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The Economic and Fiscal Consequences of a Capital Income Tax Reduction in Sweden

Study on behalf of Svenskt Näringsliv

Authors: *Clemens Fuest, Florian Neumeier, Michael Stimmelmayr, Daniel Stöhlker*

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Contents

Highlights

- We use a computable general equilibrium model to simulate the long-run economic and fiscal consequences of a capital income tax reduction in Sweden
- According to our estimates, a reduction of the capital income tax rate by 10 percentage points would lead to an increase in GDP growth by 0.2 percentage points, which translates into a 3.1% increase in GDP in the long-run
- This effect is primarily driven by a long-run increase in private investment of roughly 6.5%
- A reduction in the capital income tax rate increases the after-tax return to investment and lowers the cost of capital for firms, thus increasing incentives to invest
- The resulting increase in production capacities results in a modest increase in employment of 0.7%, which roughly corresponds to 35.000 additional jobs
- Due to the boost in economic activity, the tax reform would be almost self-financing

Executive Summary

In this study, we analyze the long-run consequences of a capital income tax reduction on economic activity in Sweden. Using a dynamic simulation model that takes the behavioral responses of economic agents and the interdependencies between the different sectors of the economy into account, we estimate the effect of a ten-percentage point cut in the capital income tax rate on important macroeconomic aggregates, including GDP, investment and employment, as well as tax revenues. Our results suggest that a reduction of the capital income tax rate would boost economic activity in Sweden. According to our estimates, the capital income tax cut would lead to an increase in GDP by about 3.1% in the long-run. The main driver behind this rise in GDP is an increase in private investment by roughly 6.5%. In addition, we observe a modest rise in employment by about 0.7%. Our results further indicate that widely-held companies and closely-held companies benefit from the capital income tax reduction to a similar extent as they exhibit a rise in output, investment and employment of similar magnitude. In contrast, output and employment decrease for non-corporate firms as they do not benefit from the capital income tax reduction. Also, the level of foreign direct investment in the Swedish economy declines in response to the tax cut, indicating a crowding-out of foreign investment.

With regard to the fiscal consequences, our estimates suggest that the fiscal costs associated with a capital income tax reduction tend to be low. Due to the boost in economic activity, the decrease in revenues from the capital income tax is partly offset by an increase in revenues from other taxes, especially the labor income tax and the value added tax. Overall, the drop in total tax revenues amounts to roughly 0.2%. It should be noted, though, that our estimates refer to the long-run economic development. The short-run fiscal costs of the simulated tax reform may be substantially higher as it takes time until the positive effects of the capital income tax reduction are fully realized.

1 Introduction

In 1991, the Swedish tax system underwent what has been called the 'Tax Reform of the Century' (Agell et al., 1996), one of its key pillars being the introduction of a system of dual taxation of labor and capital income. While a progressive tax scheme is applied to income from labor, capital income is taxed at a constant rate of 30%. Sweden was among the first countries in Europe to introduce a dual income tax and the reform has been widely considered a great success. Since then, however, the global economic environment has changed notably. The increase in global economic integration has intensified the international competition for mobile capital. As a result, many countries have significantly reduced the tax burden on capital and capital related income. Today, that is, 28 years after the extensive Swedish tax reform, Sweden effectively levies higher taxes on capital income than many other countries in Europe and the rest of the world (Svenskt Näringsliv, 2018).

The aim of this report is to investigate the long-run consequences of a reform of capital income taxation in Sweden. More precisely, we study the effects of a capital income tax reduction on important macroeconomic aggregates. The capital income tax rate affects the profitability of investment projects and, thus, the incentives of economic agents to save and invest. Consequently, the level of taxes levied on capital income is an important determinant of private investment in the economy and economic activity in general. We evaluate the effect of a capital income tax cut on GDP, investment, employment, and other important economic indicators. Moreover, we study the consequences of a reduction in the capital income tax on tax revenues, thus assessing the fiscal costs associated with the tax reform. In this context, we also focus on the effect a capital income tax cut has on the revenues from other taxes in order to evaluate the reform's 'net' fiscal costs.

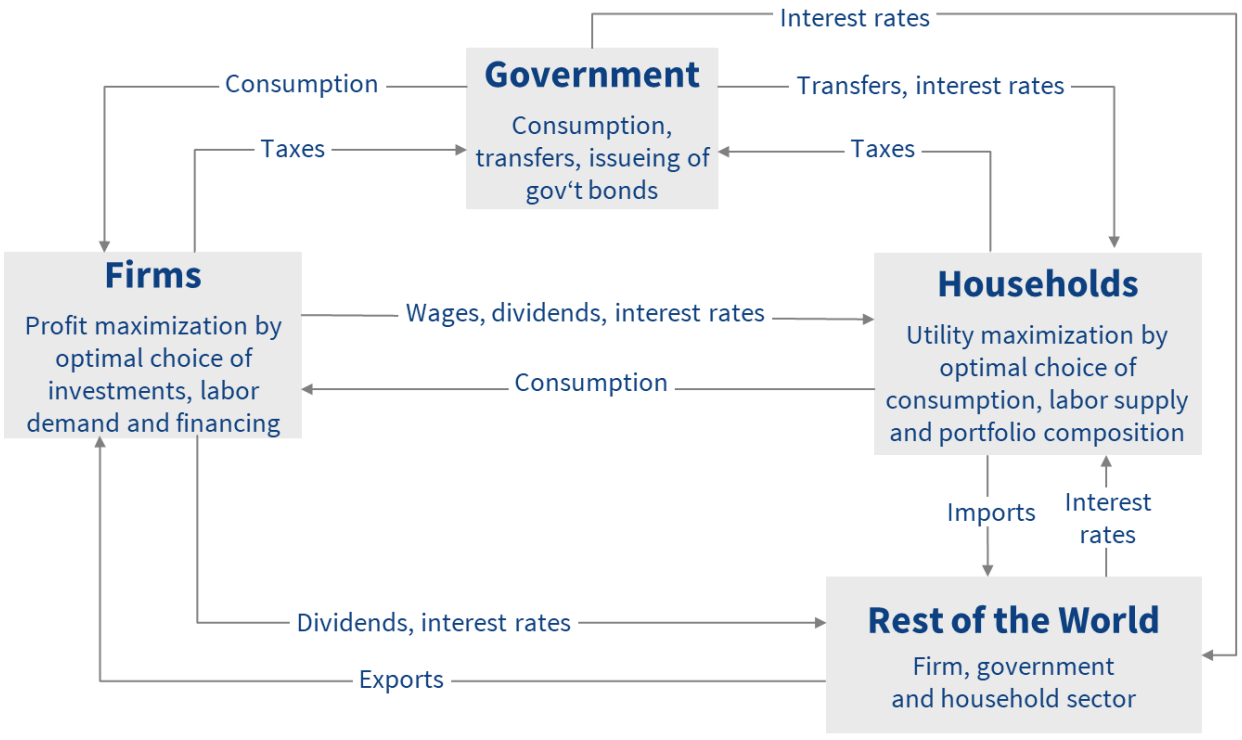
To obtain estimates for the economic and fiscal consequences of a capital income tax reduction in the long-run, we rely on a dynamic Computable General Equilibrium (CGE) model. CGE models have become a key instrument for ex-ante policy analysis. The CGE model that we employ is an extension of the dynamic CGE-model *ifoMod* introduced in Radulescu and Stimmelmayr (2010). Earlier versions of *ifoMod* have been used to study the consequences of the 2008 German corporate tax reform (Radulescu and Stimmelmayr, 2010), the introduction of a wealth tax in Germany (Fuest et al., 2017), and the introduction of an IP license box in Switzerland (Chatagny et al., 2017).

The remainder of this report is organized as follows. In the next Section, we provide a brief description of the CGE-model that we use to estimate the consequences of the capital income tax reform. Section 3 discusses the association between capital income taxation and investment from a theoretical point of view. In Section 4, we provide some information on the taxation of corporate and capital income in Sweden. Section 5 contains the results of our simulation analysis. Section 6 concludes.

2 The Computable General Equilibrium Model

Analyzing the consequences of a tax reform *ex-ante* is a challenging task. Besides more obvious first-order effects, economy-wide repercussions and second-order effects need to be considered, too. Computable General Equilibrium (CGE) models have proven to be a useful instrument to quantify the economic and fiscal consequences of tax reforms, as they allow accounting for the various behavioral responses of economic agents and the interdependencies between the different sectors of the economy. The CGE model that we employ is an extension of the model introduced in Radulescu and Stimmelmayr (2010). A detailed technical documentation of the model can be found there. The model builds on neoclassical growth theory and accounts for all important behavioral interactions between the household sector, the firm sector, the government, and the rest of the world. Figure 1 illustrates the most important building blocks of the model along with the flow of money in the stylized economy.

Figure 1:
Stylized depiction of the CGE-model



The *firm sector* features firms of different legal forms, that is, widely-held companies (listed and non-listed), closely-held companies, and non-corporate firms (i.e., sole proprietorships and partnerships), which differ with regard to their characteristics and legal tax treatment. There is one representative firm per legal form in our stylized economy, each one representing an aggregate of all firms of that particular type. All firms aim at maximizing (the net present value of) their value by choosing optimal levels of investment and labor input and the optimal mix between internal and external funds to finance investment.

The *household sector* comprises a representative agent who maximizes his lifetime utility by choosing the optimal level of labor supply as well as the optimal intertemporal consumption and savings path. With regard to its saving decision, the household faces a portfolio choice problem as it can invest its savings in several different assets, that is, different types of firm equity, firm bonds, as well as domestic and foreign government bonds. The household sectors' investment decision is characterized by a diversification motive, implying that the different assets are imperfect substitutes for each other. We apply a Ramsey-type model, meaning that, due to dynastic linkages, the household has an infinite planning horizon.

The *government* consumes, pays transfers to the household sector and imposes taxes on income (labor, capital and corporate) and sales (value added tax and other indirect taxes). Taxes on labor income include social security contributions. Dividends paid to non-residents are subject to a withholding tax (unless an exemption applies under European Directive or a tax treaty). Taxes affect the behavioral margins of the economic agents and are distortionary, that is, they result in a welfare loss. In the long-run, the government's budget is required to be balanced. Moreover, the government's budget has to meet the Maastricht criteria.

The *rest of the world* is modelled by a foreign economy that mirrors the domestic economy. That is, it comprises a firm sector, a household sector, and a government sector. However, the foreign economy is by far larger than the domestic one, implying that the domestic economy is a small open economy. The domestic and the foreign economy are engaged in trade with each other. Moreover, the model allows for cross-country ownership of assets. In addition, foreign investors can invest in domestic firms, resulting in foreign direct investment flows.

The CGE model is a dynamic, micro-founded macroeconomic growth model. The focus is on the development of potential GDP in case all input factors are fully utilized. Cyclical fluctuations in aggregate output are not considered. In the status quo, the economy grows at a constant rate. The introduction of a tax reform moves the economy from one growth path to another one. The CGE allows studying the adjustment process from the initial to the final steady state equilibrium. Any reform-induced changes in macroeconomic outcomes are measured as relative deviations between the new equilibrium and a counterfactual outcome that is computed based on the assumptions that the economy follows the pre-reform growth path. The model is calibrated to replicate the macroeconomic structure of the Swedish Economy for the year 2016. A list of calibrated parameters is shown in the Appendix.

3 The Effect of Capital Income Taxation on Private Investment: Theoretical Considerations

Taxing corporate income at the firm level and, at the same time, capital income (dividends, capital gains, and interest) at the level of the shareholder, results in a double taxation of the returns to investments. This, in turn, crucially affects the investment decisions of economic agents. The higher the tax burden investments have to bear, the fewer investment projects are profitable and, thus, the lower the level of investment in the economy. Understanding how capital income taxation affects the tax burden borne by an investment is thus of utmost importance for the analysis of the economic consequences of a capital tax reform. The overall size of the tax burden, however, depends on both the source and the use of the investment funds.

Following the *Traditional View* of dividend taxation by assuming that a firm's (marginal) investments are financed by new share issues, each SEK of the return to an investment in firm equity must bear, at first, the corporate tax and, then, the dividend tax upon distribution to the shareholders (Harberger, 1962, 1966; Feldstein, 1970; Poterba and Summers, 1983). Consequently, the effective overall tax burden per one SEK of income from the investment is equal to:

$$(1) \quad 1-(1-t_C)(1-t_D)$$

Where t_C is the corporate tax rate and t_D is the tax rate for dividend payments. A reduction of either the corporate tax rate or the dividend tax rate thus reduces the firm's tax burden and stimulates investment.

What if an (marginal) investment is financed through retained earnings rather than new share issues, as suggested by the *New View* of dividend taxation (King, 1977; Auerbach, 1979; Bradford, 1981)?[1] In that case, the investor would have to forego a dividend pay-out and reinvest the money. To use an example that is comparable to the one above, assume that a shareholder foregoes a net-of-tax dividend pay-out of one SEK. The resulting investment volume would be equal to $1/(1-t_D)$ SEK. Due to fact that the investment is financed through a retention of earnings, however, the value of the firm increases, so that return from the investment is subject to the corporate tax as well as the capital gains tax. The resulting net of tax return is then equal to $(1-t_C)(1-t_G)/(1-t_D)$, where t_G is the capital gains tax rate. Upon distribution of the profits, the dividend tax applies, yielding an effective tax burden that is equal to:

$$(2) \quad 1-(1-t_C)(1-t_G)$$

Equation (2) highlights that, in case an investment is financed through retained earnings, a firm's investment decision is independent of the dividend tax, but affected by the capital gains tax.

[1] Also see Sinn (1991a, 1991b) as well as Sørensen (1995) for a comparison between the old and the new view of dividend taxation.

However, if dividends and capital gains are taxed at the same rate, the tax burden represented by Equation (2) appears to be identical to the tax burden represented by Equation (1). Note, though, that capital gains are typically only taxed upon realization and not on an accrual basis. Due to that, a tax advantage emerges when investments are financed through retained earnings instead of new share issues, the size of which depends on the holding period.

The (relative) importance of both funding sources for investments, i.e., new share issues and retained earnings, is often believed to vary over the life-cycle of a firm. Young and still growing firms tend to have insufficient earnings to finance all profitable investment projects and have thus to rely on external funds (Sinn, 1991a, 1991b). In contrast, mature firms that generate steady cash-flows often have sufficient internal funds to finance their investments.

In addition to external capital and retained earnings, firms may also resort to debt as an instrument to finance investments. To the extent that debt interest is deductible from the corporate tax base, the return to a fully debt-financed investment is not burdened by the corporate tax. When the returns of a fully debt-financed investment project are distributed among the shareholders, the associated pay-outs are subject to the dividend tax, yielding an effective tax burden of:

$$(3) \quad 1 - (1 - t_D)$$

Note, however, that financing investment through debt may impose additional costs on firms. Most importantly, an increase in a firm's debt-to-asset ratio may lead to a more than proportional increase in its debt service costs due to the fact that it has to pay a higher risk premium because of an increase in the default risk.

In the context of this study, we assume that all three funding sources for investments are relevant for Swedish firms. Consequently, the effective tax burden of the corporate sector is equal to the weighted average of the effective tax burden associated with the three different funding sources, that is, the weighted sum of Equations (1), (2) and (3). The corresponding weight for new share issues (NSI) is measured by the value of new share issues sold at the Swedish stock exchange in relation to total private investment outlays; the weight for external (debt) finance (DF) is determined by the Swedish firms' average debt-to-asset ratio; and $1 - NSI - DF$ determines the share of investments financed through retained earnings (RE).

4 Effective Tax Burden for Swedish Companies

In line with the theoretical considerations outlined in Section 3, the effective tax burden borne by an investment carried out by a representative Swedish firm is equal to the weighted sum of Equations (1) to (3) above:

$$(4) \quad [1-(1-t_C)(1-t_D)] \times NSI + [1-(1-t_C)(1-t_G)] \times RE + [1-(1-t_D)] \times DF$$

Here, t_C is the corporate tax rate, t_D the tax rate for dividends, t_G the capital gains tax rate, and NSI, RE, and DF the share of investments financed through new share issues, retained earnings, and debt, respectively.

In Sweden, the profits of corporate firms are subject to the corporate tax with a uniform rate of 22%[2], while the profits of non-corporate firms (sole proprietorships and partnerships) are taxed at the personal labor income tax rate of the owners. The labor income tax schedule is progressive. Capital income (i.e., capital gains, dividends, and interest) is taxed at a rate of 30%. The capital income tax schedule is linear. However, depending on the legal form of the company, only a certain fraction of capital income is subject to the capital income tax. For listed widely-held companies, the share of capital income that is taxed is 100%. For non-listed widely held companies, only 5/6 of capital income is subject to the capital income tax, resulting in an effective tax rate of 25%. For closely-held companies, the share of capital income that is taxed is equal to 2/3, resulting in an effective capital income tax rate of 20%. In our simulation analysis, we thus differentiate between those four different types of firms, that is listed and non-listed widely-held companies, closely-held companies, and non-corporate firms. Dividends paid to non-resident shareholders are subject to a withholding tax of 30% (unless and exemption applies; cf. Section 2).

Since capital gains are only taxed upon realization (and not on an accrual basis), a tax advantage emerges during the holding period. Thus, the effective annual tax rate for capital gains tends to be lower than the statutory capital income tax rate. The longer the holding period, the lower the effective tax rate. We follow OECD (1991) and assume that the effective annual tax rate for capital gains is equal to 60% of the statutory tax rate for all types of firms. Note that for closely-held companies, only a fraction of the income that is paid to the (active) owners is taxed as capital income; the remainder is subject to the labor income tax. The cap for the fraction of income that can be labelled as capital income is flexible, though, depending inter alia on the value of the shares an owner holds, the wage sum the company pays to its employees as well as the income the owners were paid in the previous year.[3] However, data on the income of active owners of closely-held companies covering the years since 2007 shows that, on average, only 2.9% of the

[2] Note that the corporate income tax rate has only recently been reduced to 21.4%, becoming effective on January 1st of 2019.

[3] Both the definition of an 'active' owner as well as the details with regard to the determination of the capital income cap are laid out in the so-called 3:12 rules.

income was labelled as labor income, while the remaining 97.1% were taxed at the capital income tax rate. Due to that, the effective income tax rate owners of closely-held companies face is virtually identical to the capital income tax rate for closely-held companies.

In our simulation analysis, we simulate the economic and fiscal consequences of a reduction of the capital income tax rate from 30% down to 20%. We thereby assume that the current rules according to which only a certain fraction of the capital income generated by non-listed widely held companies and closely-held companies is taxed remain in effect. Thus, the reform implies that for non-listed widely-held companies, the effective capital income tax rate is reduced to 16.67% (i.e., 5/6 of 20%). For closely-held companies, the effective post-reform tax rate is equal to 13.33% (i.e., 2/3 of 20%). Again, the effective annual tax rate for capital gains is assumed to be 60% of the post-reform statutory capital income tax rate. Table 1 summarizes the values of the parameters that enter Equation (4) in the status quo as well as after the reform that we simulate.

Table 1: Pre-reform and post-reform effective annualized tax rates

Parameter	**Pre-reform effective rates**			**Post-reform effective rates**		
	L-WHC	**N-WHC**	**CHC**	**L-WHC**	**N-WHC**	**CHC**
Corporate Tax	22%	22%	22%	22%	22%	22%
Dividend Tax	30%	25%	20%	20%	16.67%	13.33%
Capital Gains Tax	18%	15%	12%	12%	10%	8%
Withholding Tax Foreign Investors		30%			20%	

Notes: The left panel shows the annualized effective tax rates in the status quo, the right panel the tax rates in the simulated reform scenario. L-WHC stands for listed widely-held companies, N-WHC for non-listed widely-held companies, and CHC for closely-held companies.

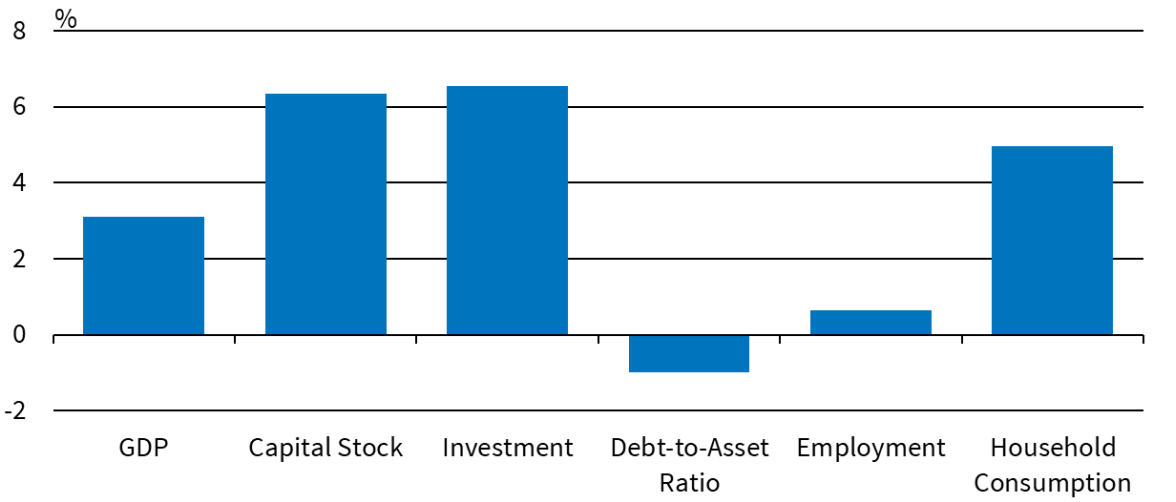
The differences between the pre-reform and post-reform effective tax rates indicate that the reform will increase the incentives to invest in the corporate sector. Note that for non-corporate firms, the effective tax burden does not change in response to the reform, as the income of owners of non-corporate firms is subject to the labor income tax. Since we assume that, in equilibrium, all production factors are fully utilized, the increase in investment may either result in an increase in production capacities, or a crowding-out of investment in other sectors, or both.

5 Results

5.1 Economic Effects of a Capital Income Tax Reduction

Figure 2 illustrates the estimated long-run consequences the simulated tax reform has on aggregate economic activity. Note that all figures are based on a comparison between the simulated long-run development of the economy with and without the capital tax reform. That is, the figures represent the estimated long-run deviations between the realizations of the corresponding variables when implementing the tax reform in relation to the counterfactual realization, where the counterfactual is computed based on the assumption that the economy develops in the future as it has in the past.

Figure 2:
Long-run Economic Consequences of a Capital Income Tax Reduction



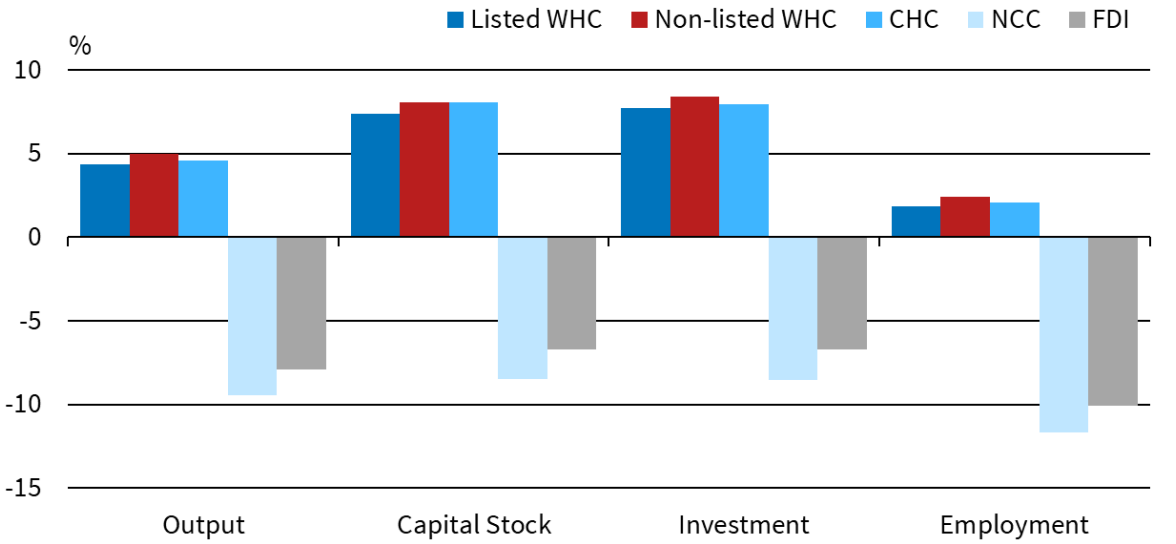
Notes: The figure shows the estimated long-run effects of a decrease in the capital income tax rate on selected macroeconomic aggregates.
Source: Own Computations.

The results suggest that, in the long-run, a reduction of the capital income tax rate by 10 percentage points leads to an increase in GDP by about 3.1%. Assuming that half of the adaptation process is completed within the first eight years after the reform, this implies that the GPD growth rate increases by 0.2 percentage points, which is quite remarkable. Thus, the economic effects of the of the capital income tax rate reduction are quite sizeable. The main driver behind this rise in GDP is the increase in private investment. Due to the increase in the after-tax return to investment, more investment projects become profitable, resulting in a hike in private investment by roughly 6.5%. Consequently, production capacities increase, as indicated by the rise in the capital stock. As a result, we also observe a rise in employment by roughly 0.7%. The positive effect the tax reform has on the household sector is further indicated by a 5% increase in private consumption. The main reason for the increase is the rise in net-of-tax capital income. However, an

increase in labor income resulting from the expansion of employment also contributes to the consumption hike.

To glean further insights into the consequences of the tax reform on the firm sector, we quantify separate effects for the different company types. The results are illustrated in Figure 3.

Figure 3:
Effects of the Capital Income Tax Reduction for Different Company Types (Unweighted Results)



Notes: The figure shows the estimated long-run effects of a decrease in the capital income tax rate on the performance of different company types. WHC stands for widely-held companies, CHC for closely-held companies, NCC for non-corporate companies (sole proprietorships and partnerships) and FDI for foreign direct investment.
Source: Own Computations. © ifo Institute

Our findings indicate that the whole corporate sector benefits from the reduction of the capital income tax. The positive effect the capital income tax cut has on listed and non-listed widely-held companies as well as closely-held companies are very similar in size. The positive investment effect ranges from 7.7% for non-listed widely-held companies to 8.4% for closely-held companies, and the output effect from 4.4% to 5%. In the non-corporate sector, however, the capital income tax cut leads to a decline in output, investment and employment. The reason is that the income of owners of non-corporate firms is taxed as labor income and not as capital income. Due to that, investment in the non-corporate sector becomes less attractive vis-à-vis investment in

the corporate sector. We also observe a drop in foreign direct investment, indicating that the increase in the domestic demand for capital in response to the tax cut crowds-out foreign investment.[4] As a result, a larger share of the domestic capital stock is owned by Swedish shareholders.

However, the different types of companies differ notably with regard to the contribution they make to aggregate output, investment, and employment. For instance, more than two thirds of the working population in Sweden is employed at widely-held companies, while the non-corporate sector absorbs only about 6% of the working population (see Table A2 of the Appendix). To account for the differences regarding the relative importance the different company types have for aggregate economic outcomes, we compute the implied long-run effects the changes illustrated in Figure 3 have on aggregate output, capital, investment, and employment for the different company types. The results are illustrated in Figure 4.

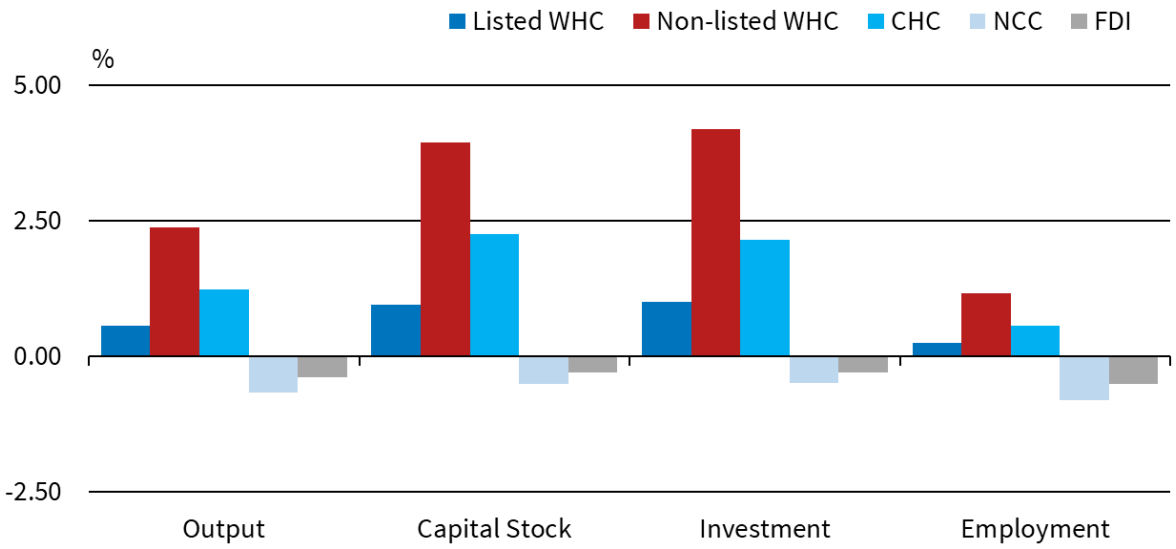
The results indicate that by far the largest part of the capital income tax cut induced increase in GDP, investment, and employment is due to the boost of the performance of non-listed widely-held companies, reflecting their significant importance for the Swedish economy. More than 75% of the increase in GDP (i.e., 2.4% out of 3.1%) and almost 65% of the hike in private investment (i.e., 4.2% out of 6.5%) can be attributed to the better performance of non-listed widely-held companies. In contrast, the drop in output, investment and employment that occurs in the non-corporate sector hardly affects aggregate economic outcomes, reflecting their minor relative importance.

To sum up, our findings suggest that a capital income tax cut would have a sizeable positive influence on aggregate economic activity in Sweden. A reduction of the capital income tax rate would trigger private investment and stimulate economic growth. Moreover, the increase in production capacities leads to a modest rise in employment. Note, however, that since the focus of our analysis is on the aggregate effects, we are not able to draw any conclusions about the distributional consequences of the tax reform.

[4] In light of the growing importance of multinational enterprises (MNEs), Sørensen (2007) argues that in a small open economy, personal capital income taxes are becoming less relevant for investment decisions and mainly affect the share of domestic equity held by foreigners. The reason is that a decrease in domestic savings in response to an increase in personal capital income taxes is fully offset by an inflow of capital from abroad, leaving the overall level of private investment unchanged. Note, though, that this conclusion is only valid (i) in case of perfect international capital mobility, (ii) if domestic assets and foreign assets are perfect substitutes and (iii) if all capital income is taxed according to the residence principle. These assumptions are hardly met in reality. Without doubt, the growing importance of MNEs has increased the international mobility of capital. However, MNEs are clearly not able (and, arguably, also not willing) to offset a shortage of capital in any sector or country around the world. Also, the existence of a diversification motive as well as institutional barriers to capital mobility and country-specific investment risks imply that investments that domestic and foreign assets are not perfect substitutes. Finally, not all capital income in Sweden is taxed according to the residence principle, as there is a withholding tax on dividends paid to non-residents. In contrast to the model proposed by Sørensen (2007), the CGE model takes these impediments to international capital mobility into account. However, our simulation results are in line with the theoretical predictions by Sørensen (2007). Specifically, the reduction of the capital income tax has a significant negative impact on foreign direct investment and foreign ownership of Swedish equity.

Figure 4:

Effects of the Capital Income Tax Reduction on Aggregate Economic Outcomes for Different Company Types (Weighted Results)



Notes: The figure shows weighted estimated long-run effects of a decrease in the capital income tax rate on the performance of different company types. Weights are equal to the ratio of the output (capital stock/investment/employment) of the respective company type to total output (capital stock/investment/employment). WHC stands for widely-held companies, CHC for closely-held companies, NCC for non-corporate companies (sole proprietorships and partnerships) and FDI for foreign direct investment.

Source: Own Computations.

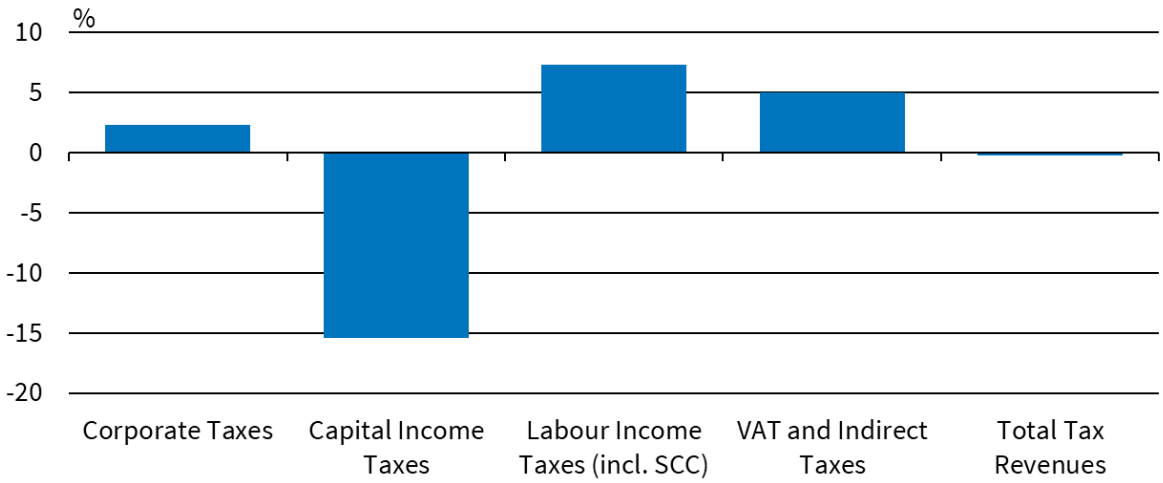
5.2 Fiscal Effects of a Capital Income Tax Reduction

The estimated effect the capital income tax cut has on tax revenues is illustrated in Figure 5. A glance at the estimates suggests that in the long-run, a capital income tax cut comes at rather low fiscal costs. The expected drop in revenues amounts to roughly 0.2%. Since we assume that the fiscal budget is balanced in the long-run, the decrease in revenues results in a decrease in public spending of the same size.[5] Thus, in the long-run, a reduction of the capital income tax appears to be almost self-financing. The most important reason is that the negative influence the reduction of the capital income tax rate has on tax revenues is partly offset by the increase in economic activity, resulting in increasing revenues from the corporate tax, the labor income tax, and sales taxes. Those revenue hikes reflect the increase in aggregate employment, income and consumption in response to the tax cut. It should be noted, though, that it takes some time until the increase in the revenues from the corporate tax, the labor income tax and the sales tax are fully realized, while the drop in the capital income tax occurs instantly. Thus, the short-run fiscal costs may be considerably higher.

[5] We assume that the necessary reduction in public spending is achieved by a reduction of transfers payed to the household sector.

Figure 5:

Long-Run Fiscal Consequences of a Capital Income Tax Reduction



Notes: The figure shows the estimated long-run effects of a decrease in the capital income tax rate on tax revenues. SCC stands for social security contributions.

Source: Own Computations.

6 Conclusion

Our results suggest that a reduction of the capital income tax rate in Sweden would significantly boost economic activity. GDP and investment would increase, as would employment and household consumption, indicating that, on average, both the firm sector as well as the household sector benefit from a capital income tax cut. Moreover, at least in the long-run, the fiscal costs associated with a reduction of the capital income tax rate are rather modest, as the decrease in revenues from the capital income tax are partly offset by an increase in revenues from other taxes.

A word of caution is necessary with regard to the interpretation of our findings. Despite its complexity, the simulation model that we use to estimate the long-run consequences of a tax reform remains a stylized depiction of reality. All results are sensitive to the behavioral assumptions on which the model is based. Moreover, the estimates presented in this study are the result of an ex-ante policy analysis that rests on the assumption that the general economic and institutional conditions remain unchanged during the adjustment process. Any future change in those conditions may affect the validity of our results. Also, the firm and household sector considered in our analysis represent an aggregate of all firms and households, respectively, in the economy. Thus, our analysis does not shed any light on the distributional consequences of the simulated tax reform.

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Appendix

The model is calibrated to replicate the macroeconomic structure of the Swedish Economy in 2016. Table A1 lists the realizations of the main macroeconomic aggregates, the corresponding three-year averages (2015-2017), and the values that were replicated by the CGE model. Values marked with an asterisk (*) are set exogenously in the model.

Table A1: Macroeconomic structure of the Swedish economy in 2016

in Mio. SEK	2016	3-Year Average (2015-2017)	CGE-Model
GDP	4 385 497	4 388 624.3	4 385 500*
Total Consumption	3 116 138	3 109 707.3	3 275 180
Househ. Consumption	1 962 610	1 964 243.3	1 962 600*
Gov. Consumption	1 153 528	1 145 464.0	1 312 590
Investment	1 075 236	1 089 901.0	1 075 760
Profits + Capital Income	1 406 843	1 419 074.0	1 213 350
Compensat. Employees	2 062 757	2 062 389.7	2 062 800
Depreciation	715 948	701 981.5~	726 895

Notes: Data are taken from OECD. ~ indicates that a 2-year average (2015-2016) was computed.

Table A2 shows statistics of the Swedish firm sector that were used to calibrate the CGE-model.

Table A2: Structure of the Swedish firm sector

	Listed WHC	Non-Listed WHC	CHC	NCC
Total Assets (Mio. SEK)	5 995 131	12 280 289	1 856 194	---
Equity (Mio. SEK)	2 741 921	5 163 524	962 969	---
Debt (Mio. SEK)	3 253 210	7 116 764	893 225	---
Debt-to-Asset Ratio (in %)	54.3%	58.0%	48.1%	48.0%
Employees (% of Total)	2.5%	66.5%	26.8%	4.3%
Wage Bill (% of Total)	3.3%	62.0%	28.8%	5.8%
Financial Structure				
New Share Issues (in %)	4.5%	19.4%	19.4%	52.00%
Retained Earnings (in %)	41.2%	22.6%	32.5%	0.0%
Debt Finance (in %)	54.3%	58.0%	48.1%	48.0%

Notes: Data on equity and debt are taken from OECD. The number of employees and the wage bill were computed based on data provided by Svenskt Näringsliv as well as Sørensen (2008). Data on firms' financial structure is taken from Riksbank (2016).

Values for behavioral elasticities (i.e., elasticity of intertemporal substitution, factor substitution elasticity, labor supply elasticity) are either set in accordance with existing empirical evidence or so to replicate the macroeconomic structure of the Swedish economy for the year 2016. Parameter values are available on request from the authors.