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Wealth-income ratios in a small, open economy: The Netherlands, 1854–2019☆

Simon J. Toussaint [a,*], Amaury de Vicq [b], Michail Moatsos [c], Tim van der Valk [d]

[a] Utrecht University, The Netherlands
[b] University of Groningen, The Netherlands
[c] School of Business and Economics, Maastricht University, The Netherlands
[d] Dutch Ministry of Finance, The Netherlands

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ABSTRACT

We construct and analyze household wealth and its composition for The Netherlands since 1854. The household wealth-income ratio followed the familiar U-shaped pattern over the 20th century. The wealth-income ratio increased in the 19th century, driven by industrialization and booming private foreign investments, to a peak of 700% around 1880. In contrast to other countries, the wealth-income ratio remained high up until 1929. We construct the first series on colonial wealth in the literature and show that colonial and other foreign investment account for most of the gap with other countries in the pre-WWII period. The initial post-war decline of the ratio is driven by rapid income growth. The increase in the ratio since the 1970s has been mainly driven by the large capital-funded pension system. Housing plays only a secondary role in net wealth accumulation due to significant mortgage debt.

1. Introduction

Wealth growth is intrinsically tied to broader economic development and improvements in societal well-being (Waldenström, 2017). Consequently, economists focus on understanding the relationship between wealth and income, how it evolves over time, and the driving factors behind these changes (Baselgia and Martinez, 2025). The wealth-to-income ratio is a key metric in such analyses, offering cross-country comparability by remaining independent of price levels and providing insights into long-term structural trends.

Piketty and Zucman's seminal study (Piketty and Zucman, 2014) analyzed national and household wealth–income ratios across four major Western economies — France, Germany, the United Kingdom, and the United States — revealing significant fluctuations

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* Corresponding author.
E-mail address: s.j.toussaint@law.leidenuniv.nl (S.J. Toussaint).

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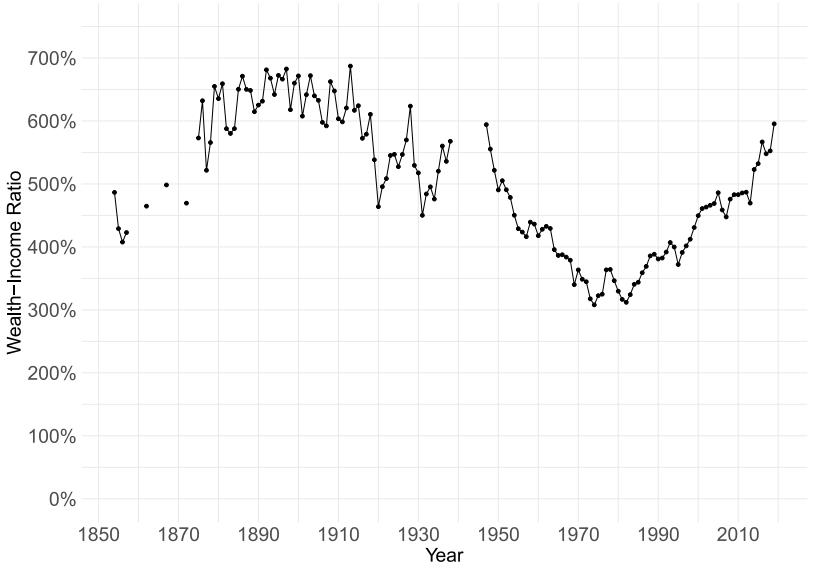


Fig. 1. The wealth–income ratio, 1854–2019.
Notes: Figure depicts the ratio of aggregate household wealth to net national income (1854–2019).

over time. They found that aggregate wealth rose sharply before World War I, declined through much of the 20th century, and rebounded in the 1970s. Their work highlights broader implications for inequality, suggesting that as wealth gains prominence relative to income, disparities stemming from wealth concentration may intensify. It may even constrain economic growth.

Building on their contributions, and those of subsequent scholars in their wake, it is crucial to examine other countries with distinct historical and economic trajectories (Waldenström, 2017; Artola Blanco et al., 2020; Baselgia and Martinez, 2025). The Netherlands provides a compelling case, as it has long been one of the wealthiest nations, shaped by its colonial riches and its pioneering role in modern capitalism ('t Hart et al., 1997). Amsterdam, once a global financial hub for trading stocks, bonds, and other instruments, lost prominence in the 19th and early 20th centuries as London rose to dominance. Nevertheless, it remained a leading center for international and colonial enterprises, bolstered by a sophisticated financial sector. Unlike most of its neighboring countries, the Netherlands was slow to industrialize, leading the Dutch elite to favor international and colonial investments due to limited domestic opportunities. This reliance on foreign investments contributed to differences in the wealth–income ratio compared to other countries in the pre-World War II period. Similarly, post-1970s variations in the Dutch wealth–income ratio reflect its large capital-funded pension system. Despite its distinctive trajectory, the Netherlands has been neglected in studies of long-term household wealth (Piketty and Zucman, 2014) which tended to look at larger, more closed economies.

Our paper fills this void by presenting the first historical household balance sheets for the Netherlands (1854–2019), fully aligned with existing System of National Accounts data. Starting from 1880, we decompose these balance sheets into wealth components — real estate, equity, bonds, liabilities, and pension and life insurance claims — and provide multiple interpretations of our findings, contrasting them with existing international evidence.

Our main contributions are threefold. First, we provide an estimate of household wealth in the Netherlands from 1850 to 2019. Second, we break down aggregate wealth into its principal components, highlighting their respective importance from 1880 to 2019. Finally, we situate these trends in the broader context of the Netherlands' early development of security markets and capitalism, its colonial past, and the pivotal role of its capital-funded pension system. By offering evidence on a small and highly open economy, our study broadens the literature on long-term wealth dynamics — which often focuses on larger, more closed economies — and supports the hypothesis by Piketty and Zucman (2014) that highly financialized economies are associated with higher wealth–income ratios. In that sense, the Netherlands' experience, especially before World War II, corroborates more recent findings for Switzerland and may likewise shed light on how wealth and income could continue to evolve in the 21st century, particularly as policymaking continues to favor free market policies (Baselgia and Martinez, 2025).

Our main results are summarized by Fig. 1, which shows the household wealth–income ratio in the Netherlands since 1854.

Our results suggest that the wealth–income ratio in the Netherlands followed the familiar U-shaped pattern observed in earlier studies, with a peak in the early 20th century, a subsequent decline until the 1970s, and an increase in recent decades. However, we find that the magnitude of this peak is among the largest observed in the international literature (Waldenström, 2024). Specifically, the wealth–income ratio peaked close to 700 percent at the end of the 19th century; notably, it remained high during and after World War I, only declining after the Great Depression of 1929. After World War II, the wealth–income ratio declined precipitously until the 1970s, and since the 1980s it has risen again, reaching 600 percent in 2019.

Second, we provide a detailed account of the composition of household wealth since 1880. We find that financial assets dominated wealth composition prior to World War II. After World War II, financial assets decreased in importance, while pension wealth rapidly became a dominant asset class for households, comprising 40 percent of the household portfolio by 2019.

To explain the peak in the wealth–income ratio in the 1880s, as well as the persistently high ratios post-World War I, we are the first to construct a series on colonial wealth. Our findings demonstrate that colonial and other foreign wealth played a particularly significant role in the Netherlands compared to most other countries. More generally, our results underscore the importance of careful accounting for foreign investment, colonial wealth, and other major trends in the late 19th century to explain global patterns in wealth inequality. Moreover, the sharp decline in the wealth–income ratio that occurred in the 1950s — rather than during the 1940s — can plausibly be related to the forced nationalization of Dutch enterprises by the newly independent Indonesian government, along with the general upheaval associated with decolonization, rather than to the expansion of the welfare state. Finally, we show that pension savings and capital gains have been the most important drivers of wealth accumulation since the 1980s.

Our findings on the wealth–income ratio differ significantly from earlier historical estimates of Dutch household wealth, stemming from methodological differences. The earliest historical estimations, traceable to the late 19th century (Boissevain, 1891), relied on the estate multiplier approach using tabulated inheritance tax records (Kopczuk and Saez, 2004). More recent findings were provided by Wilterdink (1984, 2015), who built estimates upon available wealth tax data and assumed that the wealth of those below the wealth tax threshold could be approximated by a lognormal distribution. His estimates have served as a benchmark in the (international) literature (e.g., it is used in Roine and Waldenström, 2015). We compare our estimates — which employ a consistent treatment of household wealth aligned with national accounts — with these earlier methods as a robustness check. We find that the estate multiplier method produces similar estimates to the benchmark historical national accounts pre-World War II, but that the two methods diverge after the war. As noted by van Bavel and Frankema (2017) and Coenen (2017), the lognormal extrapolation method used by Wilterdink resulted in unrealistically low household wealth estimates for the 1970s, placing the wealth–income ratio at approximately 85 percent of net national income. By contrast, our estimates yield a more realistic wealth–income ratio of roughly 300 percent for the same period.

The remainder of the paper is organized as follows: Section 2 reviews existing literature on the dynamics of wealth, both in the Netherlands and in other countries. In Section 3, we define household wealth and examine the distinct role of pension wealth in greater detail. Section 4 outlines the three methods employed to reconstruct aggregate household wealth in the Netherlands. Section 5 provides an overview of the results, including aggregates and wealth composition, as well as a brief international comparison. In Section 6, we analyze the dynamics of the wealth–income ratio. We first examine the role of international and colonial investments (Section 6.1) and then explore socio-economic developments in the Netherlands after World War II (Section 6.2), highlighting the large accumulation of capital-funded pensions as a key driver of rising wealth growth since the 1980s. Finally, Section 7 concludes.

2. Literature review

Research on long-term wealth dynamics is a relatively recent development. This is largely because such studies depend on national stock accounts, which statistical institutes only began compiling systematically in the early 1990s. In recent years, however, there has been a growing interest in the historical trends of wealth's size, composition, and distribution, particularly in Western countries and some less economical developed countries. Foundational works, including those by Davies et al. (2011), Piketty (2014), and Piketty and Zucman (2014), have motivated additional studies to investigate whether the U-shaped trajectory of wealth–income ratios documented by Piketty and Zucman (2014) can also be observed in countries with varying institutional frameworks. Examples include studies on Sweden (Waldenström, 2017), South Africa (Orthofer et al., 2019), China (Piketty et al., 2019), India (Kumar, 2019), Spain (Artola Blanco et al., 2020), and Switzerland (Baselgia and Martinez, 2025).

To contextualize our findings, we compare the trajectory of wealth–income ratios in the Netherlands to those in several developed economies. Our comparative analysis places particular emphasis on France and the United Kingdom, given the significant role that foreign and colonial investments played in shaping wealth trends in these countries. In addition, we will also investigate similarities with other small, open economies, especially Switzerland (Baselgia and Martinez, 2025). To ensure international comparability, we closely follow the methodologies proposed by Piketty and Zucman (2014) and Bauluz (2019).

It is important to note that while our study is the first to provide a consistent wealth–income ratio for the Netherlands over an extended period, there exist historical estimations of household wealth. Early efforts date back to the mid-19th century, with Pareau (1864) comparing household wealth to population size. Later, Boissevain (1883, 1891) and Stuart (1888) produced estimates of aggregate wealth for the 1880s and 1890s using the estate multiplier method. During the interwar period, Bonger (1923) criticized this method and adopted an approach closer to national accounts, which was subsequently refined by Smeets (1932) and van der Wijk (1939).

The post-World War II period saw a decline in studies on Dutch wealth dynamics until Wilterdink (1984) revitalized the field by analyzing wealth tax records from the 1890s to the 1970s and examining top wealth shares. Building on this foundation, subsequent studies explored earlier periods (Verstegen, 1996; Bos, 1990) and extended coverage to more recent decades (Wilterdink, 2015; Salverda, 2019). Despite these contributions, gaps remain in long-term, comprehensive data. Our work seeks to fill these gaps by providing the first integrated dataset on Dutch wealth spanning from the 1850s, fully aligned with contemporary international standards.

3. Definitions of wealth components

Our aim is to reconstruct household wealth, W_t, following the definition spelled out in the System of National Accounts, which is the total market value of assets minus liabilities. Assets include all financial and non-financial assets over which ownership rights can be enforced and which provide economic benefits to their owners. This definition includes most major wealth components,

including housing, real estate, savings accounts, stocks and bonds, which can be accessed and transacted by their owners. As is standard in the literature, we normalize wealth by national income Y_t to obtain the *wealth–income ratio*, commonly denoted as $\beta_t := W_t/Y_t$.

It is useful at this point to clearly spell out the concepts which we will estimate and pursue throughout the paper. National wealth W_t^n is the sum of government (public) wealth W_t^g and household wealth W_t, giving rise to the following accounting identity:

$$W_t^n = W_t + W_t^g. \tag{1}$$

Household wealth W_t includes both wealth accruing to private households and wealth accruing to nonprofit institutions serving households (NPISH).[1]

A final important decomposition we will use in this paper is the decomposition of household wealth into the private capital stock K_t — broadly defined to include land — and the net foreign asset position:

$$W_t = K_t + \text{NFA}_t. \tag{2}$$

We emphasize that Eq. (2) decomposes *household* wealth into a domestic capital and a foreign wealth part. Piketty and Zucman (2014) use this decomposition for national wealth (i.e., $W_t^n = K_t^n + \text{NFA}_t^n$), where all variables also include the relevant government-owned counterparts. However, we use this accounting identity only at the household level, in order to reconstruct total household wealth, as we will detail below. Therefore, we take care to remove government capital and foreign assets from our data, to make the accounting identity hold for household wealth.

Modern balance sheets decompose household wealth into financial assets A_t^f, non-financial assets A_t^{nf}, and liabilities L_t, each of which can be decomposed into more granular components. Our aim is to provide a series of household wealth that is as consistent as possible over time. To this end, we use the following broad categories:

$$W_t = \underbrace{D_t + S_t + P_t}_{=: A_t^f} + \underbrace{H_t + B_t}_{=: A_t^{nf}} - L_t. \tag{3}$$

In Eq. (3), D_t refers to deposits, including cash holdings. S_t refers to securities, which include listed stocks, bonds, and other financial products, both domestic and foreign. L_t measures liabilities, which for households primarily take the form of mortgage debt. H_t refers to housing assets, defined following National Accounting conventions as the sum of residential dwellings and land under dwellings. The final two components are P_t (pensions and life insurance) and B_t (business assets), both of which merit particular attention.

The Dutch pension system consists of three 'pillars': (i.) universal retirement payouts, funded as a PAYGO scheme (*Algemene Ouderdomswet* or *AOW*); (ii.) occupational capital-funded pension funds, which every employee is legally required to contribute to; and (iii.) private capital-funded pension schemes. In standard National Accounting guidelines, components (ii.) and (iii.) are included in household wealth.[2] In this paper, we follow existing guidelines and include all capital-funded pension claims in household wealth, as well as pension-like products such as life insurance.

The final component is business assets B_t. In modern National Accounts, we can clearly delineate between non-financial assets belonging to the household sector (such as agricultural land and fixed capital owned by self-employed entrepreneurs), and equity shares in non-listed corporations, which are claims on the capital stock of the corporate sector and hence financial assets of households. This delineation is not possible in the early periods of our data series. In order to make our series as consistent as possible, we will not distinguish between non-listed shares and capital directly owned by the household sector, and refer to its total value as business assets. For modern National Accounts, this labeling solely affects the composition of household wealth, not its levels or trends. In earlier periods, we effectively estimate this component residually, by first estimating all other variables in Eq. (3), and subtracting all these variables from our estimates of total household wealth to arrive at business assets. We elaborate on this procedure in the next section.

[1] We cannot distinguish between these two subcomponents in our historical series; hence, our measure of household wealth is inclusive of NPISH throughout. For simplicity, we continue to refer to this total as household wealth. Piketty and Zucman (2014) and the subsequent Distributional National Accounts literature refer to household + NPISH wealth as 'private wealth', and to household wealth alone as 'personal wealth'. We stick to 'household wealth' for simplicity. In addition, referring to pension wealth as 'private' can be misleading, since pension claims are not under the private control of households. We return to this issue below.

[2] We note, however, that in Dutch wealth inequality statistics this component is consistently excluded. The reason is that, unlike in other institutional contexts (such as the U.S. 401(k)), it is effectively impossible for Dutch households to withdraw their contributions from pension funds for consumption or transfers to others prior to retirement; in this sense, they do not have property rights over their pension claims. Although some limited exceptions exist (e.g., early retirement or disability), access to accrued pension capital before the statutory retirement age is generally heavily restricted. Once pension benefits are drawn, they are taxed under the EET (Exempt Exempt Taxed) model, which exempts contributions and returns from taxation, but taxes benefits upon withdrawal — often at a lower effective rate for retirees (Anon., 2007). We refer the reader to Martínez-Toledano et al. (2023) for more discussion of this point and its implications for Dutch wealth shares.

Table 1
Overview of methods and data sources.

Method	Years	Sources & Data steps
Estate multiplier + reconstruction of historical national accounts (benchmark series)	1854–1879	Death duties data
	1880–1938	Manual reconstruction of HNA data, using $W_t = K_t + \text{NFA}_t$
	1947–1969	Interpolated totals using savings flow
	1970–1994	CPB estimates, augmented with additional data
	1995–2019	SNA data
Lognormal extrapolation	1894–1993	Wealth tax returns

Notes: Historical national accounts (HNA) are retrospective estimates of national wealth and its components, reconstructed using a variety of historical sources. It differs from the estate multiplier method which relies on death duty and the lognormal extrapolation method which relies on wealth tax returns. CPB stands for *Centraal Planbureau* (Netherlands Bureau of Economic Policy Analysis).

4. Data and methodology

4.1. Total household wealth

For our empirical analysis of the wealth–income ratio for the Netherlands, we aim to align as closely as possible with the current System of National Accounts (SNA-2008). Our approach results in five distinct methodological periods: (i) 1854–1879; (ii) 1880–1938, (iii) 1947–1969, (iv) 1970–1994, and (v) 1995–2019.[3] We will first discuss how we estimate total household wealth before 1995; in the next subsection we will then briefly discuss the different data sources used to estimate the various components mentioned in Eq. (3) (see Table 1).

We discuss each subperiod in turn.

- **1854–1879:** Prior to 1880, we use the estate multiplier method, which relies on succession tax data. Dutch statistical agencies have published this data in aggregate form since the mid-1850s, reporting wealth information for the decedent population based on market prices (Gelderblom et al., 2022). The level of detail in these reports varies by period (see Section B in the Online Appendix). In the literature, a common concern with such data is that high thresholds for inclusion might restrict coverage to the wealthiest estates. However, this is not the case for the Netherlands, where the threshold approximated the annual earnings of an unskilled worker. As a result, the data reflect a broad range of the wealth distribution rather than just the upper tail (Gelderblom et al., 2022).
  This method estimates total population wealth by scaling the wealth recorded in inheritance tax returns with the ratio of deceased individuals covered by the tax to the total living population in that year. Since larger estates are more common among older individuals, age-specific mortality rate adjustments are required to account for differences between the sample and the general population.
  To estimate mortality rates specific to those in the inheritance tax records, additional data are needed. Possible solutions include using life insurance company records (Lampman, 1962), social class-based mortality multipliers (Alvaredo et al., 2018; Atkinson and Harrison, 1978), or wealth-mortality gradients derived from housing wealth data (Acciari et al., 2021). In our analysis, we use detailed individual-level mortality data, made available by Gelderblom et al. (2022).
  For our final series of household wealth, we take the historical national accounts as given, and index the level of the death duties series to match the 1880 national accounts estimate. This procedure preserves growth rates of the death duties series, but slightly increases levels. Fig. 1 is based on this indexed estimate pre-1880, and the historical national accounts after 1880. In Section 5, we will compare the two raw series without indexing.
- **1880–1938:** From 1880 onward, we reconstruct historical national accounts manually. To estimate total household wealth before 1947, we use Eq. (2), which tells us that household wealth W_t can be found as the sum of the capital stock K_t and the net foreign asset position NFA_t. We have high-quality estimates of the total private capital stock K_t for the entire period, which has been estimated by Smits et al. (2000) for 1800–1913 and Groote et al. (1996) for most of the 20th century. Moreover, we have detailed balance sheets compiled by *Centraal Bureau voor de Statistiek* (CBS, Statistics Netherlands) for the year 1938 (and several post-war years), which include the (private and total) NFA. For years before 1938, we have to estimate the NFA ourselves. We observe consistent series of net primary income from abroad y_t^f, which mainly consists of dividends (from Smits et al., 2000 until 1913 and den Bakker, 2019 thereafter). We convert flows to stocks by capitalizing this series, using

$$y_t^f := r_t^f \cdot \text{NFA}_t,$$

[3] Details for each wealth component are provided in Online Appendix A.

where r_t^f is the return on foreign assets. Hence, we can arrive at an estimate of the NFA by dividing foreign dividends by an estimated discount factor r_t^f.[4]

For each year, we take the average of the dividend yields of Berlin, Brussels, London, New York, and Paris; the stock exchanges which were by far the most important for Dutch non-colonial foreign investment in terms of cross-listed equities and bonds (Moore, 2012). Data on dividend yields for those exchanges are taken from Jordà et al. (2019). The five series are generally quite close to each other, with an average standard deviation over the 1880–1938 period of slightly more than 1%. During crisis years, such as 1917, the standard deviation increases; nevertheless, the average dividend yield gives a reasonable capitalization factor even in volatile years, particularly when considering that the resulting series is quite smooth; sticking with only one series would likely result in much more artificial volatility in the equity series. We benchmark the resulting NFA series to the official 1938 balance sheet. The result is a consistent series of the Dutch household net foreign asset position. In the Appendix, we discuss our methodology in more detail, and compare it to historical estimates of Dutch foreign investment, which are in general remarkably close to our estimates.

- **1947–1969:** After 1938, the next year we can recover is 1947. For 1947–1952, we again have official balance sheets listing total wealth. After 1952 and before 1970, we have some additional total wealth statistics for 1958 and 1960; however, many years are missing. Fortunately, we do observe total net savings flows for each year. Hence, we can interpolate total wealth for the missing years, using the wealth accumulation identity, which describes how wealth W evolves from period t to $t+1$ based on savings s and capital gains q:

$$W_{t+1} = (1 + q_{t+1})(1 + s_t)W_t. \tag{4}$$

  Our method is based on Piketty and Zucman (2014, Online Appendix K), and uses Eq. (4) to find an average capital gains rate that makes the identity hold. Consider the gap between 1952 and 1958. Our method is to (i.) fix a value $q_t = \overline{q}$ for all years, (ii.) plug this value together with annual savings rates s_t into the equation, (iii.) calculate final wealth as $W_{1958} = \prod_{t=1952}^{1958}(1 + \overline{q})(1 + s_t)W_t$, and (iv.) compare this estimate with actual wealth in 1958. If there is a gap between our estimated wealth for 1958 and actual wealth, we adjust $\overline{q}$ and restart the algorithm, stopping once the difference is negligible. This procedure, applied to all missing years, results in a consistent series of nominal household wealth.
- **1970–1994:** For 1970–1994, we use household balance sheets from CPB Netherlands Bureau of Economic Policy Analysis, comparing components with external sources in Online Appendix A.5 to ensure consistency. We augment these estimates with additional data on life insurance, and replace their estimates of equity wealth with data from Statistics Netherlands.
- **1995–2019:** From 1995 onward, we utilize the System of National Accounts (2015 revision), maintained by Statistics Netherlands, ensuring consistency by reporting end-of-year values throughout the series. This comprehensive approach allows us to produce a robust and continuous reconstruction of Dutch household wealth from 1880 to 2019.

4.2. Alternative approach to calculate total wealth

The exceptional richness of Dutch historical data enables us to perform an analysis that is often not feasible for other countries due to the scarcity of reliable sources. In addition to constructing our benchmark series based on historical national accounts post-1880 and death duties pre-1880, we also construct a series using lognormal extrapolation on wealth tax data, to support and validate the robustness of our benchmark series. We briefly outline this method, describe the data sources employed, and provide further technical details in the appendix.

The wealth tax, introduced in 1893, was first implemented in the fiscal year 1894 and remained in effect until 1993. Initially, it applied to fortunes exceeding 13,000 guilders,[5] covering approximately 5%–7% of households. In 2001, the wealth tax was replaced by a system ostensibly taxing capital income rather than net wealth.[6] Unlike the current tax system, the historical wealth tax targeted natural persons rather than households, although married couples were treated as a single entity for tax purposes.

The tax base included financial assets (e.g., listed and unlisted stocks, business wealth), deposits and cash, real estate, transport items (e.g., horse-carts and cars), life insurance claims, and, after 1918, jewelry and precious metals. Exclusions included pension claims, artworks, and consumer durables. Valuations were theoretically based on market value, though establishing accurate valuations was often challenging (Wilterdink, 1984).

We compiled wealth tax data from 1894–1993, with interruptions, particularly during the Second World War. To estimate total wealth, we adopt the method developed by Potharst (2022), which estimates the parameters μ and σ of a lognormal wealth distribution from censored tabulated data. This approach assumes that the wealth below the tax threshold matches a lognormal approximation of the distribution, where $W_t \sim \log \mathcal{N}(\mu_t, \sigma_t^2)$, with μ and σ derived from the wealth tax data. Combining this estimated component with wealth above the threshold yields an estimate of total wealth.

Estimating μ_t and σ_t^2 requires leveraging information from the wealth tax data's top brackets. Each data point is structured as (k, n_k, μ_k), where k is the lower threshold of the bracket, n_k is the number of individuals in that bracket, and μ_k is the average wealth within it. Using this information, μ and σ^2 are estimated by minimizing the discrepancy between a lognormal distribution and the observed bracket thresholds and frequencies (see Online Appendix C).

[4] Note that for our purposes, the dividend yield is the correct variable by which to capitalize the dividend streams and not the total return, i.e., dividends plus capital gains. This is because we are interested in the nominal value of equity at time t, and not in its real value, corrected for price revaluations.

[5] The threshold was later adjusted to 15,000 in 1915, reduced to 10,000 in 1947, and subsequently increased to 50,000 in 1957, 100,000 in 1970, and 200,000 guilders in 1983.

[6] Ostensibly, because financial assets directly held by households are assumed to generate a fixed "presumptive" return (4% for most of our data period), which is taxed at a flat rate (30%, which was made progressive in 2017). This is a *de facto* wealth tax (Jacobs, 2015).

4.3. Wealth composition

We briefly list the sources used to estimate each wealth component in Eq. (3), relegating details to the Online Appendix.

- **Deposits:** Prior to 1970, we use balance sheet data from the Dutch central bank (De Nederlandsche Bank, 2000) and publications by Statistics Netherlands (van der Bie, 2001) to estimate deposits and currency. From 1970, deposits are observable in the CPB balance sheets; from 1995, we use the National Accounts.
- **Securities:** Dutch government bonds are directly observed in annual statistics. Domestic stocks are calculated by taking total stock market capitalization from van der Bie (2001). Foreign assets are derived by the NFA capitalization discussed above. The foreign dividends series, from Smits et al. (2000) and den Bakker (2019), can be split into colonial and non-colonial dividends; this will allow us to construct the first estimates of colonial wealth in the literature.
- **Pensions:** Pension entitlements and private insurance savings are derived from technical reserves recorded by the Dutch central bank.
- **Housing:** We directly observe the value of residential dwellings in the capital stock estimates of Smits et al. (2000) and Groote et al. (1996). Land under dwellings is not directly observable before 1995, except in the official balance sheets for 1938 and 1947–1952. We estimate land under dwellings for all other years by indexing these years to the official balance sheets. As we detail in the Appendix, the fit with the official estimates from 1995 is remarkably good.
- **Business Assets:** As discussed above, this component is obtained residually before 1995. We do observe various subcomponents, such as agricultural land since 1880, and non-listed shares after 1970. These subcomponents, together with Eq. (2), enable us to discipline the size of this residual component. After 1995, this component equals the non-housing part of the non-financial balance sheets, plus non-listed shares for time-series consistency.
- **Liabilities:** Data on mortgages and other private credits are directly observed in annual statistics, and taken from the CPB balance sheets after 1970 and official balance sheets after 1995.

4.4. Population, income, prices, and savings

We briefly note our sources for supporting data series.

- **Population:** We use population figures from van der Bie (2001). Note that for the wealth tax extrapolations, where we integrate over the population to obtain total wealth, we have to consider *tax units* as a reference, i.e., all adults above 20, where married couples are treated as a single unit (Wilterdink, 1984). We follow Wilterdink (1984) and simply subtract the total number of married women from the population total above 20.
- **Prices:** Throughout, we use the Statistics Netherlands Consumer Price Index, as it appears in van der Bie (2001), which is based on the work of Smits et al. (2000) before 1913 and Statistics Netherlands and den Bakker (2019) thereafter. We normalize the index such that 2015 equals 100.
- **Income:** Throughout, we use net national income at market prices as the denominator for the wealth–income ratio. Data are from van der Bie (2001), which are based on Smits et al. (2000) for the period up to 1913, den Bakker (2019) for the Interbellum, and Statistics Netherlands thereafter. Both Smits et al. (2000) and den Bakker (2019) are extremely thorough studies who reconstruct national income in as consistent a manner as possible with modern national accounts. The internal consistency ensures that there are no breaks in the data or definition changes.
- **Savings:** We use net household savings, as reported by Statistics Netherlands in various editions of *Jaarcijfers voor Nederland*. From 1969, we use the official National Accounts.

5. Results

In this Section, we present our main results. We begin by comparing the different methods to construct total wealth, finding strong overlap between the historical national accounts and the death duties method pre-World War II. Then, we analyze the composition of wealth from 1880. We end with an international comparison.

5.1. Aggregate wealth estimates

Fig. 2 presents the ratio of household wealth to national income for the period 1854–2019, for all methods (historical national accounts, death duties, and wealth tax methods). In this Figure, death duties data are not indexed to the post-1880 historical national accounts to provide a fair comparison.

From the 1880s to the 1920s, the historical national accounts and death duties methods produce somewhat similar estimates of the wealth–income ratio. However, after the 1920s, the historical national accounts diverge significantly, reflecting a period of rapid capital gains on colonial wealth holdings. It is likely that death duties, the basis for the estate multiplier method, failed to fully capture these gains, as they did not adequately account for asset revaluation effects. This divergence underscores the limitations of the estate multiplier method in accurately capturing dynamics during periods of substantial capital accumulation. During this same early period, the wealth tax method consistently produces lower ratios (van Bavel and Frankema, 2017).

A striking feature in the data is the sharp increase in the wealth–income ratio between 1930 and 1950, which is visible across all three methods. This trend is most pronounced in the historical national accounts and is unlikely to be due to measurement error,

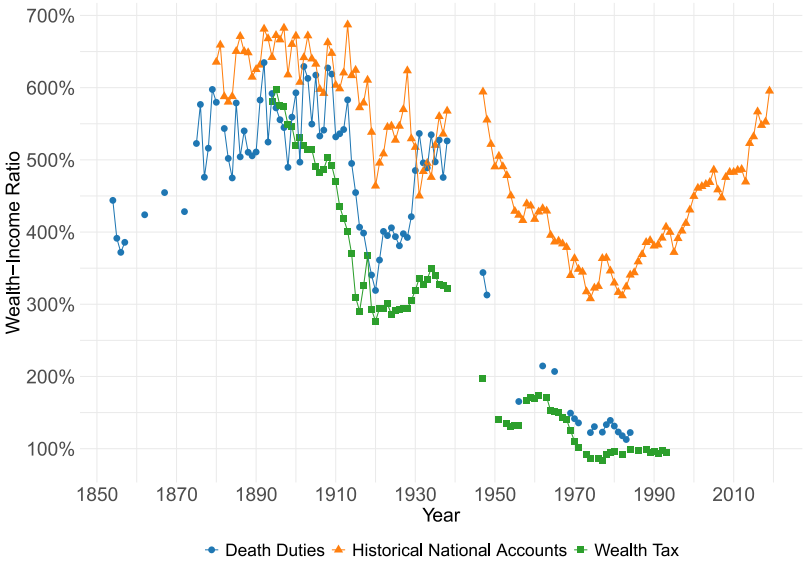


Fig. 2. Wealth–income ratios per method.
Notes: Figure shows the ratio of household wealth to net national income, using our three main methods: (i) Historical National Accounts (the benchmark), (ii) Estate Multiplier methods using death duties, and (iii) Wealth Tax methods. Death duties data are not indexed to the post-1880 historical national accounts to provide a fair comparison.

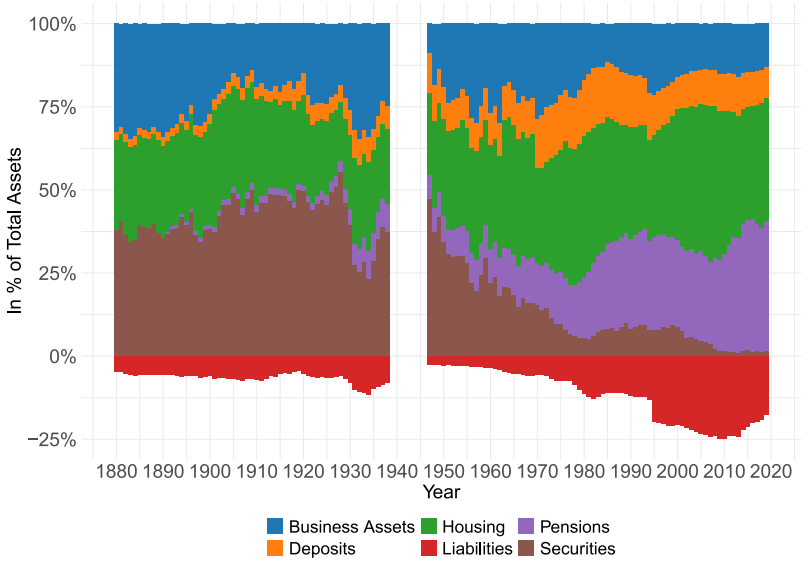
as corroborated by official balance sheets for 1938 and 1947 (Centraal Bureau voor de Statistiek, 1947). These records indicate that household wealth more than doubled over the decade, rising from 28 billion guilders in 1938 to over 70 billion in 1947. Although this increase is nominal, the evidence suggests that, in real terms, household wealth remained stable or even grew slightly during this period. This stability reflects the relatively minor destruction of household wealth in the Netherlands during the war, particularly in comparison to other countries, as discussed in Piketty and Zucman (2014). Although reliable estimates are scarce, a Statistics Netherlands publication estimates a loss to private wealth of around 6 billion guilders from 1939–1945 (Centraal Bureau voor de Statistiek, 1955). Crucially, however, economic recovery after 1945 — both in terms of income and wealth growth — is very rapid, so that by end of 1947 (the first moment in our post-war data series), much of the damage to the capital stock had been undone. An additional reason for the remarkable stability of the wealth–income ratio is a dramatic expansion of government debt, most of which was owned by households. This more than counteracted the reduction in real assets owned by households. All these factors combined result in a wealth–income ratio that appears virtually unchanged between 1938 and 1947.

After the 1950s, the death duties and wealth tax methods converge but remain consistently below the estimates derived from the historical national accounts. This discrepancy can be attributed the declining reliability of wealth and estate tax records over time, as highlighted by earlier studies such as Wilterdink (1984) and van Bavel and Frankema (2017), which may have biased these estimates downward. A closer look at the historical national accounts reveals that aggregate wealth grew more slowly than national income over much of the post-war period, leading to a decline in the wealth-to-income ratio, a trend also observed in many other countries. By the 1970s, the ratio reached its lowest point, around 300 percent of national income. However, from the 1980s onward, household wealth grew rapidly relative to national income, accelerating further in the 1990s. By 2019, the wealth–income ratio had reached a post-war peak of 600 percent, almost returning to its 1947 level.

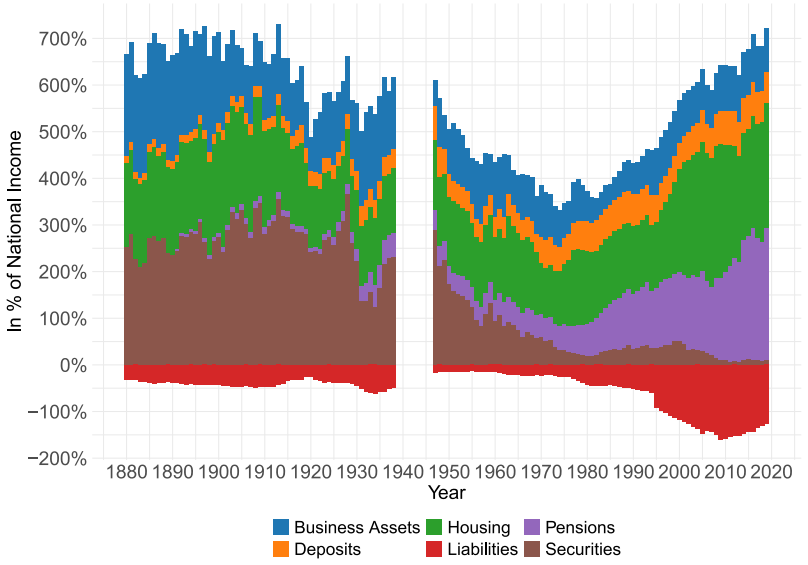
The occasional (mis-)alignment across methods may also offer valuable guidance for studying countries or time periods where historical national accounts are unavailable. Although it is difficult to draw conclusions based solely on the specific case of the Netherlands, where we have data for all three methods, it appears that in turbulent times a divergence between the methods emerges, while in less turbulent periods the estimated levels tend to fall within a similar range. At the same time, it remains uncertain how closely the methods align in terms of trends, even during more stable periods. Despite the richness of historical data, the Netherlands does not seem to provide a clear basis for drawing definitive conclusions in this regard. Therefore, it seems advisable that studies lacking historical national account data provide additional evidence to support the reliability of both the levels and the trends identified by alternative methods. In the following Section 5.2, we analyze the composition of household wealth to better understand the forces driving these dynamics.

5.2. Wealth composition

Fig. 3 illustrates the decomposition of household wealth from 1880 until today. We focus on the broad categories included in Eq. (3): Securities, housing, pension wealth, deposits, business assets, and liabilities. In panel 3(a), all asset classes are expressed as a percentage of the value of total assets, and in panel 3(b), we express the same series in percentage of the net national income, to give an idea of the magnitudes of each wealth component.



(a) as % of Total Assets



(b) as % of National Income

Fig. 3. Wealth composition, 1880–2019.
Notes: Figure shows the composition of household wealth, with each asset expressed as a proportion of total assets (panel 3(a)), and as a proportion of national income (panel 3(b)). All wealth composition data are from the historical National Accounts method, with the sources described in the main text and Online Appendix A; data on net national income are described in Section 4.4.

The period between 1880 and 1920 is first and foremost characterized by a sharp decline in the relative value of business assets; while this is a broad category, as discussed extensively above, the primary reason appears to be the reduction in value of agricultural land compared to net national income, declining from almost 200% in 1880 to 60% in 1938 (Knibbe, 1993). This coincides with trends in several other countries (Piketty and Zucman, 2014), and is driven to a large extent by falling agricultural prices as a result of global competition and technological improvement (Knibbe, 2014). A second major finding is the strong importance of securities; this category dominates all others until the 1960s. As we will explore in Section 6.1, this is mostly driven by the long Dutch history of (mostly international) financial investment. The Netherlands developed a stock market in the 17th century, and this early financialization persisted over time. Furthermore, by the start of our series in 1880, the Industrial Revolution had taken off in the Netherlands, which led to a boom in industrial corporations seeking equity (van Zanden and van Riel, 2000). Finally, and very significantly, foreign securities played an outsized role in the Dutch economy from the 1870s onward, with investments in American steel and railroad companies as well as Austrian and Russian bonds making up a major part of Dutch investors' portfolios.

Notably, the Dutch colony of Indonesia also opened up for private investment in the late 1870s, and would become a major source of household wealth by the early 1900s.

The other wealth components we identify play smaller roles prior to World War II. Housing is relatively constant at around 150% of national income, or 25% of household assets. Liabilities build up quite significantly before World War II. This is mostly due to an increase in mortgage debt (de Vries, 1976).

After World War II, we notice several similarities and other differences. Deposits and non-financial assets — housing and business assets — remain relatively constant, both as a share of total wealth and as a share of national income. By contrast, the major reason for the decline in the wealth–income ratio in this period is due to a relative decrease in the value of financial assets. The Bretton Woods system featured capital controls and other measures which limited capital mobility and the ability of securities to be traded freely. The Dutch stock market grows rather slowly from 1947 until 1980, only picking up afterward. Furthermore, foreign investment was much more limited in this period than before World War II. This is especially true for investments in Indonesia following Indonesian independence. We observe a sharp drop in the relative value of securities in the late 1950s, which corresponds precisely with the peak of nationalization of Dutch firms remaining in Indonesia at the time: a process also referred to as Indonesianization.[7]

Following the First and Second Oil Crises of the 1970s, both household shareholdings and overall wealth declined significantly. The growing welfare state further reduced the incentive for private saving by covering old age, illness, disability, and children's education through collective arrangements (Slot, 2004). Meanwhile, many institutional investors pursued higher returns through alternative channels — short-term loans, term deposits, commodity futures, venture capital, or direct company investments. By the early 1990s, however, a stock market boom began to reverse this downward trend, driving up share prices and prompting renewed private investment in equities (Slot, 2004). Around the same time, new financial products such as investment-linked insurance policies and share leasing broadened market access for retail investors. Nonetheless, this resurgence was relatively short-lived, as the dot-com bubble and the subsequent financial crisis of 2007 led to another decline in securities holdings (van der Valk et al., 2022). Despite the strong performance of stock markets since 2010, a segment of Dutch households appears to have permanently disengaged from active financial participation (van der Valk, 2019).

A striking trend in the post-1970s period is the dynamic in the relative value of housing. Its market value experiences rapid swings up and down in the late 1970s and early 1980s; since housing in the National Accounts is the sum of both dwellings — which is estimated using perpetual inventory methods — and land under dwellings, these swings in market values are relatively muted, although still noticeable (especially in the value of land under dwellings, which experiences swings of 40% of national income in a few years in this period).[8] The value of housing then continued to grow almost uninterrupted until the mid-2010s.[9] An important underlying institutional dynamic is the gradual rise in the share of owner-occupied housing over time from 35% in 1971 to 56% in 2010. From the 1980s onwards, production of new housing mainly focussed on the owner-occupied sector and housing associations were encouraged to sell off (socially) rented dwellings (Haffner et al., 2009). This increase in the value of private real estate was mirrored by a sharp increase in home mortgages; which, as a percentage of net national income, nearly quadrupled throughout this period. This reflects the growing financialization of the Dutch economy and the limited regulatory oversight over the mortgage sector (van der Valk, 2019). A particular institution which contributed to the buildup in mortgage debt was the interest-only mortgage, which was enormously popular until the Great Financial Crisis of 2008 (Bernstein and Koudijs, 2024).

Notable for the Netherlands is the sharp rise in pension wealth over the twentieth century, which saw near-exponential growth since the 1990s due to legislative reforms and the broader expansion of collective arrangements (Slot, 2004). While its most notable growth occurred more recently, the roots of the Dutch pension system extend back to the pre-war period, with crucial developments including the 1922 Pension Act establishing the *Algemeen Burgerlijk Pensioenfonds* (ABP) and a universal, capital-based pension plan for civil servants and the 1937 legislation that enabled sectoral pension agreements to be declared generally binding (Nijhof, 2009). Over subsequent decades, as an ever-larger proportion of the workforce was incorporated into collective pension funds, and as those funds themselves matured, overall pension assets grew markedly. Sectoral pension schemes also benefited from more participants paying contributions throughout their entire careers.

By the 1990s, liberalized capital flows and expanded international investment opportunities further accelerated the growth of these funds, as pension funds pursued higher returns in global markets. In the early 2000s, second-pillar pensions already covered over 90% of employees, underscoring the shift away from purely individual savings mechanisms toward collective arrangements (van der Valk et al., 2022).

This gradual shift, which originated with the expansion of welfare states, does not imply that Dutch households have withdrawn from the equity markets altogether; rather, a substantial portion of their equity exposure has been redirected through these large pension funds, instead of through direct stock holdings (Alessie et al., 2013). Although several countries have large occupational pension schemes that channel household investments in equities via institutional investors, the Dutch case is distinguished by nearly universal coverage, strong sector-wide pension arrangements, and comparatively high contribution rates (OECD, 2019). This scale, coupled with favorable tax treatment, explains why the share of household wealth funneled into institutional vehicles is so high by

[7] 'Indonesianization' (indonesianisasi) is defined as the process set in motion by the Indonesian government to realize an 'economic decolonization'. It consisted of various measures aiming at the transfer of property and economic functions held by foreigners or foreign businesses (primarily Dutch), or residents viewed as foreigners (primarily of Indonesians of Chinese descent), to what the government considered to be indigenous Indonesians (Thee, 2012).

[8] In the working paper version of this paper (Toussaint et al., 2022), we used a market-value series of housing wealth based on the CPB balance sheet; the price swings were even more pronounced in that series.

[9] There is a break in the housing and mortage data between 1994 and 1995. See Online Appendix A.4.

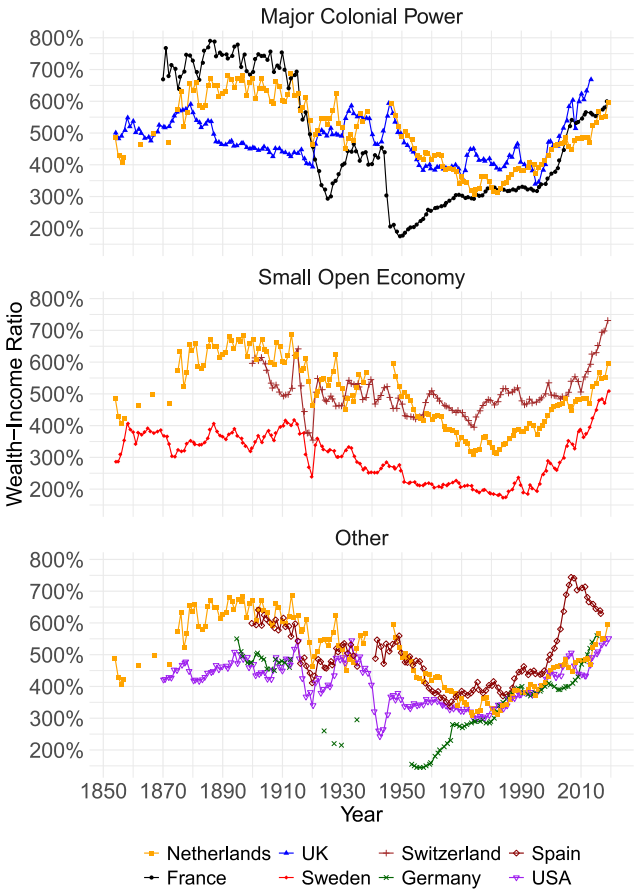


Fig. 4. Wealth–income ratio, international comparison.
Notes: Figure shows the evolution of the ratio of household wealth to net national income for the Netherlands, Germany (from Albers et al., 2020), Spain (Artola Blanco et al., 2020), Sweden (Waldenström, 2017), Switzerland (Baselgia and Martinez, 2025), and the United Kingdom (Madsen, 2019); as well as the series for France and the US from Piketty and Zucman (2014). The top panel shows France and the UK, the middle panel Switzerland and Sweden, and the bottom panel Spain, Germany, and the US. The Netherlands is in each panel for comparability.

international standards (European Commission, 2021).[10] Falling discount rates further contributed to the growth of pension wealth in more recent years by inflating the net present value of these household claims on pension funds. Whereas it was once all but a minor component of household wealth, it now slightly exceeds housing as the most important asset of households. We will return to the pension system in Section 6.2.

5.3. International comparison

Fig. 4 looks at household wealth–income ratios for several western countries for which such long-run evidence exists: the United Kingdom, France, Germany, Sweden, Spain, Switzerland, and the United States. We use the series for Spain by Artola Blanco et al. (2020), as well as the estimates by Albers et al. (2020) for Germany, Baselgia and Martinez (2025) for Switzerland, Madsen (2019) for the UK, and the series by Waldenström (2017) for Sweden; all other estimates are from Piketty and Zucman (2014). The Spanish, German, and Swedish series are all quite substantially lower before World War I than the series reported by Piketty and Zucman (2014). This fact has led Waldenström (2024) to state that wealth–income ratios were much lower pre-World War I than argued by Piketty and Zucman (2014).

In order to visually distinguish between the eight different series, we have split the Figure into three panels, with the Netherlands in each. The top panel lists the major colonial powers of the 19th and 20th century (France, the UK, and the Netherlands). The

[10] Under the Dutch EET model (Exempt Exempt Taxed), no tax is levied on pension contributions or returns, but benefits are taxed upon withdrawal. Because many retirees fall into lower income brackets, the effective tax burden tends to be lower in present-value terms than if contributions were taxed from the outset. Additionally, the accrued pension wealth in these collective schemes is not subject to annual wealth taxes (e.g., Box 3 taxation).

middle panel lists small, open economies (Sweden, Switzerland, and the Netherlands). The bottom panel contains all other countries, again with the Netherlands included for comparability.

Our evidence indicates that the Dutch wealth–income ratio was among the highest observed prior to World War I, reaching approximately 500% in the 1850s. Throughout this period, it exceeded the United Kingdom's ratio and was significantly higher than Sweden's, the only two other countries with comparable data (Madsen, 2019; Waldenström, 2017). The Dutch ratio peaked near 700% in the early 1880s, second only to France, and by the 1920s remained one of the highest at approximately 600%. However, following the 1929 crash, it converged with other countries. In Section 6.1, we will explore the dynamics of this increase, attributing it primarily to the Netherlands' substantial net foreign asset position, a consequence of early financialization and expanding colonial investments in Indonesia.

Post-WWII, wealth–income ratios declined globally until the 1980s, when they began to rise sharply. In Europe, France and the UK followed similar trajectories, with ratios increasing from around 300% in 1970 to over 600% today. Germany and Sweden saw more moderate increases, with ratios remaining below 400% until the early 2000s. In recent years, Sweden has experienced significant growth, now exceeding 500% (Piketty and Zucman, 2014; Waldenström, 2017). Spain and Switzerland witnessed dramatic increases since the 1990s, primarily driven by housing booms (Artola Blanco et al., 2020; Baselgia and Martinez, 2025). As we will discuss in Section 6.2, the Dutch case differs subtly: while housing has played a role, most net wealth accumulation since the 1990s has been driven by pension claims.

In summary, the Netherlands' wealth–income ratio trends exhibit broad similarities with other countries, but three key aspects stand out. First, the Netherlands maintained exceptionally high ratios before WWII, peaking in the 1880s at nearly 700% and remaining elevated until the 1929 crash. Second, from the mid-1960s to mid-1980s, its ratios were notably low, consistently hovering around 300%, before sharply rising in recent decades. Third, the Netherlands' trajectory aligns most closely with Switzerland's, which is unsurprising. Both nations historically pursued neutrality, low taxation, open capital markets, and strong financial sectors, leveraging these strategies to establish themselves as global financial hubs. The experiences of the Netherlands thus corroborate those of Switzerland, further illustrating how deliberate open-market policies can drive substantial wealth accumulation. However, while the Netherlands before WWI relied more heavily on its colonial trade networks and foreign capital investments, Switzerland established itself as a center of international finance in the 20th century by introducing low corporate tax rates, emphasizing banking secrecy, and institutionalizing policies specifically designed to attract and prioritize foreign capital ('t Hart et al., 1997; Baselgia and Martinez, 2025). Thus, the Dutch experience can be seen as a hybrid of colonial power dynamics (the first panel) and the characteristics of small, open economies (the middle panel).

6. Explaining the wealth dynamics

The previous sections have given an overview of the Dutch wealth–income ratio since 1850, and have placed them in an international and historical context. In this section, we delve deeper into underlying historical patterns. We focus on two episodes: the volatile dynamics of household wealth pre-World War II, and the U-shaped pattern of the wealth–income ratio after World War II. We argue that the Netherlands' unique context as a small, open economy with a large colonial empire is the main reason for the first episode. Second, we show that the enormous expansion of the capital-funded pension system, together with swings in housing prices, contributes most to the increase in the wealth–income ratio since the 1980s.

6.1. The role of foreign investments

In this section, we delve into the dynamics of the Dutch wealth–income ratio before World War II, focusing on two key questions: Why was the wealth–income ratio so high in the Netherlands? And why was it considerably lower in non-colonial powers? We argue that the historical context provides compelling explanations for both.

The late eighteenth century marked the beginning of a prolonged period of economic stagnation in the Netherlands, triggered by political upheaval and the French occupation. This stagnation lasted for approximately fifty years, disrupting the economic foundations of the Dutch Republic. Even after the restoration of independence in 1813, economic recovery was sluggish and did not gain momentum until the mid-1820s. During this time, the lack of significant economic growth meant that most businesses had little need to raise substantial amounts of capital (Jonker, 1996). Similarly, private colonial investments were minimal. Indonesia, by far the largest and most important Dutch colony,[11] had been administered by the Dutch East India Company (VOC) until its dissolution around 1800. The subsequent Napoleonic era saw the colony contested by France and Britain.

By 1830, the Dutch had reasserted control over the Indonesian archipelago and implemented a new colonial policy to address mounting sovereign debt: the Cultuurstelsel (Cultivation System). Under this system, farmers — primarily on the island of Java — were forced to grow cash crops such as coffee and sugar, which were then sold far below market prices to the Nederlandsche Handel–Maatschappij (NHM), a state-supported trade corporation with a government-granted monopoly. This monopoly effectively excluded private investment in Indonesia during this period (van Zanden and Marks, 2013; Dell and Olken, 2020). Only after the Cultivation System was phased out in the 1870s did private colonial investments begin to flourish.

[11] During the period studied in this paper, the Netherlands also held other colonies, including Suriname and the Dutch Caribbean. These territories, most of which gained independence in the 1970s, are not included in our estimates due to data limitations. Following the abolition of slavery in the 1860s, these colonies likely contributed little to household wealth. For further analysis of Western colonies' economic value pre- and post-abolition, see Koudijs et al. (2022).

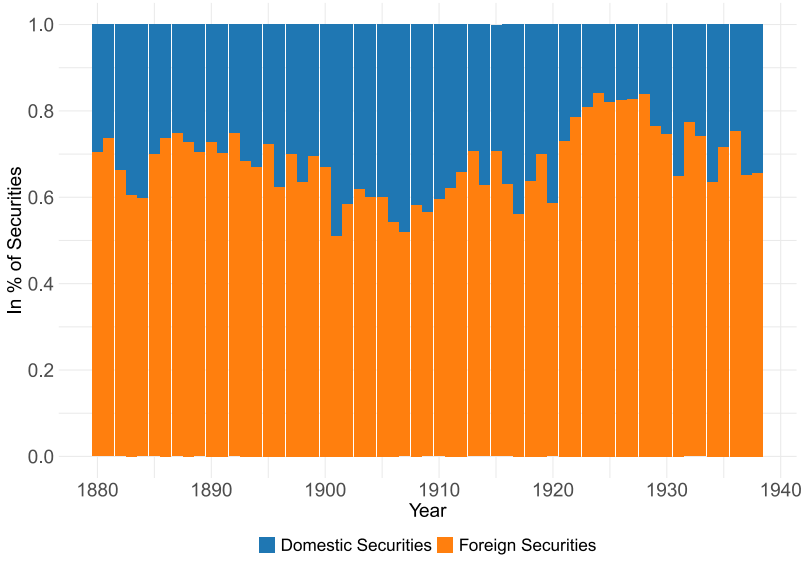


Fig. 5. Composition of securities, 1880–1938.
Notes: Figure shows the composition of directly held securities, from 1880 until 1938. All data are based on the Historical National Accounts method.

The period from 1880 to World War II, often referred to as the "liberal period" in Indonesian colonial history, is the focus of our analysis. During this time, Dutch private investors increasingly participated in the Indonesian economy, generating substantial returns from industries such as agriculture, mining, and trade. However, this era came to a definitive end with Indonesia's declaration of independence in 1945, which was recognized by the Netherlands in 1949 following a violent colonial war. In the late 1950s, President Sukarno nationalized the remaining Dutch enterprises in Indonesia, expropriating them without compensating shareholders (Thee, 2012). This marked the final chapter of Dutch private households' colonial asset holdings.

Our main period of study in this section, the liberal period of 1880–1942, coincides with burgeoning industrialization in the Netherlands. It is also at the same time that investment in other foreign countries accelerates (van Zanden and van Riel, 2000). Chief among these other foreign investments were industrial corporations in the United States, particularly steel and railroad companies. Bosch (1948) estimates the total value of Dutch investments in the United States in 1908 at 1.5 billion guilders, or close to 100% of national income.

The aforementioned trends are made visible by Fig. 5, which breaks down securities into domestic and foreign securities from 1880 until 1938, and Fig. 6, which splits foreign securities into colonial and non-colonial wealth, as a percentage of national income. Both series are based on observed dividends, which were carefully noted on an annual basis by the Statistics Netherlands throughout various publications (Smits et al., 2000; den Bakker, 2019). As discussed in Section 4, we capitalize these dividends using information on dividend yields from Jordà et al. (2019), to arrive at total wealth invested abroad. Note that, to the best of our knowledge, ours is the first series on private colonial wealth.

Fig. 5 shows that foreign securities make up the bulk of total security wealth throughout the period. This is consistent with all existing studies on the financial history of the Netherlands, all of which emphasize its nature as a financialized small, open economy (e.g., 't Hart et al., 1997; van Zanden and van Riel, 2000). The ratio of foreign to domestic securities is around 2:1 until 1895. This is corroborated by the evidence in Verstegen (1996), who examines the composition of inheritance tax records for selected benchmark years and finds almost exactly the same ratio. 1895 marks the end of a long economic depression and the beginning of sustained economic growth, which lasts until World War I. As a result of this expansion, the value of domestic securities increases after 1895, reaching almost parity with foreign securities in the 1900s. Both the timing and the equalization of domestic vs. foreign securities is again consistent with the estate-based evidence in Verstegen (1996). This lends confidence that our capitalization-based method is robust.

After the 1910s, foreign securities start again to increase in value, really taking off from the 1920s onward, before collapsing again after the 1929 crash. To shed further light on these trends, it is informative to study the makeup of foreign securities, depicted in Fig. 6.

Prior to the 1900s, most of foreign wealth was non-colonial, likely invested in American corporations (Bosch, 1948), as well as in Austrian and Russian bonds (de Vries, 1976). Colonial dividends were small in this period, but increased dramatically during the long era of economic expansion which started in 1895 and ended in 1914 (van Zanden and van Riel, 2000). Although the Cultivation System had been abolished, cash crops still amounted for the majority of wealth generated in Indonesia. From the 1890s, oil reserves were also found on the islands of Sumatra and Borneo, fueling the rise of the corporation now known as Shell. The expansion of colonial investment is clearly visible in Fig. 6.

What is also striking is the collapse of non-colonial foreign investment during the 1910s. The impacts of World War I, as well as the accompanying hyperinflation, likely played an important role here. What is interesting is that colonial investment only continued

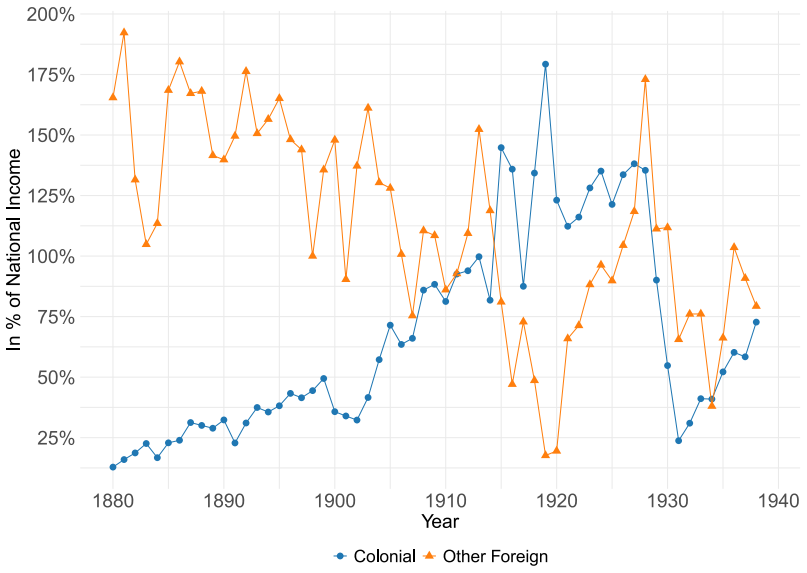


Fig. 6. Foreign and colonial investment, in % of national income.
Notes: Figure shows the evolution of (net) foreign and colonial investment from 1880 until 1938. Both series are expressed as percent of net national income.

to expand during this period. After the end of World War I, non-colonial investment crashed, reaching a nadir of around 10% in 1920; whereas colonial investment peaked to reach a zenith of approximately 175%, although with substantial volatility. Disregarding this temporary peak, both colonial and non-colonial investment trended upward again after the early-1920s. This is mainly driven by a boom in colonial commodity prices. The British had tried to introduce import restrictions on many cash crops to boost the post-war economy. The Netherlands ignored this plan and continued to export large amounts of cash crops and petroleum during the 1920s. The reduced supply by other producers resulted in high demand for Indonesian commodities, boosting profits and prices to unprecedented levels (Buelens and Frankema, 2016). At its late-1920s peak, colonial investment was worth approximately 140% of national income. A recovery in investment in the United States and other countries had also led to enormous growth in non-colonial foreign investment, resulting in a total foreign wealth peak of almost 300% of national income in 1928.

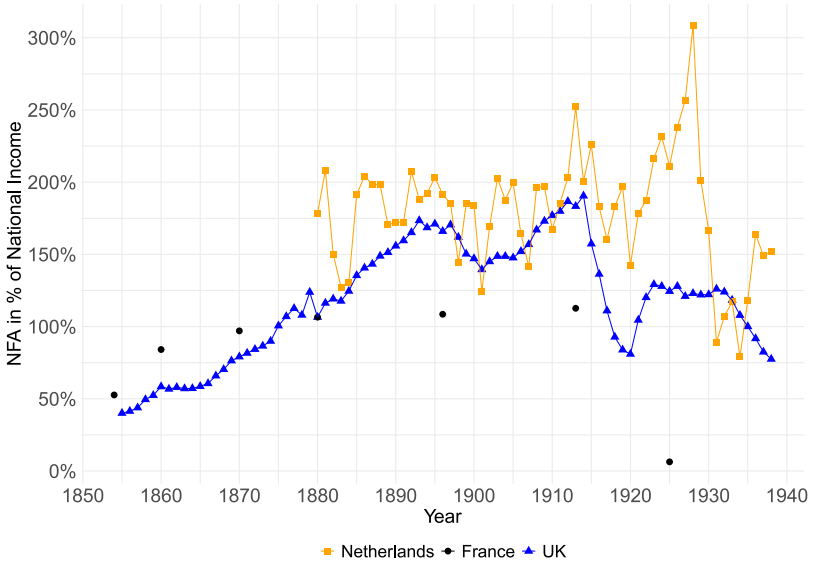
The Great Depression hit foreign investment hard; Indonesian corporations recorded losses of around 20% of their total value (van der Eng, 1998), and investment in the United States also collapsed (Bosch, 1948). By the late 1930s, some of these losses had been undone, with the final value of Dutch total private foreign investment in 1938 being close to 140% of national income.

Note that all these figures, which are based on colonial dividends and other returns to capital investment, are an estimate of the *direct* impact of Indonesia and foreign investment on household wealth. In several ways, this represents a lower bound on the overall importance, given that the value of many *domestic* firms also depended indirectly on the colonies. The textile industry in the rural region of Twente, for instance, would derive much of its value from the availability of a large sales market in Indonesia. We do not attempt to quantify such general-equilibrium effects of colonial investment here, but note that precisely such a calculation has been made back in 1945 by Derksen and Tinbergen (1945). Their estimate puts the total contribution of Indonesia to Dutch national income in 1938 at almost 14% (or about 765 million guilders at the time). In the same article, they estimate the total value of Dutch private investment in Indonesia at almost 4 billion guilders, which equals our estimate.

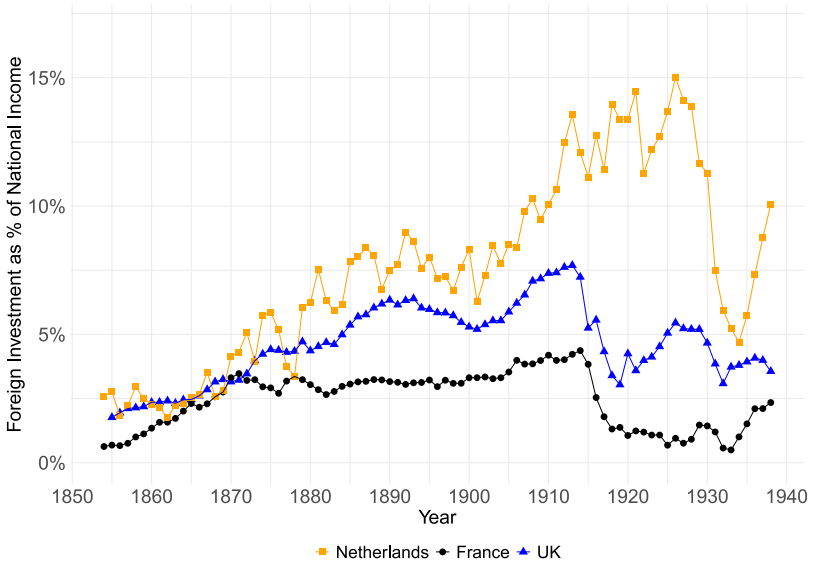
How do these statistics compare to other countries? To the best of our knowledge, no direct estimates of colonial investment in total wealth are available for other major colonial powers. Instead, we will compare net private foreign asset positions of three major colonial powers for which these are available: the Netherlands, France, and the UK. The result is given in Fig. 7, which expands upon the analysis in Piketty (2020, pp. 276). In panel 7(a), we compare the net private foreign asset positions of these three countries. Note that for France, only isolated benchmark years exist, whereas for the UK and the Netherlands, a continuous series is available.[12] We note that the Netherlands and the United Kingdom had comparable levels of foreign wealth until 1910, but started to diverge dramatically afterward, with the Netherlands increasing its foreign investment substantially, whereas the United Kingdom's foreign investment plummeted. France's foreign investment was much lower throughout this period.

The Dutch series seems more volatile than the other two series, which are estimated using different methods (see Piketty and Zucman, 2014 for details). One might wonder how robust this feature is. Panel 7(b) shows that the volatility is mostly unrelated to the estimation method, since the flows of foreign income — which are directly taken from official statistics — are also much more volatile for the Netherlands than for the United Kingdom or France. It is an interesting open question why this should be the

[12] Piketty (2020) interpolates the benchmark years for France, leading to a smooth series in his Figure 7.9.



(a) Foreign Wealth



(b) Foreign Income

Fig. 7. Foreign wealth and income as % of national income, international comparison.
Notes: Figure shows the evolution of foreign wealth and foreign income for France, the Netherlands, and the United Kingdom. Data for France and the United Kingdom are from Piketty and Zucman (2014).

case; it is possible that the nature of colonial relations in the British and French empires resulted in more price stability, or that the Dutch investments were more tied to the world's financial markets and hence more volatile. Also note that for foreign income, we can go back further than our starting point of 1880 for wealth. As a result, we see clear evidence that foreign investment in the Netherlands increased substantially in the second half of the 19th century, with foreign income growing from 2% of national income to almost 15% in the 1920s.

Hence, we can conclude that foreign investment, and especially colonial investment, was to a large extent responsible for the different trajectory of the Netherlands compared to other countries. Given that the British and French empires were vastly larger in size, it is remarkable that the value of investment relative to national income of the Netherlands is comparable to those two empires and even exceeds their value from the 1910s onward.

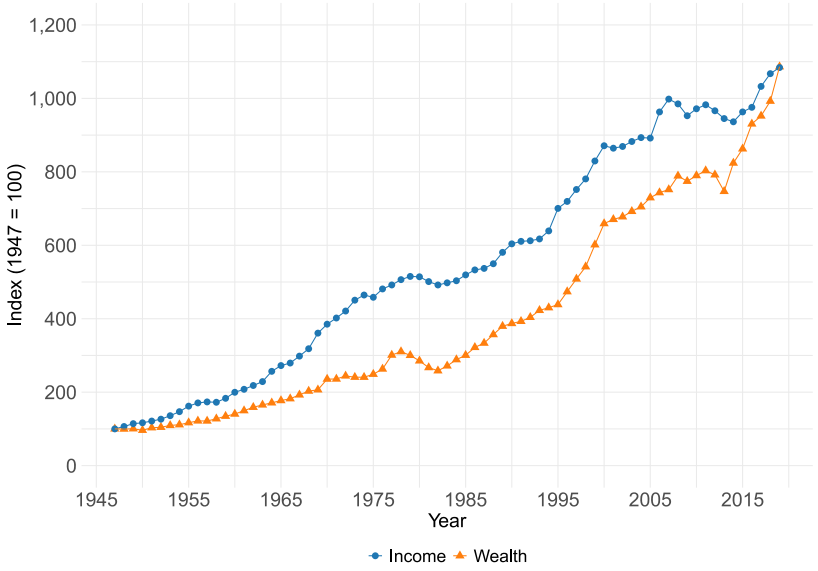


Fig. 8. Real wealth and income growth, 1947–2019.
Notes: Figure shows the evolution of real household wealth and national income from 1947–2019. Both wealth and income are normalized such that the 1947 values equal 100.

6.2. Pension savings and housing capital gains

In this Section, we explore the decline and subsequent increase in the wealth–income ratio after 1947. Specifically, we will focus on the role played by savings and capital gains in the observed real growth rates, and we will argue that the dominance of capital gains in the Netherlands reflects the institutional design of its pension system and its housing market.

After World War II, a large expansion of domestic investments contributed to the continuous growth of the Dutch economy, characterized by an annual increase of nearly 3 to 4 percent in national income in the 1950s and 1960s. This is seen in Fig. 8, which shows real wealth and income growth from 1947 until 1980. Comparing the increase of national income across this period to the nominal growth in wealth, it becomes apparent that the growth of wealth has lagged considerably behind. Hence, the Netherlands experienced its equivalent of the compression identified by Piketty (2014). Between the 1950s and the 1970s, the wealth–income ratio dropped to unprecedented levels, with an all-time low of approximately 300 percent in the early 1970s.

Things started to change by the 1980s. We observe that real wealth skyrockets, in particular from the second half of the 1990s. This increase coincides with the Dot-Com Bubble in the stock market, as well as a large increase in the housing market. The early 2000s see a relative stabilization until the 2008 crisis, when real wealth briefly declines. However, from the early 2010s wealth grows spectacularly, mostly driven by booming housing prices after 2015. In contrast, real income grows at much slower rates and even seems to stagnate since the beginning of the 21st century. In 2019, indexed real income and wealth overlap for the first time since 1947, completing the upward curve of the U-shape in Fig. 1.

How can we make sense of these large upswings and downturns in the wealth–income ratio? A useful accounting decomposition is to split real wealth growth into a savings component and a capital gains component, using Eq. (4). We observe real wealth growth $g_t := \Delta W_t / W_t - 1$, as well as savings rates out of wealth s_t; hence, we can residually calculate real capital gains or losses as $q_t = (1 + g_t)/(1 + s_t) - 1$. Starting with Piketty and Zucman (2014), the subsequent literature has used this identity to identify an important role for capital gains in driving the recent boom in wealth–income ratios (e.g., Artola Blanco et al., 2020; Baselgia and Martinez, 2025). We do a similar exercise in Table 2, which shows the decomposition of real wealth growth into its savings and capital gains components for the period 1947–2019.

Looking at the first row of Table 2, we observe that household wealth growth was sizeable and positive, averaging 3.4% per year from 1947 until 2019. It is also clear that a sizeable portion of this wealth growth is attributable to savings. This is true even when we use the narrowest savings concept, household savings; even with that conceptualization, savings accounted for $1.6/3.4 \approx 50\%$ of all household wealth growth.

The subsequent rows show decadal averages, and reveal substantial variation. Capital gains drove most of average wealth growth in the first two decades after World War II. By the 1970s, this pattern reverses, and the period from 1970 to 1990 is marked by growth driven exclusively by savings. After the 1990s, the pattern once again reverses, with capital gains contributing more on average than savings.

Inspection of the underlying annual data, while more volatile than decadal averages, reveals further insights. The most important conclusion is that while savings are relatively steady, capital gains are highly volatile. Periods of positive capital gains (most of the 1950s and early 1960s) are followed by periods of negative capital gains (most of the 1970s and 1980s). However, occasional swings

Table 2
Decomposition of real wealth growth, 1947–2019.

Period	Real wealth growth	Savings	Capital gains
1947–2019	**3.4%**	**1.6%**	**1.8%**
1947–1959	2.7%	0.6%	2.1%
1960–1969	4.9%	1.7%	3.2%
1970–1979	3.1%	3.2%	0.0%
1980–1989	2.7%	3.1%	−0.4%
1990–1999	6.4%	2.3%	4.0%
2000–2009	2.8%	0.6%	2.2%
2010–2019	3.8%	1.2%	2.6%

Notes: Table shows average real wealth growth rates for the respective periods in each row. This average growth rate is then decomposed into a savings and capital gains component using Eq. (4).

Table 3
Decomposition of household wealth growth by wealth component, 1995–2019.

	1995–2019	1995–1999	2000–2004	2005–2009	2010–2014	2015–2019
Real wealth growth	**3.8%**	**8.4%**	**4.0%**	**2.7%**	**1.2%**	**7.1%**
- *Financial*	0.5%	2.5%	−0.3%	0.2%	0.0%	0.6%
- *Pension*	2.0%	2.3%	1.3%	1.6%	3.9%	3.0%
- *Housing*	1.2%	3.0%	3.0%	0.5%	−2.6%	3.3%
- *Non-Financial*	0.2%	0.5%	0.1%	0.4%	0.0%	0.2%
Due to savings	**1.3%**	**2.3%**	**1.4%**	**1.2%**	**1.4%**	**1.6%**
- *Financial*	0.6%	1.7%	1.0%	0.6%	0.1%	0.4%
- *Pension*	1.1%	2.0%	1.5%	1.1%	1.0%	0.8%
- *Housing*	−0.5%	−1.5%	−1.2%	−0.7%	0.2%	0.3%
- *Non-Financial*	0.1%	0.1%	0.2%	0.2%	0.1%	0.1%
Due to capital gains	**2.5%**	**5.9%**	**2.6%**	**1.5%**	**−0.2%**	**5.4%**
- *Financial*	−0.1%	0.8%	−1.3%	−0.4%	−0.1%	0.2%
- *Pension*	0.9%	0.3%	−0.1%	0.5%	2.8%	2.2%
- *Housing*	1.7%	4.6%	4.3%	1.1%	−2.7%	3.0%
- *Non-Financial*	0.1%	0.4%	−0.1%	0.2%	−0.1%	0.1%

Notes: Table shows the decomposition of average real wealth growth per five-year period from 1995 until 2019, split into savings and capital gains components per major wealth component. All wealth components are measured net of debt.

of large magnitude in capital gains result in a decadal average for the 1970s near zero. The early 1980s show severe negative capital gains. This is consistent with the decline in housing value observable in Fig. 3. However, while the timing is consistent with our knowledge of the housing market, we do not have the data to disentangle savings and capital gains per wealth component for this period.

From 1995, we can get a grasp on the sources underlying these savings and capital gains components. From that year on, Statistics Netherlands publishes modern household balance sheets that include all wealth components, as well as volume and price mutations happening during each year to these components. Hence, we can decompose the household wealth growth rate into savings and capital gains components per major wealth component. We focus on four major categories: financial wealth (net of financial debt), pension wealth, housing wealth (net of mortgage debt), and non-financial wealth. This exercise bears some similarity to the work of Bauluz et al. (2022), Baselgia and Martinez (2025), and others. Important to note here is that we do not estimate synthetic savings and capital gains over the wealth distribution, as is done by Saez and Zucman (2016) and the literature following it. By contrast, we are only concerned with decomposing aggregate household wealth growth into the relative contributions of each component.[13] We do so in Table 3, which shows five-year averages, and Online Appendix Figure D.3, which shows annual growth rates.

By focusing on five-year intervals, we can shed further light on dynamics happening in the last 25 years. We notice that the positive real wealth growth since 1995 has been extremely heterogeneous over time, with the years following the Great Financial Crisis seeing little more than a percentage point of growth per year. By contrast, the late 1990s were characterized by growth rates of over 8% annually. By decomposing these growth trends across savings and capital gains and across wealth components, we observe various patterns. First, the major contributor to wealth growth since 1995 has been pension wealth. This component accounted for slightly more than half of all real wealth growth, with housing playing a secondary role. Other financial and non-financial assets matter far less for wealth growth in general, with the exception of the late 1990s, when financial assets were the most important contributor to wealth growth leading up to the Dot-Com bubble.

Pension wealth added to wealth growth both via savings and via capital gains, with those channels being roughly equal in magnitude across the whole period but showing significant fluctuations in between. By contrast, housing actually dominates pension

[13] While the distributional decomposition is interesting, it is not feasible with the data at our disposal, since the distribution of pension claims is not known and would require stringent assumptions to impute. Hence, we focus on the aggregate decomposition and leave distributional decompositions for future work.

wealth in most five-year intervals; however, housing experienced a stark slowdown in growth from 2005 onward, turning negative in the 2010–2014 interval. This period, associated with the collapse of housing prices following the Great Recession, clearly repressed real wealth growth of households. We note that even in the other periods, housing's contribution to wealth growth almost exclusively originates from capital gains, with housing savings being negative or very weakly positive throughout. This is due to the enormous accumulation of mortgage debt by households; the value of mortgages, in excess of 100% of national income in 2019, was stimulated by various government policies from the 1980s onward and relatively limited oversight over the mortage sector (van der Valk, 2019). We can conclude from this exercise that pension wealth is the dominant factor explaining the real wealth growth of Dutch households.

Appendix Fig. D.3 further investigates the trends reported in Table 3, by decomposing the annual growth rate since 1995 into a savings- and capital gains-induced part, with each part further decomposed into the contributions by the broad wealth components. Focusing on annual rates yields additional insights. We observe that housing's contribution to savings growth is negative until 2010; this further illustrates the weight of mortgage debt, and reveals the impact of policy choices. After the 2008 crisis, mortgages became more heavily regulated; for instance, the maximum loan-to-value of the mortgage was reduced from its peak of 130% to 100% at the end of our series. These and other measures contributed to housing saving becoming a net positive contributor to wealth accumulation. A second conclusion from the Figure is that pension capital gains really take off from 2007 onward in contributing to wealth growth. Prior to 2007, most capital gains were in housing; while the housing boom from the mid-2010s again introduced positive housing capital gains, pension capital gains have remained quantitatively the most important for the last 15 years in our sample.

7. Conclusion

Following the seminal work by Piketty and Zucman (2014), this study analyzed the historical development of aggregate wealth–income ratios for the Netherlands from 1854 until 2019; a country that has not been analyzed so far in the literature. In addition, we decompose total household wealth into various components, tracking the relative value of financial and non-financial asset categories for 140 years (from 1880 until 2019). Finally, we discuss various interpretations of these trends, and contrast them to the available international evidence.

We find that while the household wealth–income ratio in the Netherlands followed the familiar U-shaped pattern observed in earlier studies, its unique history as both a major colonial power and a small, open economy significantly shaped its wealth–income dynamics. In comparison with other industrialized countries, the Netherlands, experienced periods with some of the highest as well as one of the lowest household wealth–income ratio: from a ratio in excess of 700% at the turn of the 20th century, to a ratio as low as 300% in the 1970s.

The main empirical contribution of this paper is to expand the existing evidence on long-term wealth dynamics for large, at times closed, economies with evidence on a small and very open economy throughout. A novelty of this paper is that it provides empirical evidence that the very high wealth–income ratio was at least in large part due to a significant proportion of household wealth invested in colonial and non-colonial foreign securities. This finding further highlights the significance of colonial empires in explaining (global) wealth dynamics and thus makes an important contribution to this ongoing debate (Chancel and Piketty, 2021).

Methodologically, we exploit the rich availability of data sources for the Netherlands, and simultaneously use (i) historical national accounts; (ii) estate multiplier methods; (iii) wealth tax methods. We find that the estate multiplier, if one is not too far from the benchmark year, is likely to be a reasonable method to employ in cases where the necessary data to reconstruct historical balance sheets are unavailable, especially when the tax threshold is relatively low as in the case of the Netherlands. The wealth tax extrapolation method performs less satisfactorily, and appears to be more sensitive to the quality of the underlying wealth tax data.

Our findings can inform policymakers about household wealth dynamics, by placing recent figures in a historical perspective. Moreover, our decomposition of aggregate wealth highlights the important institutional determinants of household portfolio choice. Policy choices since the 1980s aimed at stimulating homeownership, like the mortgage interest deduction, are likely to have contributed to the rise in mortgage debt and housing prices. Likewise, the tax-exempt treatment of pension wealth will have contributed to its increase in relative importance in household portfolios. These results illustrate the impact of careful policy design to stimulate household private savings while also not encouraging overreliance on debt. Policy choices on the composition and distribution of household wealth also matter for macroeconomic stability, the level of the interest rate, and other key macroeconomic variables, and therefore the findings presented here are relevant regardless of preferences for wealth redistribution.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.euroecorev.2025.105099.

Data availability

Data will be made available on request.

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