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The National Wealth of Sweden, 1810–2014

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The National Wealth of Sweden, 1810–2014*

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Abstract

This study presents a new database, the Swedish National Wealth Database (SNWD), which contains annual data on private, public and national wealth and sectoral saving rates in Sweden over the past two centuries. The paper reviews previous investigations of national wealth, compares their estimates with the new ones and discusses method approaches and measurement problems. Then the main data series are presented for assets and liabilities and their subcomponents, for the private and public domestic and foreign sectors. Complementing the traditional focus on economic flow variables in the past literature on long-run economic developments, this new database offers potentially new perspectives of a number of important issues in the modern economic history of Sweden.

JEL: E21, H31, N33, N34

Keywords: National wealth, Household portfolios, Saving, Pension wealth, Economic history

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1. Introduction

In most previous research studies of long-run macroeconomic developments in Sweden and other European countries main focus has been put on analyzing different *economic flows*, such as income, investment or consumption. While these outcomes are arguably crucial to examine, a comprehensive understanding of many of the economic phenomena in question also requires a scope that includes analyzing the structure and development of the *economic stocks* in society, i.e., the assets, liabilities and net wealth of private and public actors.[1] The reasons for this prevalence of a one-sided focus on flow variables in past historical macroeconomic analysis are many, but a major one is surely the general lack of consistent data on central stock variables over longer time periods and sectors in society.

The main contribution of this paper is to present a new consistent database, the Swedish National Wealth Database (SNWD), which contains annual observations of private, public and national wealth spanning the period 1810–2014. The series encompass different kinds of assets and liabilities of all these sectors and net foreign assets as well as a new set of sectoral (and national) gross and net saving rates. The series are constructed using mainly secondary sources in official statistical publications and third-party report, e.g., private bank statistics. An overall ambition has been to offer consistency and comparability across all historical eras. For example, household borrowing data are not based on personal tax returns but on official bank lending statistics, which is available annually and for the whole economy back to the early 19th century (personal tax returns became comprehensive for the full population only in the postwar era). Stock ownership data come from (adjustments of) national totals of incorporated company stock and stock exchange-based market capitalization. Farm assets are calculated from central tax assessments of agricultural land and counts of livestock combined with time series of market prices or insurance values. Public sector wealth is estimated from contemporary balance sheets and additional valuation adjustments using sales price ratios to get market-valued property assets.

The paper also provides a brief introduction to some basic facts about Sweden's national wealth and its components. In a companion paper, Waldenström (2015a), a number of specific analyses of the Swedish wealth-income ratios are presented with specific aim at showing how

[1] Examples of questions that require a focus on stock variables are: the role of household indebtedness for instability in housing or financial markets (e.g., Jorda, Schularick and Taylor, 2014), the determinants of consumer spending and savings behavior (e.g., Guiso, Haliassos and Jappelli, 2002) or whether household wealth spring primarily out of life cycle savings or inheritance (Piketty, 2011; Ohlsson, Roine and Waldenström, 2014).

and why they contrast with historical wealth-income ratios observed for other Western economies. An extensive appendix paper, Waldenström (2015b), also contains further details and discussions about the database, methodological considerations, measurement problems and comparisons with previous estimates.

The SNWD adheres to a research literature dealing with the structure and development of aggregate household and national wealth, with prominent contributions being Goldsmith (1962, 1985), Goldsmith, Lipsey and Mendelsen (1963), Atkinson and Harrison (1978), Wolff (1989), Soltow (1989), Davies, Lluberas and Shorrocks (2011) and Piketty and Zucman (2014, 2015). The next section of this paper discusses the previous investigations of Swedish aggregate balance sheets that have also been valuable in the construction of the SNWD.

An important feature of the SNWD is that it is fully available for download in its entirety.[2] The ambition is to make this database accessible and useful to everyone with an interest in the Swedish – and Scandinavian – economic history since the early 19th century. However, it also a way to facilitate a continuing improvement and revision process of the database in the light of the numerous methodological problems (described further below) from which it suffers.

Having a new historical wealth database like the SNWD also opens up a wide array of possibilities to address new and old research questions in economics and economic history. For example, the data allows for a new take on understanding the role of private and public assets and liabilities in the Swedish industrialization process which has so far been mainly based on analyses of flow data (income, agricultural vs industrial output, sectoral wage differentials etc.). Similarly, the financial development in Sweden can now be analyzed with greater accuracy using the series over bank deposits, bank lending and share ownership. Related to this is the question of household indebtedness which has increased over the past two centuries and now it is possible to put the current levels in a long-run historical perspective. In addition, the SNWD offers a new view of all Swedish economic and financial crises since the beginning of the 19th century: Were the crises preceded by unusually high levels of private or public indebtedness? Did they induce reshuffling of household portfolios from risky to less risky assets? How do the patterns in the wealth data square with previously observed patterns in income or output data? These and numerous other questions can hopefully be studied more

[2] The current web address is www.uueconomics.se/danielw/SNWD.htm (2015-09).

deeply using data on wealth.

The rest of the paper continues as follows. Section 2 contains an overview of earlier studies of Swedish household wealth stocks. Section 3 presents the basic methodology and important measurement problems. Section 4 presents the main results. Section 5 compares the SNWD series with previous Swedish investigations and some international series, and section 6 concludes.

2. Previous investigations of the national wealth of Sweden

There are some previous investigations of the size and structure of aggregate balance sheets in Sweden. While these assessments only cover shorter periods or, in some cases, single years, they have been crucial inputs to the reconstruction of the long-run series presented in the present study.

The earliest investigations known came in the first half of the 19th century. The first was an unpublished summary of the wealth tax assessment in Sweden and Finland in 1800. The exact source of this investigation is unknown, but a retrospective treatment by Fahlbeck (1890, p. 88) refers to a total taxable wealth in 1800 was about 800 million SEK in current prices (or 200 million *riksdaler specie*, the monetary unit used at the time). Adding non-taxable wealth such as inventories and livestock, but not debts the gross national wealth in 1800 was acclaimed to be well above one billion SEK.[3] For the years around 1810, a second estimate was made by Hyckert (1815, pp. 28ff). This estimate was also a relatively rough and sketchy calculation, combining tax sources and capitalized flows. Its estimated gross national wealth was 2,218.6 million SEK (or 1,479,117 *riksdaler banco*), but Fahlbeck (1890, p. 88) criticizes this number for being both badly documented and for not sufficiently accounting for liabilities of the various sectors.

A second wave of national wealth assessments appeared in the end of the 19th century. These estimates were updated, relying on more "modern" templates for constructing wealth totals using sectoral decompositions and a richer balance sheet structure. Karl Daniel Bollfras made two assessments, one for the year 1875 (Bollfras 1878) and another one for 1880 (Svensk

[3] Soltow (1985) examines the 1800 wealth census in a study of personal wealth distribution, but only includes a sample of households and therefore lands at smaller aggregate values.

Trävarutidning 1885). A third estimate was made for 1885 by Pontus Fahlbeck (Fahlbeck 1890) and a fourth one, essentially updating his previous numbers, was made for 1898 by Fahlbeck (1901, pp. 453ff). These were all systematic and ambitious investigations of the total stock of wealth. Several asset classes were included, e.g., forestry, financial assets, inventories, infrastructure and communication equipment. Private and public—mainly foreign—debt was also assessed for the first time. Unfortunately for our purposes, no decomposition was made between public and private sectors and, of course, not for households.

The arguably most comprehensive investigation of Sweden's national wealth before the 1980s is Isidor Flodström's large-scale inquiry of the national wealth in year 1908 (Flodström 1912). In this extensive and detailed work, Flodström collected information about the whole population of private firms, associations, and public bodies. The household wealth is mainly reaped in a smaller survey of estates, which was adjusted to reflect the wealth of the living using mortality multipliers. Despite this breadth of data, Flodström's investigation suffers from a few beauty spots from our point of view. In particular, the sectoral decomposition is not identical with today's system; most importantly, Flodström reported households and firms in one and the same category. Another problem is that no detailed balance sheets are reported for households, but instead that their wealth is reported only as the net marketable wealth (at death).

A follow-up on Flodström's investigation was made for the year 1952 by Englund (1956). However, Englund's exercise was not very ambitious and it was merely based on a set of back-of-the-envelope calculations following Flodström's structure for 1908. In the 1970s, Roland Spånt published an extensive study of the evolution of the Swedish household wealth distribution since 1920 (Spånt, 1979). The basis of Spånt's analysis was information about household assets and debts from the Swedish Censuses of 1935, 1945 and 1951. Complementary data was collected from smaller surveys made in 1958 (a savings survey), 1966 (public estate and wealth tax return surveys), 1970 (a public household budget survey) and 1975 (a wealth tax return survey). Among Spånt's most important contributions is that he for each these data points provides detailed compositional evidence of the household wealth. Furthermore, he reports assets in both tax-assessed and (approximate) market values.

Another important contribution is Lennart Berg's estimations of annual household balance sheets made for the period 1950 onwards (Berg 1983, 1988, 2000 and later updates). The ba-

sis for Berg's pre-1970 series is Spånt's investigation, but he extends these data in a number of important ways not only by constructing annual estimates but also by adding estimates of the stock of consumer durables and pension assets. Berg's post-1970 data are based on the financial information in the Financial Accounts (of Statistics Sweden). Information on real assets is retrieved from other official data series at Statistics Sweden. The consumer durable series are constructed using annual consumption data and the perpetual inventory method. While these data are to a large extent the state of the art they suffer from the deficiencies of the material underlying Spånt's analysis.

In an attempt to reconcile the financial assets and liabilities of all sectors in society, Werin (1993) collected a unique database spanning the period 1945–1990. The series are basically an extended version of the financial accounts. While the project is impressive in its scope, there is no documentation for much of the pre-1970 part of the series, which make them problematic for subsequent use. Furthermore, the project disregarded—deliberately—the real assets on the balance sheet.

For the 1980s and early 1990s, Statistics Sweden constructed an official series of national wealth for Sweden (Tengblad 1992; Statistics Sweden 1995). The ambition was to generate a set of stocks for the entire economy, and the result was annual estimates over the period 1980–1994. These stocks represent important benchmarks for the series reported in the current study.

The most recent contributions to the analysis of Swedish household assets and liabilities are the studies of Bergman, Djerf and Lindström (2010) and Bergman (2015), Waldenström (2015a) which uses the SNWD, and also by and Lindmark and Andersson (2014). In Bergman et al. (2010), a comprehensive examination of the evolution of household balance sheets between 1970 and 2008 is presented. The point of departure is the Financial Accounts of Statistics Sweden which covers balances and transactions of all financial assets and debts of all sectors. Then the authors add estimated stocks of non-financial assets based on the national wealth project (Statistics Sweden, 1995; Tengblad, 1992) and additions thereof for both earlier and subsequent years using housing price developments. Bergman (2015) extends these data and discusses the financial approach to national accounts, where the corporate sector is incorporated into the other sectors of society with no net worth of its own. Lindmark and Andersson (2014) investigate series from tax assessments, fire insurance compilations and some

other sources to discuss a number of issues in measuring the size of the capital stock.

3. Methodology and measurement problems

This section presents and discusses some of the main methodological principles and empirical problems of the construction of the SNWD. Given spatial constraints the discussion is kept short here, but further information and details can be found in the appendix Waldenström (2015b) and the separate datafiles included in the SNWD package.

The definition and estimation of the variables in the SNWD follows the current standard statistical principles laid out in the System of National Accounts of the United Nations, SNA 2008 (United Nations, 2009) and Eurostat's, ESA 2010 (Eurostat, 2013). The study also builds on the analysis of Piketty and Zucman (2014) in which another new historical national wealth database for other Western countries is presented. For further details of the construction of the SNWD, see the data appendix Waldenström (2015b).

The main variable of interest, net wealth, is defined in a standard manner as the sum of non-financial assets and financial assets less liabilities. Non-financial assets are composed of produced assets, which are outputs from a production process (goods, constructions, dwellings etc.), and non-produced assets, which appear naturally (farmland, forestry, gardens etc.). Financial assets and liabilities are claims, held and issued, that are payable in everything from the (sometimes very) short-run (currency, deposits) and longer-run (stocks, bonds). In the case of households, liabilities include mortgage debt, consumer debt and all other household debt. Note that the balance sheet is unconsolidated, which means that financial assets and matching liabilities are not netted out within sectors by, e.g., cancelling out all informal lending of households to other households. Instead the assets held by one sector, e.g., households, are matched by liabilities of other households as well as of other sectors (corporations, public agencies or foreigners).

The SNWD reports sectoral wealth holdings. Private wealth is the sum of household and corporate net wealth. The estimation of private wealth departs from subtracting all household liabilities from all household assets, following an approach also used in Piketty and Zucman (2014). Corporate wealth held by the private sector is thereby included in the private wealth

through the household stock ownership.[4] Government wealth is the sum of central and local government wealth. National wealth, finally, is the sum of private and public wealth. Table 1 presents the balance sheet of the Swedish national wealth, with a detailed focus on the household balance sheet, by the end of 2014.

Table 1: Wealth of Sweden and its sectors in 2014

	Million SEK	Million EUR	Share of national wealth (%)	Share of national income (%)
Private assets	18,932	2,058	107	569
Non-financial assets	9,272	1,008	53	279
Produced assets	4,979	541	28	150
Inventories	32	3	0	1
Non-produced assets	4,261	463	24	128
Consumer durables	1,029	112	6	31
Financial assets	9,660	1,050	55	290
Bank deposits and currency	1,531	166	9	46
Shares and mutual funds	2,992	325	17	90
Bonds	113	12	1	3
Other claims	12	1	0	0
Private pension savings	5,012	545	28	151
Private liabilities	3,762	409	21	113
Financial sector	3,057	332	17	92
Public sector	302	33	2	9
Loans to unincorporated farms	378	41	2	11
Other loans	24	3	0	1
Private net wealth	15,170	1,649	86	456
Government assets	5,089	553	29	153
Central government	3,696	402	21	111
Local government	1,393	151	8	42
Government liabilities	2,611	284	15	78
Central government	2,023	220	11	61
Local government	588	64	3	18
Government net wealth	2,478	269	14	74
National wealth	17,648	1,918	100	530

Note: Condominiums are included in private produced non-financial assets. SEK/Euro exchange rate is 9.4. *Source*: SNWD, v 1.2, Tables SE2.1 (national wealth), SE2.2 (private non-financial assets), SE2.3 (private financial assets) and SE2.5 (private liabilities). National income from Edvinsson (2014).

[4] This means that the SNWD does not report the corporate sector balance sheet separately. Note that there may be a deviation between the market value of corporations, shown in households' market-valued stocks, and the difference between corporate assets and liabilities, i.e., when Tobin's Q differs from one. See Waldenström (2015b, section C3) for a calculation of Tobin's Q for Sweden since 1980.

Problems and challenges associated with constructing a national balance sheet that spans over long time periods have previously been pointed out by, e.g., Goldsmith (1985) and Piketty and Zucman (2014). A central difficulty concerns the valuation of assets (and sometimes liabilities). The guidelines of the SNA 2008 and ESA 2010 stipulate that assets should always be market-valued, at current market price levels. Many of the non-financial assets in the SNWD are recorded in tax-assessed values, which typically – but not always – differ from market values (sometimes explicitly stipulated in tax legislation). Considerable effort is therefore spent on converting the tax values to market values and the main method to do so is to use sales price ratios which are market-to-tax value ratios based on local sales prices compiled by statistics authorities and related to tax values. Some historical investigations explicitly discuss the extent to which tax-assessed values were pegged at current market prices or not, and if so why. Evidence on market prices comes from a wide array of sources, mostly public statistical publications and previous investigations. In some cases, particularly following very share tax reassessments, this adjustment becomes quite coarse and causes sudden jumps in asset values.

Sectoral decompositions in historical aggregate data series is another problem. Today's sectors (public, non-financial and financial corporate, households) have not always formed the basis for how statistical evidence are presented. Some sources, e.g., banking statistics and property tax sources, often lump together households and firms into one joint, private, category. Drawing on different objective and subjective pieces if of evidence about the shares of household and firm assets or liabilities, a homogenous household sector has been created for all series.

Perhaps the single most difficult asset component to estimate, and yet one of the most important ones in the entire national balance sheet, is privately owned shares in business equity, mutual funds and unincorporated firms. A basic distinction concerns whether the incorporated shares are listed (and traded) on organized secondary securities markets (stock exchanges) or if they are not. This difference has bearing on both valuation approaches and, in particular, the general availability of information on the size of these stocks. In the case of market-listed shares, new information about the number of listed shares and their market value has recently been presented in Waldenström (2014). For non-listed shares, however, the opposite is unfortunately true. Little is known about the number of total value of these shares, this is true today and even more so for historical periods. Unincorporated businesses are even more problematic and in the absence of systematic public sources of information, their size has to be estimat-

ed from estimations of their total output and assumptions about capital-output ratios. Adding to this uncertainty does the almost complete lack of previous attempts to estimate their size or aggregate value of this arguably important class of private assets.

Separating between produced and non-produced non-financial assets has been another difficulty. The prime reason is that the central source used, tax assessments, reported in most historical periods only aggregate property values with no reference made to the relative value of produced (dwellings, other buildings, livestock) and non-produced (land, farmland, forestry) assets. Some evidence is available the national wealth investigations cited above and from the 1920s onward the tax authorities have produced various series that can be used to estimate the relative shares.

Valuing public sector assets is more difficult than in the case of private assets since many public entities are not for sale and therefore lack a current market value. This is especially true for the many public utilities (water power, railways etc.). In these cases, a rough capitalization approach has been used, departing from reported annual earnings and assumptions of rates of return (usually three percent real rate). Since the 1990s, most public were transformed into public corporations and valuation is more straightforward.

Another problem with constructing the database is that the reported annual levels and variations in the SNWD may be inaccurate due to interpolations made. This is a well-known problem in historical investigations when annual observations are created from series when only less frequent data actually exist.

Altogether, while the SNWD offers the first comprehensive historical national wealth database it is obviously not perfect and will likely be revised in various respects over the coming years. As a means to facilitating this process, the database is made fully downloadable in its entirety, including subfiles showing detailed computations and a lengthy abstract describing data, methodological approaches and problems. Hopefully this will facilitate not only the comprehension and use of the actual series but also to suggest improvements and additions of the database.

4. The basic facts: Swedish national wealth over two centuries

This section reports basic facts from the new SNWD. The exposé begins with private wealth and its composition of assets and liabilities. Some specific areas are discussed: the composition of deposits across bank categories, the evolution of listed and unlisted stocks, the relative importance of pension entitlements and the stock of consumer durables. Next, the stock of public wealth is presented, divided across central and local government wealth. Finally, section presents the evolution of the national wealth, addressing also the estimation of net foreign assets. Note that most figures report wealth (or its composition) as share of national income.[5] This is done to make the stocks more easily interpretable in real terms and relative to an intuitive – and consistently measured over time – economic concept: the total amount of income earnt by the Swedes during one calendar year.

4.1 Private wealth

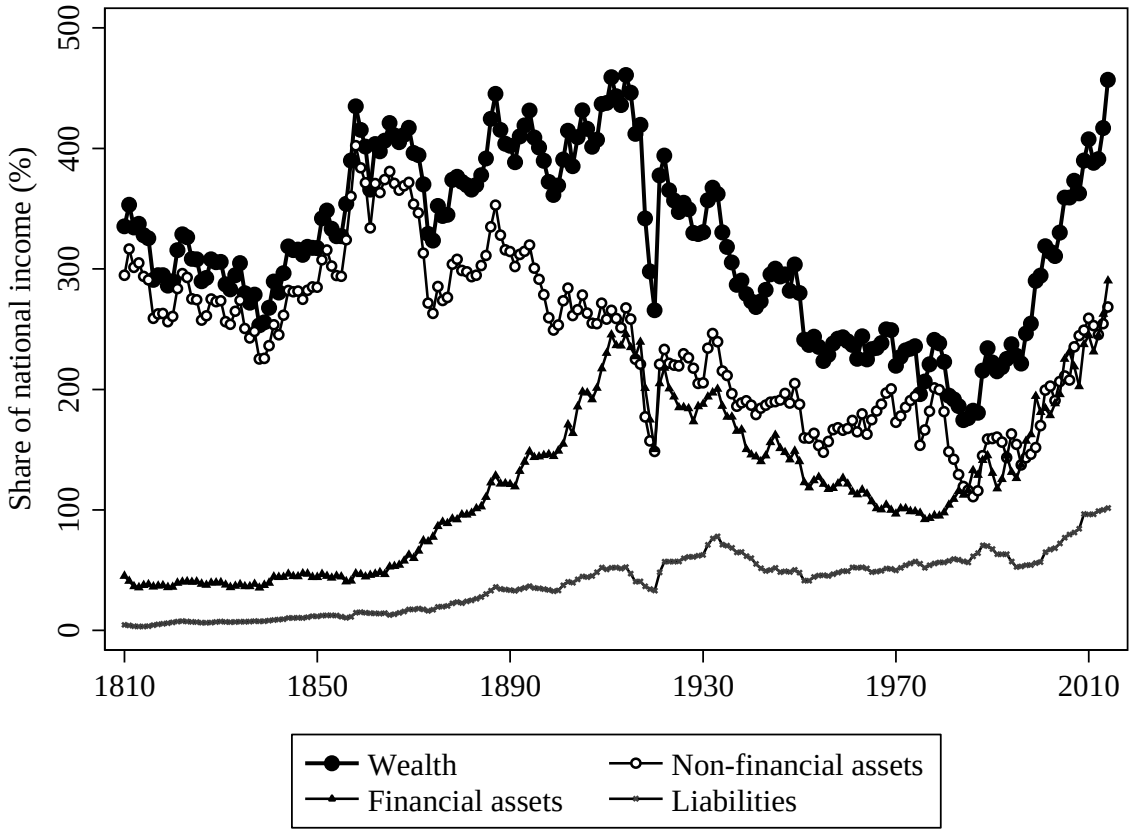
Figure 1 shows the private wealth-income ratio for Sweden over the last two centuries. Several interesting patterns stand out. To begin with, the level of the wealth-income ratio hovers between three and five, meaning that the private sector net assets have represented between three and five year's income through the past two centuries. The series yet exhibits some apparent secular trends that are informative for the economic historiography of Sweden. During the pre-industrial era, which ended around 1870, the wealth-income ratio was stable at a relatively low level, roughly 300 percent. The industrial take off (1870–1910) brought with it an increase in the ratio, to 400–450 percent. Although Swedish households experienced a sharp wealth shock, largely inflation-driven, around the time of World War I, it was restored at pre-war levels already by the early 1920s. During the rest of the 20th century, the private wealth-income ratio fell steadily, despite a continuing industrialization, up the 1980s down when it fell to even below pre-industrial levels. From around 1990, by contrast, there is a sharp and rapid increase and today it has reached a level not seen since a century ago.

Looking at the composition of private wealth, non-financial assets represent the most important component over the entire period. During the 19th century it completely dominated the asset side. This was before the emergence of an organized corporate legislation, free enterprise and formal credit markets. Transactions were largely based on barter or in-kind based exchanges. Industrialization and economic modernization began in the 1870s, monetizing the

[5] National income equals the gross domestic product minus net foreign factor income (i.e., incomes to and from foreigners in and outside of Sweden) and capital depreciation. Data come from Edvinsson (2005, 2014).

economy and this spurred a rise in the share of financial assets in household portfolios which caught up with non-financial assets by the time of the outbreak of the First World War. Liabilities were relatively unimportant in the agrarian era, even when including estimates of the sizeable informal credit market (see further below). Over time their share rose steadily, however, and in recent decades the share has reached historic levels.

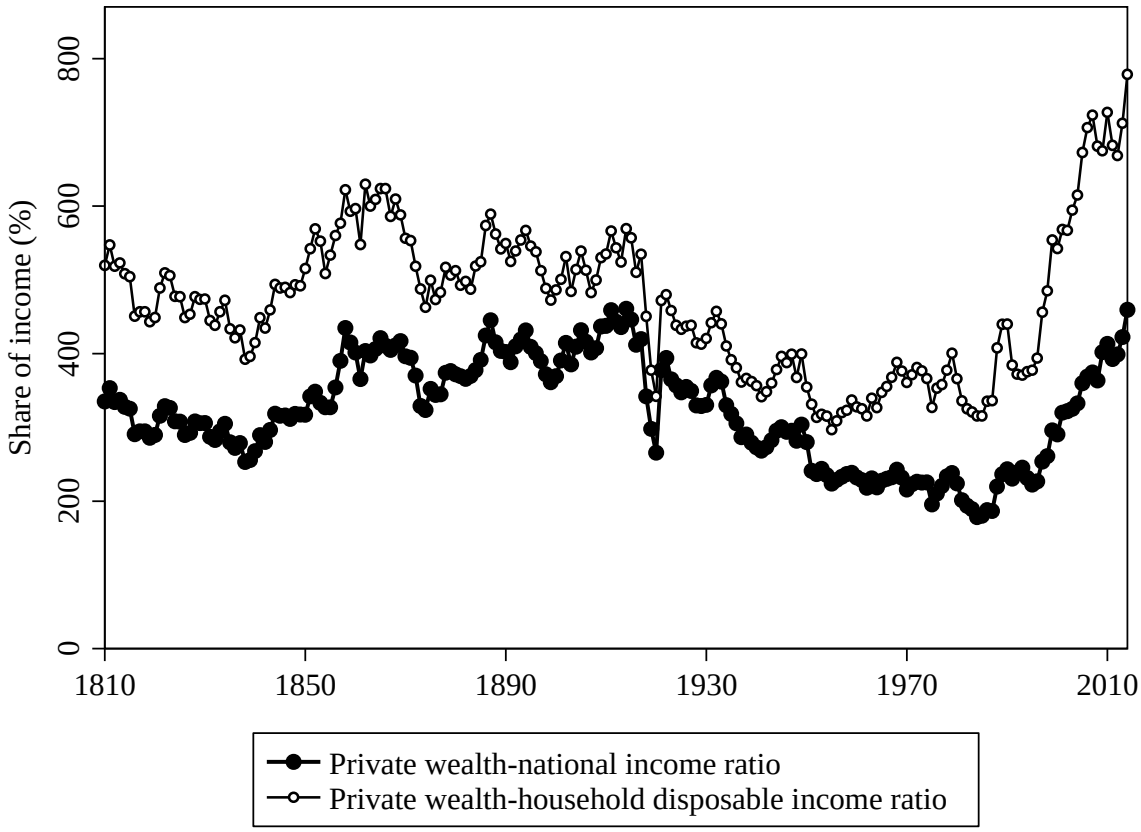
Figure 1: Private wealth-income ratio in Sweden, 1810–2014.



Source: SNWD, v 1.2, Table SE2.1 (downloadable at www.uueconomics.se/danielw/SNWD.htm).

One can also relate the stock of private wealth to *household disposable incomes*, which are also available in SNWD for the whole period. Figure 2 shows this ratio alongside the private wealth-national income ratio and. The two series are bound to differ and this is most clearly visible in the postwar era. This reflect naturally reflects the increasing share of welfare services shifting from private to public provision, financed largely via the tax bill. While it is a matter of perspective which one of these series one prefers to use, the arguably most homogenous one over time is the ratio based on national income as this is not sensitive to the column shift from private to public welfare spending.

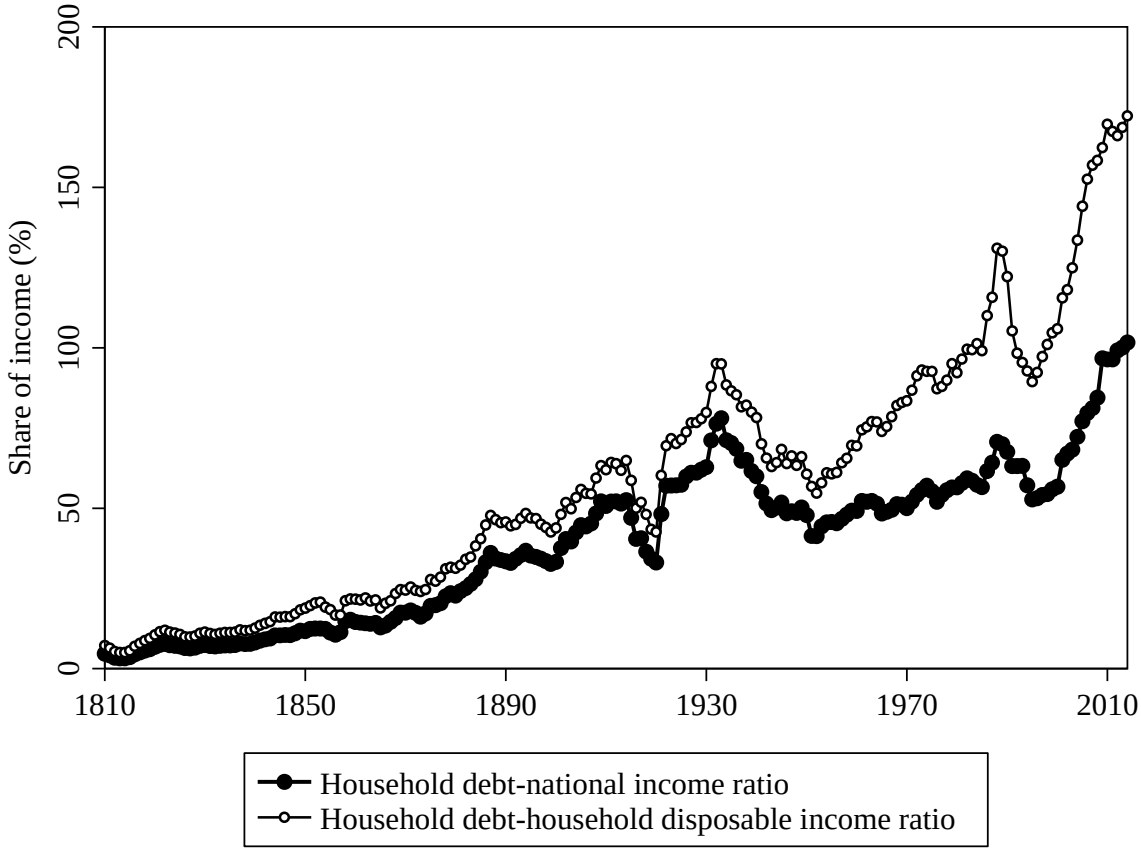
Figure 2: Private wealth to household disposable income and national income, 1810–2014.



Source: SNWD, v 1.2, Tables SE2.1, SE4.1 (downloadable at www.uueconomics.se/danielw/SNWD.htm).

A final note on relating the household portfolio to household disposable income is offered by Figure 3 which relates the debt to disposable income of households. In recent years the role of household liabilities and its long-run effects on fiscal and economic stability in the rest of the economy have attracted enormous attention among researchers and in the policy debate. There is a clear rise in ratio in both series, and the current levels seen in the 2000s are obviously of historic proportions. There is a similar drift in the gap between the two series, a drift that suggests that the focus on disposable incomes for deeming the graveness of indebtedness may be only part of the full story.

Figure 3: Household debt over disposable incomes in Sweden, 1810–2014.



Source: SNWD, v 1.2, Tables SE2.5, SE4.1 (downloadable at www.uueconomics.se/danielw/SNWD.htm).

How were household assets and liabilities structured? Figure 4 shows a detailed decomposition. The left panel shows that agricultural assets, including farmland, forests and buildings (including livestock), comprised four fifths of non-financial assets in the agrarian era while housing stood for the remaining fifth. Industrialization brought about a reduction in the share of agriculture, caused by the gradual rise of the value of personal homes that become more important to people as their incomes rose. The process was slow and it was not until the 1930s as housing overtook the role of being the major share of non-financial household assets.

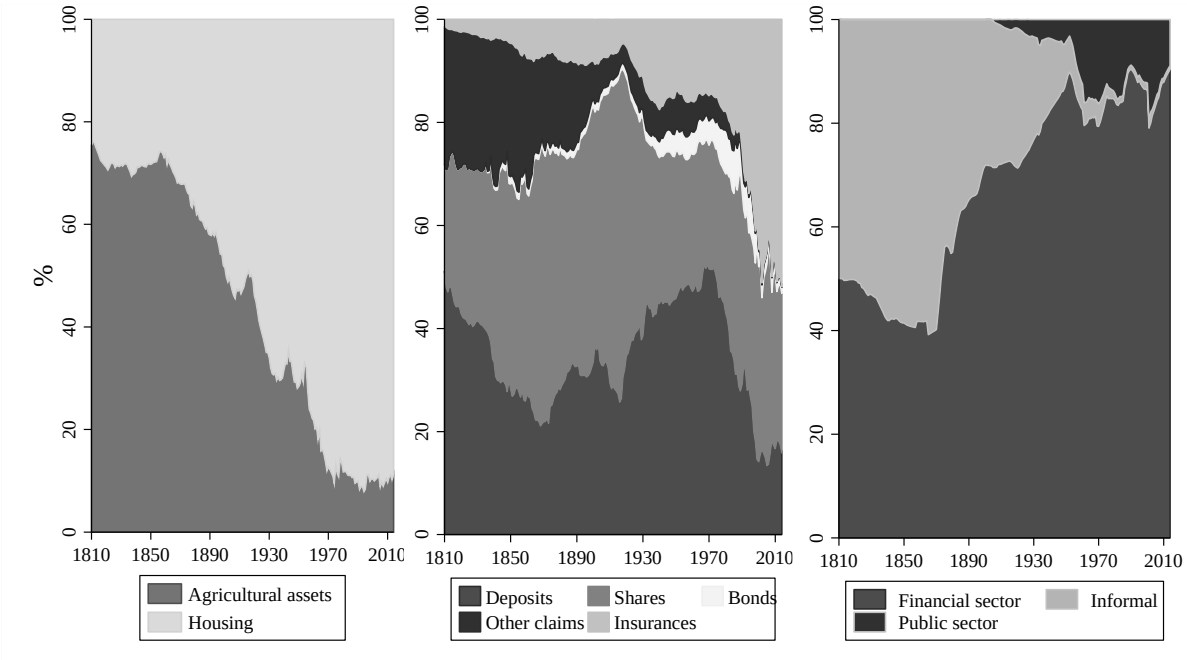
The middle panel shows financial asset composition. Until the 1970s bank about two thirds of them were made up of deposits and currency together with business equity (incorporated and unincorporated). Informal claims, i.e., loans given informally to others as trade credit or other type of loans, were important in the 19th century, representing about one fifth of financial assets. The large share of business equity is interesting and it reflects that when making a serious attempt to value the stock of businesses, unincorporated and later incorporated, it turns out that their total value was sizeable. In the late postwar era, insurance savings – mainly

funded occupational pension savings – grew rapidly expanded in household portfolios and they today represent half all household finance assets.

The right panel shows the composition of household liabilities. As has already been mentioned, Sweden had no really well-functioning market for household credit before the 20th century. The few banks and financial intermediaries that existed were either mainly focusing on attracting deposits (savings banks) or lending to agriculture (mortgage associations) or private industry (commercial banks). Consequently, up until the 1900s the majority of household borrowing came from informal lenders, mainly other households (neighbors, merchants).[6] Informal borrowing was thus dominant during the 190th century, but its role decreased rapidly in the early 20th century along with the institutional development of the Swedish economy and society in general. The financial sector became the main household creditor thereafter, a position that is has retained ever since. Today financial intermediaries, broadly defined, represent roughly 90 percent of all household borrowing. In the postwar era state lending to households was expanded, initially centered around direct or indirect housing credit but since the 1970s increasingly in the form of subsidized student loans which today represent 90 percent.

[6] Quantifying the spread and size of these informal claims is, of course, difficult since they do not appear in the official statistical sources or banking statistics. However, they do show up in people's probate records that are compiled at the time of death, and this source of the sum of informal credits has formed the basis for their estimation (see further Waldenström, 2015b). The structure informal and formal credit markets in 19th century Sweden has been studied by, e.g., Lindgren (2002), Lilja (2004) and Perlinge (2006).

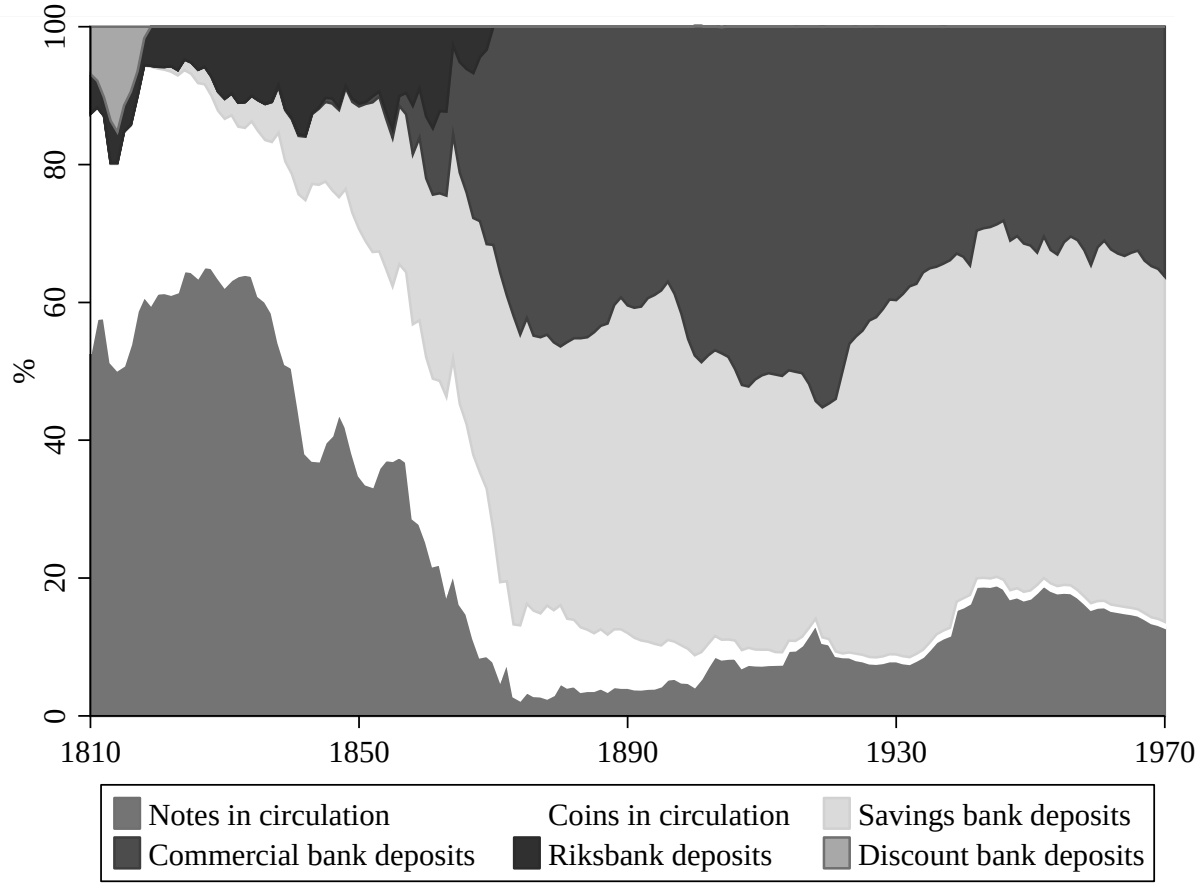
Figure 4: Composition of Swedish household assets and liabilities, 1810–2014.



Source: SNWD, v 1.2, Tables SE2.2, SE2.3, SE2.5 (downloadable at www.uueconomics.se/danielw/SNWD.htm).

The new SNWD database also offers new perspective to some particular parts of the modern economic history of Sweden. Figure 5 depicts a disaggregate view of liquid financial assets held as cash and bank deposits between 1810 and 1970. Early on, notes and coins represented about four fifths of people's financial assets with the rest being deposits in the Riksbank and Discount banks. Saving banks started emerging in the 1820s and soon become relatively important and even though the first commercial banks came in the 1830s, they were not oriented towards household services until the 1870s when joint-stock banking became widespread. By the turn of the century 1900, commercial and saving bank deposits were the vastly dominating form of household savings, mirroring the remarkable financial development that Sweden underwent during this era.

Figure 5: Household bank deposits and currency, 1810–2014.



Source: SNWD, v 1.2, Table SE2.3 (downloadable at www.uueconomics.se/danielw/SNWD.htm).

One specific financial asset is the unfunded (defined benefit) pension entitlements in private (occupational) and public pension schemes. These assets lack a well-defined counterparty and are therefore in a memorandum category in the SNA outside the main wealth concept. However, since people may consider their expected future pension incomes when deciding how much wealth to accumulate during their working life, it may be of interest to assess the size of these unfunded pension claims.[7] The SNWD includes estimated series of these unfunded private and public pensions of Swedish households and their relative importance in Swedish household wealth is shown in Table 2.[8]

[7] Indeed, Feldstein (1974), Berg (1983) and Gale (1998) present evidence on a negative relationship between public pension assets and private financial wealth.
[8] Waldenström (2015a) analyzes the historical evolution of these pension assets back to the 19th century.

Table 2: The role of pension wealth in Swedish household portfolios in 2014.

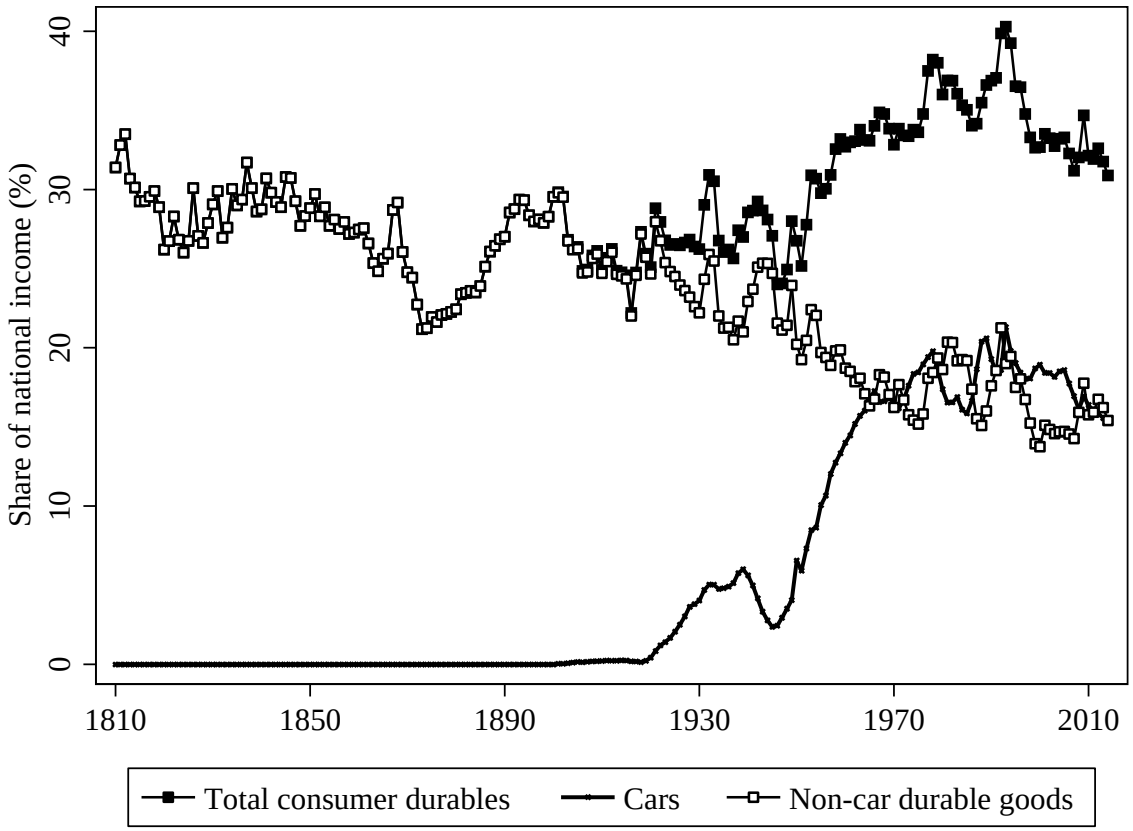
	Million SEK	Million EUR	Share of W (%)	Share of AW (%)	Share of national income (%)
Assets	18,932	2,058	125	69	569
Non-financial assets	9,272	1,008	61	34	279
Financial assets	9,660	1,050	64	35	290
Liabilities	3,762	409	25	14	113
Private wealth, W	15,170	1,649	100	55	456
Public pension entitlements	8,947	973	59	33	269
Unfunded	8,141	885	54	30	245
Funded (PPM)	806	88	5	3	24
Private occupational pensions	3,404	370	22	12	102
Unfunded	309	34	2	1	9
Funded	3,095	336	20	11	93
Total unfunded pension wealth, PW	8,450	919	56	36	254
Total pension wealth	12,352	1,343	81	45	371
Augmented private wealth, $W + PW$	23,620	2,567	156	100	710

Source: See text and Waldenström (2015b) for a description. SNWD, v 1.2, Tables SE2.1, SE2.3 (pension wealth). National income from Edvinsson (2014). SNWD based on SNWD, v 1.2, Table SE2.1..

Consumer durable goods (cars, boats, furniture etc.) are another special kind of household asset that is not included in SNA's core wealth definition, the reason being that all consumption goods are assumed vanish within one year and can thus not result in fixed asset formation. Nevertheless, many durables last arguably for more than one year, e.g., cars, boats or electronic equipment, which is why some countries (e.g., the U.S.) do in fact include them in household balance sheets. In the SNWD, durable consumer goods are not included in the main wealth concept but there is an estimated series based on consumption flow data and the perpetual inventory method, assuming an annual depreciation rate of 15 percent.[9] Figure 6 shows that consumer durables amounted to about 30 percent of national income throughout the last two centuries, a level which corresponds to about a tenth of non-financial assets in the 19th century and then about 15–20 percent in the postwar era mainly due to the expansion of personal car ownership.

[9] See further Waldenström (2015b, section B3).

Figure 6: Consumer durables: Cars and other durable goods, 1810–2014.



Note: The stock of consumer durable goods based on accumulating annual consumption flows and subtracting an assumed depreciation of 15 percent. See text and Waldenström (2015b) for a description.
Source: SNWD, v 1.2, Table SE2.2 (downloadable at www.uueconomics.se/danielw/SNWD.htm)

4.2 Government wealth

Public sector assets and liabilities are also part of the national balance sheets. Tremendous attention has since long been paid to the size and growth of government debt and its role for a number of economic and political processes in society.[10] However, the size and structure of government assets have received much less interest despite their undisputable importance for the shaping of public infrastructure, utilities and the potential of government to offer welfare services that many today take for granted.

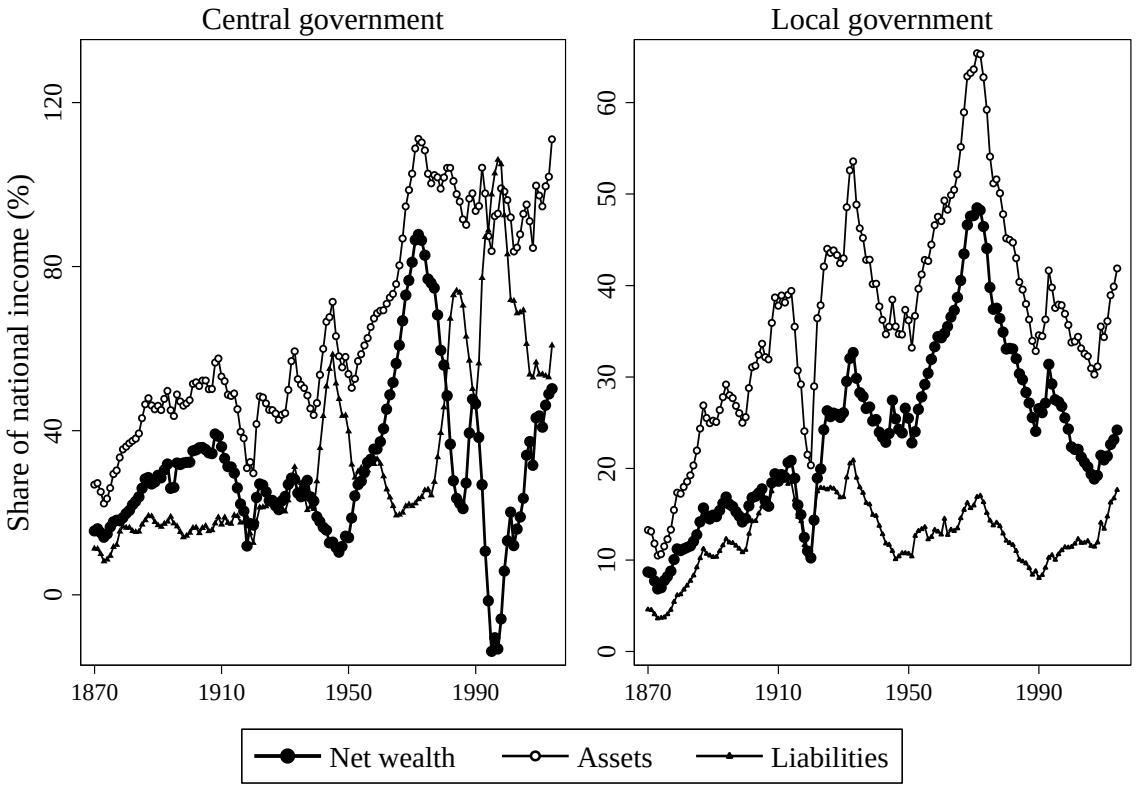
The SNWD covers a public sector balance sheet annually since 1870. In the database, the public sector is divided between *central government* and *local government*, which follows the way it has been institutionally organized in Sweden since centuries. Central government is effectively the state and, since the 1950s, also the social insurance system ("socialförsäkrings-

[10] See, e.g., the historical investigation by Reinhart and Rogoff (2009).

systemet") which consists of funds supporting the payment of pensions and other social insurances. Local government consists of two administrative levels: counties ("landsting") and municipalities ("kommuner").[11]

Figure 7 shows the size of assets, liabilities and net wealth as share of national income of the Swedish central and local governments since 1870. It should be noted that local government balances are consistently smaller, a fact due to the balanced budget requirement that have been in place in municipalities and counties for most of their existence. The central government, by contrast, exhibits a more volatile wealth structure. Particularly interesting episodes are the accumulation of state pension funds in the 1960s and government borrowing during the 1980s and 1990s, both of which were of historic proportions as shown by the database.

Figure 7: Public wealth: Central and local governments, 1870–2014.



Source: SNWD, v 1.2, Table SE3.1 (downloadable at www.uueconomics.se/danielw/SNWD.htm).

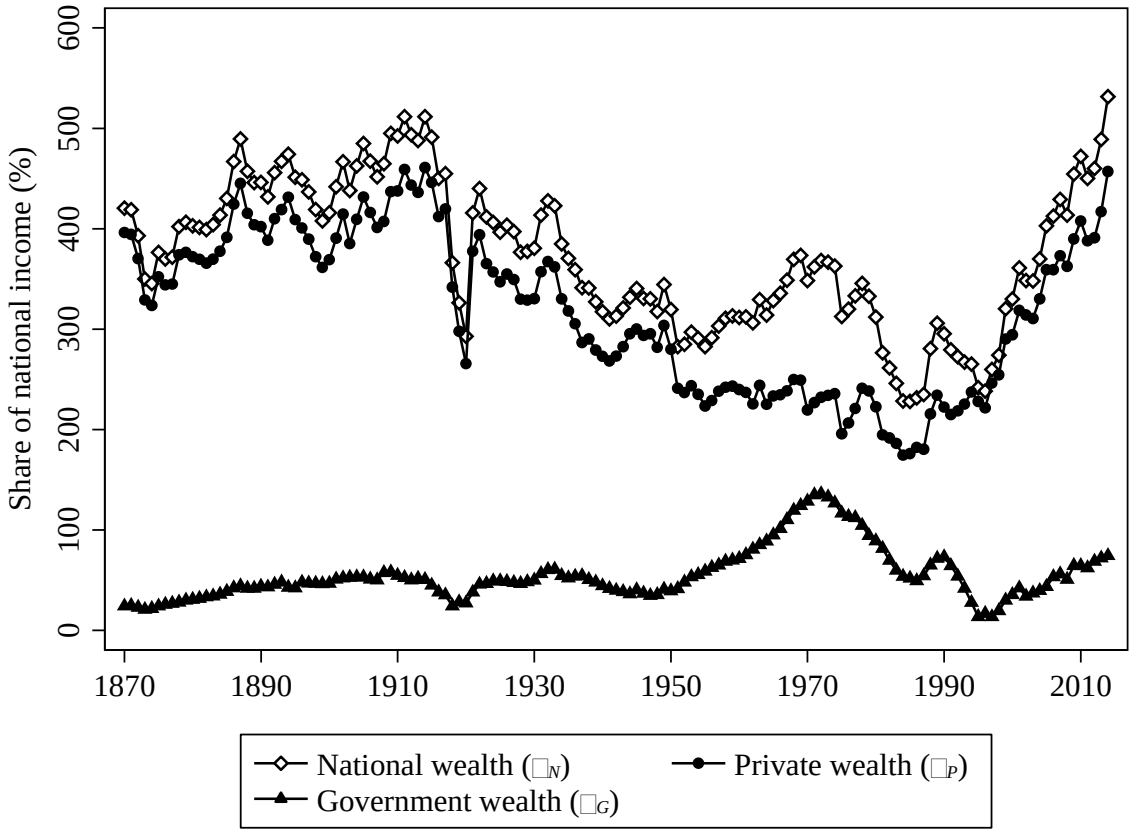
4.3 National wealth

The evolution of national wealth in Sweden as share of national income during 1870–2014 is shown in Figure 8. Both its level and time trend are remarkably similar to those observed for

[11] The formalization of the modern municipalities and counties was done in the early 1860s.

private wealth shown in Figure 1 above, and the explanation lies naturally in the fact that private wealth has made of the vast majority of national wealth throughout the period. Only in a couple of decades in the postwar era, when the Swedish government expanded its realm by accumulating large buffer funds to back up the public pension system, was public wealth over one third of national wealth to be contrasted with its long-run average share of one seventh.

Figure 8: National wealth of Sweden, 1810–2014.



Source: SNWD, v 1.2, Table SE1.2 (downloadable at www.uueconomics.se/danielw/SNWD.htm).

Net foreign assets are the difference between claims on foreigners held by Swedes and the claims on Swedes held by foreigners. These are included in the country's national wealth besides the domestic capital stock. There is a long-standing debate in Swedish economic history research about the role of foreign capital in the initial industrial era, some parties arguing that it mattered little as most of observed firm credits came from domestic banks while others arguing that these banks indeed capitalized themselves using these foreign funds.[12] Calculating the foreign position of Swedes in past times is, however, not trivial. Past research suggest two

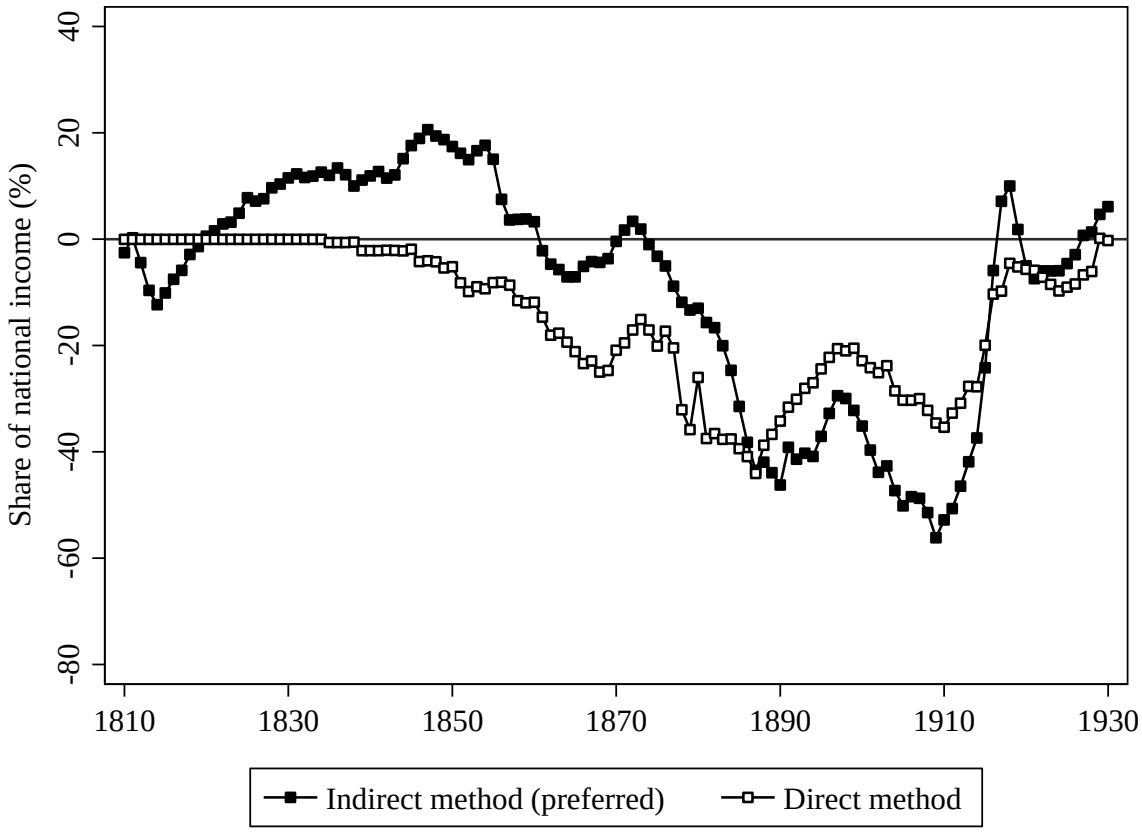
[12] See, e.g., Gårdlund (1942).

main methods. The *indirect method* accumulates the capital account,[13] while the *direct method* sums the value of Swedish bond (and bank) loans floated abroad, both of which are fairly well documented historically, and subtract the Swedish possessions of foreign bonds and bank debt, which less well observed.

Figure 9 plots two series of net foreign assets as share of national income resulting from the two distinct methods. As can be seen, they comfortingly enough match each other fairly well in levels as well as in time trends. Their message, moreover, is fascinating: they show how Sweden started importing capital from the middle of the 19th century and how this import peaked around the turn of the century. Later, when Sweden had become industrialized and also gained from staying outside the First World War, the country was rich enough to start repaying its foreign debt and Sweden turned from being a net debtor to being a net creditor within less than a decade. This evolution is well-known by economists and historians, but less known is the relative importance of the stock of Swedish capital imports in terms of the country's available domestic and national endowment. At their peak, the capital imports reached about one half year's national income or one tenth of national wealth. While this is indeed economically significant, and at par with the total outstanding lending by commercial banks, it represented only about one fourth of the country's total corporate (and incorporated) business equity, about a third of household deposits in banks, or the same level as either total private agricultural land or total privately owned timber tracts. In other words, while these new wealth data may not settle the long-standing debate about the role of foreign capital in Swedish industrialization, it does indeed provide perspective and contribute in tempering some of the arguments raised.

[13] Schön (1989) estimates a series of Swedish net capital imports from the 1820s, using a method based on comparing the net export and changes in the foreign exchange reserves at the Swedish Riksbank. Schön adds the costs of the imported capital, using the interest on government bonds as a proxy for the cost of capital. The foreign debt stock is the equal to the accumulated capital imports. See further Waldenström (2015b, section C7).

Figure 9: Foreign wealth, 1810–1930: Direct and indirect estimation approaches.



Source: See text for a description (downloadable at www.uueconomics.se/danielw/SNWD.htm).

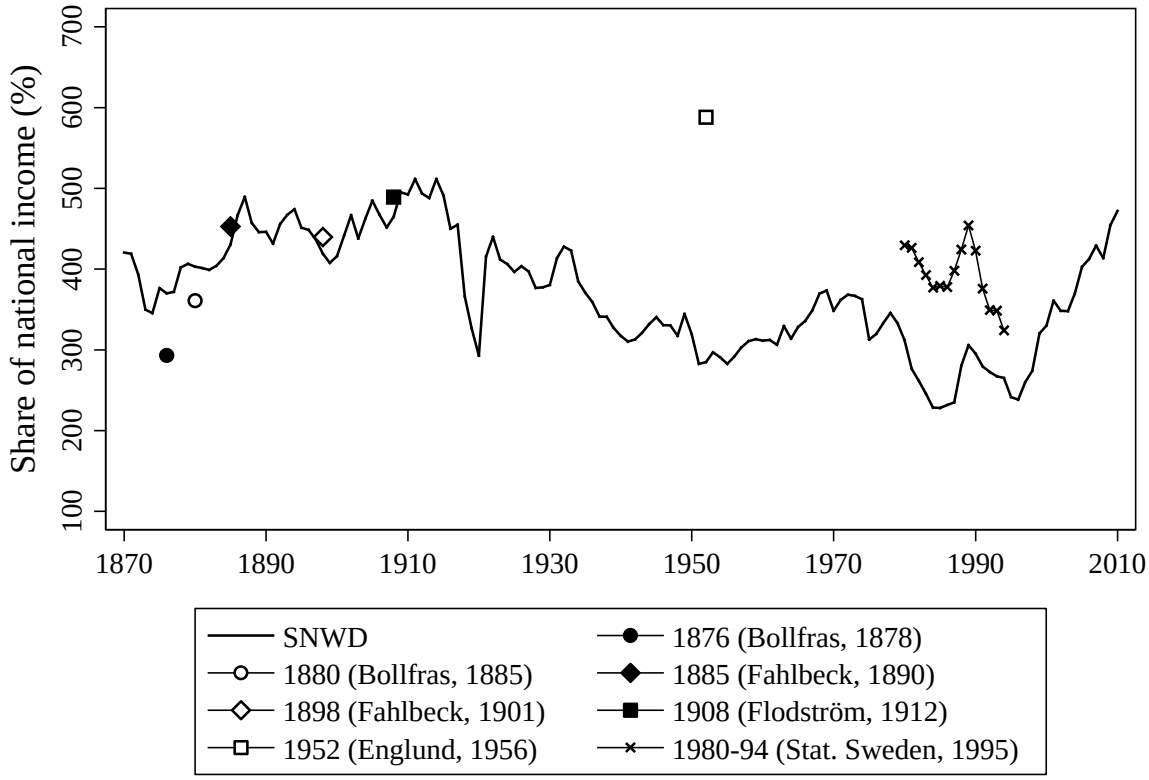
5. Comparisons with previous estimates for Sweden and other countries

It is informative to contrast the series in the SNWD against other series offered by earlier investigations for single years or periods. Figure 10 shows the ratio of national wealth to national income in Sweden between 1870 and 2010 for the SNWD series, which is available annually over the full period, and the previous estimates available offered for single years and periods.

The early estimates by Bollfras (1878, 1885) are 10–20 percent smaller than the SNWD numbers whereas the estimates by Fahlbeck (1890, 1901) and Flodström (1912) actually exceeds the SNWD figures by a few percentages. The estimate by Englund (1956) is twice as high as the SNWD estimate, and this is caused by Englund's use of fire insurance values to estimate the stock of non-financial assets instead of using the tax assessments (or net present value of accumulated investments). There are at least two reasons why Englund's estimate should be interpreted with specific caution. First, Swedish fire insurance values have exhibited a very

volatile development over time with little relationship to fundamental changes in asset prices: they amounted to less than a third of total non-financial assets and the stock of consumer durables in the 1860 and 1870s, reached the same level in the 1900s and 1910s and then rose to more than twice the value from the 1930s onwards.[14] Second, the postwar wealth-income ratio according to Englund vastly exceeded all wealth-income ratios seen in any Western country at this time of depressed postwar capital values.

Figure 10: Swedish national wealth in the SNWD and previous investigations



Source: See text and Waldenström (2015b) for a description. SNWD based on SNWD, v 1.2, Table SE2.1 (downloadable at www.uueconomics.se/danielw/SNWD.htm).

In the period 1980–1994 the most recent effort by Statistics Sweden (Statistics Sweden, 1995; Tengblad, 1992) to estimate the national wealth shows stocks that are between one fifth to two thirds higher than the levels in the SNWD. The main explanation to this deviation ought to be related to the valuation of corporate assets using either current market prices or accumulated investments as in the perpetual inventory method. Evaluating this claim is difficult, but it is possible to calculate a ratio between estimates of these two entities, i.e., Tobin's Q. Corporate capital can be calculated residually from the national wealth in SNWD by removing

[14] See Waldenström (2015b, Section B3) for a closer comparison.

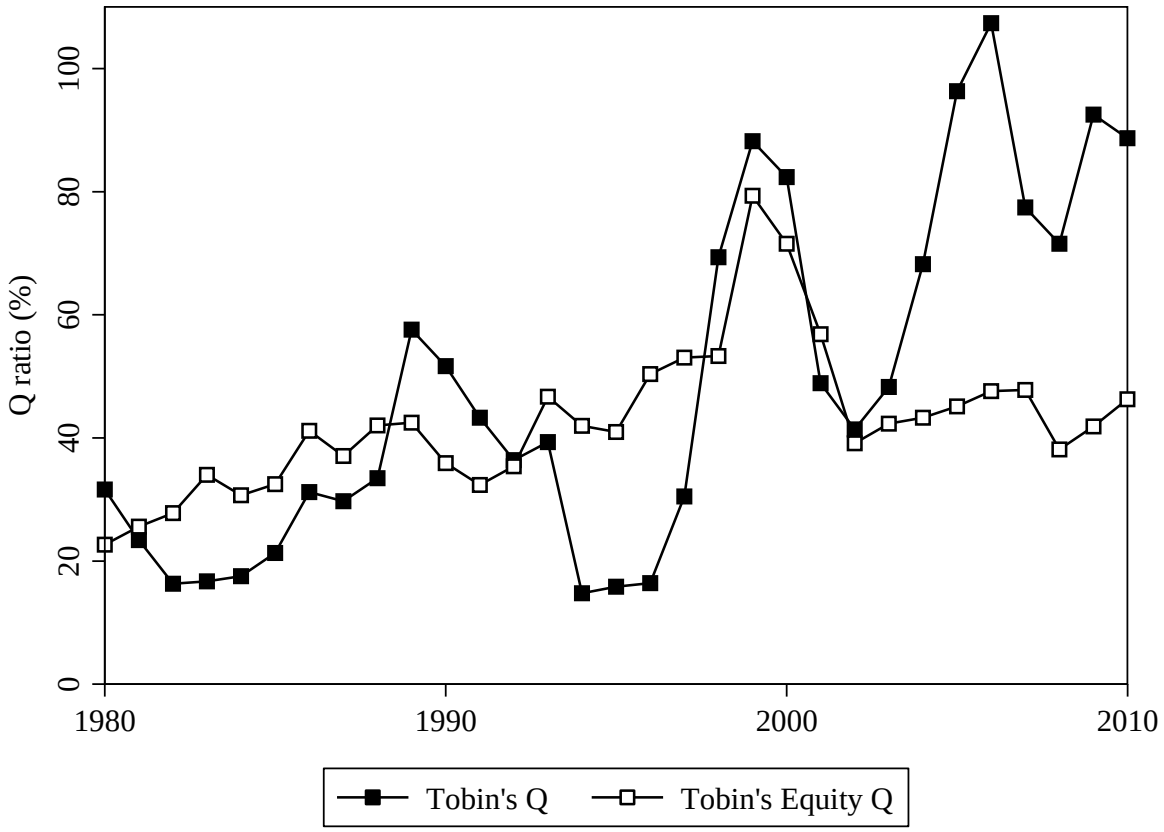
net foreign assets and non-financial assets of households and the governments.[15] The replacement value of corporate capital is offered by Statistics Sweden (1995) and later versions based on the perpetual inventory method (PIM).[16] Tobin's Q is the ratio between the corporate capital in the SNWD and Statistics Sweden's PIM-totals. An alternative expression of the relationship between market-valued and book-valued corporate equity is Tobin's Equity Q, which is the ratio of the market value of corporate equity to total corporate assets less non-equity liabilities, reported in the SNWD and by Statistics Sweden (same source as above), respectively.[17] Figure 11 shows these two ratios since 1980. The main message is that both ratios are well below 100 percent, suggesting that market values were systematically low over this period. The variability in the ratio reflects swings in the stock market.

[15] To see this, note that national wealth is composed by domestic capital and net foreign assets and that domestic capital is composed by private (i.e., household + corporate) and government capital.

[16] Statistics Sweden (1995, table 3:7) lists the stock of produce and non-produced non-financial assets of both non-financial and financial corporations for the end of years during the period 1980–1994 (or actually January 1 in 1981–1995). Since 1995, Statistics Sweden reports the produced stocks in the quarterly and annual national accounts. I estimate the stock of non-produced non-financial assets (i.e., land and timber tracts) assuming the average relation as in 1980–1994.

[17] Note that the number for E_C includes the total value of market capitalization of the Stockholm Stock Exchange and not only the share of listed stocks held by households, the reason being that it is not possible to single out household-owned corporate assets from the national accounts.

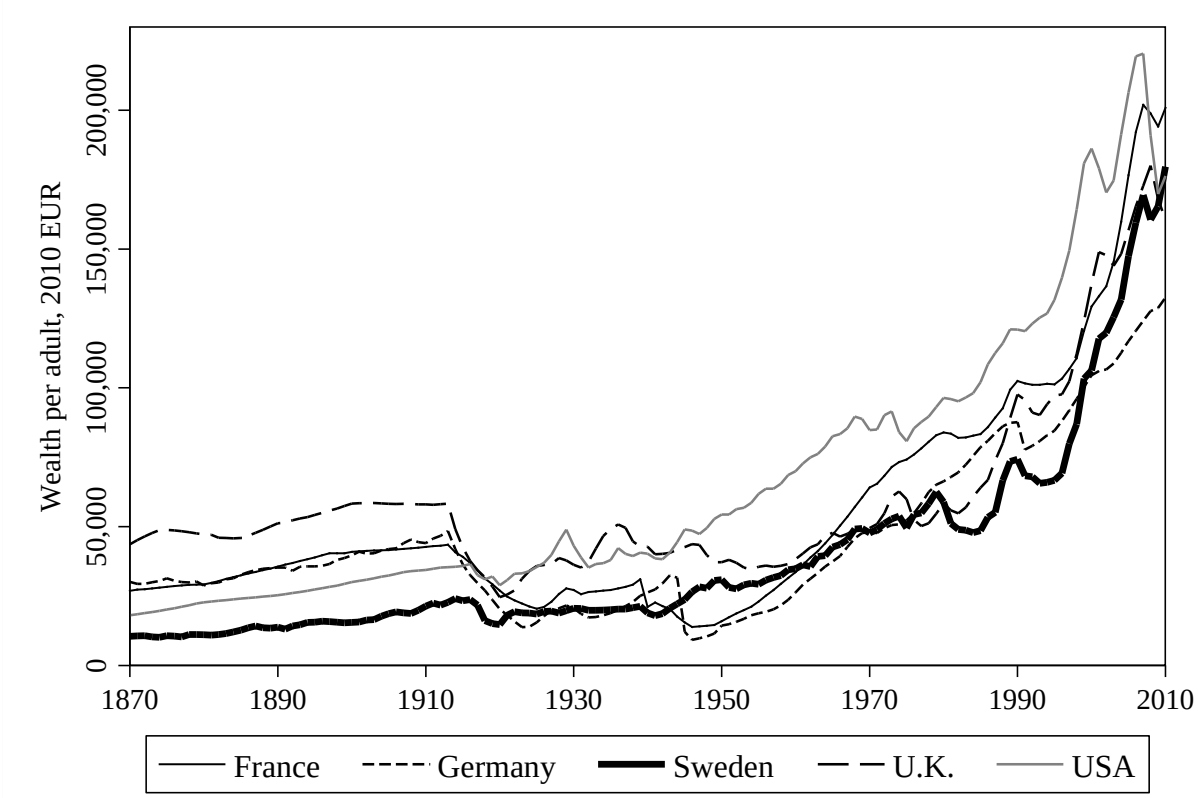
Figure 11: Tobin's Q in Sweden, 1980–2010.



Notes and sources: Tobin's Q is the ratio between corporate capital in the SNWD (national wealth – net foreign assets – household non-financial assets – government non-financial assets) and corporate capital according to accumulated investments minus depreciation computed by Statistics Sweden. Tobin's Equity Q is the ratio between all corporate equity (in market values) in Sweden and the sum of corporate assets less non-equity liabilities in the national accounts of Statistics Sweden. See text for further description and sources.

Finally, how does the historical development of the Swedish wealth compare with other Western countries? Figure 12 shows per adult private wealth in constant prices for France, Germany, Great Britain, Sweden and the United States since 1870. Some interesting patterns stand out. Perhaps the most striking finding is that Swedes are the poorest in this group of countries throughout the period with exception for two eras: the decades immediately after the Second World War and the 2000s. Differences are the largest before the First World War when the relatively late industrialization of Sweden is reflected by the fact that Swedish average wealth per adult was only between one fifth and one half of the wealth of people in the other countries. The turmoil associated with the World Wars had dramatic consequences for the rich continental European countries, but also the post-1980 consists of historically large wealth changes.

Figure 12: Per adult wealth in five countries, 2010 EUR.

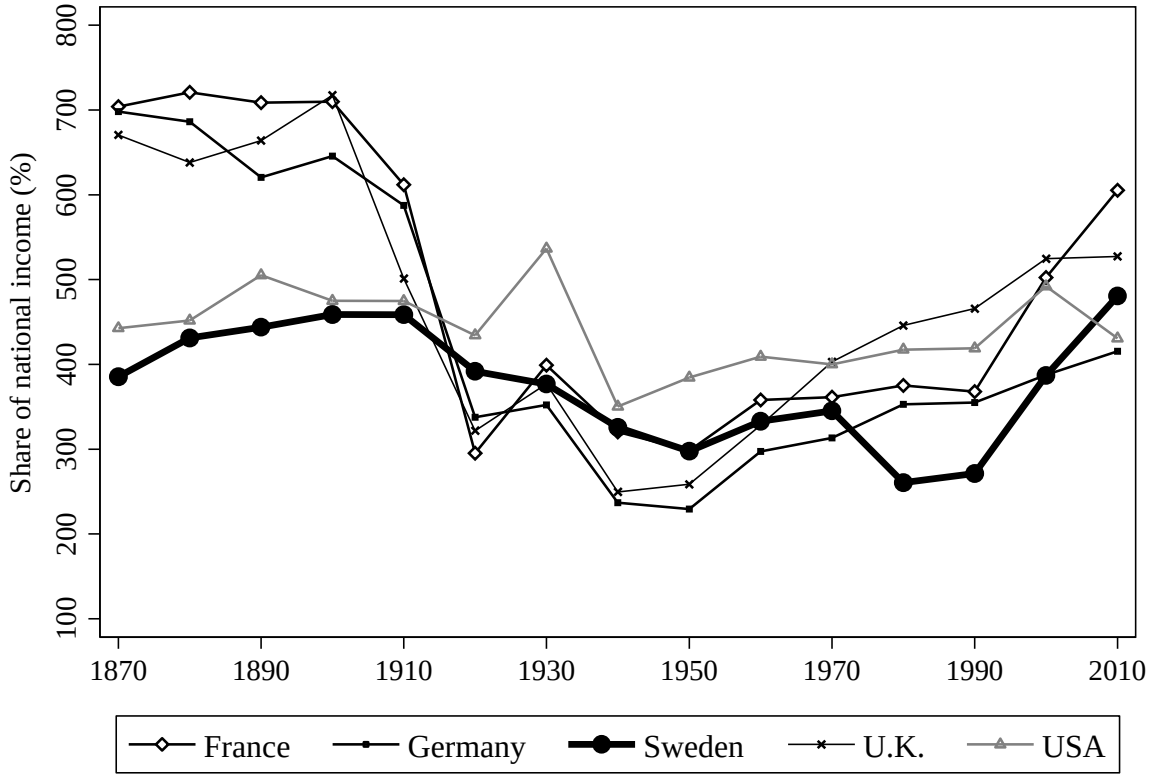


Source: Sweden: SNWD, v 1.2, Table SE1.1. Other countries: Piketty and Zucman (2014). Exchange rates as of 2010-12-31 were used (EUR/SEK = 0.11; EUR/GBP = 0.86; EUR/USD = 1.34).

Figure 13 presents national wealth-income ratios in these countries over the same period. The pattern is similar, with Sweden having a pre-First World War ratio of about half of that of France, Germany and Britain. However, it is almost at the same level as that in the U.S. and Waldenström (2015a) attributes this difference to relatively low saving rates in the backward Sweden which prevented the country for accumulating a domestic capital stock of its own. During the 20th century, however, the geopolitical and economic turmoil associated with the two world wars and interwar economic crises had huge implications for wealth on the European continent, but almost none in Sweden. That this divergence in outcomes is closely related to the wars seems quite plausible, although the effect may have primarily worked via the political channels rather than military. In his account of the dramatic swings in household wealth during the 20th century, Piketty (2011) suggests that wartime capital destruction represented only a small part of absolute and relative wealth compression. Instead the main mechanisms seem to have been government regulation and, in particular, increased taxation of wealth, property and high incomes. Sweden was neutral in both wars, and although the country did indeed raise taxation of the rich and increased the regulatory pressure on the private

sector, this does not seem to have been pursued at the same order of magnitude as in the belligerent countries.[18] After the Second World War, the Swedish national wealth-income ratio is almost at par with those of the other countries.

Figure 12: International comparison of wealth-income ratios, 1810–2010.



Source: Sweden: SNWD, v 1.2, Table SE2.1 (downloadable at www.uueconomics.se/danielw/SNWD.htm). Other countries: Piketty and Zucman (2014).

[18] That wars matter for taxation of the rich has also been found by Ken Scheve and David Stasavage, who have linked the degree of tax progressivity (Scheve and Stasavage, 2010) and the level of inheritance taxation (Scheve and Stasavage, 2011) to mass mobilization of countries actively participating in wars. Their suggested mechanism is that the increased taxation was the "price" that the wealthy had to pay for having the rest of the population putting their lives at stake in the actual fighting.

6. Conclusions

This paper presents a new historical database over the balance sheets of Sweden's private and public sectors spanning the past two centuries. The composition of the portfolios is analyzed, not only through the separation between real and financial assets and debts, but also by studying sub-classes within these broader categories. A specific contribution lies in the investigation of the historical evolution of traditionally "difficult" assets such as consumer durables, pension wealth and informal loan contracts.

Looking at the overall trends, the wealth of Swedish households has fluctuated quite notably over the past two centuries. Many of these fluctuations are consistent with what we know about Swedish historiography. Wealth in the agrarian era was relatively small, but the onset of industrialization made it accumulate faster than incomes grew. In most of the 20th century, the situation was the opposite: income growth surpassed the rate of wealth accumulation, a process where the spread of human capital and the rise of a redistributional welfare state was surely important. Since the 1980s, wealth has once again outgrown income. Exactly what explains these patterns will require the use of other data series, and hopefully such analyses can build on the evidence presented here.

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