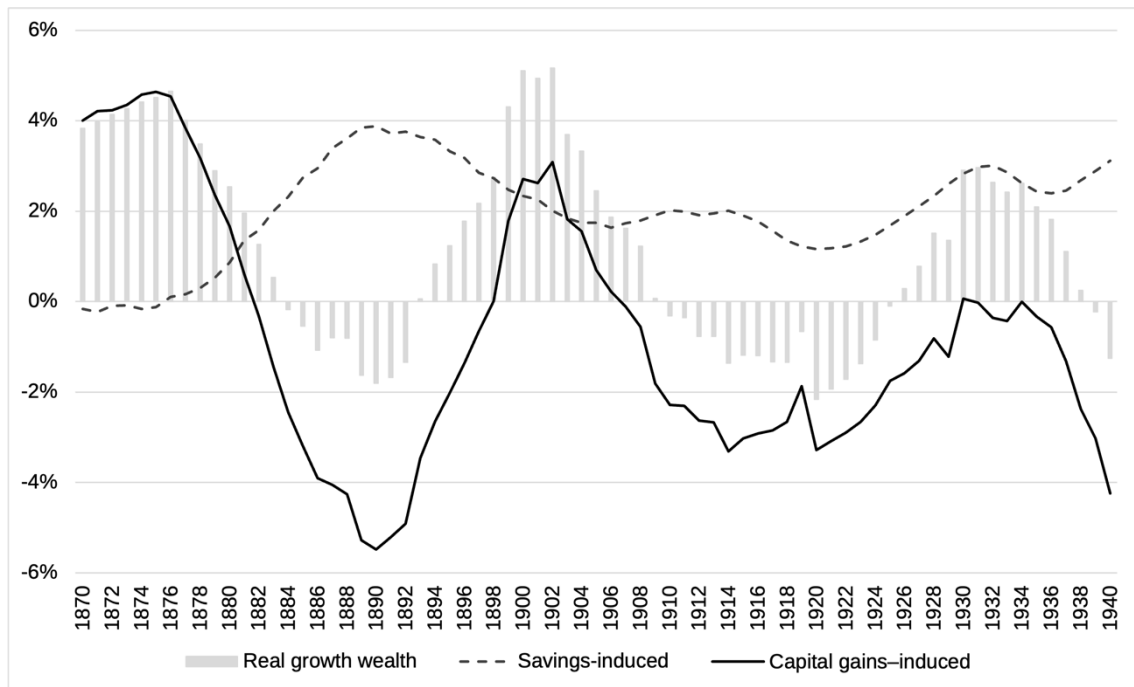
Sources. Authors' calculations.

On the one hand, the increasing phases showed a notable change in the incidence of the components. Initially (1860–1876), the entire real expansion of wealth (4.2%) corresponded to capital gains (4.2%) with a negligible expansion in the saving-induced component (0.1%). In the second period (in the change of centuries: 1891–1902), both components were positive (2.2% and 2.6%) and made equivalent contributions. Finally, in the last phase, only the saving-induced component contributed positively (with a growth rate of 2.9%).

On the other hand, the rates of the decreasing stages were similar (around -1.5%), and the characterization did not change: capital losses played a decisive role, with significant negative values (-4.5%, -3% and -4.4%, respectively).

The impact of each component becomes more apparent on an annual basis (Figure 5). The actual growth rates of wealth followed the dynamics of real capital gains and losses, and the latter were more sustained in the 20th century than in the 19th century. This evolution affected the economy's real wealth and halted the expansion evident in the second half of the 19th century.

Figure 5. Decadal real growth rates of private wealth and components, Uruguay, 1860–1940 (averages of annual rates, %).



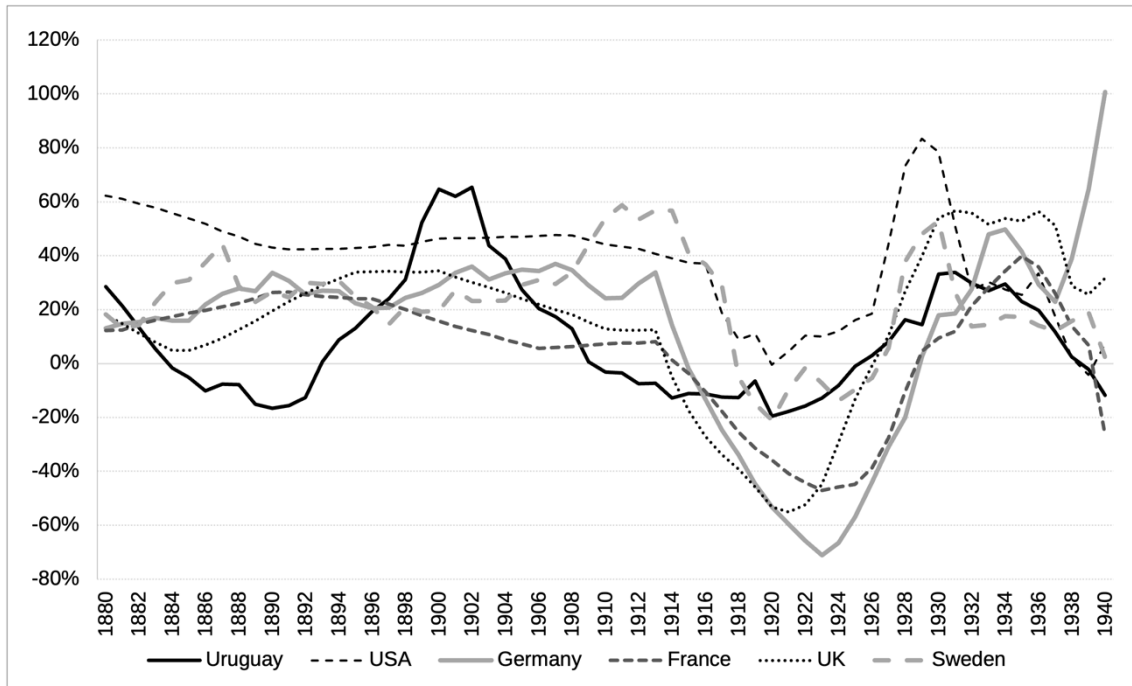
Sources. Authors' calculations.

There is not enough international evidence to assert that this cyclical behavior constitutes a pattern for peripheral countries, but some differences between economies are illustrative. Figure 6 shows the evolution (in 10-year periods) of real private wealth growth rates in the economies for which we have the β coefficients. The trajectories of the core economies and Sweden are much more stable than Uruguay's indicator before WWI.

Uruguay was the only economy to experience a real decline in wealth during the 19th century and, strikingly, showed the highest growth in the transition between centuries. The capital destruction caused by WWI prevents further comparison, but this points to differences between economies that can be better addressed as more and better evidence becomes available.¹⁸

¹⁸ Our intuition is that the evolution of terms of trade is a key determinant of this differential evolution between countries (Bértola and Lorenzo 2004) but demonstrating this hypothesis requires specific research.

Figure 6. Private wealth in constant (local) prices: decadal growth rates, Uruguay and other countries, 1880–1940.



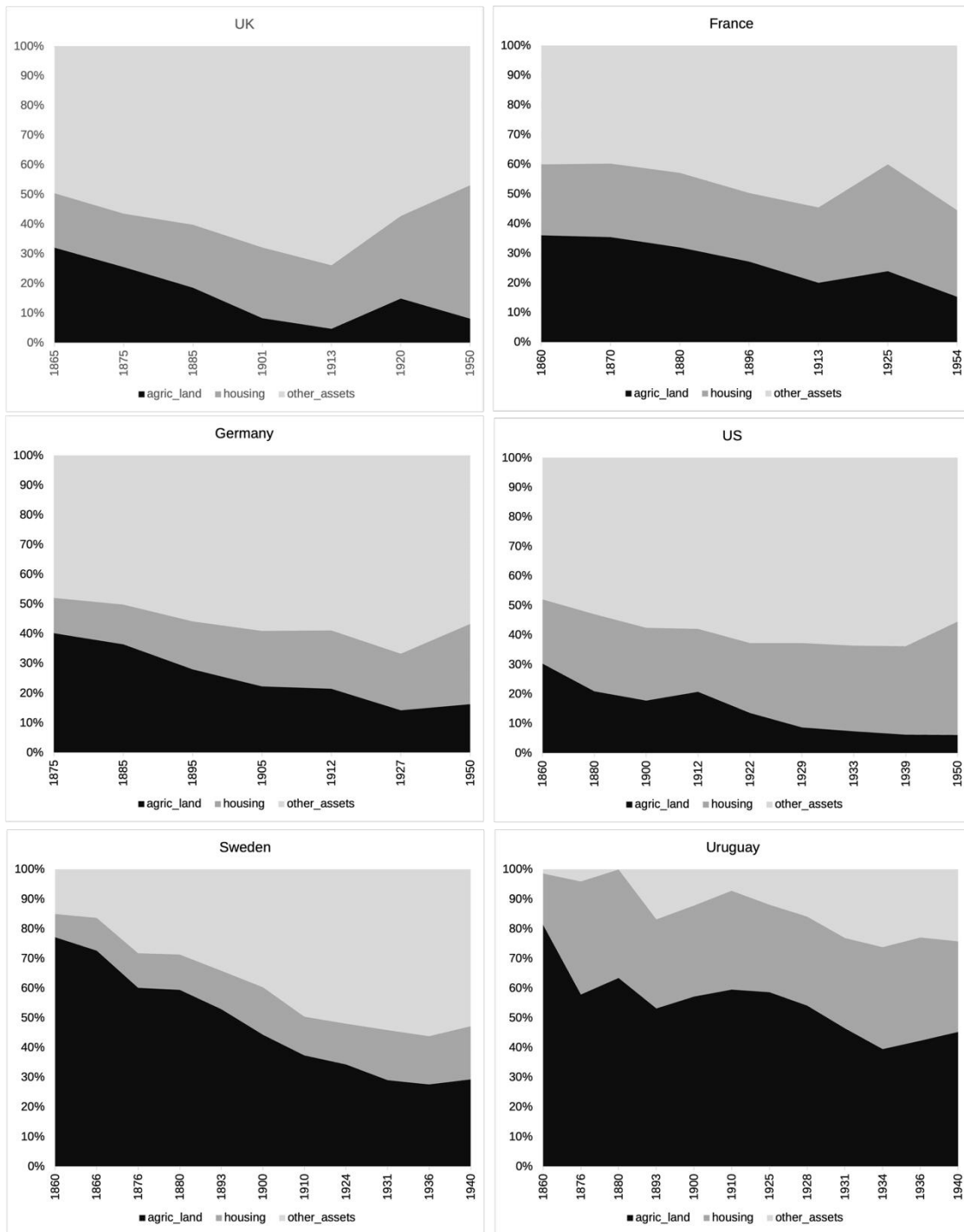
Sources. Uruguay: authors' calculations. Other countries: Piketty and Zucman (2014); Sweden: Waldenström (2017).

WWI marks a watershed in the explanation of Uruguayan economic development in the local historiography, and our estimates are consistent with this. Around the end of the first decade of the century, the accumulation of assets expressed several notable facts: the peak of β (7.5, 1911), the last positive decadal growth rate of private wealth before a long period of decreasing (0.07%, 1909), and the last positive capital gains (0.2%, 1906).

The transition from an agrarian-based development model to a new yet unconsolidated one should have entailed significant transformations in the patterns of wealth creation beyond land-based assets, transformations that, apparently, failed to take place.

Although Uruguay's β levels are similar to those of core European countries, the US, and Sweden, the composition of private wealth reveals sharper developmental differences. Using Piketty and Zucman's (2014) tripartite framework –agricultural land, housing (including the land under residences), and other domestic assets– and adopting similar definitions for the UK, France, Germany, the US, and Sweden, we classify Uruguay's private wealth so that “land” includes agricultural land and livestock.

Figure 7. The changing composition of private wealth: the US, UK, Germany, France, Sweden, and Uruguay, 1860–1940/1950.



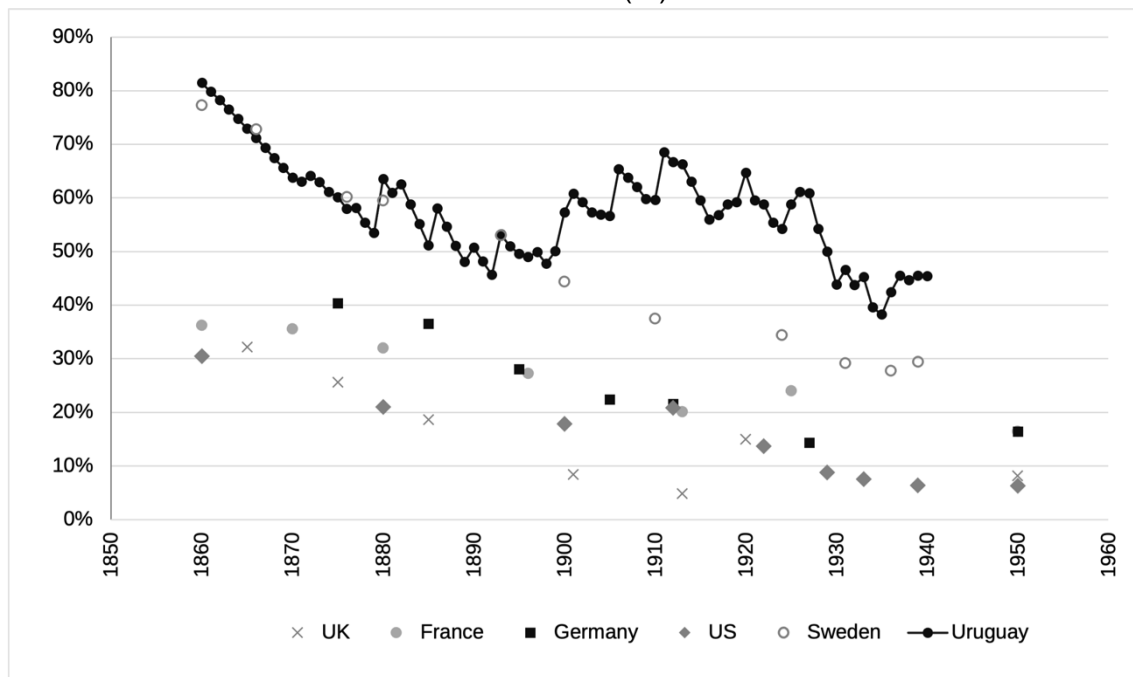
Sources. Uruguay: authors' calculations. US, UK, Germany, France: Piketty and Zucman (2014). Sweden: Waldenström (2017).

As Figure 7 shows, Uruguay begins with a land share of 60–70%, comparable only to Sweden and far above the 30–40% in core economies; by the end of the period, land falls below 20% in the core ($\approx 25\%$ in Sweden) but remains around 50% in Uruguay.

These contrasts –while sensitive to data availability and construction specifics across countries– underscore the persistent land-heavy structure of Uruguayan wealth, in contrast to the shift toward housing and other assets documented for other economies (Piketty 2014; Piketty and Zucman 2014; Waldenström 2017; Artola et al. 2021).

As core economies continuously reduced the share of agricultural land assets in private wealth, Uruguay maintained high ratios throughout the period. Despite severe restrictions and changes in growth strategy in the 1940s, land and agricultural assets remained the primary wealth factors in Uruguay. In other words, while the economy was entering a progressively new productive configuration based on industrial production, the structure of wealth retained a 'traditional' composition that could hardly support the new pattern of income generation. Figure 8 illustrates this delay in changes in wealth composition relative to core economies.

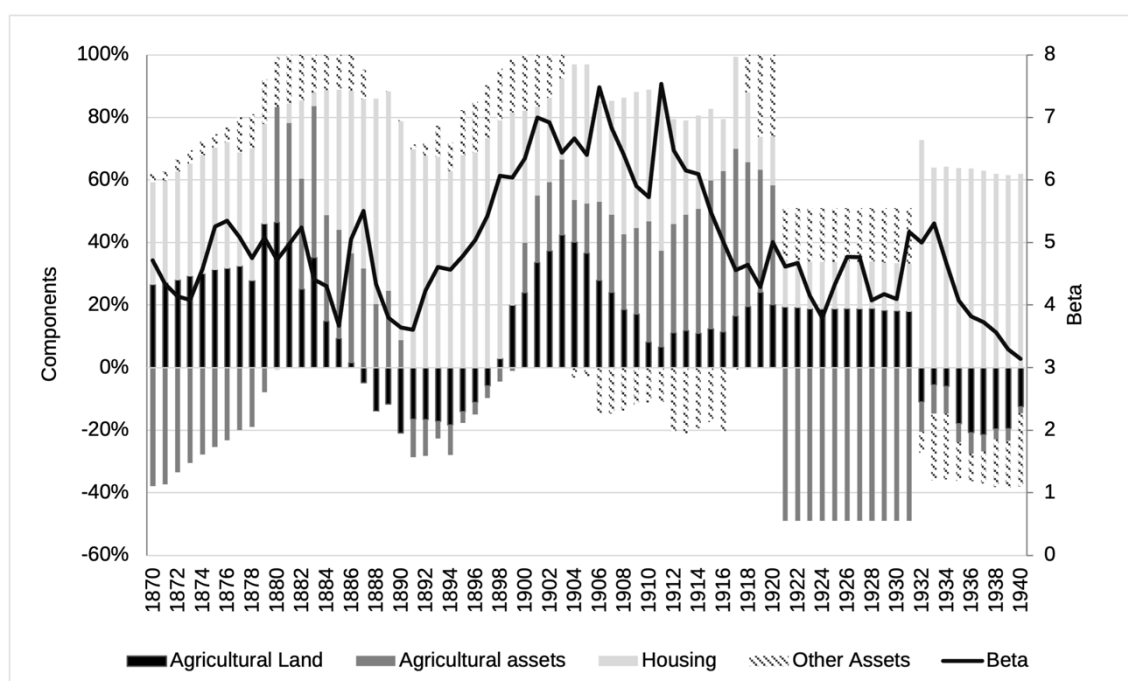
Figure 8. Agricultural land as a share of private wealth: Uruguay and other countries, 1860-1940 (%).



Sources. Uruguay: Authors' calculations. Other countries (US, UK, Germany, France): Piketty and Zucman (2014). Sweden: Waldenström (2017).

To explore this aspect further, we are able to calculate the contributions of the different components to the growth rate of wealth (at current prices). Since these calculations are subject to high volatility, Figure 9 presents the contributions as five-year moving averages. This also allows us to revisit several of the concepts discussed in Section 3, for which reason the evolution of the β coefficient is also included in the graph.

Figure 9. Contributions to total wealth growth according to components, Uruguay, 1870-1940 (in %, 5-years periods)



Sources. Uruguay: Authors' calculations.

As we argued earlier, a substantial part of the trajectory of the β coefficient mirrors developments in the agricultural land component. Focusing on the period in which the coefficient followed a distinctive path –moving from levels typical of peripheral economies toward those of core economies, before eventually adopting the dynamics of the latter– it becomes evident that the appreciation and depreciation of land values played a central role in explaining this process. Only from the second half of the 1920s did housing and other assets begin to make a significant contribution to changes in wealth, and probably also to the decline of the β coefficient itself.

Historiography attributes this period to the economy's difficulties in promoting structural transformation, and our calculations are consistent with this interpretation. The transition

from an agrarian-based development model toward a new, still unconsolidated economic structure –characterized by a gradual shift in wealth generation from land to other forms of assets– imposed substantial costs on both wealth accumulation and savings.

5. Capital returns

The full significance of the trajectory of β emerges only when combined with the first fundamental law of capitalism and a key inequality relationship (Milanovic 2013). The first fundamental law states that the share of capital incomes on total national income (α) is equal to the rate of return on capital r multiplied by β . There is nothing new here: this is simply an identity:

$$\alpha = r * \beta \quad (13)$$

However, suppose r remains permanently above the rate of growth of the economy, g . In that case, if Piketty's key inequality relationship $r > g$ applies, then α increases by definition, representing a worsening income distribution. In other words, the process can lead to a shifting functional income distribution favoring capital. Since capital incomes are generally more concentrated than labor incomes (an uncontroversial fact), this will result in an unequal distribution of personal income (which is why inequality increased in European countries in the last decades of the 20th century). We can now try to quantify this type of Piketty's reasoning in the case of Uruguay 100 years ago.

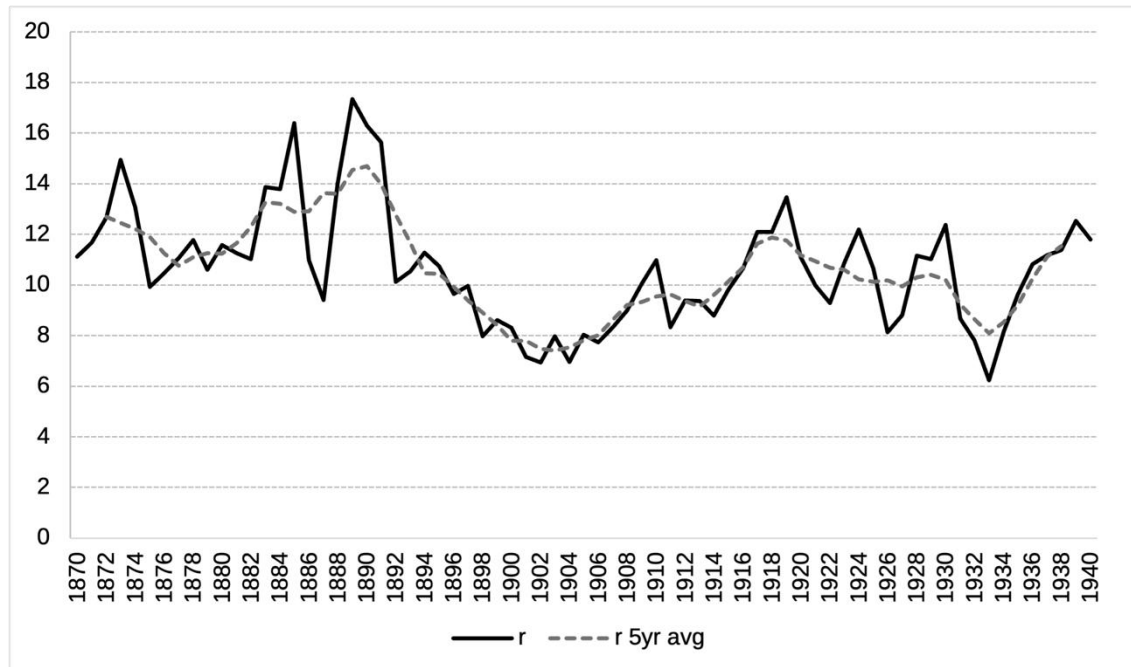
Based on data from Marmissolle and Willebald (2023) and Marmissolle et al. (2023) we know that capital shares remained relatively stable throughout the 19th century, with a clear downward trend only emerging from WWI onward. This latter trend broadly coincides with the trajectory shown by β .

Combining those figures with our estimates of β yields the rate of return of capital (Figure 10), which showed three significant trends over the 80 years.

Initially, the impact of the Baring Crisis is striking. The sudden drop in 1890–1891 marked a change in the trend of capital returns. Until then, Uruguay had experienced growth in r , characteristic of an economy in development, with assets showing increasing returns in value. However, following the shock, the trajectory changed notably, and the trend became downward until the early 20th century (with a minimum in 1902: 6.9%) and a

decade of levels below those of the post-crisis period (reaching 11% in 1910, the level of 1894). Therefore, a decline in the return to capital accompanied the progressive weakening of the agro-export model. The WWI years marked a period of adjustment in the return to capital, but this process was exhausted by the 1920s. It was only in the second half of the 1930s that a gradual recovery became apparent.

Figure 10. Rate of return of capital in Uruguay. In percentage. 1870–1940



Sources. Based on β : authors' calculations. α : Marmissolle & Willebald (2023), Marmissolle et al. (2023).

While the indicator's evolution makes historical sense, it is essential to consider whether the levels align with the reality they describe. To do this, we compare it with a couple of "opportunity costs" from the period: the bank lending rate (Román et al. 2023)¹⁹ and the yield on government bonds (Obstfeld and Taylor 2003). As expected, the rate of return to capital predominantly exceeded these rates, following a historically consistent pattern.²⁰

¹⁹ Bank lending rate (active rate) corresponding to a state bank (*Banco de la República*) since 1895 and average bank lending rate of private banks previously. We spliced both series according to the lineal correlation between both rates in 1895-1940 ($\text{IBROU} = 1.084 \cdot \text{iPriv.Banking}$; $R^2 = 0.9696$).

²⁰ The following information is somewhat anecdotal but still reflects certain market relations. From 1945 to 1961, the Industry and Commerce Profit Tax taxed the sector's profits when it exceeded 12% over the fiscally adjusted capital with progressive and cumulative rates. Our average return on capital was 14% in the 20th century, which indicates a level consistent with entrepreneurs earning "taxable" capital returns. Thanks to Prof. Garcia-Repetto for this insight.

Figure 11. Rate of return to capital (r) and opportunity-cost benchmarks, Uruguay, 1870-1940



Sources. r : authors' calculations. Interest-rate: Román et al. (2023); Bonds: Obstfeld and Taylor (2003).

Finally, to more directly relate our evidence to issues of income distribution, we can draw on Rodríguez Weber (2024), who, based on evidence from Bértola (2005) and Lezama and Willebald (2020), examines long-run inequality in Uruguay. This analysis argues that inequality worsened during the First Globalization, although following an irregular trajectory and in line with the 'typical' factors associated with settler economies: a declining trend in wages and a rising trend in land rents, following the evolution of relative factor prices.

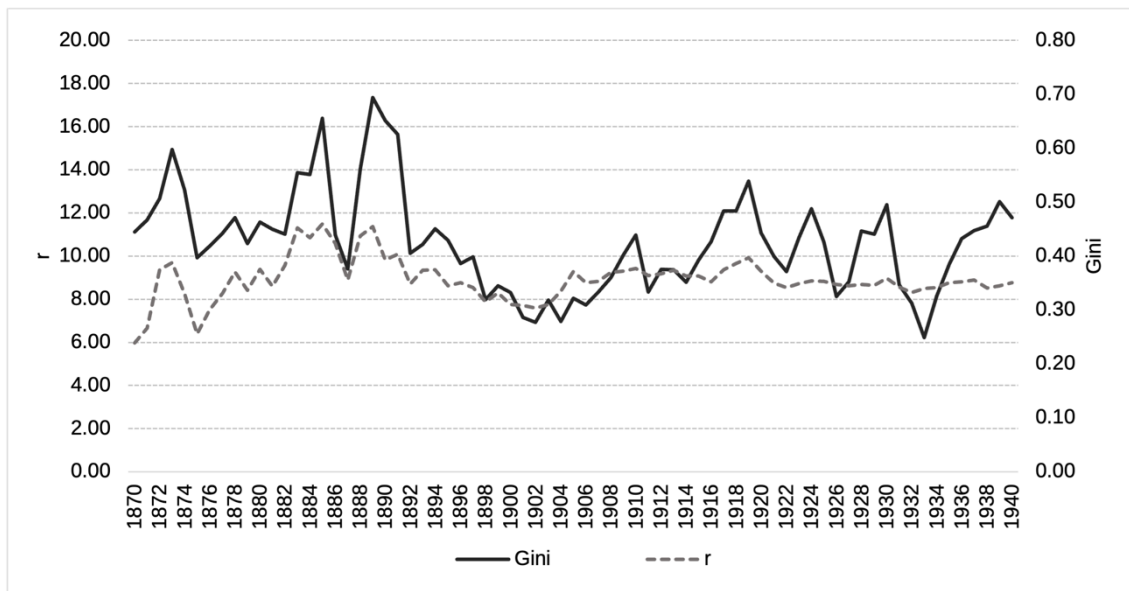
Building on this underlying trend, the author argues that the share of capital profits rose somewhat in the 1870s and markedly in the 1880s, likely driven by the price bubble that characterized the so-called 'Reus era' (the speculative movement that preceded the 1890's Crisis). The improvement in distribution observed in the final decade of the 19th century, likely linked to the effects of the 1890 crisis on profits, was reversed during the first decade of the 20th century, as shown by the lower shares of land rents and profits on total income. During the 1930s, the personal income distribution probably remained stable, as did the functional distribution, which tended to stabilize. Our evidence offers new insights into this analysis.

In Figure 12, we show the evolution of the capital return rate and the Gini Index, and the trajectories are consistent and closely aligned.²¹ The presumption by Bértola (2005) and Rodríguez Weber (2024) regarding the loss of non-wage income (profits, land rents) in

²¹ Coefficient of correlation: 0.59; 0.65 in the 19th century; 0.56 in the 20th century.

comparison with that linked to labor compensation is, therefore, better defined by our estimates of the rate of return on capital. Our evidence confirms that changes in inequality during the period had, in the remuneration of productive factors, one pivotal explanatory factor.

Figure 12. Rate of return on capital and income Gini index, Uruguay, 1870–1940.



Sources. Authors' calculations; Rodríguez Weber (2024).

6. Concluding remarks

This paper reconstructs and harmonizes long-term series on private wealth and national income for Uruguay, 1860-1940, by re-estimating Ochoa's (1948) benchmark inventories using consistent concepts, framed within the comparative literature on wealth-income ratios. We interpret Uruguay's trajectory within a bounded international context, using cross-country series for orientation while emphasizing within-Uruguay dynamics and institutional specificity. To achieve this, we construct and harmonize several historical series, which are core contributions of this paper. Organizing the evidence through an accounting decomposition allows us to differentiate between saving-induced accumulation and real capital gains.

Substantively, the results show that long-run β outside the core depends critically on asset mix and policy regime: in land-intensive settings with expanding states, trajectories

can replicate the U-shaped paths of several industrial economies even under standard accounting, though explaining them requires appeal to a different set of factors.

Four substantive findings emerge from this study.

First, β was high by the late 19th and early 20th centuries, with distinct turning points that align with Uruguay's macro-history. The rebound after the 1890–91 crisis, the subsequent rise and plateau, and the decline into the 1920s–1930s might be explained by the interplay of saving behavior, income growth, and valuation effects. The decomposition shows that movements in β reflect shifts in both the saving-induced volume term (s/β) and real capital gains (q), with policy, cycles and price shocks shaping the timing and magnitude of changes.

Second, Uruguay's portfolio remains persistently land-heavy relative to the industrial core: agricultural assets (land and others) dominate for much of the period and decline only gradually, in contrast to the shift toward housing and other assets observed for core economies (Piketty and Zucman 2014). This composition aligns with an outward-oriented, resource-based growth model, in which enclosure, improvements in the definition and enforcement of property rights, and commodity-market integration facilitated land valorization, while posterior industrialization and institutional choices hindered the reallocation of wealth toward urban assets (Bonino et al. 2015; Bertino et al. 2005; Moraes 2008). The development trajectory of the Uruguayan economy during this period suggests that the transition from an agrarian-based model of development, predominant in the 19th century, to an import substitution model from the 1930s onwards entailed severe challenges in terms of wealth and savings. The low intensity of structural change is often cited as a primary explanatory factor for the "failure" (Rama 1991) or "decline" (Oddone 2010) of the Uruguayan economy in terms of economic development. According to Román and Willebald (2021), structural change did not drive long-run economic growth (1870–2020). Vallejo and Willebald (2024) highlight the persistent export specialization in primary products and natural-resource-based manufactures since the 19th century, indicating a lack of significant structural change. Our evidence adds another related aspect to this process: the structure of wealth showed little change over the 80 years covered by our study.

Third, when Uruguay is situated against a simple core envelope (Germany-France-UK) and compared with the US and Sweden, the narrative is one of different mechanisms

rather than anomalous facts: early levels and trajectories resemble the lower- β cases (US/Sweden), later episodes bring β closer to the European core, but the channels are those of a land-intensive peripheral economy. Domestic fiscal and regulatory developments –most notably the expansion of the state and attempts to raise the tax burden on large landholdings– coincide with a slowing of private accumulation (Bertino et al. 2005; Barrán 1979; Filgueira 1995). In line with national historiography, inheritance/property taxation is not characterized as “anti-capital” per se; we treat it only as a plausible channel operating through valuation, saving and expectations (Finch 2005; Martínez Lamas 1930; García-Repetto 2006) that informs about possible adverse effects on capital accumulation.

Fourth, the distributional and pricing evidence is consistent with the aggregate patterns. The co-movement of the capital share (α) and β implies portfolio returns $r=\alpha/\beta$ that sit within the range of available financial benchmarks, a heuristic check rather than a structural test. The association between r and the income Gini underscores the role of prices and portfolio structure for inequality dynamics, while avoiding causal overreach given data and identification limits. While our evidence is only indicative, it is consistent with other data, such as the decreasing trajectory of inequality from the 1920s onwards (Bértola 2005; Rodríguez Weber, 2024). Combining our calculations with those related to functional income distribution reveals an evolution in the rate of return on capital, corresponding to the progressive change in the economic model, and consistent with the trajectory of income inequality.

In sum, our results tell a coherent story. Within a highly irregular long-term trajectory of β , Uruguay experienced a marked process of capital deepening from the 1890s until the eve of WWI, reaching levels comparable to those of the core economies of the world system (Figure 2). Thereafter, however, the trend reversed, with sharp declines extending into the early 1920s and recurring during the 1930s.

This evolution reflects an economy that successfully expanded its real wealth throughout the 19th century, but whose wealth stock stagnated during the 20th century, largely as a consequence of sustained capital losses (Table 3). Post-1910s Uruguay was, in many respects, an expanding economy (Figure 1.B): output continued to grow while income distribution became more egalitarian (Figure 10). Yet this occurred alongside stagnant

aggregate wealth levels. In other words, Uruguay combined economic expansion and greater distributive equality with a process of decapitalization.

By the 1920s and 1930s, the country's wealth structure remained heavily concentrated in agricultural and natural-resource-based assets (Figure 8), whose performance accounted for a substantial share of the dynamics of total wealth (Figure 9). Other asset categories only began to gain some relevance during the 1930s (Figure 7). Thus, by the eve of WWII and the transition toward import substitution industrialization, Uruguay still exhibited low capital depth and a predominantly land-based wealth structure.

Uruguayan historiography has characterized the dominant economic trajectory of the second half of the twentieth century as one marked by low growth, volatility, divergence, and weak efficiency performance (Oddone & Cal, 2008). Our findings add further interpretative support to this broader argument.

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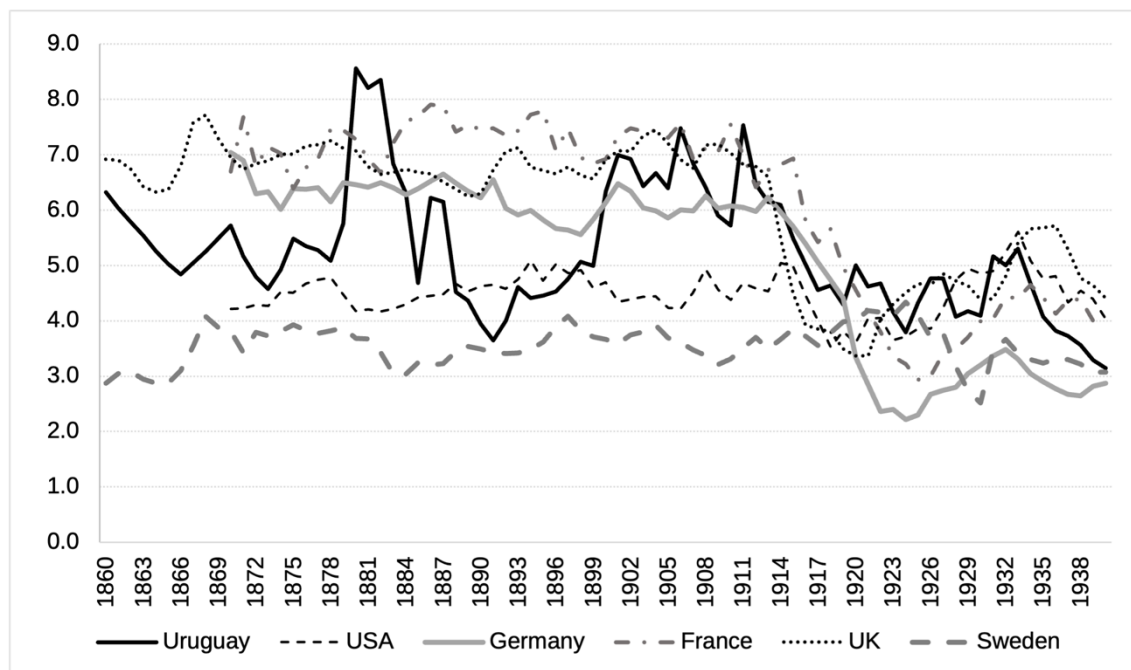
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Appendix A. Alternative estimation of β

Figure A.1 shows the changes in β over time, using the adjustment proposed by Ochoa (1948) and several other authors, which triples the land and housing values corresponding to 1860 and 1880, assuming that all other variables remain the same (this graph would be the corresponding to Figure 2).

The changes in β are puzzling, and it's hard to justify the results, especially the significant changes over relatively short periods and the substantial increase in the 1870s.

Figure A.1 – Private-wealth-national income ratios in Uruguay and other countries.
1870–1940



Sources. Authors' calculations based on Piketty and Zucman (2014), Waldenström (2017), Ochoa (1948); and Bértola et al (2024a). Calculation includes the triplication of housing values proposed by Ochoa (1948), corresponding to 1860 and 1880.

Appendix B. Annual estimates of wealth and β -coefficient

Our source of wealth corresponds to specific years (12 temporal points), but for the completion of several of our exercises, annual data are essential. One methodological option would be to linearly interpolate the four wealth categories we defined (agricultural land, agricultural assets, housing, and other assets) and sum them to obtain the total (gross) wealth. However, under this approach, the evolution of the β -coefficient would result from the ratio of an interpolated variable (wealth) to an estimated one (national

income). Consequently, the variability of β would be determined by the variability of income, which is at least analytically inconvenient.

Therefore, we opted for a second method, which consists of temporally interpolating the known data for the four components of wealth according to the movement of value variables (price $\times$ volume), provided that their nature is representative of the variable in question. Once estimates for each of the four categories are obtained, they are aggregated to derive the total (gross) wealth.

As discussed in previous studies (Willebald, 2011; Rodríguez Weber, 2017), the selected variables can adequately represent the annual movement of the components (its dynamics). However, at the end of the interpolation period, they may yield levels that do not replicate the known value of the variable. Therefore, the annual rates of growth are rescaled so that, without altering the dynamics, the known value that closes each interpolation period is obtained. In Table B.1, we present the variables we use to represent the movement of each wealth category by volume and price.

Agricultural land

Volume: all data derived from the Agricultural census and secondary sources (Willebald 2015). 1874–1943: lineal interpolation between available data (1874, 1883, 1893, 1900, 1903, 1908, 1912, 1916, 1924, 1937, 1943). 1860–1874: We assume the average annual growth rate corresponding to 1874–1879.

Price: 1860–1869: we assume the same price as in 1870, based on the low volatility and price levels of the period (Barrán and Nahum 1967).

Table B.1. Wealth categories, volume and price variables, and sources

Category	Volume, Price, and Definitions	Sources
Agricultural land	Land used for agricultural production (livestock, crops), in hectares	Willebald (2015): 1874, 1883, 1893, 1903, 1912. Castro Scavone (2023): 1900, 1908, 1916, 1924, 1937, 1943.
	Land price index, 1913=100, U\$/ha	Bértola et al. (1999) based on: 1870–1885: Barrán and Nahum (1967), T.1. Apéndice Documental, p. 319. 1886–1895: Barrán and Nahum (1968), T.2. Apéndice Documental, p. 637. 1896–1905: Barrán and Nahum (1973), T.3, p. 467.

Category	Volume, Price, and Definitions	Sources
		1906–1913: Barrán and Nahum (1977), T.6, p. 429. 1911–1930: Balbis (1995), p. 123. 1931–1970: Reig and Vigorito (1986), pp. 183-184.
Agricultural assets	Livestock: number of animals (bovine and ovine).	Castro Scavone (2023): 1860, 1883, 1889, 1900, 1908, 1916, 1924, 1937, 1943.
	Livestock VA deflator.	Bértola (1998): 1870–1936 Bertino and Tajam (1999): 1937-1940.
Housing	Housing VA, 2005 constant U\$	Bértola et al. (2024a): 1870-1940. Bértola et al. (2024b) and Population Census 1860: 1860-1869.
	Housing VA deflator:	Bértola et al. (2024a).
Other assets	Primary and Secondary VA, 2005 constant U\$	Bértola et al. (2024a).
	Primary and Secondary VA deflators.	Bértola et al. (2024a).

Notes: ha: hectare; U\$: Uruguayan *peso*.

Sources. Authors' elaboration.

Agricultural assets

Volume: data derived from the Agricultural census and secondary sources. 1860-1943: lineal interpolation between available data. To obtain a combined series (cattle unity), we consider the equivalence 1 cow=4 sheep (Alvarez Scaniello, 2014; Astori, 1979).

Price: Bértola et al. (2024a) provide data on agriculture (implicit deflator), but do not specifically refer to livestock. However, their estimates are based on Bértola (1998) and Bertino and Tajam (1999), who distinguish between livestock production and crop farming. We therefore use the implicit deflator corresponding to livestock: for 1870-1936, we rely on Bértola (1998), and for 1937-1940, on Bertino and Tajam (1999). As before, for 1860-1869, we assume the same price level as in 1870, based on the low volatility and relatively stable prices observed during that period.

Housing

Volume: Housing includes rural and urban real estate, and we represent the movement of the stock from 1870 to 1940, with the evolution of the sector's VA expressed in

constant 2005 prices (Uruguayan *pesos*). We estimated the series for the period 1860-1869 using data on population movement.

Price: Housing VA deflator 1870-1940, and we maintain the prices stable in 1860-1869.

Other assets

Volume: Other assets include a wide set of capital goods of different scope and nature. We represent the movement of the stock in 1870-1940 with the evolution of the VA of the “material” activities –agriculture, fishing, mining, manufacturing, construction, and utilities; i.e., primary and secondary activities– expressed in constant prices of 2005 (Uruguayan *pesos*). We estimated the series for the period 1860-1869 based on the sector's movement in 1870-1875 (annual average).

Price: Primary plus secondary activities VA deflators for 1870-1940, and we maintain the prices stable in 1860-1869.

Appendix C. Estimation of National Income

Gross National Disposable Income (GNDI) is defined as Gross Domestic Product (GDP) plus net receipts (NR) from abroad of compensation of employees, property income, and net taxes less subsidies on production, along with net current transfers (NCT) receivable by resident units from the rest of the world and payable to non-resident units. Employees' compensation from abroad includes earnings from residents who primarily live within the economic territory but work abroad or individuals who live and work abroad for short periods (seasonal workers) while maintaining their economic interest in their home country. Property income receivable from or payable abroad encompasses interest, dividends, and retained earnings of foreign enterprises partially or wholly owned by resident enterprises (and vice versa). Current transfers, distinct from capital transfers included in the capital and financial account, affect the current account and comprise workers' remittances, donations, tax payments, foreign aid, and grants (BCU-SCN2008).

For the annual series of Uruguay, we combine official information with historical estimates to provide a long-run estimation²² covering our period of interest. The

²² For methodological reasons, we must propose a long-run estimation combining the official data (from 1955 afterward) with historical estimations (1860-1954). This paper presents data for our study period (1860-1940), but the complete series is available upon request.

methodology is as follows. For the period 1955–2020, we utilize data from the System of National Accounts, which has been available in Uruguay since 1955 for various base years. However, homogeneous time series are only available from 1997 onward (Román and Willebald, 2024). For 1870–1954, we rely on the historical GDP estimates presented in Bértola et al. (2024a), who employ the retropolation procedure to obtain time-consistent series at current prices.

Starting with the official calculations, the data for NR and NCT are derived from the System of National Accounts, available in multiple publications (Instituto de Economía, 1969; Banco Central del Uruguay, 1973, 1989, 1994, and website). The net nature of these variables complicates interpolation methods due to potential sign changes between periods. Therefore, we adopt an alternative strategy: we calculate the shares of NR and NCT relative to GDP from the corresponding publications for each year and apply these shares to our GDP estimates. This approach preserves the economic influence represented in the source while operating on a different (scaled) level.²³

We compute historical estimates of NR by retropolating the 1955 levels using the annual movement reported in IECON (1969) for 1946–1955, Blengio (1959) for 1940–1945, and Donnángelo and Millán (2006) for 1870–1939. For NCT, additional challenges arise from significant discrepancies among sources, as well as from zero transactions reported for 1955 and for the period 1941–1945. We use similar sources to address this: IECON (1969) for 1946–1955 and Donnángelo and Millán (2006) for 1870–1945. Given the second challenge, we estimate levels (in currency) instead of rates of variation.

NR and NCT values were initially published in dollars and converted to Uruguayan pesos using the annual average exchange rate (Bonino et al. 2015; Maubrigades 2003).

The historical GDP estimates began in 1870 and, for the previous years, we used instrumental estimates. Vaillant (1873) estimated the economy's output at 48 million Uruguayan pesos in 1866, based on a 12% return on his estimate of "*riqueza pública*" (total wealth). This value approximates our 1870 GDP estimate (42 million pesos) and aligns with historical evidence, recognizing 1866–1869 as a critical period related to the

²³ The historical estimations presented in Bértola et al. (2024a) are based in different exercises of interpolation and horizontal consistency that implies the estimated GDP, even for official data (since 1955), can differ from the records opportunely published by the corresponding statistical board (based on GDP evolution by BROU until the 1960s, and BCU since the 1970s).

bankruptcy of Maua Bank (Yaffe, 2003). Thus, we consider this value for 1866, interpolate the intermediate years to 1870, and assume that pre-1866 economic activity followed the same pace as population growth).

We estimate GNDI for the 1860s by adjusting the 1870 level according to GDP evolution (over the entire period the ratio is: $GNDI/GDP=0.97$).

Appendix D. Estimation of private saving rates

Estimating private saving rates requires a succession of adjustments. The starting point is calculating the economy's total savings, which we estimate as the difference between GNDI (our estimate) and consumption (Bértola et al. 2024a) for 1870–1940. This saving rate has two components: private and government saving rates (Figure D.1).

We approximate the government savings as the current fiscal result –i.e., the fiscal result deduced from investments– for 1910-1940, from Azar et al. (2009), and for 1860–1909, our estimates. Our estimates require data on fiscal revenues and expenditures –the difference between which constitutes the fiscal balance – as well as on public investment.

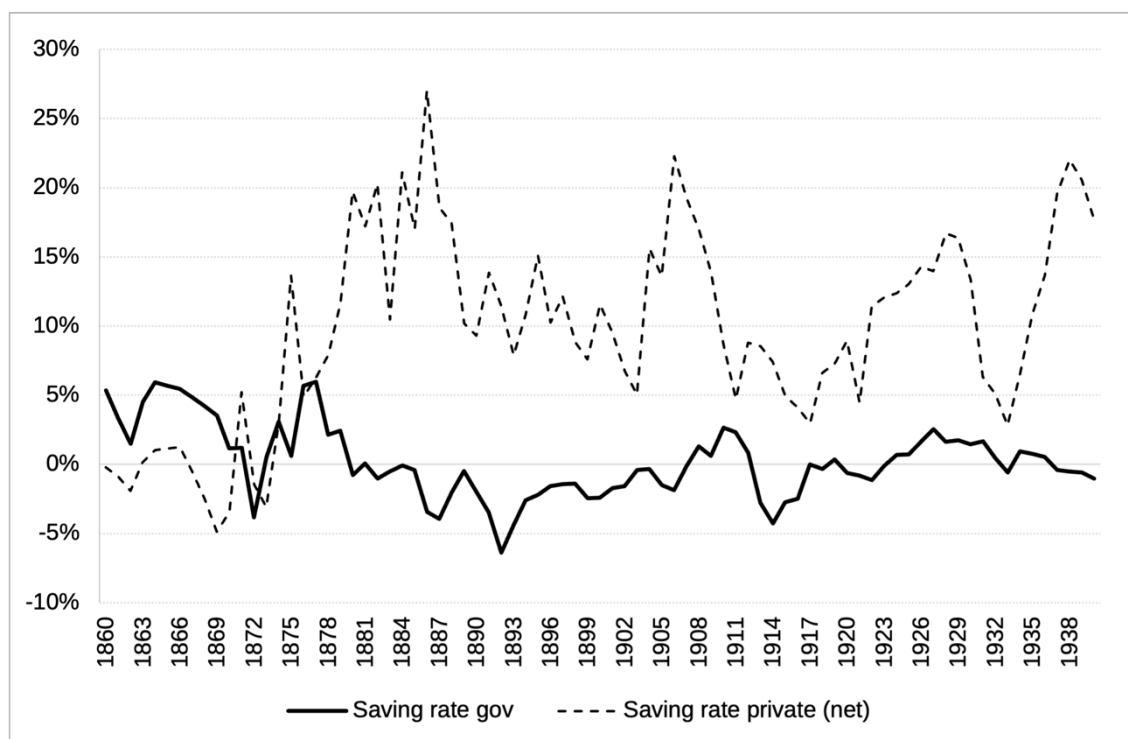
Initially, we took advantage of the close connection between central government revenues and GDP and used the structural relationship between 1910 and 1960 to estimate the fiscal revenues in 1860–1909.²⁴ Then, consider the central government expenditures and splice the series of Azar et al. (2009) with the movement of public consumption (Bértola et al., 2024a) corresponding to 1870-1909 and the fiscal expenditures (Martínez, 2021, p. 28) corresponding to 1860-1869 (data for 1860, 1862–1864, 1869 and lineal interpolations). Information about public investment is scarce. Martínez (2019, p. 138) presents information on state spending on public works and postal services, which we classify as public sector investment (data for 1860, 1862–1864, 1869, and lineal interpolations). With these three components, we estimate the current fiscal balance and, in consequence, a proxy of the government savings.

Private saving is the difference between total saving and government saving for 1870–1940. To estimate private savings for 1860–1869, we need an estimate of private consumption, which we calculated using population movements. This calculation is

²⁴ A simple OLS model with fiscal revenues (FR) as dependent variable and GDP as independent variable offers the following result: $FR = 0,0966GDP + 2,4499$, $R^2 = 0,9973$.

expressed in terms of the GNDI, and the difference in total savings (also in terms of GNDI) yields the (gross) private saving rates. We calculated depreciation and used this ratio to deduce the net private saving rates.

Figure D.1. Saving rates. Government and Private (net) 1860–1940



Sources. Authors' calculations

Román and Willebald (2015) provide data on capital stock and depreciation, and we updated and extended this calculation to estimate capital depreciation. First, we updated the original calculation using the new investment data (Bértola et al., 2024a) for 1870–1940. We extended the series until 1860, incorporating the annual movement of two components of wealth: housing and other assets (in 1913 constant prices). We transform capital stock from constant prices to current prices using the investment deflator and estimated depreciation, following the rate used by Román and Willebald (2015) (5%).

During the 1860s, Uruguay was an economy with very low levels of saving, based primarily on public saving. This pattern changed completely from the 1870s onward. Although the private (net) saving rate was highly irregular, it averaged 11.2% between 1870 and 1940, while the public sector, unsurprisingly, exhibited a negative saving rate (-0.4%) and, consequently, persistent financing needs.