

Taxation of Swedish owner-entrepreneurs, 1862 to 2018*

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Abstract: This study analyzes the taxation of owner-entrepreneurs, in the form of active owners of closely held corporations, in Sweden between 1862 and 2018. It calculates annual time-series data on the marginal effective tax rates on capital income (METR) for a marginal investment financed with new share issues and retained earnings. Five tax regimes are econometrically identified. The first stretches from 1862 until World War I where the METR is low, stable and the differences depending on the owner's income or source of finance are negligible. The second emerges between the Wars, when the METR and the differences between income and sources of finance increase. The start of the third regime coincides with World War II, and taxation sharply increases. The METR peaks during the fourth regime from the mid-1960s and often exceeds 100 percent. The tax incentives for owner-entrepreneurs were conducive during the first regime, weakened during in particular the third and fourth regime and improved during the fifth regime starting with the 1990–1991 tax reform.

JEL-codes: L25, L26, H21, H31, H32, N44

Keywords: cost of capital, entrepreneurship, institutional quality, marginal effective tax rates, marginal tax wedges, tax regimes; tax reforms

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1. Introduction

The tax system is one of society's most important institutions because it affects the structure of payoffs and shapes the incentives for economic actors. Consequently, its impact on behavior and economic performance is extensively analyzed among researchers and policymakers. A critical step in such an analysis is to describe the tax system's structure and evolution. Presumably, a long-run perspective is desirable because institutions like tax systems generally change slowly and it may take a long time before economic actors' behavior fully adjust (c.f., Williamson 2000). Even though business owners are crucial actors for creating employment and economic growth, their long-term tax incentives are rarely studied.

The purpose of this study is, firstly, to examine the capital income taxation of investments by active owners of closely held corporations (*fåmansbolag*) in Sweden between 1862 and 2018.¹ Secondly, to econometrically identify tax regimes that differ substantially in the taxation of active owners of closely held corporations.²

We illustrate the evolution of capital income taxation by calculating the marginal effective tax rate on capital income (METR), based on the method presented in King and Fullerton (1984). The King-Fullerton framework is an established tax measure used to compare tax rates between countries and investment projects. The total effect of capital income taxation depends on corporate income taxation, personal capital income taxation and wealth taxation, and the interactions of these taxes with inflation. The result will also depend on the source of finance, and we will calculate the METR for investments financed with new share issues or retained earnings.³ The inclusion of the rules for owners of closely held corporations into the King-Fullerton framework requires an extension of how the METR is calculated (see Wykman 2019a). Tax regimes will be identified through a structural change approach.

¹ Closely held corporations make up almost all corporations in Sweden (Andersson et al. 2018). The long-run tax incentives for corporations with dispersed ownership is analyzed in Johansson, Stenkula and Du Rietz (2015). The surplus in sole proprietorships or partnerships is normally taxed as labor income. Sole proprietorships and partnerships contribute little to aggregate employment and gross domestic product (Andersson et al. 2018) and will not be included in our analysis.

² Our analysis is part of a comprehensive project to characterize the Swedish tax system from 1862, when Sweden introduced a new tax system, up until today. The studies undertaken in the project until year 2015 are summarized in Stenkula (2014) and in Henrekson and Stenkula (2015) and cover six key aspects: the taxation of capital income of households, consumption, gifts and inheritance, labor income, real estate, and wealth. Since then, two additional studies have been completed; Johansson et al. (2018) document the evolution of taxation of private foundations, and Wykman (2019b) studies the taxation of closely held firms from 1991 to 2018.

³For parsimony, we limit the presentation of the results in the main text to these two equity financed sources of finance because ownership rests on equity. Debt financed investments will be presented in the Appendix B.

Granted that individuals who pursue their business ideas and carry out innovations in their own closely held corporations could be considered entrepreneurs, our approach can be taken as an indication of the long-run taxation of entrepreneurs who own their companies, i.e., owner-entrepreneurs.⁴

Our analysis is general and applicable to other countries. This analysis is based on publicly available tax law. The King-Fullerton framework is developed with the explicit purpose of facilitating taxation comparisons between countries and investments., and it is widely used internationally. The econometric procedure used to identify tax regimes is standard, described in textbooks and included in software such as R.

Sweden is also of general interest. The long time series make it possible to follow the evolution of taxation from the time when Sweden was an agricultural economy, through industrialization (in the second half of the 19th century) to the period when Sweden was established as a modern welfare state. During the studied period, Sweden has generally been an open economy that has been well integrated into the global economy. Sweden is a member state of the European Union and deeply rooted in the Western hemisphere. Other countries may have undergone a similar evolution. Besides other studies on Sweden, we are not aware of any studies examining the taxation for such a long period and at such a detailed level.

We distinguish five tax regimes. The first stretches from the start of our analysis until World War I. During this period, the METR is low, stable and the differences depending on source of finance or owner's income are negligible. The interwar period constitutes a second tax regime. The METR begins to increase and vary according to source of finance and owner's income. The establishment of the third regime coincides with World War II. Several tax reforms are carried out during this period that, together with an increase in inflation, make the METR increase and vary sharply. New tax reforms and higher inflation make the METR peak during the fourth regime between the mid-1960s and 1980s. The METR often exceeds 100 percent. The fifth regime begins with the introduction of the 1990–1991 tax reform. Tax rates were cut and a dual tax system, which taxed capital and earned income separately, was implemented. Inflation also dropped because of price stability becoming the primary goal of

⁴ There is no consensus on the definition of the entrepreneur in previous literature (see Hébert and Link 2007 for a survey of different definitions of entrepreneurs), and the tax code does not recognize entrepreneurial income as a distinct tax category. However, it is reasonable to assume that at least a subset of the active owners of closely held firms can be regarded as owners with entrepreneurial intentions.

monetary policy. Taken together the METR and its variation decreased. New share issues, which was disfavored from the second regime and onwards, are no longer disfavored.

The rest of the paper is organized as follows. Section 2 describes the taxation of owners of closely held corporations. Section 3 accounts for the development of corporate income taxation, wealth taxation and inflation. Section 4 shows the results for the METR using new share issues and retained earnings as source of finance. Section 5 analyzes the structural breaks and identifies the tax regimes. Section 6 concludes. Appendix A presents all graphs with structural breaks for the time series we have calculated. Appendix B shows corresponding results using debt as a source of finance.

2. Personal capital income taxation

2.1 General rules

Personal capital income taxation includes the taxation of physical individuals' income from dividends, capital gains and interest. Dividends were tax exempted until 1903. Between 1903 and 1991, they were in principle taxed in the same way for physical owners as other personal income (labor and business income), regardless of whether the corporation paying the dividend was unlisted, widely held or closely held.⁵ Dividends were therefore due to personal income tax, which differed significantly between taxpayers because the personal income tax schedules included many tax brackets.

Interest income was taxed in the same way and jointly with other personal income (labor and business income) from the beginning of the studied period until the tax reform in 1990–1991.

Before 1911, only so-called “speculative” capital gains were taxable. Formal capital gains taxation was introduced in 1911. The tax depended on the holding period. The longer the holding period was, the smaller the proportion of the gain that is taxable. The rules about the tax-exempt share have changed several times (Johansson et al. 2015). As with dividends, the taxable share of the capital gains was taxed jointly with other personal income until the tax reform in 1990–1991.⁶

⁵ However, between 1903 and 1919 shareholders only paid state income tax on dividends. Corporations were allowed to deduct dividends paid between 1903 and 1910, but only up to six percent of the booked value of equity. From 1920 and onward, local taxes were also levied on dividends.

⁶ From 2013, an investment deduction (*investeraravdrag*) was implemented for new share issues. However, this cannot be used in corporations that you already own and is excluded from our analysis.

The tax system underwent a significant change due to the 1990–1991 tax reform. With the reform, a dual income tax system was implemented and capital income was no longer taxed jointly with labor income. A separate personal capital income tax was introduced, subject to physical persons investing in listed and non-listed *widely* held corporations. Capital gains were made fully taxable independent of the holding period and the tax on dividends, capital gains and interest was initially set at a flat rate of 30 percent. The tax rate has occasionally deviated from 30 percent and from 2006, the tax on dividends and capital gains from widely-held unlisted companies was decreased to 25 percent (see Wykman 2019b and Johansson et al. 2015 for further details).

As a result of the 1990–1991 tax reform, the marginal tax on labor for individuals subject to the state income tax exceeded the combined corporate and personal capital income tax.⁷ This, in turn, implied that specific rules for closely held firms, the so-called 3:12 rules⁸, had to be applied to prevent income shifting, i.e., the possibility for active owners of closely held corporations to shift higher and progressively taxed labor income to lower and flat rate taxed capital income.⁹ The goal was to tax active owners equivalently to shareholding employees in public corporations, which was argued to be in accordance with both uniformity and neutrality.¹⁰

For active owners, the 3:12 rules stipulate that dividends are divided into a capital income and a labor income component. Dividends below the limit for the so-called dividend allowance (DA, *gränsbeloppet*) are taxed as capital income, while dividends exceeding the dividend allowance are taxed as labor income. The way that the dividend allowance is calculated has changed over time. It was initially roughly calculated as an imputed return times the acquisition cost of the shares. Later on, a part of the company's wage sum could be added

⁷ The labor income tax was progressive, starting with a municipality tax and for higher incomes a state tax. The marginal tax rate on labor income decreased from a range between 36 to 72 percent to a range between 31 to 51 percent, and the individual marginal tax rate on personal capital income decreased from a range between 36 to 72 percent, to a flat 30 percent tax rate (Sørensen 1998). The total tax on labor income includes social security contributions in addition to labor income tax. Profits are taxed with corporate income tax and dividends are then taxed with personal income tax.

⁸ The widely used term “3:12” is due to the rules original position in the law book.

⁹ Rules for closely held corporations were introduced in 1976 to ensure a correct income split between the stakeholders, for instance to prevent that a high income earner could avoid paying high marginal tax rates by distributing incomes from the closely held firm to relatives with lower incomes and lower marginal tax rates. The principal rule concerning the definition of closely held corporations is that four or fewer owners have to control more than 50 percent of the ultimate voting rights in the firm (SFS 1999: 1229, Ch. 56, §3; see Bjuggren et al. 2011 for a detailed analysis).

¹⁰ An active owner invests both capital and labor, i.e., take active part in the governance and the development of the corporation. An owner is regarded active if (s)he or a close family member is, or during the past five years has been, active in the income generation of the corporation to a “considerable extent.”

to the dividend allowance, i.e., the higher the payroll in the company the more dividends could be taxed as capital income. It is possible to save unused dividend allowance and carry them forward for use later in time. The tax rate for dividends within the dividend allowance was decreased from 30 to 20 percent in 2006.

In addition to this, part of the dividends below the limit for the so-called relief amount (RA, *lätnadsbeloppet*) was completely exempted from personal income taxation between 1997 and 2006. The relief amount was calculated in the same way as the dividend allowance, but with a lower imputed rate of return.

Before 2006 as well as between 2007 and 2009, capital gains (from selling shares) were split between capital income and labor income, i.e., half of the gains was taxed as labor income and the other half as capital income.¹¹ In 2006 and as from 2010 the split rule was abolished so that all capital gains were taxed as labor. For all years, the amount that was supposed to be taxed as labor income could, however, be reduced with (unused) dividend allowance.

A simplification rule (*förenklingsregeln*), still in force, was also introduced in 2006, implying that the dividend allowance always could be defined as a fixed amount—specified in the law—regardless of the amount of capital invested or the corporation’s wage bill.¹²

Tax ceilings have also been applied to limit the share of capital income from closely held companies that are taxed as labor income. Already when the 3:12 rules were initiated, there was a ceiling on the amount of capital gains that could be taxed as labor income. In 2012, an additional tax ceiling for dividends was introduced.

Besides tax rates, inflation and source of finance, the owner’s effective marginal tax rate depends on several details in the tax code, such as the definition of the corporation’s equity base and the imputed rate of return. The description of those is beyond the scope of this paper, but a complete overview of the tax rules for closely held firms after the 1990–1991 tax reform is given in Wykman (2019b).

¹¹ The only exception is year 1994 when 70 percent of capital gains were taxed as labor income.

¹² The rule allowed initially 1.5 so-called “income base amount” to be taxed as capital income taxation per corporation, not per shareholder. The amount was raised stepwise to 2.75 income base amount in 2012. As of January 1, 2012, an owner can only use the simplification rule in one of her/his closely held corporations. The income base amount is a government standard related to the development of income in the economy. In 2018, the income base amount was SEK 62,500 (about USD 6,500).

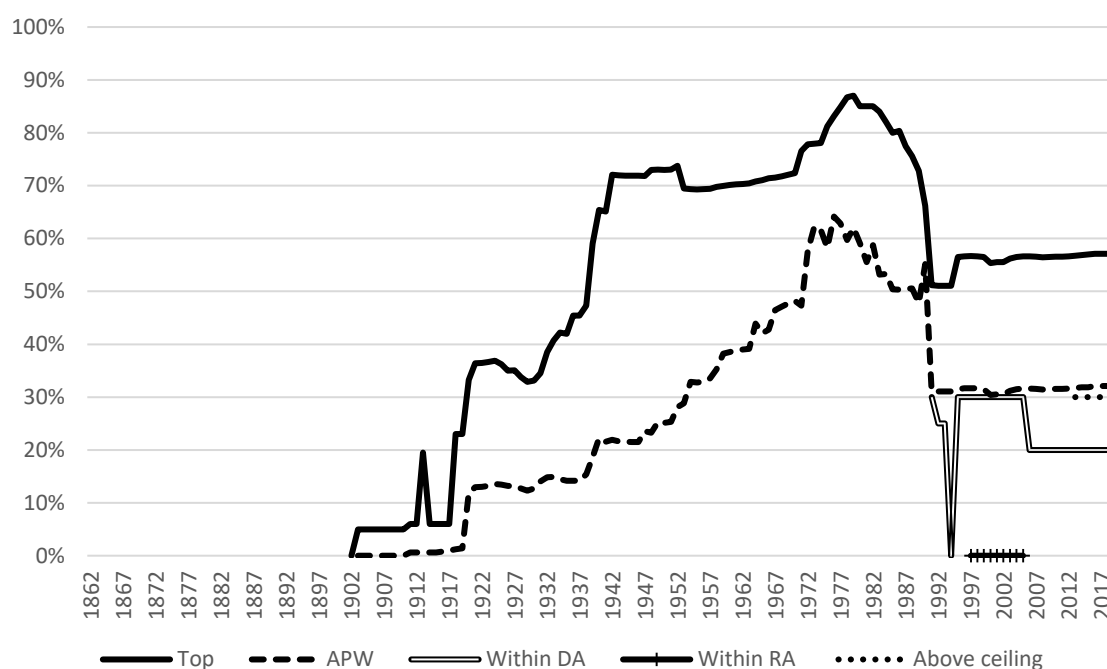
2.2 The evolution of marginal tax rates of personal capital income

As described in section 2.1, personal capital income was taxed jointly with labor before 1991 and the marginal tax rate depended on the total income. After 1991, the marginal tax rate on dividends and capital gains from closely held firms will depend on total income only if it is above the dividend allowance.

To illustrate the evolution, we will depict the marginal tax rate on personal capital income for an active owner of a closely held corporation paying the same marginal income tax rate as an average production worker (denoted APW) and for an owner of a closely held corporation paying the top marginal income tax rate (denoted top income earner). The APW can be viewed as a proxy for an entrepreneur earning average incomes and the top income earner as a proxy for an entrepreneur having extraordinarily high incomes and wealth.¹³ The tax rate for the APW and the top income earner will be used to calculate the METR in section 4 as well. The top income earner and the APW will—after 1991—refer to dividends above the dividend allowance that is taxed as labor income. From 1991, we will also display the marginal tax rates for active owners of closely held corporations within the dividend allowance (paying personal capital income tax), within the relief amount (paying no personal capital income tax) and above the tax ceiling. Figure 1 illustrates the evolution of marginal tax rates on dividends for active owners of closely held corporations.

¹³ In Stenkula et al. (2014) and Johansson et al. (2015) the tax rates for a tax payer earning 0.67 or 1.67 times the income of an average production worker are presented and used as well. The evolution of these tax rates mimics the general evolution depicted by average production worker though at a somewhat lower (0.67) or higher (1.67) level and we therefore do not report them. We will assume that the marginal social security contributions can be regarded as a tax for the APW, though occasionally there might be some social benefit connected to the contributions, i.e., the threshold for insurance value might occasionally be higher than the income level.

Figure 1. Marginal tax rates on dividends, active owners of closely held corporations, 1862–2018



Note: Top refers to an active owner of a closely held corporation paying the top marginal labor income tax, APW refers to an active owner of a closely held corporation paying the same marginal labor income tax rate as an average production worker. DA refers to dividend allowance and RA refers to relief amount. Dividends were tax-exempt before 1903 and thereafter taxed jointly with labor income up to 1991. The marginal income tax rate on labor income does not matter for dividends falling within the dividend allowance and for dividends falling within the relief amount or above the tax ceiling. These dividends are due to a flat capital income tax rate or are tax exempt.

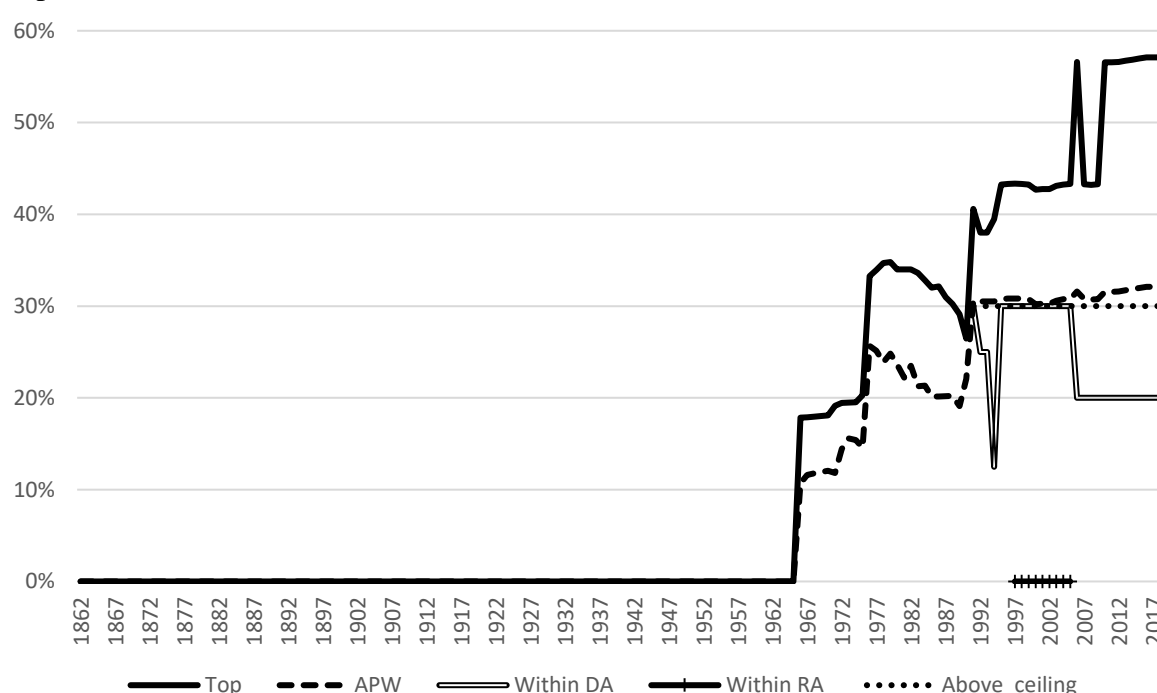
Source: Stenkula et al. (2014) and Wykman (2019b).

During the early 1900s, the marginal tax rates were generally below 10 percent. They increased during the Interwar years to nearly 50 percent for a top income earner. Yet, they were below 20 percent for an average production worker. The income tax reform implemented in 1948 was highly progressive and inflation in combination with real wage increases implied steadily increased marginal tax rates the following decades. The progressivity was further sharpened with the tax reform implemented in 1971 and continued to be sharpened during the rest of the 1970s. The top marginal tax rate was 85 percent in 1980. A minor tax reform in 1983–1985 decreased the marginal tax rates somewhat. After the 1990–1991 tax reform, the marginal tax rate could vary between zero and almost 60 percent—depending on year and if the dividends were within or above the dividend allowance or the relief amount.

It should be noted that the dynamics of the model presented in section 5 will capture the whole tax effect of an investment, sorting some of the income inside, and some outside, the dividend allowance.

Figure 2 depicts the marginal tax rates for capital gains on long term possessions. The tax rate was zero until 1965 and varied between about 10 percent and 20 percent from 1966 up until 1975. The tax changes implemented in 1976 increased the marginal tax rate for a top income earner sharply to more than 30 percent, and it peaked in 1979 at almost 35 percent. Thereafter, it decreased to almost 25 percent before the 1990–1991 tax reform. After the 1990–1991 tax reform, the marginal tax rate could vary considerably depending on year and whether dividend allowance or the relief amount could be used, in the same way as with dividends.

Figure 2. Marginal tax rates on long-term capital gains, active owners of closely held corporations, 1862–2018

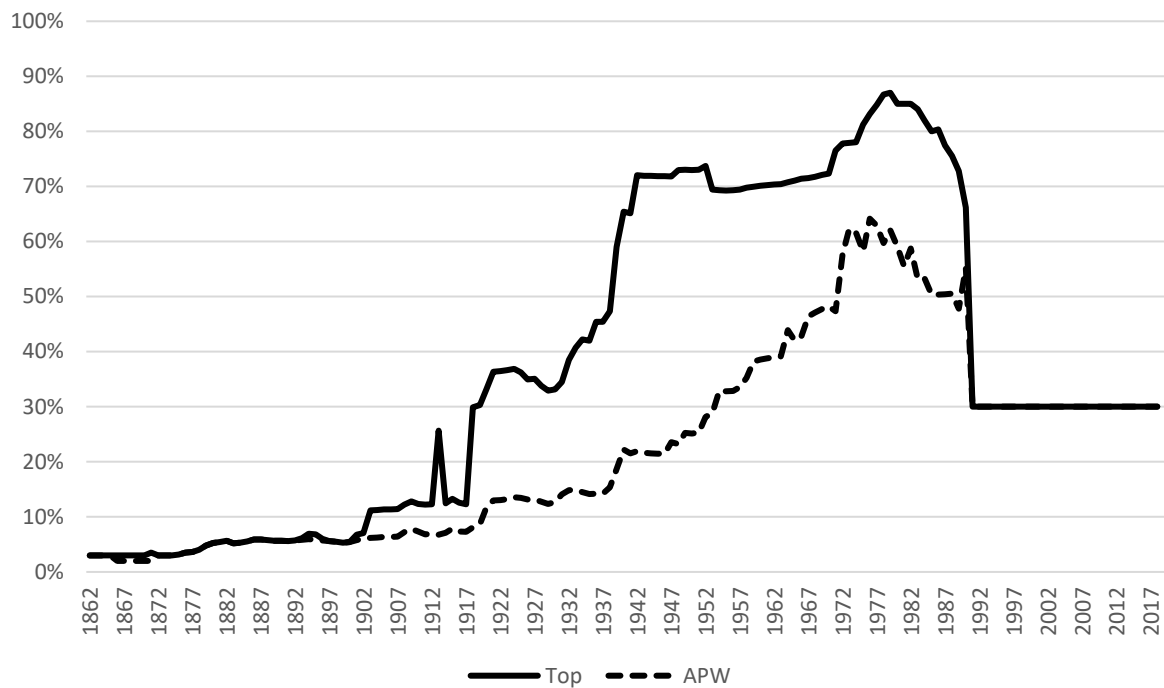


Note: Top refers to an active owner of a closely held corporation paying the top marginal labor income tax, APW refers to an active owner of a closely held corporation paying the same marginal labor income tax rate as an average production worker. DA refers to dividend allowance and RA refers to relief amount. The marginal income tax rate on labor income does not matter for capital gains falling within the dividend allowance and for capital gains falling within the relief amount or above the tax ceiling. These capital gains are due to a flat capital income tax rate or are tax exempt. Before 1966, long-term capital gains (>5 years) were tax exempted. From 1966 until 1990, only a proportion of capital gains was taxable. The tax ceiling was introduced in 1991.

Source: Stenkula et al. (2014) and Wykman (2019b).

Figure 3 shows the evolution of interest taxation for a top income earner and an APW. The tax rate did not exceed 10 percent until the 1903 tax reform, when it increased for the top income earner. As of 1920 until 1991, interest and dividends were taxed in the same way, i.e., jointly with labor income. The marginal tax rate is 30 percent from 1991 and onward independent on income.

Figure 3. Marginal tax rates, interest income, active owners of closely held corporations, 1862–2018



Note: Top refers to an active owner of a closely held corporation paying the top marginal labor income tax, APW refers to an active owner of a closely held corporation paying the same marginal labor income tax rate as an average production worker.

Source: Stenkula et al. (2014) and Wykman (2019b).

3. Corporate income taxation, wealth taxation and inflation, 1862–2018

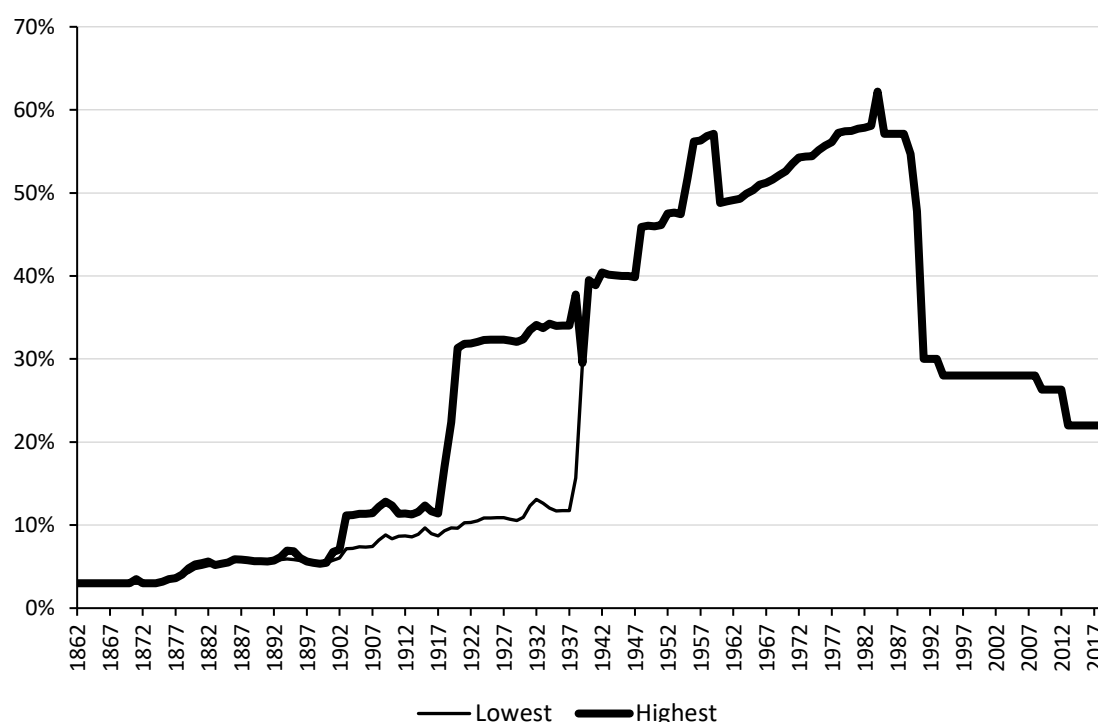
In order to calculate the METR, we must know how the corporate income and wealth taxation have evolved and how the inflation level fluctuated over time. Figures 4–6 describe how these variables have changed between 1862 and 2018. A more comprehensive and detailed description can be found in Henrekson and Stenkula (2015).

Corporate incomes were taxed similarly to personal income before 1911. Taxes were paid to the state (national government) and to the municipality (local government) until 1985. In 1903, a progressive state income tax was implemented but the local tax system was proportional. The top tax rate increased substantially in 1920, but the lowest tax rate increased sharply first in 1939 when the state tax system was made proportional again. The tax rates continued to increase slowly after World War II. Following the tax reform in 1990–1991, the statutory tax rate was substantially cut.¹⁴

¹⁴ We will use the average corporate tax rate when the system was progressive (1903–1939). Using the lowest or highest tax rates during this period will not change our general conclusions.

There have been ample possibilities to reduce the statutory corporate tax by allowances and grants—in particular between the years 1939 and 1991 when the effective corporate tax rate could be substantially lower than the statutory corporate tax rate (e.g., Heshmati et al. 2010). The tax reform in 1990–1991 abolished most of these options, thus making the statutory and effective corporate tax rate much more equal.¹⁵

Figure 4. The statutory marginal corporate tax rate, 1862–2018



Note: The statutory marginal corporate tax rate refers to the total effect of local and state corporate taxes. The progressive state corporate income tax system was replaced by a proportional tax system in 1939.

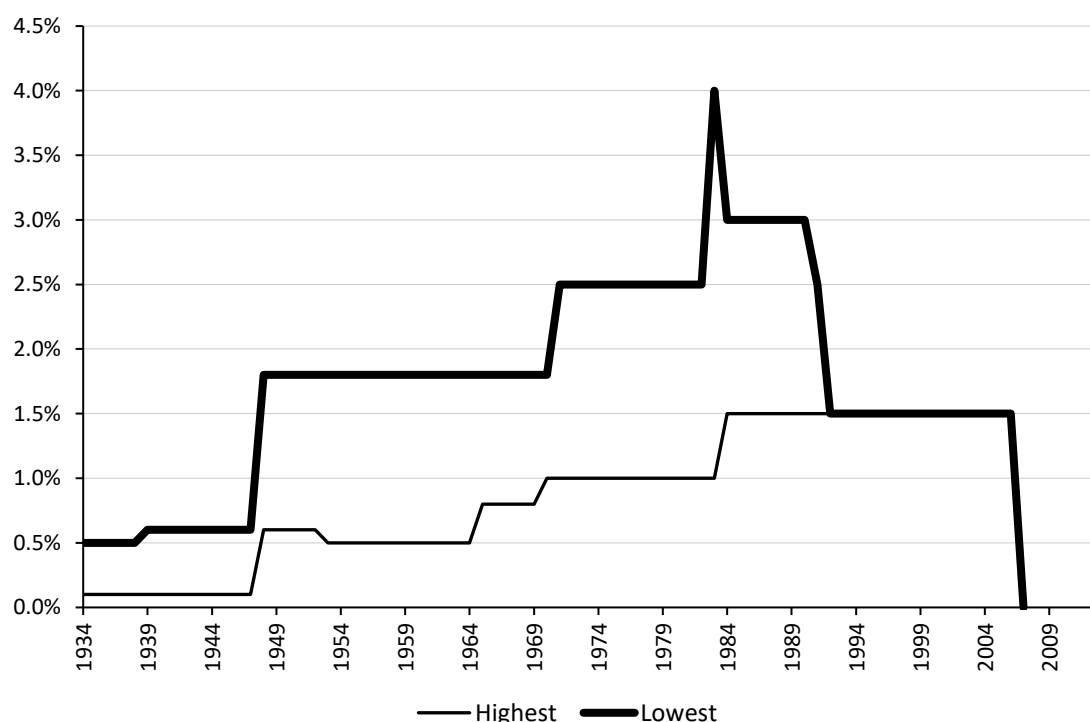
Source: Johansson et al. (2015) and updating.

The Swedish wealth taxes were paid from 1911 to 2006 and was only applied to individuals. Between 1911 and 1947, the wealth tax was integrated with the ordinary income tax system as a part of the tax payer’s wealth was added to taxable income (and then the taxpayer paid income tax on this new higher income level). The share of wealth that was added varied over time (it could be between 1 and 10 percent). There were also additional income and wealth taxes during and between the World Wars. From 1934 until 2006, a separate wealth tax that levied specific tax rates on assessed net wealth also existed. The tax rates associated with this tax increased stepwise until the early 1980s. From the mid-1980s until the wealth tax was completely

¹⁵ See Lodin (2011, chapter 7) for a further discussion about the design of the new corporate taxation.

abolished, the tax rates diminished. To reduce the effect of the wealth tax, occasionally, valuation reliefs and average tax caps have been used to limit the total tax on income and wealth.¹⁶

Figure 5. Marginal wealth tax, 1934–2006



Note: The figure refers to the specific wealth tax in place between 1934 and 2006.

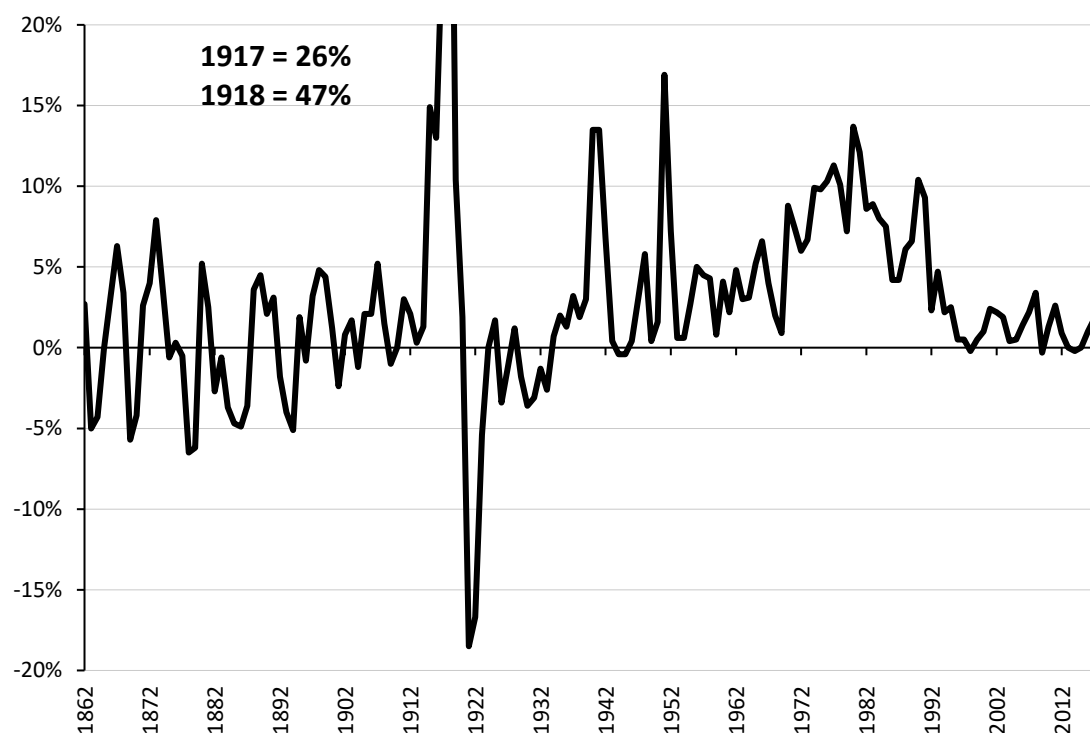
Source: Du Rietz and Henrekson (2015).

During the 19th century, inflation was on average zero percent. Inflation and deflation spikes followed during and after World War I, but also during World War II. Between the Wars, there were occasionally deflation or moderate inflation. After World War II, Sweden experienced high inflation during the Korea boom in the 1950s and during the 1970s and 1980s, when inflation occasionally exceeded 10 percent. In the 1990s, an explicit inflation target was implemented to an independent central bank. Inflation fell and has been about 1 percent on

¹⁶ There do not exist data that make it possible to calculate the marginal wealth tax rate as far back as to 1862. We will therefore use the same marginal wealth tax as in Johansson et al. (2015), who draw on Du Rietz and Henrekson (2015) and base the estimate on a wealth equal to 10 times the wage of an average production worker. Robustness checks using different wealth tax in the calculations do not affect our general conclusions. If the top income earner is assumed to pay a higher marginal wealth tax, which may be plausible, our conclusions would be strengthened as the distortions during the periods when wealth tax was in force would be amplified and the differences between tax regimes would be more pronounced.

average from the 1990s until 2018. The actual annual inflation rates will be used in our calculations.

Figure 6. The inflation rate, 1862–2018



Source: Statistics Sweden (2019).

4. The METR

The King-Fullerton model is a standard method for measuring the marginal effective tax rate on investment projects used in research as well as in practice, for example by the OECD. The METR is formally the difference between the pretax and post-tax real rate of return of a marginal investment project, divided by the pretax real rate of return. For example, if the pretax return of an investment project is 10 percent and the post-tax return 6 percent, the METR will be 40 percent $((10-6)/10)$.

It is, however, important to note that the METR is not simply an addition of corporate and owner-level taxation adjusting for inflation. It is an equilibrium model that is supposed to be solved where

(i) the present discounted value of the profits from the investment must equal the cost of the investment, and

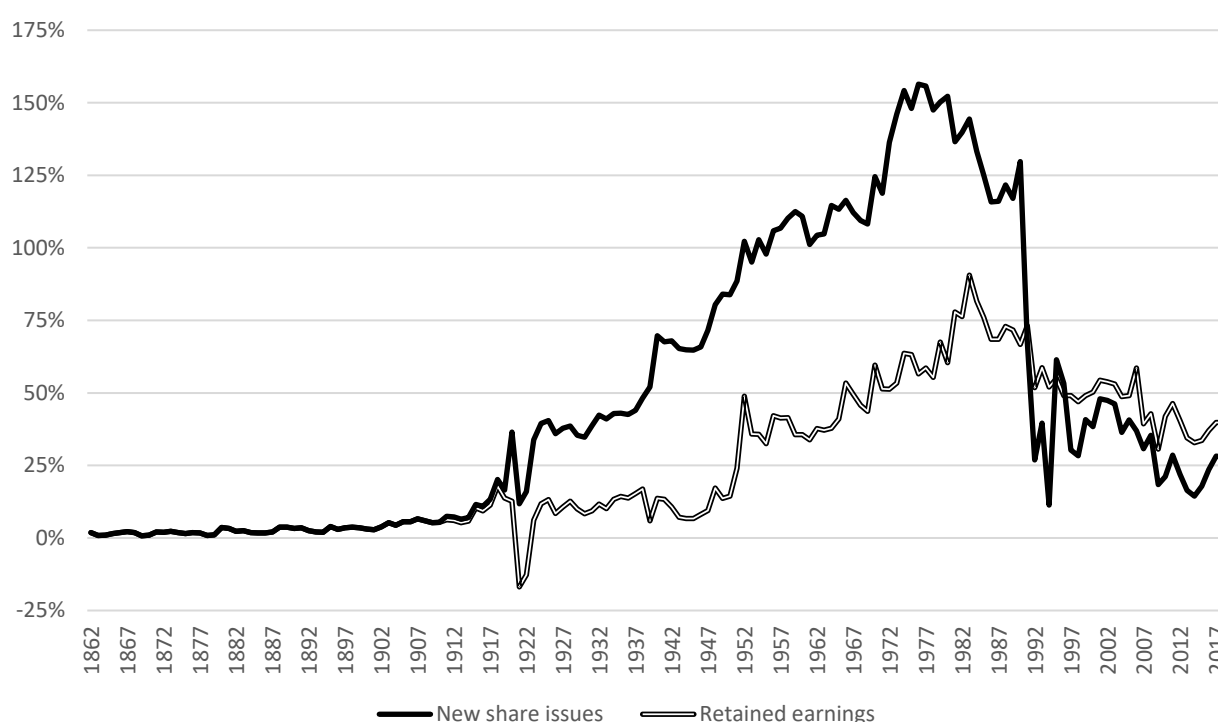
(ii) the potential investor must be indifferent between receiving the after-tax revenue from the investment project and receiving the after-tax market interest rate (which in the model corresponds to the best alternative return).

The model assumes that no (further) tax changes will occur and that all tax allowances for investments always can be used. The result will depend on the source of finance—new share issues, retained earnings or debt—as the equilibrium conditions will be altered due to this. For this paper, the specific rules for closely held firms must also be included in the model. The extended model and the formal equilibrium conditions that we will use to calculate the METR has been thoroughly presented and explained in Wykman (2019a)¹⁷. We will in this paper just show the results. As we focus on active owners, we will only present results for equity financed investments, i.e., investments where the source of finance is new share issues or retained earnings.¹⁸

¹⁷ To calculate the time series for the whole period it is necessary to incorporate some special rules into the model, that are not explained in Wykman (2019a). Those are “Immediate write-offs” between 1939 and 1951, “Investment Funds” between 1955 and 1991 and extra investment allowance 1976 to 1979. Immediate write offs are incorporated straightforward by allowing full write off the first year, and no write offs the following years. For the investment funds we will follow the approximations given by King and Fullerton (1984) and Agell et al. (1995). The extra investment allowance is introduced expanding the normal allowance with a quarter of the corporate tax. When introducing the immediate write-offs the calculations must be done approximately. A fourth special rule is the “Profit Equalization Fund”, this will however not affect the METR in our calculations, since the model rely on that all tax credits always can be used, why shifting the tax payments in time will be of no use.

¹⁸ The METR for debt financed investments can be found in appendix B.

Figure 7. Marginal effective tax rate (METR), APW, new share issues and retained earnings



Note: APW refers to an active owner of a closely held corporation paying the same marginal labor income tax as an average production worker.

Source: Johansson et al. (2015), Wykman (2019b) and own calculation.

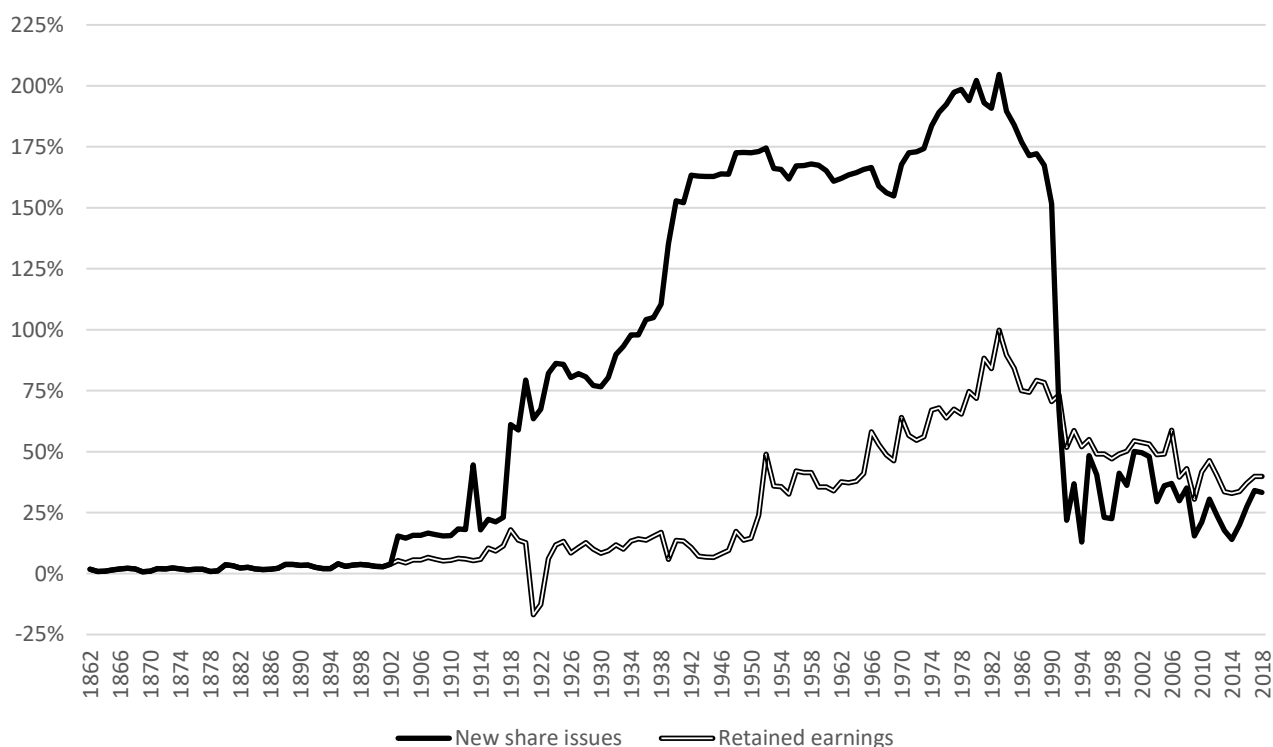
Figure 7 depicts the METR for an APW. New share issues has been more unfavorable than retained earnings from World War I until the tax reform in 1990–1991 and has been associated with the highest METR—occasionally well above 100 percent.¹⁹ Financing investments with internally generated funds (retained earnings) has been more favorable with a METR often 50 percentage points lower than new share issues and at a level below 20 percent until the 1950s. Despite the favorable treatment of retained earnings, the METR was relatively high during the 1970s and 1980s, often well above 50 and with a peak at about 85 percent in the mid-1980s.

With the tax reform in 1990–1991, the METR decreased substantially for both new share issues and retained earnings. The METR has after the reform seldom been above 50 percent and has on average been about 25–35 percent. The difference in METR between the sources of finance also decreased. The tax reform actually made new share issues the most

¹⁹ Efforts to mitigate the high tax effect from new share issues by introducing specific tax reliefs (such as the so-called Annell deduction) has been tried, but as seen from the figure, this form of financing has still been the most unfavorable option until the tax reform in 1990–1991.

favorable source of finance.²⁰ The tax rules for closely held firms implies that the dividend allowance and relief amount is permanently increased when new shares are issued to finance an investment making new share issues advantageous (in contrast to retained earnings).²¹

Figure 8. Marginal effective tax rate (METR), top income earner, new share issues and retained earnings



Note: Top income earner refers to an active owner of a closely held corporation paying the top marginal labor income tax.

Source: Johansson et al. (2015), Wykman (2019b) and own calculation.

In Figure 8, the METR is recalculated using the top marginal income tax. The general conclusions from the APW case are still valid. METR is basically the same irrespective of source of finance until the 1903 tax reform, when new share issues becomes the most unfavorable alternative until the tax reform in 1990–1991. The METR is higher and could at most be as high as 200 percent. Retained earnings are, as before, more favorable. After the tax reform in 1990–1991, the differences between sources of finance are heavily reduced and the preferential order is reversed.

²⁰ This is not the case for owners of widely held firms. New share issues is still the least favorable for owners of widely held firms after the reform (see Johansson et al. 2015).

²¹ As the dividend allowance and relief amount is permanently increased and as the capital from the investment depreciates over time, this will in the model result in a tax credit, see Wykman (2019a) for further details.

5. Structural breaks

Du Rietz et al. (2015) argue that the evolution of the Swedish tax system since 1862 could be divided into five tax regimes: the first stretching until World War I, the second going on during then interwar period, the third taking place from World War II until the end of the 1960s, the fourth occurring during the 1970s and 1980s, and finally the fifth starting with the tax reform in 1990–1991 and still going on. Their finding rested on graphical analysis of time series on taxation of household income. Interestingly, these regimes largely coincide with Lindbeck's (2012, pp. 342–359) categorization of Swedish economic policy from 1870 into four economic policy-regimes, where his first period coincides with Du Rietz et al.'s first two periods. Lindbeck's conclusion rested on a verbal discussion. In this paper, we make a formal analysis and examine the prevalence of structural breaks and tax regimes applying an econometric method to identify structural breaks.

5.1 The method

Using the King-Fullerton framework, we will be able to calculate four time series for the METR (based on two sources of income and two income levels). To determine whether there are different tax regimes between 1862 and 2018, the METR time series are tested for structural breaks. To do so, the METR is considered to be a function of time with the parameter β and the error term μ . Hence, for each year t we have:

$$METR_t = \beta t + \mu_t \quad (1)$$

Equation (1) converts the METR time series into a standard linear regression model, where β can be estimated. The main idea behind the analysis of structural breaks is whether there exists a segmentation of $t \in [1862, 2018]$ which significantly improves the fit of the model, comparing all the segments, with the whole period.

To test for one or a few breaks in time (at a known or unknown break time) there are well-known tests based on F statistics such as the Chow test (known break time) and sup-F test (unknown break time). Those tests are described in most standard econometric literature such as Stock and Watson (2015). Since the METR is a combined measure of many tax rates, tax rules and inflation, it is difficult to make an *ex ante* assumption of possible break times. Over the long period between 1862 and 2018, it is also possible for multiple breaks. Hence, it is

necessary to use methods that are more general. This method for multiple breaks at unknown points in time is described in Bai (1997a, b), Bai and Perron (1998) and Zeileis et al. (2003). In the following, a brief summary of the method is given. The calculations are made with the program R and the package *strucchange*.²²

Assuming that there are structural breaks, it is meaningful to re-write Equation (1) as:

$$METR_t = \beta_i t + \mu_t \quad (i = 1, \dots, m + 1) \quad (2)$$

Equation (2) allows for m breaks in the time interval [1862, 2018] so that the METR time series is divided into $m+1$ segments.

The underlying hypothesis is:

$$H_0: \quad \beta_0 = \beta_i \quad \forall i, i[x, y] \in [1862, 2018], x < y \quad (3)$$

If (3) holds, there is no partition (sequences of regressions) that will explain the METR significantly better over time than Equation (1). Hence, there is no point(s) in time t where there is a break. If the null hypothesis can be rejected there are however 1 to m structural breaks.

To test the null hypothesis, two difficulties have to be solved at the same time, choosing the optimal number of breaks and calculate when in time they occur. The number of breaks are chosen to minimize the sum of squared residuals. This can be done by a dynamic programming approach. A residual sum of square matrix is constructed, with all RSS values starting at all observations and ending at all future observations, and then choosing the number of starts, start points and endpoints so that the overall sum of squares is minimized. A full explanation of this process is beyond the scope of this paper but is given in Bai and Perron (2003). If the minimum sum of squares is from Equation (1), the null hypothesis in (3) cannot be rejected. With one break it can be proven that the break point that minimizes the sum of squares is the same as the one who maximizes the F statistic in a sup-F test.

All regressions are carried out as OLS-models and we analyze the differences in intercepts since we are interested in changes in the level of METR rather than changes in the

²² For a description of structural change in R, see <https://cran.r-project.org/>. The algorithm is described in Bai and Perron (2003).

development of the METR over time. The number of breaks will correspond to the partition associated with the overall lowest Bayesian information criterion (BIC).

5.2 Results

All series analyzed show four structural breaks at approximately the same point in time, i.e., during or after World War I, during or after World War II, during the mid of the 1960s/beginning of the 1970s and in the beginning/mid of the 1990s (see Table 1).²³

However, the breaks for new share issues occur earlier in time than those for retained earnings. This is explained by the late introduction of capital gains taxation on long-term holdings (which has the largest impact on the METR in the case of retained earnings) and because the effective capital taxation of long-term holdings increased with the 1990–1991 tax reform, while the taxation of dividends decreased. For new share issues, the two first breaks occur earlier for the top income earner than for the APW because the increased marginal tax rate for the top income earner preceded that of the APW.

To further the analysis of the structural breaks and the tax regimes, we create a new series that is an equally weighted average of the top income earner's and the APW's METR for the two sources of finance (denoted Merge in Table 1). This merged time series has structural breaks in 1916, 1939, 1965 and 1990. Figure 9 depicts the evolution of the merged METR and the structural breaks associated with this time series.²⁴

Table 1. Years for structural breaks

Source of finance	Level of income	
	Top	APW
New share issues	1916, 1939, 1967, 1990	1921, 1944, 1967, 1990
Retained earnings	1923, 1949, 1972, 1995	1923, 1949, 1972, 1995
Merge	1916, 1939, 1965, 1990	

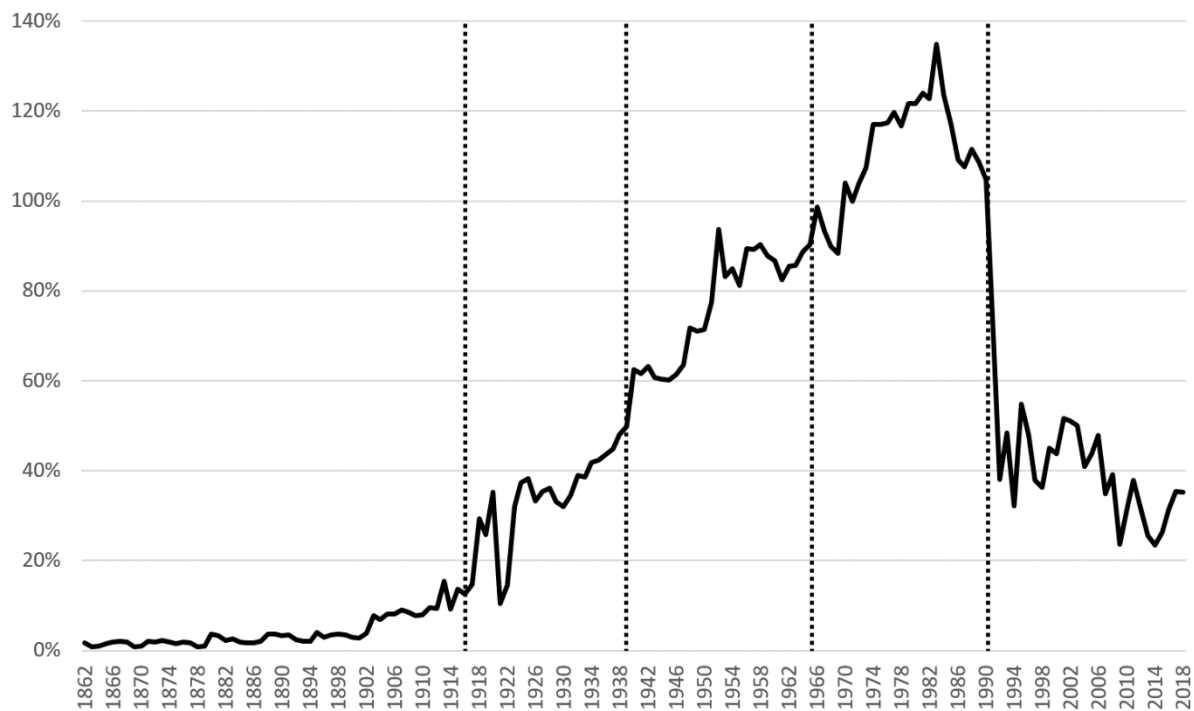
Note: 'Merge' is an equally weighted average of the METR for new share issues and retained earnings for the top income earner and the APW. Top refers to an active owner of a closely held corporation paying the top marginal labor income tax. APW refers to an active owner of a closely held corporation paying the same marginal labor income tax as an average production worker.

Source: Own calculation.

²³ All breaks are calculated with a confidence interval and conclusions based on small variations between the breaks for different sources of finance or income should be made cautiously.

²⁴ Appendix A shows separate figures for each of the other four time series (new share issues and retained earnings for the top income earner and the APW, respectively).

Figure 9. Structural breaks and tax regimes for the merged METR



Note: The merged METR is an equally weighted average of the top income earner's and the average production worker's METR for new share issues and retained earnings.

Source: Own calculation.

5.3 Tax regimes

There are five different tax regimes according to the structural breaks from the merged time series: the first regime stretches from the beginning of our analysis until World War I, the second takes place between the Wars, the third stretches until the mid-1960s, the fourth occurs from the mid-1960s to the tax reform in 1990–1991, when the last one begins. The time series for new share issues or retained earnings show essentially the same thing.

The tax regimes can be characterized according to the following four measures:

- i) The magnitude of the METR,
- ii) The variance of the METR,
- iii) The difference in the magnitude and variance of the METR between the top income earner and the APW,
- iv) The difference in magnitude and variance of the METR depending on source of finance.

Table 2 shows these tax regimes' characteristics if the structural breaks from the merged time series are used.²⁵ We report standard deviation instead of variance to ease interpretation.

Table 2 reports the magnitude and standard deviation for the METR and compares the APW with the top income earner. The table replicates the result discussed in section 4. The METR is low during Regime I, increases over time and could be well above 100 percent during Regime IV. It finally decreased during Regime V. The difference between the average and top income earner is in principle negligible during Regime I and Regime V, and highest during Regime III. The standard deviation has fluctuated over time but was lowest for both the top income earner and the APW during Regime I. The standard deviation has been higher for the top income in all tax regimes with the exception of Regime III. The standard deviation in the last regime is still relatively high in comparison with Regime I.

Table 2. Average marginal effective tax rates (%) and standard deviation (percentage points), tax regimes, top income earner and APW

	Regime I (1862–1915)	Regime II (1916–1938)	Regime III (1939–1964)	Regime IV (1965–1989)	Regime V (1990–2018)
METR					
Top	4.76	44.04	94.46	124.14	42.00
APW	3.26	21.43	56.58	97.15	42.18
Difference	1.50	22.61	37.88	26.99	-0.18
SD					
Top	4.81	12.62	9.23	13.12	16.48
APW	1.99	8.59	16.17	11.46	14.99

Note: METR refers to the marginal effective tax rate and SD to standard deviation. Top income earner refers to an active owner of a closely held corporation paying the top marginal labor income tax. APW refers to an active owner of a closely held corporation paying the same marginal labor income tax as an average production worker.
Source: Own calculation.

Table 3 shows the top income earner's average METR for new share issues and retained earnings during the five tax regimes. In line with the results in section 4, new share issues is the most unfavorable source of finance during Regimes I–IV and the average METR exceeds 100 percent during Regime III and Regime IV. The differences between new share issues and retained earnings were low during Regime I, but were pronounced already during Regime II. These differences are substantially reduced during the last regime. The standard deviation

²⁵ The main result will be the same if we base the analysis on the time series for new share issues or retained earnings.

fluctuates substantially over time. The standard deviation has been higher for new share issues in all tax regime with the exception of Regime III.

Table 3. Average marginal effective tax rates (%) and standard deviation (percentage points), tax regimes, top income earner

	Regime I (1862–1915)	Regime II (1916–1938)	Regime III (1939–1964)	Regime IV (1965–1989)	Regime V (1990–2018)
METR					
NSI	6.32	78.44	164.05	179.90	36.37
RE	3.20	9.63	24.87	68.38	47.64
Difference	3.11	68.81	139.17	111.52	-11.27
SD					
NSI	8.07	21.91	7.83	14.44	25.07
RE	1.89	8.03	14.03	14.39	10.10

Note: METR refers to the marginal effective tax rate, NSI to new share issues, RE to retained earnings and SD to standard deviation. Top income earner refers to an active owner of a closely held corporation paying the top marginal labor income tax.

Source: Own calculation.

Table 4 is the corresponding table for the APW. In all essential aspects, it mimics the results for the top income earner in Table 3. The differences between the sources of finance are not as large as for the top income earner, but are still substantial between Regime II and Regime IV. The standard deviation is highest for new share issues in all tax regimes.

Table 4. Average marginal effective tax rates (%) and standard deviation (percentage points), tax regimes, APW

	Regime I (1862–1915)	Regime II (1916–1938)	Regime III (1939–1964)	Regime IV (1965–1989)	Regime V (1990–2018)
METR					
NSI	3.31	33.23	88.29	131.97	36.81
RE	3.20	9.63	24.87	62.32	47.54
Difference	0.11	23.60	63.42	69.65	-10.73
SD					
NSI	2.11	11.53	18.79	16.18	22.13
RE	1.89	8.03	14.03	12.41	9.76

Note: METR refers to the marginal effective tax rate, NSI to new share issues, RE to retained earnings and SD to standard deviation. APW refers to an active owner of a closely held corporation paying the same marginal labor income tax as an average production worker.

Source: Own calculation.

5.4 Discussion

The analysis shows that the taxation of active owners of closely held corporations has fluctuated substantially between tax regimes over time. The METR for this category of owners may be used as an indication of the taxation of entrepreneurial activities as many entrepreneurs are active owners in closely held firms.²⁶

The four measures used above to characterize the tax regimes may all impact the economic activities associated with entrepreneurship. The magnitude of the METR affects the payoff of investments and will, hence, influence entrepreneurs' incentives to invest. The potentially very high METR during tax Regime III and IV—with levels occasionally above 100 percent—will dampen the economic aspiration and motivation of potential entrepreneurs.

The variance of the METR may be one indicator of political risk and will make it more difficult to do economic foresights. The standard deviation has fluctuated substantially over time. In general, retained earnings as well as the METR for an APW have a lower standard deviation. The standard deviation in the last tax regime is still high compared to the first.

The differences between the top income earner and the APW may show the difference in the tax situation between an entrepreneur generating high incomes and an entrepreneur only earning an average income. Hence it might give an indication of the incentives for a regular business owner to expand, take risks and strive for a higher income. The differences are here more pronounced during tax Regime II and IV.

Finally, the differences between new share issues and retained earnings may be an indication of distortions according to source of finance. Retained earnings has been preferable to new share issues in all tax regimes except for the last. The differences have been relatively high during tax Regimes II and IV. The favorable treatment of retained earnings over new share issues favors incumbent, well-established and mature firms, which historically has generated profits in contrast to new entrants which lacks retained earnings to use. New and small firms with growth ambitions were disfavored.²⁷

Taken together, the taxation of active owners made entrepreneurial initiatives more unfavorable between mainly tax Regime II and IV, and in particular during tax Regime III and IV. The 1990–1991 tax reform, in the beginning of tax Regime V, made the tax system more

²⁶ The idea that active owners are a subset of—or perhaps the very definition of—entrepreneurs finds support in Knight (1921) and subsequent writings. According to this literature, it is the owner who ultimately decides whether resources should be used in innovative ways, i.e., ownership and entrepreneurship are intertwined.

²⁷ New share issues has been shown to be of particular importance for new firms which introduce radically new innovations that transform industries and boost economic growth (Gompers and Lerner 2001).

market conforming by sharply reducing the level and differences in METR depending on owner's income and source of finance. However, the tax rules for closely held corporations, described in section 2, introduced new distortions because of their complexity and often yearly changes.

There were other occurrences—not necessarily connected to tax policies of closely held firms—during our examined period that strengthens our conclusions regarding how the system may have dampened or encouraged entrepreneurship over time.

The generally favorable treatment of debt financing over equity financing (as interest payments are deductible) has supported large and capital intense firms with readily available collateral as they can more easily and at a lower cost get credits from banks and the bond market than new, small and less capital intense firms. During the post-war period until the mid-1980s and early 1990s, Sweden's credit market was also highly regulated, which favored large firms with good contacts with banks and politicians.²⁸ Several of the largest firms were also part of ownership spheres including banks, which gave them an advantage in getting credit on a regulated credit market. The Wallenberg sphere is the most well-known example. At the industry level, this kind of tax system also furthered the manufacturing industry and other capital intense industries.²⁹

The increased taxation of wealth and inheritance after World War II (in combination with increased income taxes) made it difficult to retain large family firms and to transfer ownership to the next generation. However, families could keep control over their firms by transferring ownership to a tax-exempt foundation with charitable purposes, which was controlled by the family (Johansson et al. 2018). The growth of new established firms was hindered, while large (i.e., generally older firms) firms with tax-exempt owners had a competitive advantage, which resulted in a preserved industrial structure (Henrekson and Johansson 1999; Henrekson 2005).

Altogether, the institutional framework during tax Regime III and IV favored incumbent firms (with retained earnings), large firms (with good relations with banks), as well as capital intense firms (with assets that could be used as collateral) who have institutional owners (tax-exempt institutions). These distortions were reduced during tax Regime V.

²⁸ See Jonung (1993) for a further discussion about credit regulation and credit rationing in Sweden during the post-war period.

²⁹ Cf. discussion in Henrekson and Johansson (1999), Henrekson and Jakobsson (2001, 2005) and Henrekson (2005, 2017).

6. Conclusions

In this study we examine the evolution of the capital income taxation in Sweden between 1862 and 2018. We calculate the marginal effective capital tax rate (METR) on a marginal investment for both an active owner of a closely held corporation (*fåmansbolag*) paying the top marginal tax rate and an active owner paying the same marginal tax rate as an average production worker (APW). The calculations are made for an investment financed with new share issues and retained earnings, and includes the effects from corporate income taxation, capital income taxation and wealth taxation, and the interactions of these taxes with inflation. Moreover, we identify tax regimes econometrically and discuss the tax system during these tax regimes in terms of the magnitude and variance of the average METR, and the difference in METR due to both owner's income and source of finance.

We identify four structural breaks—during or after World War I, during or after World War II, during the mid of the 1960s/beginning of the 1970s and in the beginning/mid of the 1990s—and, consequently, five tax regimes. These regimes are found for both the top income earner and the APW. The first regime is characterized by low and stable METR with small differences between new share issues and retained earnings, and owner's income. During the second regime, the METR for new share issues increases profoundly and the METR starts to differ substantially between the two sources of finance and owner's income. The level of and differences in the METR continues to increase during the third and fourth tax regime. In the last tax regime, following the tax reform in 1990–1991, the evolution is reversed. The preferential order between the sources of finance is also changed and new share issues is no longer the least preferable one for owners of closely held corporations.

Altogether the analysis shows that the METR has fluctuated heavily and differed substantially between source of finance and income level over time, affecting firms and investors. As many entrepreneurs are active owners in closely held firm, the analysis in this paper also indicates the tax incentive for owner-entrepreneurs to invest. The increasing METR over time weakened the incentives during Tax regime II, but in particular during Tax regime III and IV. During these regimes, the tax system has together with credit controls, mainly favored large, incumbent and capital intense firms as they could finance investments by retained earnings and/or debt using their assets as collateral to borrow money.

The last regime, following the tax reform in 1990–1991, had profound effects on the tax system. With this reform, a dual tax system was introduced and special rules for closely held corporations were applied to avoid income shifting. The METR decreased and the differences between the sources of finance and owner's income declined. The incentives for entrepreneurship was strengthened.

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Appendix A. Structural breaks.

Figure A1. Structural break, new share issues, APW

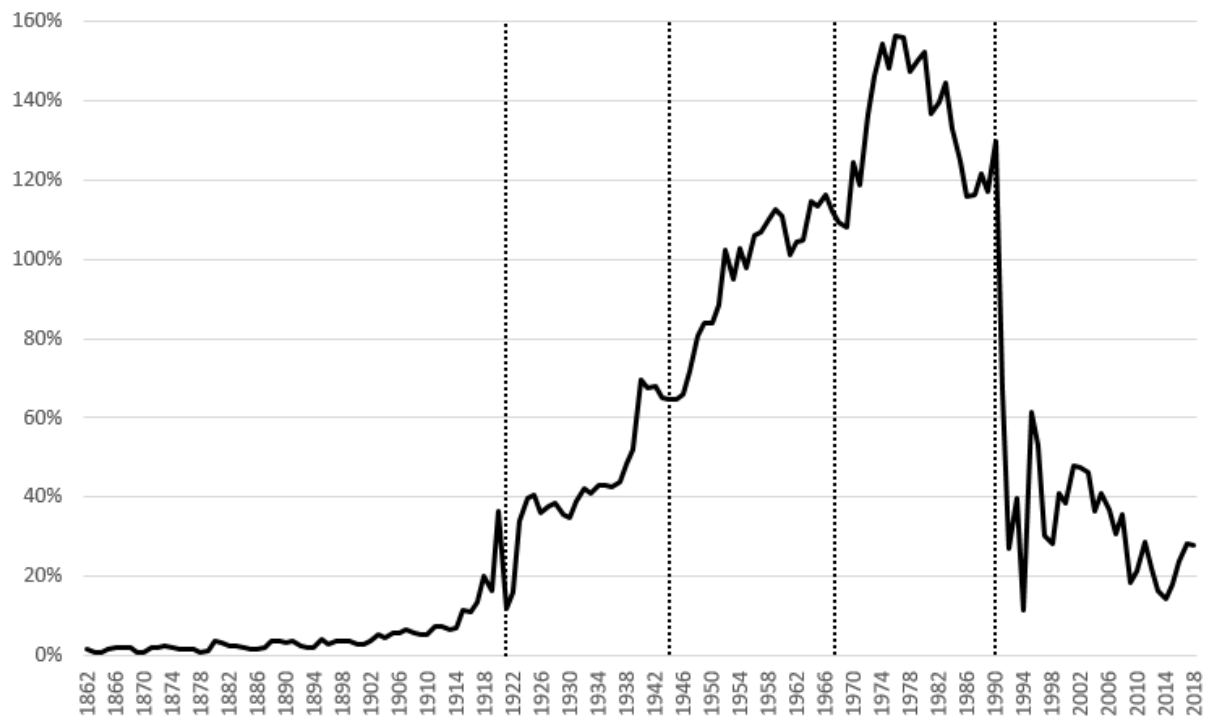


Figure A2. Structural break, new share issues, top income earner

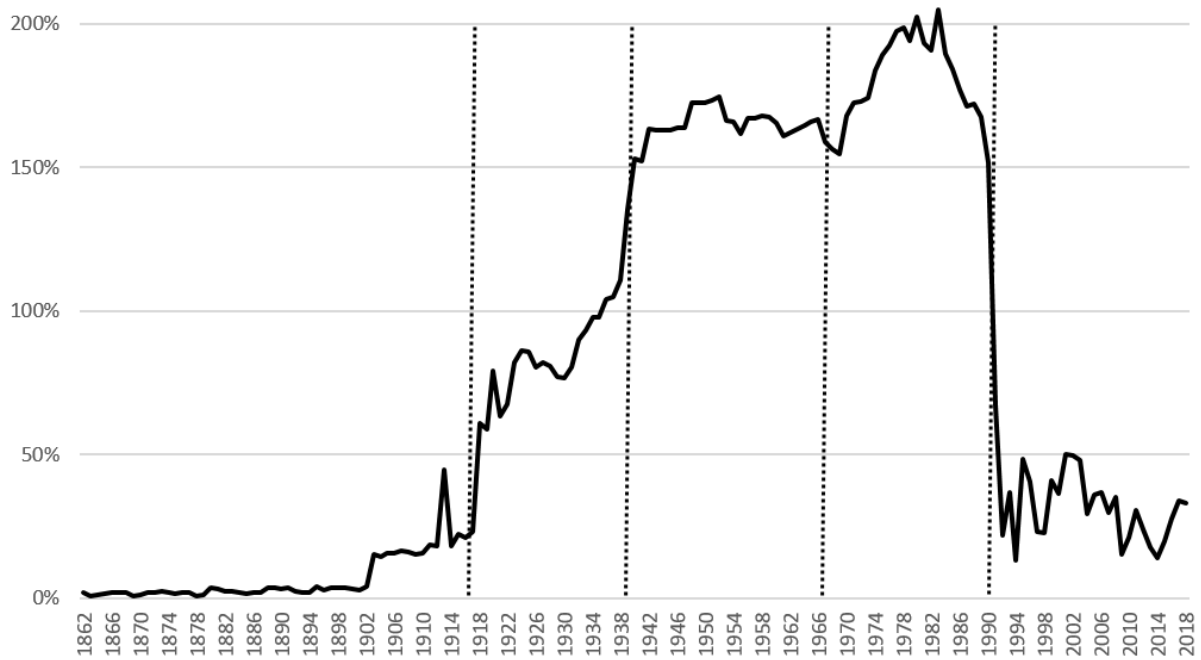


Figure A3. Structural break, retained earnings, APW

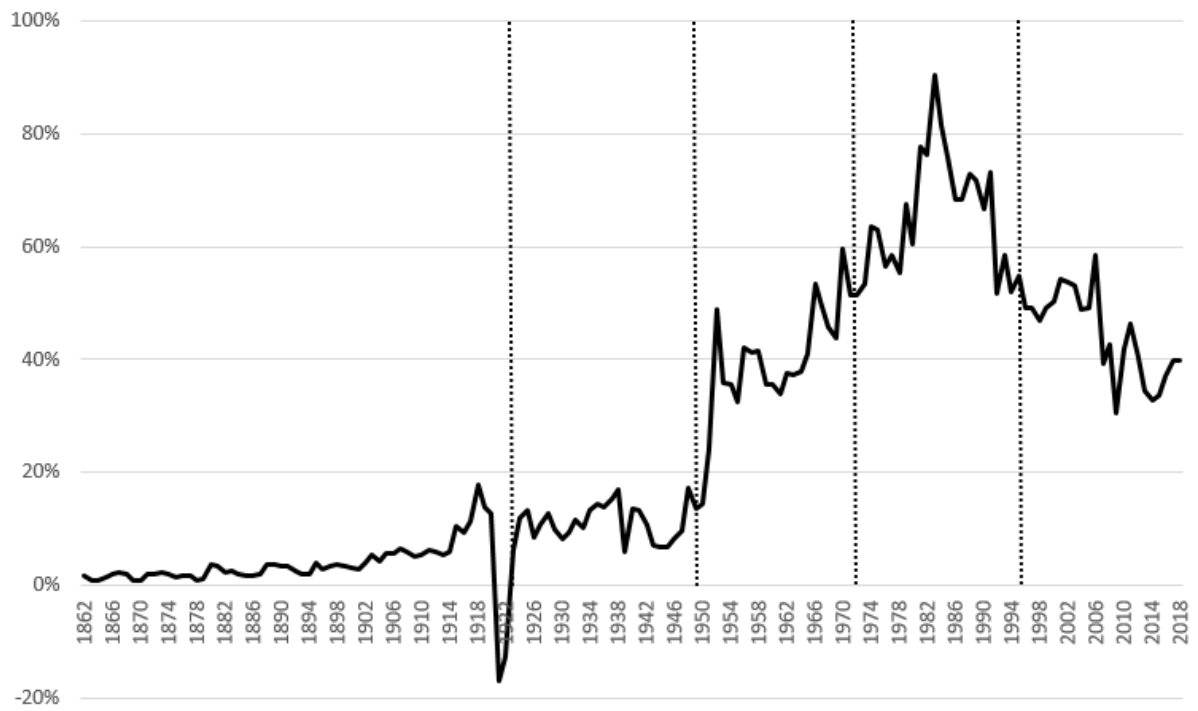
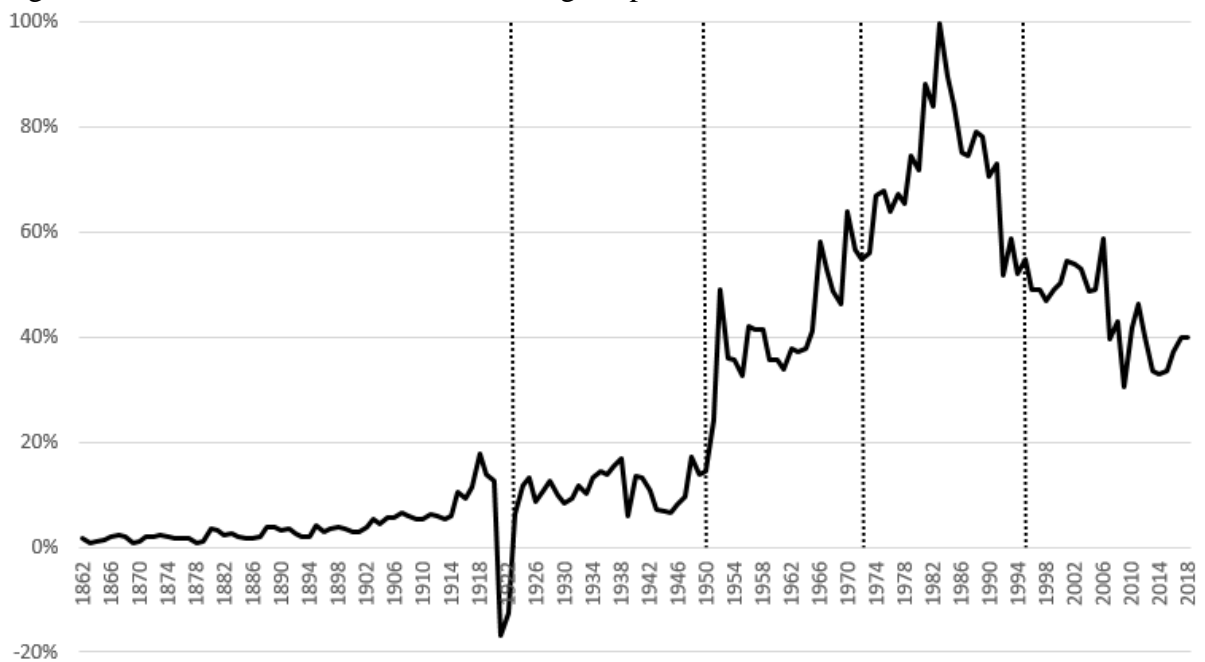


Figure A4. Structural break, retained earnings, top income earner



Appendix B. The debt case.

For debt financing by an APW, only two breaks are identified—compared to four for a top income earner. This difference is explained by the gradually raise in interest tax for the APW, while the tax rate for top income earners was sharply increased during a shorter period.

Table B1. Years for structural breaks, including debt

Source of finance	Level of income	
	Top	APW
New share issues	1916, 1939, 1967, 1990	1921, 1944, 1967, 1990
Retained earnings	1923, 1949, 1972, 1995	1923, 1949, 1972, 1995
Debt	1916, 1939, 1967, 1990	1963, 1990
Merge, excluding debt	1916, 1939, 1965, 1990	
Merge, including debt	1917, 1944, 1967, 1990	

Note: 'Merge, excluding debt' is an equally weighted average of the METR for new share issues and retained earnings for the top income earner and the APW. 'Merge, including debt' is an equally weighted average of the METR for debt, new share issues and retained earnings for the top income earner and the APW. Top refers to an active owner of a closely held corporation paying the top marginal labor income tax. APW refers to an active owner of a closely held corporation paying the same marginal labor income tax as an average production worker.

Source: Own calculation.

The merged series, including debt, differs slightly from the merged series in the main text, which only included new share issues and retained earnings. The first three structural breaks occur somewhat later in time, whereas the last break coincide with the main case. The structural breaks and the corresponding tax regimes for the merged series, including debt, is depicted in Figure B1. The marginal effective tax rate (METR) using debt as source of finance and the corresponding structural breaks are shown for the APW (Figure B2) and for the top income earner (Figure B3).

Figure B1. Structural breaks and tax regimes for the merged METR, including debt

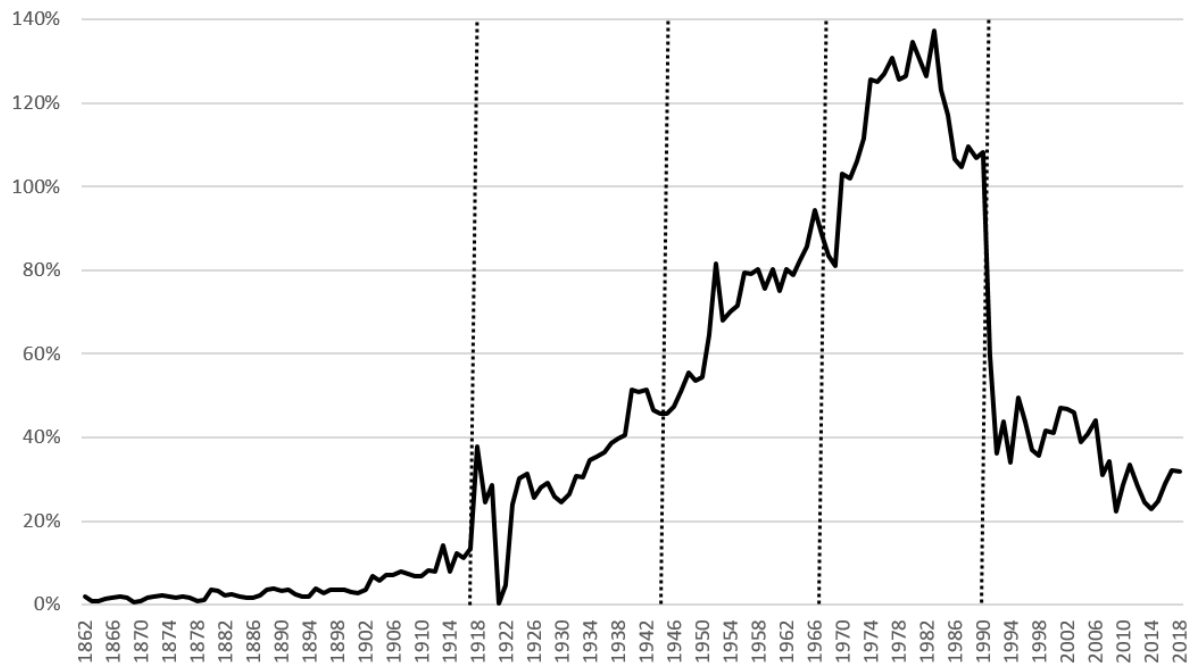


Figure B2. Marginal effective tax rate (METR), and structural breaks, APW and debt

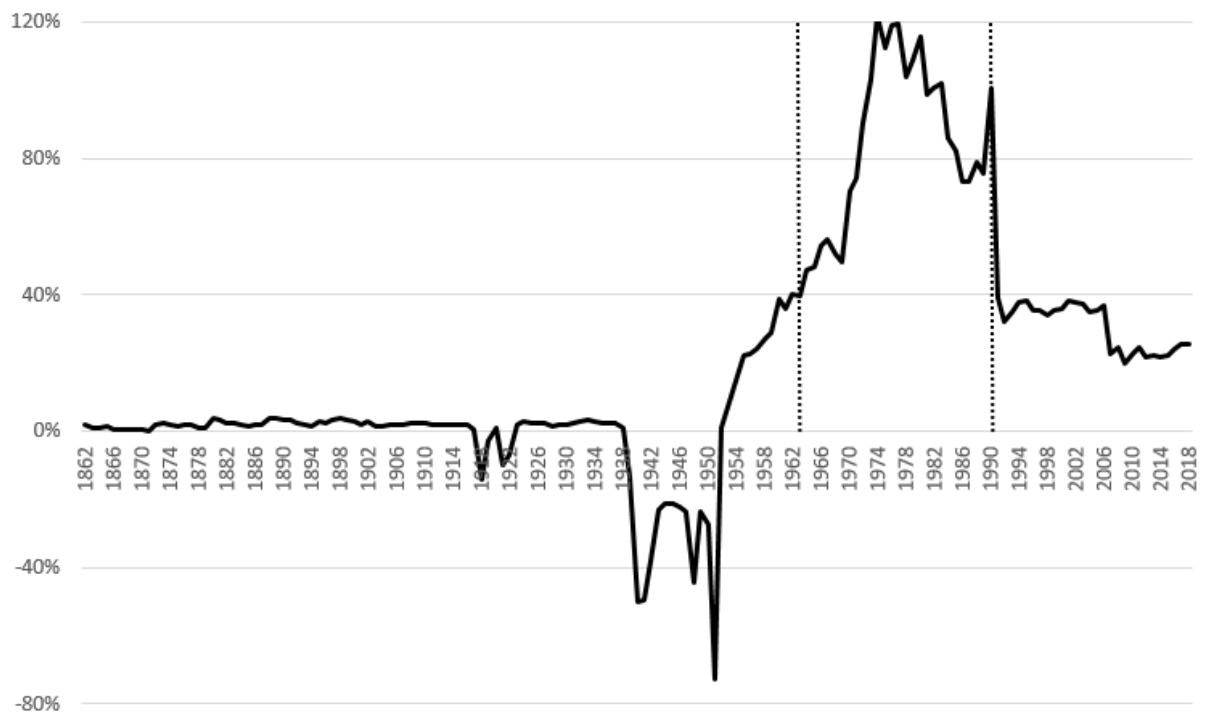


Figure B3. Marginal effective tax rate (METR), and structural breaks, top income earner and debt

