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The Impact of Reducing Capital Taxation on Savings and Entrepreneurship

A synthetic control study on Sweden

Ellen Olsson (41901) and Bharat Bommana (41868)

Capital taxes have gained prominence in public discourse for their perceived redistributive capabilities. Understanding their effect on individual economic decision making is key to designing effective tax policy. Sweden provides a good case study of the implications of capital taxes, as it repealed most of its capital taxes between 2005 to 2007. We study the effect of the abolition of four net capital taxes: inheritance, gift, wealth and property tax, on the household savings rate and self-employment. We estimate the impact using the synthetic control method, where a counterfactual scenario is created from a control pool of 16 OECD countries. We find that the treatment has had a large and robust positive effect of 48 per cent on the net household savings rate. Our results are in line with those of Jakobsen et al. (2020) and Brülhart et al. (2017) who also find a sizeable behavioural effect to changes in capital taxation. We find a substantial effect, which could be due to the treatment being an abolishment rather than a change in tax rates. We are not able to find an effect on self-employment. Our results suggest that decision-makers should take the effect on savings rate into account when deciding on capital tax policies.

Keywords: Synthetic control method, Net capital taxes, Sweden, Savings rate, Entrepreneurship

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Discussants:	Alfred Eriksson & Mika Lindgren
Examiner:	Karl Wärneryd

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1 Introduction

Tax policies are in constant debate due to their encompassing effects on society and citizens. Although usually not popular among the voters, governments need to levy taxes to be able to produce public goods. However, to not distort consumers' and producers' behaviour, they need to be careful about the specifics of their tax policies. A tax can affect people's behaviour if it distorts incentives, potentially affecting a wide range of economic decisions such as production, labour supply and savings. The government wants to maximise the benefits of taxation, raising as much revenue as possible without disincentivising choices regarding production and labour supply decisions. Considering the impact of tax policies is always essential when deciding on what policies to enact.

A particular aspect of the tax policy, net wealth taxes, has attracted attention lately, with many governments and advocates contemplating its merits due to the growing inequality in society. One such net capital tax, the wealth tax, used to be popular in Europe, but most have abolished them in the recent decades. Other net capital taxes, like inheritance, gift, and property tax, are more prominent than the wealth tax but are not prevalent in all countries. The lack of existing wealth taxes, and the complexities in assessing net capital taxes' effects, have resulted in research studying their impact being scant. As net capital taxes are currently prominent in the public debate in many countries, it is vital to study their design and understand their implications to ensure the desired outcomes.

Capital taxes reduce the amount of capital taxpayers possess and alter the returns to capital, making it compelling to study how it affects individuals' capital accumulation process, in other words, savings behaviour, and the effect on their propensity to engage in entrepreneurial activity. Savings rates have important implications in an economy, to the growth of an economy by providing capital for investments in firms and the role in individuals' wealth accumulation process. Similarly, entrepreneurship can drive innovation and growth and propel socioeconomic mobility. Entrepreneurship is believed to be dependent on the capital level in society, as capital is needed to start a business and for investments to be made possible. Hence, the savings rate impacts the amount of capital in the economy, which can impact the level of entrepreneurship due to increased investments or ease of borrowing constraints.

Theoretically, a reduction in capital taxes could lead to an income effect and a substitution effect. The income effect leads people to decrease their savings rate or keep it constant,

as their capital stock has increased due to not paying capital taxes. On the other hand, the substitution effect means people make use of not having to pay capital taxes and save more as they have more to keep. Hence, the reduction in capital taxes could lead to either an increase or constant/decreased savings rate, depending on which effect dominates.

For entrepreneurship, having more capital could increase the entry of new businesses as people are less credit constrained and can more easily start a business. Moreover, the reduction of capital taxes could lead to a higher motivation to become an entrepreneur since a successful endeavour would yield larger returns without the taxes. This would predict that entrepreneurship would increase with a decrease in capital taxes. However, the previous empirical literature is inconclusive about the effects of capital taxes on savings and entrepreneurship.

To contribute to the research to understand the effects of net capital taxes, we aim to study the impact of abolishing multiple net capital taxes in Sweden on savings and entrepreneurship. Between 2005 to 2007 Sweden repealed the wealth tax, the inheritance tax, the gift tax and the property tax, although a property fee replaced the property tax. Most net capital taxes in Sweden were abolished, leading to a reduction in the taxation of capital. Using the synthetic control method, a novel method that makes specific policies easier to study, we construct a counterfactual Sweden by looking at the trend of a weighted mix of other OECD countries similar to Sweden that did not experience these tax reforms.

The existing literature on the impact of capital taxes on savings and entrepreneurship mainly focuses on the changes in the tax rates of the wealth tax or one of the taxes. But the unique nature of policy change in Sweden, helps us study the effect of the abolition, which is interesting for the larger debate about the effects of the introduction of these taxes since many countries do not impose wealth taxes. Moreover, we can look at an abolition whilst most other papers can only use differences in the tax schedule to deduce impacts from different levels, which might not bring about the same effects as total abolition. In addition, we can study this abolition by using the synthetic control method. For comparative analysis of this nature, difference-in-differences has been the standard method, but newer methods, primarily the synthetic control method building on the same framework, have been able to present more reliable and less biased counterfactual for the estimation of causal effects (Abadie, Diamond and Hainmueller, 2015).

We find that the reform impacted savings, leading to an increase in savings by 48 per cent. Our result is similar to studies by Brühlhart et al. (2017) and Jakobsen et al. (2020) that

also find that savings behaviour is very sensitive to taxation. We find a high impact on savings, which can potentially be due to the specific policy change of complete abolition of net capital taxes rather than a change in tax rates. For entrepreneurship, we are not able to find any impact, but due to declining levels of entrepreneurship, we would be interested in looking further into this. For future research, getting hold of micro-data that specifies the type of entrepreneurs that are declining could more successfully examine the connection between capital taxes and entrepreneurs.

The rest of this paper is built as follows. The next section will review the existing literature on this topic and how our paper complements these. Then, in section 3, we will describe the capital reforms and their motivations. Section 4 describes the synthetic control method and our identification strategy, followed by a section on the data used. Then, in section 5, we will go through our results, followed by a discussion of them and surrounding issues in section 6. Lastly, section 7 concludes.

2 Literature Review

Capital income taxes affect the net income and wealth of people. With a reduction in capital taxes, people have higher net-of-tax wealth, and the additional money can be used for extra consumption or savings. Many economists have tried to uncover which of these options are more prominent. Standard economic theories give people utility primarily or exclusively from consumption, which indicates that people should want to consume as much as possible. However, empirical data shows that this is not the case, and many theories try to explain why. Some of the more popular explanations relate to precautionary savings or bequest motives (see e.g. Carroll and Samwick, 1997, Benhabib and Bisin, 2018 and Benhabib, Bisin and Zhu, 2011). However, this cannot explain all savings and a more recent strand of the literature explore becoming an entrepreneur being a motivation to save (Cagetti and De Nardi, 2006). Capital is needed to start a business and due to constraints on borrowing part of this capital needs to come from savings. Moreover, as entrepreneurs are overrepresented among people with large monetary wealth (Cagetti and De Nardi, 2006), being an entrepreneur is either a way to become wealthy or a lucrative option for the wealthy to hold their fortunes. Hence, savings and entrepreneurship are closely linked, and capital taxes are likely to impact both.

To a non-economist, it might seem evident that people with higher incomes save more. Dynan, Skinner and Zeldes (2004) discuss how this view differs between economists and non-economists, with economists often proposing that lifetime savings do not increase with income. From an economist's point of view accumulating capital for the sake of it would not be a rational choice as it brings no utility. The authors mention that research shows opposing results, with some supporting the first view and some the other. Moreover, they point out that although there has been an increase in real per capita income over the last century, there has not been an increase in the aggregate savings rate over time. One proposed reason saving could increase over income is that the rate of return is also correlated to income level making the savings accumulate faster. Fagereng et al. (2020) studies Norwegian tax records and finds that returns on net wealth differ between individuals. They find that returns are positively correlated with wealth and that this is not due to differences in the type of assets invested in, risky or less risky. Other reasons often cited are leaving a bequest to one's heir, saving up to start a business, or investing in profitable businesses to earn more money.

Knowing the mechanisms behind what people do with an increase in wealth is vital to evaluate whether taxation increases or reduces wealth. However, mechanisms are often hard to study as they are not directly observable. As a result, most of the existing literature is focused on what outcomes different tax policies have. The following sections will review the existing literature regarding capital tax policies' impact on savings and entrepreneurship.

2.1 Household Savings Rate

The impact of capital taxation has been debated heavily over the decades due to its macroeconomic significance. Two models (Judd, 1985 and Chamley, 1986) in the 1970s and 80's concluded that the optimal capital taxation was zero due to the disincentive it provides to save. Providing an overview of this Perret (2021) show that it has primarily been refuted and that the models relied on unrealistic assumptions. Advani and Tarrant (2021) argue that even from a theoretical perspective, wealth taxation might not have a negative impact on savings. If the income effect is larger than the substitution effect this might be the case, as the incentive to accumulate more capital to compensate for the reduced wealth can be stronger than the effect of reducing accumulation of wealth due to being taxed on it. Most of the studies looking at the impact of capital taxes on savings

focus on measuring the elasticity of the tax in question. The tax elasticity measures how much savings behavior change for a given change in the tax rate which shows how responsive individuals are to tax changes.

There is a limited number of studies looking at savings and capital taxes specifically. Recently, an empirical strand of the literature has grown with researchers studying country-specific cases to determine behavioural changes in capital taxation. These have produced differing results, with some finding small responses on savings to tax changes (Zoutman, 2018, Seim, 2017, Duran-Cabré, Esteller-Moré and Mas-Montserrat, 2019) and others finding larger responses to tax changes (Jakobsen et al., 2020, Brülhart et al., 2017, Ring, 2020). Another salient finding is that tax changes impact tax avoidance and evasion (Seim, 2017, Duran-Cabré, Esteller-Moré and Mas-Montserrat, 2019, Advani and Tarrant, 2021).

Some of the studies that have found minor effects on savings behaviour due to the tax are Seim (2017) and Zoutman (2018). Zoutman (2018) finds that an increase in the wealth tax leads to a small response to savings in the Netherlands. He studies a reform that created change in the wealth tax for different households at the same income or wealth level and could thus use a difference-in-difference framework to study the causal impact of the reform. Zoutman (2018) finds that a 0.1 percentage-point increase in the wealth tax leads to savings being reduced by 1.38 per cent, measured from the current Dutch wealth tax of 1.2 per cent. Similarly, Seim (2017) studies the wealth tax in Sweden and how it affected behaviour around savings using administrative records and a difference-in-difference design. He finds a range of tax elasticities to be between 0.09 to 0.27. Exploring these results, he finds that the small elasticity reflects that people avoided reporting wealth to avoid the tax and therefore did not need to change their savings behaviour.

More studies have found that a wealth tax leads to people avoiding reporting wealth or shifting their capital to tax-exempt assets. Duran-Cabré, Esteller-Moré and Mas-Montserrat (2019) studies the reintroduction of the wealth tax in Spain and finds that an increased tax does not seem to affect taxpayers' savings negatively but leads to an avoidance of the tax by shifting their wealth into assets that are wealth-tax exempt. They conclude that the behavioural response to an increase in the tax is large but leads to tax avoidance instead of reducing savings. Advani and Tarrant (2021) discuss possible effects of implementing a wealth tax in the UK based on the empirical studies that exist

(primarily those cited above) hypothesise that introducing a wealth tax of 1 per cent would lead to a reduction of the tax base of 7-17 per cent. Thus they believe that the behavioural effects of levying a wealth tax would be an avoidance of the tax.

Other studies find that individuals change their savings behaviour due to capital taxes. In Denmark, Jakobsen et al. (2020) show that the long-run effects of a wealth tax create a sizeable elasticity of the net-of-tax return to wealth at the top of the distribution and that it affects the very wealthy more than the moderately wealthy. Moreover, they create a theoretical model to study the savings motive and find that life cycle motives and bequest motives are more important than precautionary motives to save. They also argue that to match the wealth data, the bequest motive must be strong and the elasticity of bequest tax high at the top of the distribution. Brülhart et al. (2017) uses the heterogeneity in wealth tax policies in Swiss cantons to find an impact on wealth holding from the wealth tax. They conclude that wealth holdings are highly sensitive to wealth tax levels and that a 0.1 percentage-point increase in wealth tax leads to a reduction of wealth holdings by 3.4 %. This exceeds the low elasticity found in, e.g. Zoutman (2018) and proposes that the amount of savings people hold is sensitive to the wealth tax level. Brülhart et al. (2017) finds no effect on capital income tax changes and posits that this might be due to the more certainty and greater salience of a wealth tax compared to a capital income tax. They also look at the inheritance tax and find similar responses in savings to the inheritance tax as to the wealth tax. They propose that this change is due to altered consumption behaviour and possibly a shift in the division of holding of private and corporate assets.

Lu (2021) conducts an experiment wherein the participants get to make savings choices under different types of capital taxes and finds that the participants have an overreaction to being subject to a wealth tax and react more strongly than they do to a capital income tax. Faced with a wealth tax, the subjects reduce their savings significantly, while an equally substantial decrease in financial terms of capital returns does not yield the same behaviour. Moreover, the author finds that when running the experiment with a capital income tax instead of a wealth tax, the change in savings is similar to that of an equal change in capital returns. He posits that this is due to an overreaction to having a wealth tax levied, that stems from overestimating the impact of the wealth tax on their savings. People seem to exhibit strong feelings toward wealth taxation, which can affect their behaviour and sensitivity to the tax in a setting where avoidance is impossible. Ring (2020) also finds a behavioural sensitivity to changes in wealth tax, but as opposed to most

other studies, finds a positive impact on savings. He looks at geographic discontinuities in Norwegian wealth tax rates and finds that households facing a higher wealth tax save more and that this is primarily due to an increase in labour income. Hence, he posits that the income effect is dominating and that faced with a higher tax which reduces their savings, households increase their efforts to earn more.

Unfortunately, there are only few studies on the impact of bequest and property taxes due to the difficulties in studying it empirically. More attempts have been made to study the bequest tax than the property tax, even if this has proven to be difficult too. Kopczuk (2013) argue that this is due to the difficulties in establishing a causal impact between behaviour today and the outcome of the bequest tax, which happens many years in the future. Nevertheless, the author argues that the elasticity of savings with respect to the net-of-tax rate of bequests to be between 0.1-0.2 based on baseline specifications in Kopczuk and Slemrod (2001), Holtz-Eakin and Marples (2001) and Joulfaian (2006). In a more recent study, Goupille-Lebret and Infante (2018) find that although there is a small response to savings from changes in the inheritance tax, retaining capital was not the motivation behind this change. They conclude this since they find that individuals do not make use of an allowed tax-exemption, namely inter-vivos giving. Instead, the authors propose that individuals may not react strongly to an inheritance tax because they want to avoid dealing with death and not planning their estate. Moreover, Jakobsen et al. (2020) suggest that bequest elasticities are large at the top of the wealth distribution.

Our paper differs from the existing literature in that we use the novel method of synthetic control. This method allows for the construction of a relevant counterfactual scenario instead of a difference-in-difference, where the researchers need to find a relevant counterfactual constrained by strong assumptions. This makes it possible to study an abolition, which in a difference-in-difference would require another country as a comparison. Most of the existing literature instead study a tax rate change. We believe this to be a valuable contribution as using a change in tax rate might not reflect the actual effects as it is reliant on the baseline tax levels and the existing tax framework. Studying the abolition also eliminates the impact of avoidance as it is no longer of concern post-treatment. In addition, using the method, we study the impact of capital tax reform on savings rather than specific taxes' impact, as we can construct a counterfactual scenario for the entire reform. The sensitivity to one capital tax might be impacted by what other capital taxes are in place. As the literature on the effect of wealth and bequest taxes are inconclusive, we attempt to make a broader argument for the sensitivity of capital tax changes to

savings rate.

2.2 Entrepreneurship

The effect of capital taxes on entrepreneurship can potentially be important for two reasons. First, capital is often needed to start a business, both for start-ups and larger investment projects. With the stock of wealth decreasing with a wealth tax, the potential money available for investments could decrease. Second, suppose the primary motivator for becoming an entrepreneur is the outlook of a higher earning potential. In the case of being subject to a wealth tax that reduces the wealth earned, the motivation to become an entrepreneur might be distorted. Castaneda, Diaz-Gimenez and Rios-Rull (2003), and Quadrini (2000) construct models of wealth inequality and find that including entrepreneurs enables them to match the skewness of wealth inequality better than not including it. This could point to entrepreneurs saving more, either to build their businesses or because they have gotten richer out of it and if more wealthy people save more. Cagetti and De Nardi (2006) also proposes this, exploring entrepreneurship as a factor for heterogeneity in returns and positing that entrepreneurial activity that can offer high returns makes entrepreneurs richer, leading them to save more. In addition, they believe that entrepreneurs need to save more in order to become entrepreneurs to finance their businesses.

The effect of capital taxation on entrepreneurship has not been extensively studied, especially not empirically, but a few studies exist. Researching the fear of entrepreneurs being disincentivised to expand or build businesses due to high taxation, Brüggemann (2017) study top marginal income tax and finds that the wealthiest entrepreneurs are responding negatively to an increase in the top tax rate by reducing their investment into their businesses. However, in her model, lower-earning entrepreneurs are positively affected by this change as the lower wages enable them to hire more people and expand their businesses. Although this can be beneficial in regard to welfare, the author acknowledges that her study does not consider the potential effect on innovation that might be reduced by the high earning entrepreneurs. Guvenen et al. (2019) looks at the difference in capital income taxation to wealth taxation for entrepreneurs in a model simulated to match US data. They posit that capital income taxation taxes only the more productive entrepreneurs, who earn a higher income, whilst a wealth tax taxes everyone regardless of productivity as it is based on wealth stock, shifting the tax burden to unproduct-

ive entrepreneurs. They believe this is a shift towards increasing aggregate output and productivity. This could increase the incentives to become an entrepreneur, as being a successful entrepreneur implies a lower effective tax rate on returns than a capital income tax does.

On the empirical side, Hansson (2008) studies how the wealth tax impacts levels of self-employment in OECD countries using a difference-in-difference framework. She finds that abolishing the wealth tax would increase self-employment by 0.2-0.5 per cent, a small but discernible effect according to the author. Bjørneby, Markussen and Røed (2020) find a small positive effect on employment from the wealth tax in Norway but hypothesise that this is due to shifting investments to non-traded firms that are not subject to the wealth tax. Hence, the effect of the tax on entrepreneurship is inconclusive and depends on the circumstances surrounding the tax. Berzins, Bøhren and Stacescu (2019) find that the wealth tax affects businesses through the change of shareholders' liquidity in Norway. In their study, shareholders having to pay a higher wealth tax on their home is associated with shareholders receiving more payment from the firm and the firm holding less cash and lower investments and performance. They thus propose that personal financial shocks have a causal impact on firm behaviour. However, both Berzins, Bøhren and Stacescu (2019) and Bjørneby, Markussen and Røed (2020) study the effect relative to variations in the tax schedule and not the total abolition of the tax, which is what we are attempting to do.

Although the effect of property and bequest taxes on the level of entrepreneurship has not been extensively studied, some researchers have touched upon it. Grossmann and Strulik (2010) constructs a model to explore the argument that the bequest tax can hinder business continuation if the heirs have to pay a bequest tax. They find that if there exists an exemption in the inheritance law favourable to family-owned businesses, that shrinks the firms' gross income by about 2 per cent. They believe this is due to low-ability heir being more inclined to continue the firm with the existence of the preferential treatment policy. They also find that the policy reduces entry into entrepreneurship. This is an important contribution as also, in the Swedish case, the argument of family-owned businesses having a hard time continuing whilst being subject to the inheritance taxes was the primary motivator to abolishing the tax. Tsoutsoura (2015) studies the impact of a reduction of the inheritance tax in Greece and finds that the tax led to a 40 per cent decline in family firm investments. Moreover, it influenced the decision to keep or sell the business with a large share choosing to sell the family firm. Unfortunately, our

study cannot discern the quality of the remaining entrepreneurs but only the number of entrepreneurs.

Related, a worry with a wealth tax is that it would discourage innovation as the potential returns are not as large. Saez and Zucman (2019) discuss this possibility and draws on studies researching business taxation's effect on entrepreneurship which shows that the cash-constrained are hindered from starting a business. However, as Saez, Slemrod and Giertz (2012) argue, this is not the case with a wealth tax if the tax is set at a high enough level that the cash constrained would not be subject to the tax. Moreover, they argue that innovation could be upheld by encouraging young and not yet wealthy people to become entrepreneurs. As wealthy, already established companies fight to keep newcomers out of the competition, they also argue that the wealth tax could have the benefit of facilitating becoming an entrepreneur.

Regarding entrepreneurship, it has been more common to study how being financially constrained affects the level of entrepreneurship. Ferreira, Pereira dos Santos and Venâncio (2019) take advantage of a Portuguese tax reform to study how reducing the property tax has affected entrepreneurship. Although they make assumptions about the implications of businesses' credit availability from this, their study suggests that reducing property taxes increases entry into the manufacturing industry for businesses. This supports the argument that with fewer capital taxes, there is more capital available which can be used to invest or to start businesses.

As in the case of the literature on savings, our study contributes to the literature on capital taxation's impact on self-employment by providing a broader study researching the impact of capital tax reform rather than specific taxes. Moreover, many of the previous studies use either models or find a natural experiment when a tax was implemented or revoked, to study the impact of taxes. This can make specific events hard to study as not all are conducive to quasi-experiments. Moreover, with the difference-in-difference approach, an existing comparison example needs to be identified. This often results in researchers using variation in tax schemes in a country rather than studying the total abolition of a tax. The method we choose, the synthetic control method, can be used even when there is not a single good comparison, as is required for a difference-in-differences approach. Many researchers have used this novel approach to study a wide variety of subjects, and its usefulness in studying tax policies is not unnoted. For example, Rubolino and Waldenström (2020) uses a synthetic control method to study tax progressivity and top

income shares. However, to the best of our knowledge, there have been no studies on the impact of capital taxation on savings or entrepreneurship using this method.

3 Capital Taxation in Sweden

Sweden is a country known for its expansive welfare system. Swedish citizens benefit from social structures such as free health care, free education and a solid social security system which protects them in bad times. However, providing this comes at a cost, and up until 2002, Sweden had the highest tax revenue amongst all OECD countries. In 2002 it was surpassed by Denmark but has remained in the top 5 (OECD, 2022e).

Less known about the Swedish tax system is that it is mainly the high marginal tax on labour that contributes to the high tax level. Regarding other taxes, especially capital taxes, Sweden has a comparatively low level. Sweden's property tax level, which refers to wealth, inheritance and property taxes, is below the OECD average (OECD, 2022d).

In Sweden, as in other countries, a large part of the political divide concerns the economy and the level of taxation. Up until 2006, Sweden had a wealth tax, an inheritance tax and a property tax, but reforms in the subsequent years saw them all abolished.

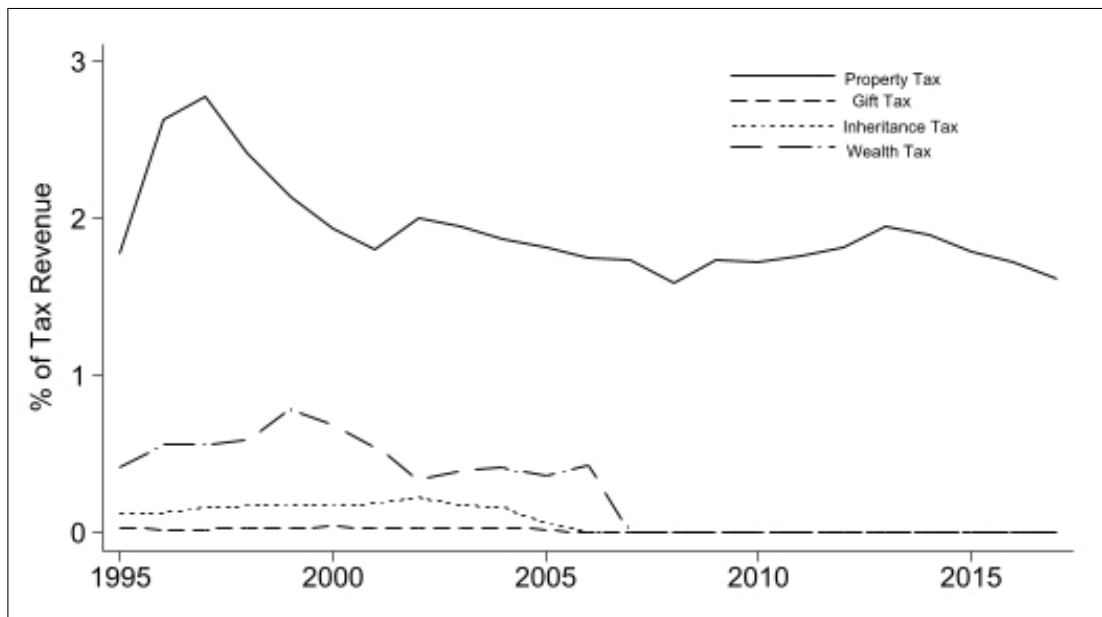


Figure 1: Plot of % of Tax Revenue from different Net Capital Taxes 1995-2017: Sweden

The wealth tax was introduced in 1911 with the motivation that people that possessed large amounts of capital and assets would have a higher ability to pay taxes than other taxpayers and to secure more funding for the government (Rietz and Henrekson, 2015). Before the abolition, a tax of 0.5-1 % was applied to all forms of capital (Rietz and Henrekson, 2015). This was around 0.5 to 1 per cent of total tax revenue, meaning it was not an essential contributor to the government's finances (Rietz and Henrekson, 2015). According to Rietz and Henrekson (2015), the wealth tax was based on net wealth, excluding insurance and pension rights. Moreover, they explain that additional rules applied to certain assets, including housing, which was being taxed based on its tax-assessed value. The tax-assessed value amounted to around 75 % of the market value. In addition, according to the authors, businesses were taxed at the market value, but stocks were often taxed at less than their market value. Moreover, stocks listed on different exchanges were taxed at different rates. This differential treatment of certain assets introduced an incentive to choose asset types based on how they were taxed. A cap was applied to the wealth tax, and from 1995 to 2007, this cap was 60 per cent of taxable income (Rietz and Henrekson, 2015). The cap was motivated by protecting individuals who held low-yielding wealth. In their paper, Rietz and Henrekson (2015) constructs a scenario of synthetic wealth taxpayers, who are holding wealth or are business owners. Their depiction shows that wealthy business owners paid less wealth tax than non-business owners, implying that the wealth tax was more cumbersome for non-business owners.

Giving an overview of the effective tax rate of the Swedish inheritance- and gift taxation, Henrekson and Du Rietz (2014) describe the details of the tax that existed from 1885 to 2005. A gift tax is primarily imposed to ensure that the inheritance tax is not evaded by gifting away estates at a lower or zero tax obligation. Hence the information related to the inheritance tax is also applicable to the gift tax.

The Swedish inheritance tax was levied on the heirs on the amount inherited after payment of any outstanding debt of the testator (Henrekson and Du Rietz, 2014). This is different from an estate tax, which is levied on the deceased person's whole estate. Henrekson and Du Rietz (2014) describe how the tax gradually increased through the years up until the 1970s, when it peaked at 65 per cent for descendants and 72 per cent for others. Furthermore, his calculation shows that the effective tax rate was about 40-50 % for a large estate in the 1990s, and then it was constantly lowered until its abolition in 2005. As the government's revenue from the tax was never substantial, the authors posit that the motivation behind the tax was primarily to reduce large transfers of wealth at

the top of the distribution. The reasons behind the abolition of the tax have not been adequately researched according to Henrekson and Du Rietz (2014), so the motivation behind it has not been correctly discovered. However, Lodin (2011) claims that it was done as a compromise between the Social Democratic Party and the Left Party, but that there existed ample structural reasons to abolish it that could have played a role in the decision, like tax avoidance and the public's negative opinion of the tax. In the government's proposition to abolish the tax (Regeringen, 2004), they also mention that it obstructs the passing of family firms to heirs.

Property tax is usually considered a less distortive tax than wealth and inheritance taxes (Stenkula, 2015) as it is hard to evade, and people need housing regardless of taxation. Sweden had a property tax from 1862 to 2008, when it was abolished (Stenkula, 2015). After that, however, the tax was replaced by a property fee. From 1991 the tax amounted to 1.5 per cent on owner-occupied housing. The new property fee amounts to 75 % of the property's tax value. However, it is capped at 8524 SEK, making the tax less progressive and a net reduction of the taxation for most households compared to before (Skatteverket, 2022).

Since taxes determine how much of earnings and assets are left after taxes, they directly impact how much can be saved. Saving is usually defined as disposable income less consumption. If the disposable income grows due to a reduction in taxes, savings can increase. The same goes for accumulating wealth and assets; if there are fewer taxes, a bigger portion of income is left, which can be used or saved. Researchers have recently debated if different people have different returns on investments, especially if the return on capital is bigger than on labour. Effectively, this will mean that savings grow faster than other types of incomes, rapidly accumulating until it is concentrated at the top, especially compared to people who cannot save. A considerable proportion of people do not save or have negative net wealth, usually due to large mortgages.

An overarching goal of reducing these taxes is to let people keep what they earn and make people motivated to work hard, start businesses and invest. However, it is crucial to evaluate and ensure that these policies achieve the goal. Reducing capital taxation can be seen as a way toward a more liberal society. Regarding capital taxation, Sweden is different from most OECD countries. All OECD countries have some property tax, and the majority have an inheritance tax. Currently, France, Switzerland, Spain and Norway have a wealth tax. Hence, it is possible to use these countries to evaluate the

Table 1: Net capital tax rates at the time of reform

Tax	Wealth Thresholds (in SEK)	Marginal Tax Rate (in %)	Notes
Wealth Tax	1,500,000	1.5	Single
	3,000,000	1.5	Couples
Property Tax	none	1	75% of the assessed market value
Inheritance Tax & Gift Tax	0 – 300,000	10	Children, spouse, descendants
	300,000 – 600,000	20	
	above 600,000	30	Brothers, sisters, parents and other heirs
	0 – 70,000	10	
	70,000 – 140,000	20	
	above 140,000	30	

Notes: Basic exemptions for inheritance tax; Spouse: SEK 280,000; Children: SEK 70,000; Others: SEK 21,000; Gifts: SEK 10,000.

effect of the policy on different metrics, such as savings rates. As the countries have a myriad of differences, they cannot be compared without making adjustments for their differences in other regards that could lead to any difference in the savings rate. Here the synthetic control method is useful, as it is a method that creates a counterfactual scenario to compare with the real outcome. Here, we will attempt to recreate Sweden by creating a synthetic Sweden out of other similar OECD countries that have these taxes. By doing this, the actual savings rate in Sweden and the synthetic Sweden can be compared to evaluate the outcome of the capital tax reform.

The elimination of the inheritance tax in the year 2005, the removal of the wealth tax in 2007 and the alteration of the property tax into a property fee with a cap on the progressivity in 2007 add up to a major change in the net capital tax burden faced by households. This culmination of policy changes, while many other Nordic and OECD countries continue to have at least one of the net capital taxes, presents an interesting treatment to study.

4 Method

This section will explain the synthetic control method in greater detail. We first describes the conceptual framework of the method, then the robustness checks necessary to establish causal inference. Then, we go into some of the suggested guidelines that have been established by existing literature on the method.

4.1 Theoretical Framework

The synthetic control method compares the actual outcome of a country with a counterfactual scenario in a created country, made to emulate the actual country. This is done by choosing a set of countries most similar to the country in question and then weighing them until the synthetic country matches the actual country. This is done for a pre-treatment period, and as in a differences-in-differences approach, the pre-treatment trends need to be similar for the country and the synthetic version of the country.

Following Abadie (2021) and Abadie, Diamond and Hainmueller (2010), consider a total of $J + 1$ countries: the treated country ($J = 1$) and J control countries observed over T time periods, with T_0 being the treatment year. Let Y_{it} be the observed outcome variable of country i and time period t . X_{mt} is a set of m predictor variables of the outcome variable for each country j , which may also include the point estimates of the outcomes variables from the pre-treatment period.

From the potential outcomes framework established by Holland (1986), the true treatment effect for causal inference is given by,

$$\tau_{1t} = Y_{1t}^I - Y_{1t}^N$$

where Y_{1t}^I is the observed post-treatment outcome of the treated unit and Y_{1t}^N is the unobserved counterfactual of the treated unit in the absence of treatment. Using the synthetic control method, this counterfactual is estimated as

$$\hat{Y}_{1t}^N = \sum_{j=2}^{J+1} w_j^* Y_{jt}$$

where $j = 2, 3, \dots, J + 1$ are the control units, which make up the control or donor pool and $w_2, \dots, w_{J+1}$ are the country weights.

Abadie and Gardeazabal (2003) and Abadie, Diamond and Hainmueller (2010) propose to choose the weights so that the resulting synthetic control best replicates the pre-intervention values for the treated unit of predictors of the outcome variable, abiding to convexity constraints. This can be formally carried out by two minimizations,

$$||\mathbb{X}_1 - W(V)\mathbb{X}_0|| = \left[\sum_{m=1}^k v_m \left(X_{1m} - \sum_{j=2}^{J+1} w_j X_{jm} \right) \right]^{1/2}$$

where $\mathbb{X}_1$ and $\mathbb{X}_0$ are $m \times 1$ matrices of predictor variables for the treated unit and control units, respectively. $v_1, \dots, v_m$ are the weights assigned to the predictors based on their explanatory power of the outcome variable and $w_2, \dots, w_{J+1}$ are the country weights that make up the synthetic control. The optimisation operates under the constraint that the country weights given by $W(V)$ add up to 1 for a given V matrix which represents the weights given to the predictor variables in the model. The V matrix is obtained from the second optimisation by minimising the pre-treatment Mean Squared Prediction Error during the pre-treatment period. This is given by

$$\text{PRE-MSPE} = \sum_{t=1}^{T_0} \left[Y_{1t} - W(V) \sum_{j=2}^{J+1} Y_{jt} \right]^2$$

The synthetic controls weights' in vector W are determined by a nested, double minimisation problem. The V and W vectors are jointly calculated in order to obtain the optimal solution $w^*(V)$, which minimises the pre-treatment MSPE of the synthetic control and the predictors based on their relative importance. The optimising exercise follows the synthetic control method set out by Abadie and Gardeazabal (2003) and Abadie, Diamond and Hainmueller (2010) where the synthetic control is constructed to resemble the treated unit in the predictor variables and the outcome variable of the treated unit. It allows the unobserved confounders to vary over time by weighing the control group and representing the most optimal comparison unit for the particular time period and predictor variables.

Compared to difference-in-difference, the synthetic control method offers significant advantages when it comes to estimating treatment effects in specific countries in the context of comparative studies using panel data (Rubolino and Waldenström, 2020). The main

distinction between the methods is in the treatment of unobservables. In the difference-in-difference framework, with a treated unit and comparison units, the unobservables of the two groups are assumed to be time-invariant. That is, in the absence of the treatment both the groups are assumed to have the same difference in trend over time. This is known as the parallel trends assumption and is a necessary assumption to carry out difference-in-difference studies. Although it is a crucial assumption there is no statistical method to test it and is identified by visual inspection of the trends over time. The synthetic control method, by allowing the unobservables to vary over time, imposes parallel trends on the pre-treatment periods. The optimization exercise, minimizing the mean squared prediction error, automatically matches the trends of the treated and control group, creating parallel trends. Hence, the parallel trends criteria of a synthetic control is more robust than that of a difference-in-difference.

4.2 Robustness Checks

Building on the method proposed in Abadie and Gardeazabal (2003), the authors in later papers, Abadie, Diamond and Hainmueller (2010) and Abadie, Diamond and Hainmueller (2015), establish a series of tests to evaluate the robustness of results obtained with the synthetic control method. These are largely falsification exercises conducted on the data set, primarily to understand the likelihood of obtaining results similar to or better than the results predicted by the method. Though Abadie, Diamond and Hainmueller (2015) argue that there might be other tests to assess the results of the method, the tests listed below have become standard practice in synthetic control literature.

In the in-time placebo test, the treatment year is replaced by a randomly chosen period in the pre-treatment period, and a new synthetic control is estimated from the original data and predictor variables. In this test, no divergence should be found between the trends of the actual treatment and the placebo treatment. A potential divergence would mean that the treatment effect cannot necessarily be attributed to the actual treatment as a randomly assigned treatment year is also able to produce an effect.

The in-space, or placebo test, assigns treatment to all donors in the donor pool and a synthetic control is constructed for each case. The estimated placebo treatment effects are then compared to the treatment effect of the actual treated unit. For the results to pass the test, the treatment effect of the actually treated unit has to be the largest amongst

all the countries in the control pool. The presence of larger treatment effects would cast doubt on the treatment effect estimated since there is the possibility of obtaining similar or better outcomes by random assignment of treatment to the units in the donor pool. This helps establish that the treatment effect is unique to the actual treated unit in the sample.

The outcomes from the test can also be expressed as p-values for the results, which in the context of the synthetic control represents the probability to find a treatment effect equal to or larger than the estimated treatment effect of the true treated unit. This method was formalized in Abadie (2021) and is calculated as follows:

$$\text{p-value} = \frac{1}{J+1} \sum_{j=1}^{J+1} I_+(r_j - r_1)$$

where r_j and r_1 are the ratios of post-treatment MSPE divided by the pre-treatment MSPE of the placebo control units and the true treated unit, respectively. I_+ is an indicator function that returns one for non-negative values and zero otherwise.

The last test is the leave-one-out test, where iteratively, each country with positive weights in the estimated synthetic control is excluded and re-estimated to check if any one specific country drives the results. If a specific country drives the treatment effect, this points to a potential bias in the estimated results as they might be driven by an unknown change in the outcome variable of the control country.

5 Data and Identification Strategy

To implement the empirical analysis on the household savings rate and self-employment, we have compiled two panel data sets ranging from 1997 to 2017 with the respective outcome and predictor variables of all OECD countries. The data has been accessed from the Organisation for Economic Co-operation and Development (OECD) and World Development Indicator Data. These are open access databases maintained by the OECD and the World Bank. The predictor variables and control units have been chosen based on the guidelines illustrated in Abadie, Diamond and Hainmueller (2010) and Abadie (2021).

Moreover, as the treatment is defined as the abolition of net capital taxes, and the tax

reforms in Sweden happened over three years from 2005 to 2007, we consider the last year before the first reform as the year of treatment. This helps us capture the effects beginning from the first reform, which was the abolition of inheritance and gift tax, followed by the abolition of wealth tax and property tax in 2007. Also, considering the treatment year to be 2005 eliminates any potential anticipation effects generated from individuals expecting the abolition of the other net capital taxes following the abolition of the inheritance tax and gift tax in 2005.

5.1 Exclusion Restriction and Control units

Since the synthetic control method by nature is a comparative case study, the control unit is crucial in the analysis. Hence, the first and foremost step is to limit the control units to countries similar to the treated unit, Sweden. This is because of the interpolation bias that might arise, as the synthetic control method can average out significant discrepancies between the treated and control units (Abadie, 2021). Thus, the donor pool has been limited to OECD countries, following Abadie, Diamond and Hainmueller (2015) and Andersson (2019), as this grouping imposes qualitative matching of social and economic attributes.

Thereafter, we exclude countries that might have had treatment-like changes or large idiosyncratic shocks that impacted the outcome variables. This ensures that the control units are indeed true counterfactuals without any potential treatment-like effect altering the outcome variable (Abadie, Diamond and Hainmueller, 2015). Since the treatment in our analysis is defined as the abolition of net capital taxes, a comprehensive analysis of various net capital tax changes in the OECD countries was carried out. Countries that repealed any kind of net capital taxes during the period of consideration are excluded. In addition, to be included in the control group, the countries must have at least one of the net capital taxes we consider, more specifically a wealth, inheritance, gift or property tax. These restrictions ensure a high quality counterfactual to Sweden.

By imposing the exclusion restrictions on our donor pool of OECD countries, we are left with 23 countries that can be used to construct Synthetic Sweden. The detailed analysis of the particularities of the taxes in OECD countries can be found in appendix A. The treatment studied is the same for both outcome variables analysed in this paper, hence the same control countries are used in both cases.

5.2 Household Savings Rate

The first outcome variable of interest is the net household savings rate. This is an aggregate metric calculated as part of national income accounts for all OECD countries. The net household savings rate represents the total amount of saving as a percentage of net household disposable income. It represents how much households are saving from their current income and the amount of income they have added to their wealth. This data has been accessed from the OECD National Accounts database (OECD, 2022b), which is compiled from submissions of the countries according to guidelines set by the OECD. Countries whose data were not compiled in the OECD database, Israel and the Republic of Korea, have been accessed from the Bank of Israel database (Bank of Israel, 2022) and the Korean Statistical Information Service (Statistics Korea, 2022).

Next, relevant predictor variables are selected. The predictor variables allow for the matching of the synthetic counterfactual to be similar to the treated country in the different features that might affect and is a predictor the outcome variable (Abadie, Diamond and Hainmueller, 2010).

For our study of the evolution of savings rate, we include potential predictors of the household savings rate or, more broadly, the savings behaviour in a country. From a net income perspective, the income tax level in a country affects the net income of a household and directly affects their ability to save. Since the outcome variable is an aggregate metric, the percentage of income tax to GDP is a good predictor of how much disposable income households have, determining their ability to save. This variable has also been accessed from the OECD National Accounts database (OECD, 2022e).

A key factor influencing household savings is precautionary savings for consumption insurance, arising from unexpected or expected unemployment (retirement). To predict the necessity of consumption insurance from consumption risk faced by individuals in a country, variables measuring the social security system they have access to are included. The in-kind and in-cash transfers as a percentage of GDP measure the number of governmental transfers that the individuals are pledged in their respective countries (OECD, 2022c). These two variables summarise the level of social security that individuals have access to in a country. Beyond consumption insurance, household savings are also motivated by costs attributable to children in the household and a desire to transfer wealth to future generations, bequests. Hence, the fertility rate is used as a predictor to account

for this aspect of savings behaviour and has been accessed from the World Development Indicators database (World Bank, 2022).

5.3 Entrepreneurship

The second outcome variable of interest is the percentage of self-employed individuals in the working population. This metric has been accessed from the World Development Indicators database of the World Bank, which is obtained from the International Labour Organization (International Labour Organization, 2022).

To study the effect of treatment on entrepreneurship, we compare the evolution of the share of the labour force categorised as self-employed between synthetic and actual Sweden. To construct a relevant counterfactual for this outcome variable, predictor variables that are found to be relevant in explaining the share of self-employed in the labour force are chosen. Apart from the inherent motive of some individuals to engage in entrepreneurial activities, savings accumulated by the households impact the likelihood of entrepreneurial activity, as it is costly to start and run a business. Therefore, the net household savings rate from the OECD National Accounts database is included as a predictor in the analysis (OECD, 2022b). Similarly, the cost of borrowing money influences the likelihood of becoming self-employed, as it alters the cost of running a business. Thus, we include the interest rate as a predictor, which has been obtained from the OECD Main economic indicator (OECD, 2022a). The perception of consumption risk would be more prominent for individuals who pursue entrepreneurship, and hence the social security system plays a vital role in their decision. Same as before, we include in-kind and in-cash transfers as a percentage of GDP as predictors (OECD, 2022c).

We also include point estimates of the outcome variable as they are themselves predictors and is thought to be important in achieving a good pre-treatment fit (Abadie, 2021). Along with serving as predictors they also help match the level of the synthetic Sweden with actual Sweden. The selection of the specific point estimates to include has been made based on their ability to improve the fit of the synthetic Sweden. We try different point estimates and arrive at using the years 2002 and 2005 for the analysis of savings rate and years 1999 and 2003 for the analysis of entrepreneurship.

Combining the exclusion restriction and data of all the predictor variables, adjusting for missing values, we are left with a control pool of 16 countries for the analysis of savings rate

and 17 countries for self-employment which can be found in appendix B. The exclusion of countries because of missing values is not problematic when using the synthetic control method as the structure of the method is such that, in principle, the synthetic control is not dependent on any specific country in the control pool. This ensures that excluding any country does not introduce a significant bias. The exclusion might be problematic in the case of a relatively small control pool, but our control pool is large enough that this likely will not cause any problems.

Table 2: List of Predictor Variables

Net Household Savings Rate	Self Employment
Fertility Rate	Interest Rate
Income Tax(% of GDP)	In-Kind Welfare Transfers
In-Kind Welfare Transfers	In-Cash Welfare Transfer
In-Cash Welfare Transfers	Net household savings rate
Net household savings rate(2002)	Self-employed(1999)
Net household Savings Rate(2005)	Self-employed(2003)

6 Results

6.1 Household Savings Rate

From figure 2, we see that synthetic Sweden performs well in tracing the pre-treatment trend of true Sweden, especially from 1999 to 2005. The bad fit in the earlier period can be attributed to the fact that Sweden had a negative savings rate at the start of the time period of consideration, and only a few countries in the control group had a similar feature. From the point of view of causal inference of the estimation, the pre-treatment fit closer to the year of treatment is more relevant (Abadie, 2021). Clearly the fit improves and in the time period 1999 to 2005 the synthetic Sweden follows actual Sweden very closely. The matching of pre-treatment fit ensures that the treatment effect predicted by synthetic Sweden is not underestimated. The absolute difference between the synthetic and true Sweden’s pre-treatment trends from figure 3, during the period 1997 to 2005, is about 0.02 units of net household savings rates. The Root-Mean Squared Prediction Error from the entire pre-treatment period is 0.32, which is quite low. This suggests that the predicted synthetic Sweden is a highly comparable estimation of actual Sweden.

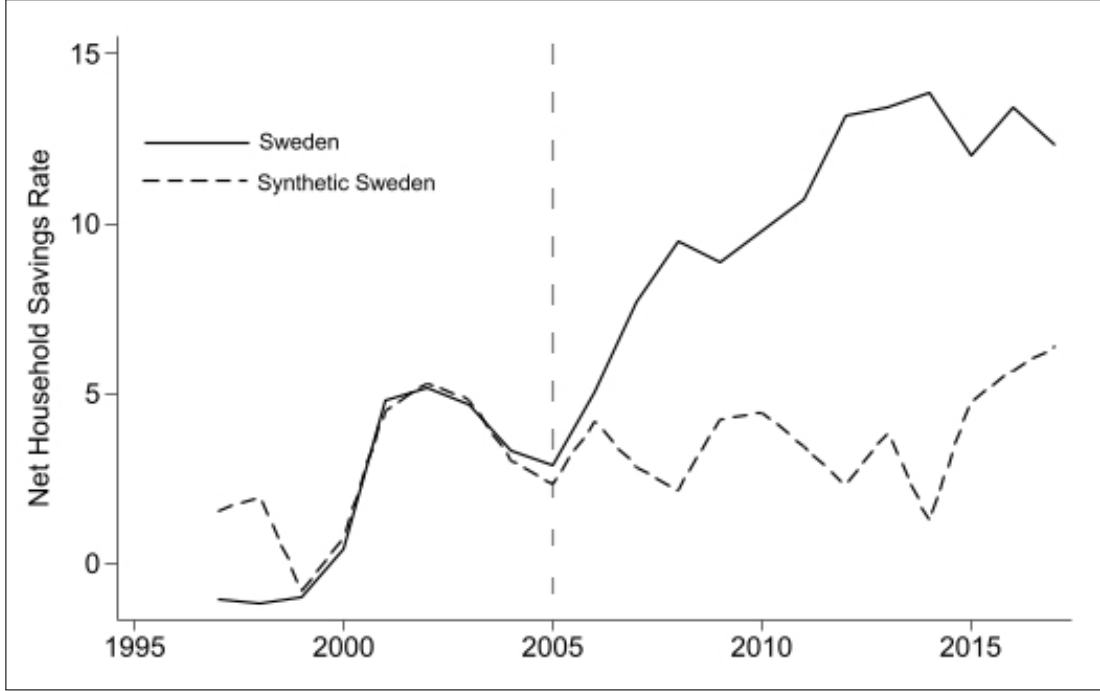


Figure 2: Plot of Net Household Savings Rate during 1997-2017: Sweden and Synthetic Sweden

Table 3: Pre-Treatment Predictor Variable Mean

Predictor variable	Sweden	Synthetic Sweden	Average Control
Fertility Rate	1.6122	1.6167	1.6472
Income Tax(% of GDP)	15.7514	15.7707	9.4925
In-Kind Welfare Transfers	17.7742	14.5243	11.2048
In-Cash Welfare Transfers	15.1088	16.7499	12.0054
Net household Savings Rate(2002)	5.1532	5.3062	5.9751
Net household Savings Rate(2005)	2.8628	2.3202	5.8034

Note: Non-lagged predictors are average from 1997-2005

Along with the pre-treatment trends of the outcome variable, comparing the values of the predictor variables between Sweden and synthetic Sweden can provide an understanding of the fit. Table 3 compares the average values of the predictor variables between Sweden, synthetic Sweden and the baseline case of giving all the units in the control group equal weights. A comparison with the average control provides a view of the improvement to pre-treatment prediction generated by the synthetic control method. For most predictors, except the welfare transfers, synthetic Sweden and Sweden have similar values. Synthetic Sweden showcases a significant improvement from the baseline case of the average con-

trol. Even though the variables of welfare transfers are further away from the true values than the other variables, they are an improvement from the baseline case of the average control. The weights assigned to the predictors by the optimisation carried out to find synthetic Sweden (V matrix) are: Fertility rate - 0.488, Income tax(% of GDP) - 0.344, In-Kind Welfare Transfers -0.006, In-Cash Welfare Transfers -0, Net Household Savings Rate(2002)- 0.095 and Net Household Savings Rate(2002)- 0.067. The low weights assigned to the welfare transfer variables explain the difference in the predicted values between Sweden and synthetic Sweden. It is important to note that from the synthetic control methodology, the variable weights of the predictors represent the relative importance of the variable for the estimation of synthetic Sweden and do not provide any causal insights into the dynamics of predicting the outcome variable.

Table 4: Country Weights in Synthetic Sweden

Country	Unit Weights	Country	Unit Weights
Australia	0	Netherlands	0
New Zealand	0	Slovenia	.262
Switzerland	0	United Kingdom	0
Norway	0	Spain	0
Denmark	.514	Korea, Rep.	0
Belgium	.005	Germany	.002
Estonia	0	France	.175
Hungary	.043	Israel	0

From table 4, we see that synthetic Sweden is comprised of Denmark, Slovenia, France, Hungary, Belgium and Germany, while the rest of the countries in the donor pool are given zero weights. A little more than half of the weight of synthetic Sweden is made up of Denmark, which is reasonable considering both countries have similar socio-economic indicators and have had similar growth in those indicators. Other empirical studies that try to construct synthetic Sweden have also arrived at a large part of their country weight being set to Denmark and other Scandinavian countries (Andersson, 2019, Rubolino and Waldenström, 2020).

The post-treatment difference between Sweden and synthetic Sweden in figure 2 measures the effect of treatment on net households savings rate and is further illustrated in figure 3. The results suggest that the savings rate has increased substantially in Sweden compared to synthetic Sweden as a result of the tax reform. Moreover, the growth is sustained

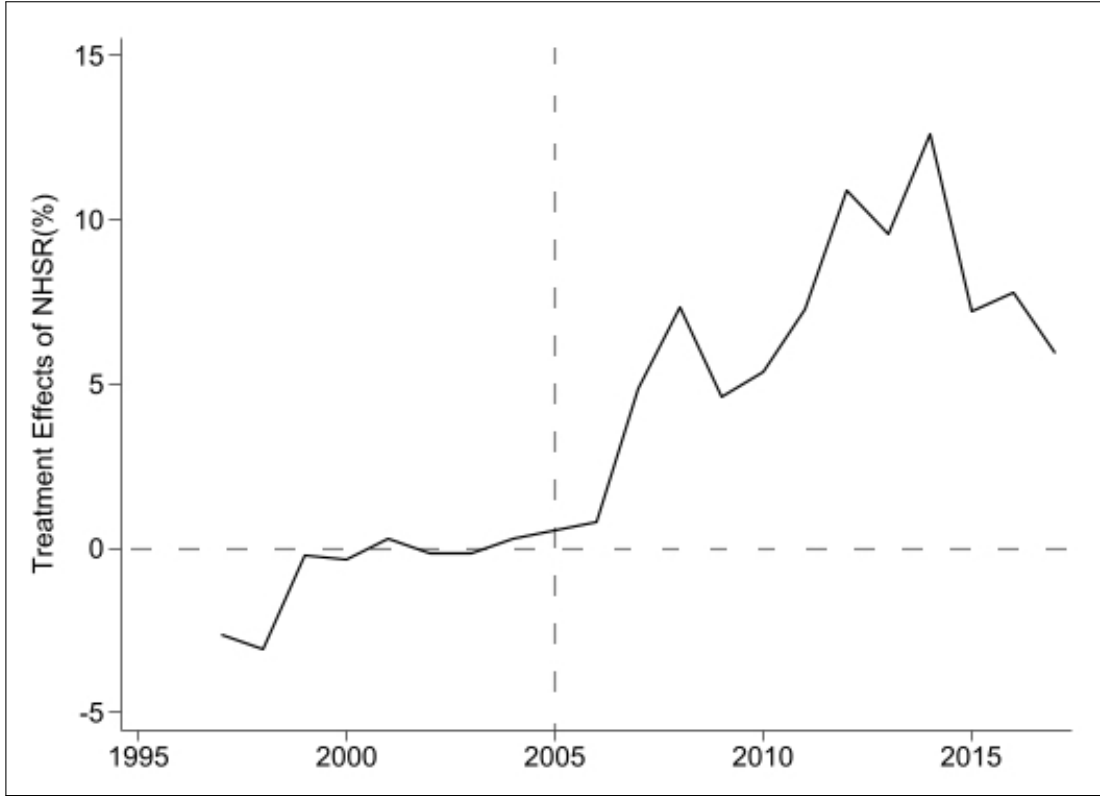


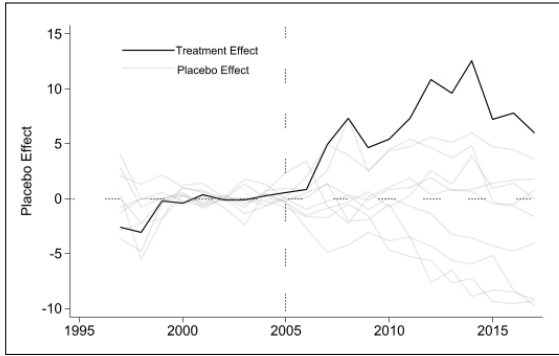
Figure 3: Treatment Effect of Net Household Savings Rate during 1997-2017: Sweden and Synthetic Sweden

through the years of consideration. By the end of the period of consideration, 2017, the outcome variable of Sweden would have been 5.935 units lower or 48 per cent lower than the 2017 savings rate of 12.3 units in actual Sweden if the abolition of net wealth taxes was not carried out. This is a large effect, suggesting a considerable sensitivity to net capital tax changes, similar to results found by Brülhart et al. (2017) and Jakobsen et al. (2020). Unfortunately, due to differences in methods used, we cannot directly compare effect sizes between our and their results.

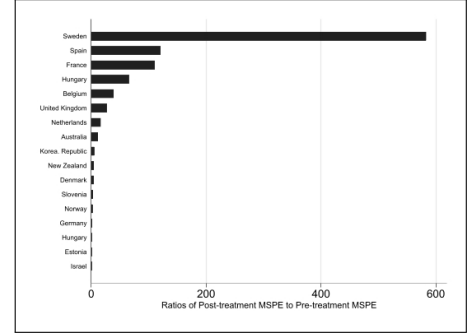
To evaluate the robustness of the results, we run the robustness checks discussed earlier, suggested by Abadie, Diamond and Hainmueller (2010): the "in-time" placebo test, "in-space" placebo test and leave-one-out test.

For the "in-time" test, we perform the analysis on the same data but backdate the treatment time period to 2002 which is randomly chosen to evaluate the trajectory of synthetic Sweden till the actual time period of intervention. From figure 12 in appendix D we see no treatment effect in the time period between the placebo intervention year and the ac-

tual year of intervention. Synthetic Sweden can trace Sweden closely during this period and suggests that the treatment effect results from the abolition of wealth taxes and not because of a lack of predictive power of the synthetic control.



(a) Placebo Treatment Effect

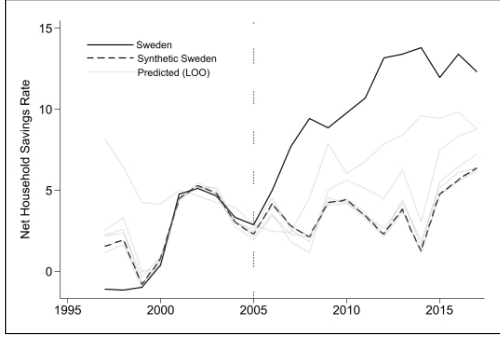


(b) Ratios of Posttreatment MSPE to Pretreatment MSPE

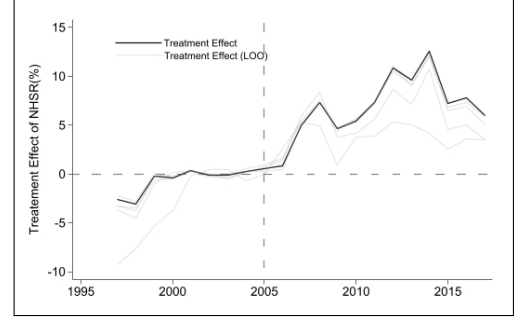
Figure 4: In-space Robustness check on Net Household Savings Rate

For the "in-space" placebo test, we assign treatment to all the countries in the control group and compute the treatment effect using the same synthetic control attributes. This helps establish if the treatment effect estimated for Sweden is significantly larger than for any other country in the control group. This test also helps with the inference in calculating the p-value by computing the probability of finding a treatment effect as large or larger than that obtained for Sweden (Abadie, Diamond and Hainmueller, 2015). Figure 4a and 4b shows the results of this test. We see that the treatment effect for Sweden, the black line, is the largest amongst all the countries in the control group, depicted by the grey lines. The extent of the treatment effect is further illustrated in 4b by the ratio of the treatment effect pre-and post-treatment. The ratio takes into account the pre-treatment fit of the synthetic control computed for each country. In both tests, Sweden has the largest treatment effect. Since there are 16 other countries in the control group, the p-value amounts to $= 1/17 = 0.058$. This is the smallest p-value that is possible to obtain based on the strong exclusion restriction that has been enforced in this paper.

In the leave-one-out test, we compute the synthetic control and treatment effect, iteratively excluding the countries that have a positive country weight from the sample. This test establishes that the treatment effect estimated from the synthetic control is not dependent on any specific country in control. Figure 5a and 5b show the outcome of the leave-one-out test. The magnitude of the treatment effect varies between 3.4971 and 6.0569. The range of the effect suggested by the test can be interpreted as a confidence



(a) Leave-One-Out test of Net household savings rate



(b) Treatment Effect Net household savings rate

Figure 5: Leave-One-Out Robustness check on Net Household Savings Rate

interval, suggesting the minimum and maximum effect of the model. We see that all the permutations show a positive treatment effect and do not challenge the direction of the effect.

A cause for concern is the leave-one-out prediction without Denmark in the donor pool, which is the grey line closest to actual Sweden. Leaving Denmark out makes the synthetic control resemble more closely the real outcome in Sweden, indicating that Denmark has a considerable influence on the result. However, this should be expected because Denmark has the highest weight in synthetic Sweden and because there is an established understanding of the similarity between Sweden and Denmark. Thus, we believe it is natural that Denmark plays a more prominent role in predicting synthetic Sweden than other, less similar OECD countries do. Moreover, Abadie (2021) indicates that if the leave-one-out test predicts a large change in the treatment effect without any noticeable change in the pre-treatment fit, it can cast doubt on the robustness of the results. When Denmark is excluded from the control group, the synthetic control estimates the lowest treatment effect, but since the pre-treatment fit is the worst as indicated in figure 5a the test does not challenge the results. Even though the predicted effect is the lowest when Denmark is excluded, the direction of the effect is in line with the results estimated by the actual synthetic control.

From the findings of all the tests, we can conclude that the results are reasonably robust. Furthermore, the treatment effect is unique to Sweden, and its dependence on Denmark can be explained.

6.2 Entrepreneurship

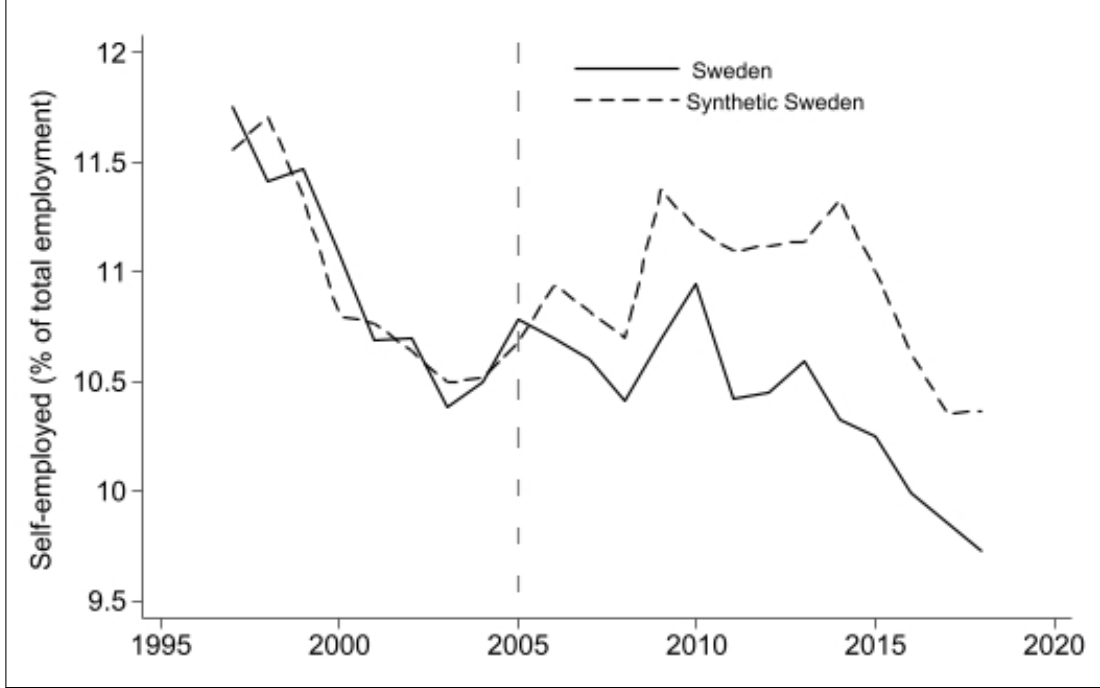


Figure 6: Plot of Self-employed, total (% of total employment) during 1997-2017: Sweden and Synthetic Sweden

From the analysis of the net household savings rate, we move to the effect of the same treatment on self-employment. To comment on the pre-treatment fit of synthetic Sweden compared to Sweden, we consider figure 6 where the outcome variable is plotted. Predicted synthetic Sweden is fairly reasonable in tracing the trend of Sweden over the entire pre-treatment period. The Root-Mean Squared Prediction Error on the pre-treatment period is 0.17, which is quite low, suggesting a good pre-treatment fit.

The next step is to compare the values of the predictor variables between Sweden and synthetic Sweden along with a baseline estimation using the equal-weighted control group. Table 5 presents these values for all the predictor variables considered in the analysis. All variables except for in-kind welfare transfers are estimated accurately by the synthetic control and represent a considerable improvement from the baseline case. The weights assigned to the predictor variables (V matrix) by the optimization are: Interest Rate - 0.12, In-Kind Welfare Transfers - 0, In-Cash Welfare Transfers - 0.557, Net Household Savings Rate -0.126, Self-employment(1999) - 0.115 and Self-employment(2003) - 0.082. The bad prediction of the in-kind welfare transfer is explained by the predictor weight assigned to the variable in the optimisation. As discussed earlier, the variable weights

Table 5: Pre-Treatment Predictor Variable Mean

Predictor variable	Sweden	Synthetic Sweden	Average Control
Interest Rate	4.9786	4.9744	5.0239
In-Kind Welfare Transfers	17.7742	14.8916	11.1333
In-Cash Welfare Transfers	15.1088	15.1071	12.4363
Net Household Savings Rate	3.5354	3.5388	6.7843
Self-employed(1999)	11.4700	11.3278	17.0171
Self-employed(2003)	10.3800	10.4946	15.8959

Note: Non-lagged predictors are averaged from 1997-2005.

are purely optimisation driven and do not lend any causal analysis between the outcome and the predictor variables.

Table 6: Country Weights in Synthetic Sweden

Country	Unit Weights	Country	Unit Weights
Australia	0	Belgium	0
France	0	Hungary	.009
Israel	.099	Japan	.022
Korea, Republic	0	Netherlands	0
New Zealand	.002	Slovenia	.142
Switzerland	0	United Kingdom	0
Norway	.003	Spain	0
Denmark	.641	Germany	0

From table 6, we see that synthetic Sweden is now comprised of Denmark, Slovenia, Israel, Japan, Hungary, Norway, and New Zealand. Similar to synthetic Sweden in Section 6.1, the countries with the largest weights are Denmark and Slovenia.

The effect of the abolition of net capital taxes, which is the difference between Sweden and synthetic Sweden from figure 6 is given in figure 7. We see that treatment has had a negative effect on self-employment in Sweden; that is, self-employment would have been higher in the absence of treatment. At the final time period of consideration in 2017, we see that self-employment in Sweden would have been 0.05% or 0.498 units less in the absence of treatment.

To further analyse the results, we conduct the same robustness tests discussed in Section

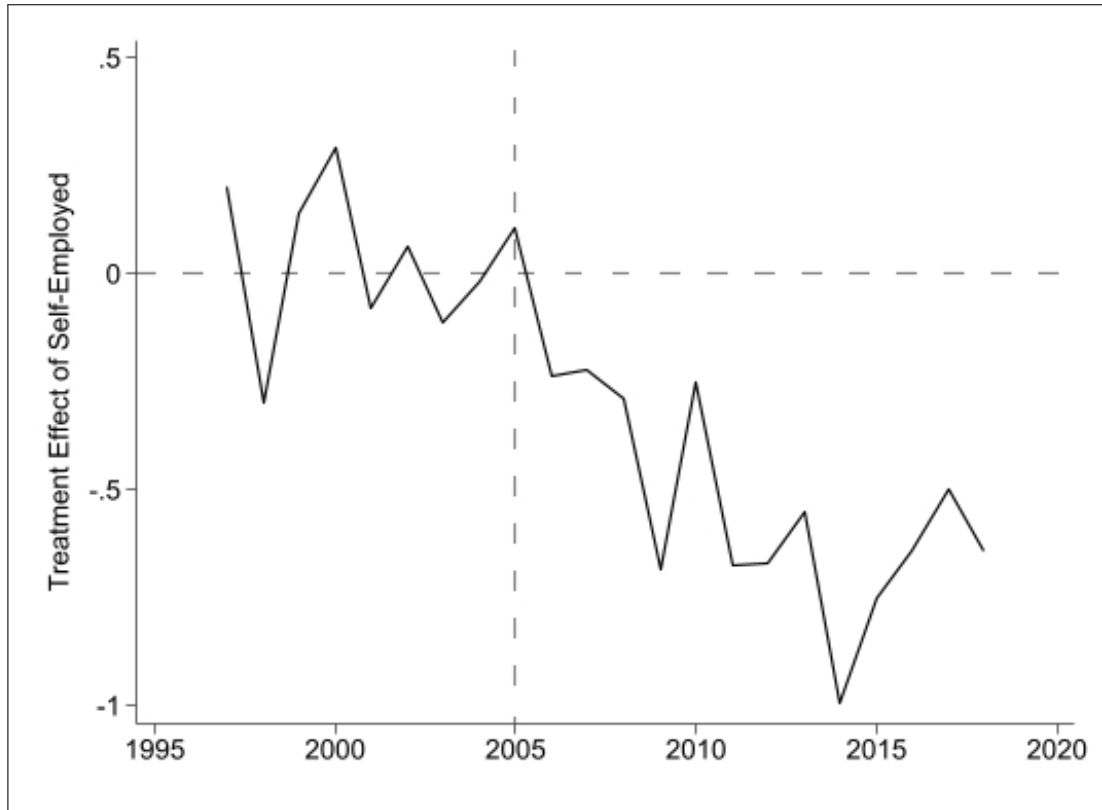
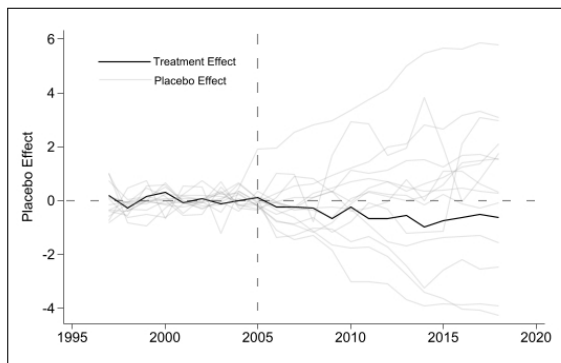
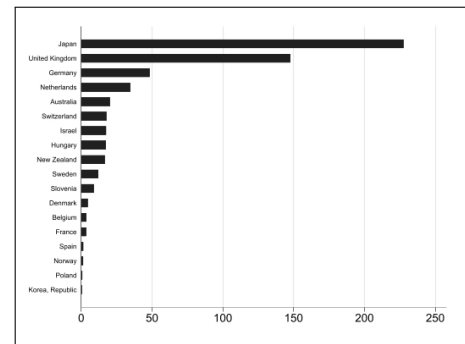


Figure 7: Treatment Effect of Self-employed, total (% total employment) during 1997-2017: Sweden and Synthetic Sweden

4. For the in-time placebo test, the treatment year is changed to 2002 again. From the results shown in figure 13 in appendix D we can infer that synthetic Sweden follows actual Sweden through the remaining pre-treatment years. This suggests that the treatment effect estimated is an outcome of the actual treatment.



(a) Placebo Treatment Effect

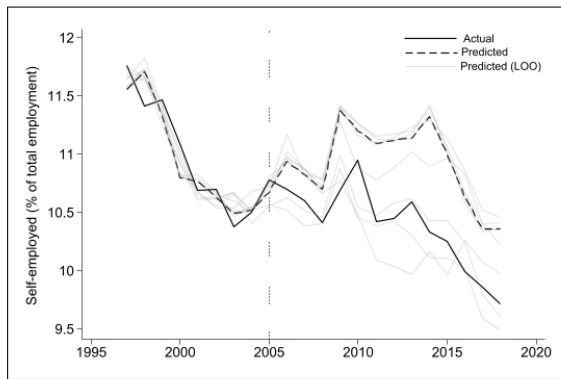


(b) Ratios of Posttreatment MSPE to Pretreatment MSPE

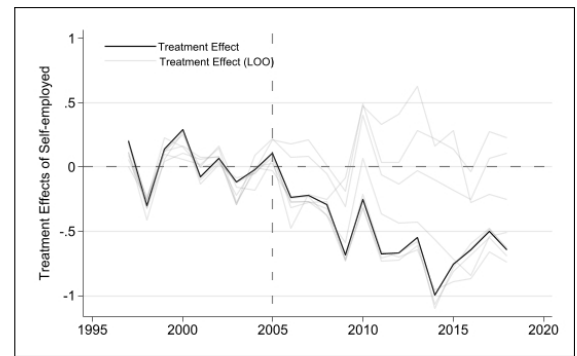
Figure 8: In-space Robustness check on Self-employed, total (% of total employment)

The results from the "in-space" placebo test are illustrated in figure 8a and 8b. Assigning the treatment to countries in the control pool yields a much larger and smaller treatment effect than Sweden. The likelihood of finding an effect larger than that of Sweden, the p-value of the results obtained is $p\text{-value} = 10/18 = 0.59$. This outcome does cast doubt on the results. The high p-value suggests that following the treatment year, the probability of finding an effect larger than that of Sweden is close to 60%, which means the treatment effect estimated could be a random outcome and not related to the treatment of abolition of wealth taxes specific to Sweden. There seems to have been a larger change in the number of self-employed individuals in the countries in the donor pool, which weakens our case of establishing a relationship between the treatment and Sweden.

The results of the leave-one-out test are illustrated in figure 9a and figure 9b. The results of this test also cast some ambiguity on the treatment effect estimated by the synthetic control. All the leave-one-out predictions are acceptable from their pre-treatment fit. However, they have significant differences in the treatment effect predicted, even predicting a positive treatment effect in some cases. For example, the range of the treatment effect predicted from the LOO test is -0.6588 and 0.2730. Therefore, the test suggests that the results predicted are not statistically significant.



(a) Leave-One-Out test of Self-employed, total (% of total employment)



(b) Treatment Effect of Self-employed, total (% of total employment)

Figure 9: Leave-One-Out Robustness check on Self-employed, total (% of total employment)

The findings of the tests cast serious doubt on attributing the treatment effect estimated to the abolition of wealth taxes. As the results of the analysis of self-employment are not robust, no treatment effect can be ensured.

7 Discussion

Our results point towards an effect on savings from the abolition of the taxes, whilst we could not find any significant result for an impact of entrepreneurship. In the sections below we will discuss the implications and limitations of these findings, first on savings and then on entrepreneurship.

We measure the impact of the tax reform on the savings rate to have resulted in a 48 per cent increase in the savings rate. Unfortunately, our study cannot discern the underlying mechanism to why this increase would come about. There could be a mechanical effect to it, with people saving more because they have more money. This will be the case if people save the additional money they gain. Unfortunately, due to the lack of micro-data, we cannot calculate the mechanical effect as it would be dependent on individual wealth. Jakobsen et al. (2020) find in their study that the mechanical effect amounts to around one-tenth of the change, suggesting that the increased saving is not only due to a mechanical effect but also has a behavioural aspect to it. Life cycle models that measure wealth inequality (Carroll and Samwick, 1997, Benhabib, Bisin and Zhu, 2011) find that savings increase because of precautionary motives and bequest motives. However, this cannot explain all wealth accumulation, and other proposed reasons for savings are entrepreneurship (Cagetti and De Nardi, 2006). Although we find an increase in savings, we cannot discern an effect on entrepreneurship, so our study cannot provide further evidence of this being a transmission channel. However, this does not mean there is no effect on entrepreneurship, which will be discussed more below.

The notion that people save more because they have more capital would go against standard economic theory that proposes that a permanent increase in income would not lead to an increase in savings rate but rather lead to an increase in consumption that can be maintained over the life cycle. This would be conditional on people believing the tax policy change to be permanent. According to theory, with a permanent abolition of capital taxes, people should change their behaviour to incorporate this additional net-of-tax wealth. If people believe the changes to be temporary and foresee that the government will shift or change their opinions, their behaviour could be different. Then, the substitution effect might prevail, as people see it as their chance to accumulate as much capital as possible when they can do it without paying taxes on it. In the Swedish case, people likely believed the abolition to be permanent, as the first of the changes were enacted by the more left-leaning parties, which are usually more supportive of capital

taxes than the right-leaning parties. Moreover, it is more difficult to re-introduce a tax than to change tax levels, making it more unlikely that the tax policy would change. As savings increased, we would believe the substitution effect to be dominant.

Our result suggests a significant impact of the tax that would point toward taxpayers being very sensitive to capital taxes and greatly reducing their savings rate when a tax is levied. This interpretation would follow the findings of Brülhart et al. (2017) who finds a considerable sensitivity to wealth taxes in Switzerland. On the other hand, as other studies find no or minor sensitivity to taxes, one can question why we find such a large impact. In relation to many other countries in our sample, Sweden has a lower savings rate before and after the reforms. This could be due to the more extensive welfare system leading to Swedes not having the same need to save for retirement, health care, or education as individuals of other countries might. Hence, an increase of almost 50 per cent in the savings rate might reflect the low levels that existed before. With the reduction of capital taxes, the people most affected by the tax could have decided to increase their savings as their capital would not be taxed as heavily any more. As the rich hold proportionally more of the wealth, shifting their behaviour could significantly affect the total savings rate. As we only have access to aggregate savings rate data and not split on wealth levels, we cannot discern the impact on different parts of the wealth distribution. Further research to study the sensitivity of the tax on different parts of the wealth distribution would be interesting to undertake to uncover the underlying mechanism behind the change.

Another critical dimension is tax evasion. Many previous studies emphasize that part of the problem of capital taxes have been taxpayers avoiding or evading them (Seim, 2017, Duran-Cabré, Esteller-Moré and Mas-Montserrat, 2019). Seim (2017) suggests that people were evading the wealth tax in Sweden by not reporting their wealth correctly. However, as savings rate is an aggregate measure and not self-reported this should not affect our estimates. Tax evasion could also include capital flight, which is the movement of money out of Sweden. Capital flight is difficult to measure and hence we have no reliable estimates to investigate whether its prominence has decreased after the repeal of the capital taxes. Thus, we cannot determine if capital flight had an impact on savings rate in Sweden, but there is a possibility that the repeal of the taxes led to a reduction of capital flight. This would affect the level of capital in Sweden, but as savings rate is measured based on aggregate income and not capital the effect is likely smaller. Hence, it is possible that our estimated effect is smaller if capital flight impacted income but

we do not believe this to have happened to a large extent. Studying the effect of net wealth taxes on capital flight would be an interesting area for future research, potentially providing insight into its impact on capital levels and saving rates.

The savings rate in Sweden has increased over the studied period, from -1.1 % in 1997 to 12.3 % in 2017, and our study suggests that the repeal of capital taxes is one reason for this change. Taking a broader perspective, the repeal of capital taxes almost by definition benefits the individuals in the top of the wealth distribution, as it is specifically wealth that is no longer taxed. That this also increases savings could point toward the rich in society increasing their savings, as they reap the most benefit of the reforms. Along with research hypothesizing that the savings rate increase with income, this facilitates a higher rate of wealth accumulation for the wealthy. Although we cannot research the impact this change has had on wealth inequality, due to the lack of high-quality data on wealth, it could be theorized that this can lead to a higher concentration of wealth in society. For example, Lundberg and Waldenström (2018), using the individual data from the Swedish Wealth register, find a 10 per cent increase in the Gini coefficient in the years following the abolition of wealth taxes. Building on the findings of this paper, future research with access to more individualized data can test the potential linkages.

For self-employment, our study is not able to pass the robustness check and hence does not find any significant effect. These results do not necessarily mean that there is no significant effect of the abolition of capital taxes on the level of entrepreneurship in Sweden, but that our study cannot discern it. Abadie (2021) in their section about contextual requirements, point out that since synthetic control by nature is a comparative study, that the presence of a comparable group is fundamental. Though a strong exclusion restriction has been implemented to limit any bias in the control group, the placebo tests suggest that the outcome variable has changed a lot in the control countries. Hence, it could be that another factor has caused self-employment to evolve in these countries, making them less ideal of comparison than previously thought.

Another reason we cannot capture an effect could be the obtuse measurement of entrepreneurship we had to use, self-employment, due to data restrictions. Self-employment measures everyone that is working for themselves, rather than for an employer, but this is not necessarily the same as entrepreneurship, although the distinction can be challenging to make. Self-employed can also include people who work in sectors where it is necessary to be self-employed, for example, in creative jobs where freelancing is common. This

might be done out of necessity rather than ambitions to start a successful company or to increase their income. If this is the case for self-employed, then the capital taxes would not impact their decisions to become self-employed. Halvarsson, Korpi and Wennberg (2018) explore the income of entrepreneurs in Sweden and find different effects for self-employed individuals who have sole proprietorship of their business and whose business is incorporated. The individuals whose businesses are incorporated are found to be at the top of the income distribution whereas self-employed individuals in a sole proprietorship can be found at the bottom of the income distribution, often earning less than they would at a wage job. This shows that not all self-employed are successful, and capital taxation might only be a concern for the incorporated entrepreneurs and thus not impact the overall level of self-employed.

Moreover, Rietz and Henrekson (2015) show that at the end of the Swedish wealth tax, business owners barely paid any wealth tax, so it would only be through the channel of general wealth that most entrepreneurs were taxed. Moreover, it could be that not enough time has passed for an effect to be discernible. Even without wealth taxes, it would likely take some time to build up the capital needed to start a business so changes might not be immediate.

Even though the results do not point out any significant effect of capital taxes, the general downward trend in self-employment is interesting to reflect on. Though self-employment is not an exact measure of entrepreneurship, the variable would overestimate the number of entrepreneurs. Therefore a decline in self-employment could be inferred as a decline in entrepreneurial activity. Some studies also show that a high personal net worth does not increase the likelihood of engaging in entrepreneurial activity but increases the likelihood of being successful if you engage in entrepreneurial activity (Frid, Wyman and Coffey, 2016). Suppose entrepreneurial success is concentrated at the top. In that case, entrepreneurialism becomes an amplifier rather than a modifier of wealth inequality in society Piketty (2014), and there is some evidence of increased wealth inequality in Sweden post the wealth tax reform (Lundberg and Waldenström, 2018). Moreover, Saez and Zucman (2019) argue that capital taxes would be a concern for already established businesses and not start-ups who are not expected to make a lot of money in the beginning. In addition, established businesses often devote significant resources to securing their market positions and keeping out newcomers. Hence it could be that reducing wealth taxes benefit already existing businesses and hinders the establishment of new entrepreneurs which could diminish competition and innovation.

Next, we focus on the limitations of our study. One potential concern is the relatively short pre-treatment time period of 9 years. Even though there are no clear guidelines for the amount of pre-treatment years in the synthetic control literature, conducting and matching the outcome variable on a long pre-treatment time frame is believed to increase the robustness of the results. Abadie (2021) raise concerns that a short pre-treatment carries a risk of overfitting and specification search, but does not establish the minimum number of pre-treatment periods. Due to limitations in the data, we are restricted to starting our pre-treatment in 1997, and although more years are preferable, many papers use a similar time span as we do.

Another limitation is the lack of micro-data. As we only have access to aggregate data, we are confined to looking at aggregate savings rate and levels of entrepreneurship. Having access to micro-data that specified income and wealth holdings of individuals linked to their savings rate and entrepreneurship would have been useful to analyse the impact on different income groups. This would have helped uncover what is driving our results. This would be especially useful as the existing literature suggests that the outcome variables vary widely across different income and wealth deciles.

When constructing a counterfactual in a synthetic control study, it is crucial that the counterfactual is made up of countries comparable to the studied country. We have chosen to include the OECD countries as our donor pool, as the OECD is an organisation which requires its members to have similar social and economic opinions. Thus, all countries in the OECD share values and policies, making them a good comparison to Sweden. Moreover, the Scandinavian countries, generally thought to be similar to Sweden, are part of the OECD, furthering the argument that the donor pool consists of countries similar to Sweden.

Regarding external validity, our results could be an indicator for other countries, as the mechanisms of taxation behaviour can be expected to work similarly. As most papers do not look at the repeal of taxes, our relatively high treatment effect can also be plausible in other countries, although it is unlikely to have the exact same effect. This is underlined by the fact that most other countries in the sample have a higher savings rate than Sweden. This could be due to the difference in social security systems making the need to save lower in Sweden than in countries with less expansive welfare systems. Another reason could be Sweden's high income taxation, if lower level of net income makes saving more difficult. It is likely that individuals react similarly to changes in capital taxes and that

the importance of the substitution effect is similar in the OECD countries. However, as we have only analysed one country, it is difficult to draw any stronger conclusion about the effect in other countries, and more studies would have to be conducted to see if there is a pattern.

8 Conclusion

This paper sets out to analyse the impacts of the Swedish capital tax reforms of 2005 to 2007 on savings rate and entrepreneurship. During this period, Sweden repealed the wealth, the inheritance, the gift and the property tax, which creates a good case study to research the impact of the abolition of net capital taxes. A synthetic control method is employed to create a counterfactual Sweden based on OECD countries to measure the difference in trend between synthetic Sweden and actual Sweden. This indicates what could have happened if Sweden had not removed the taxes. We find a large, significant increase in the savings rate of 48 per cent. However, we are not able to establish an effect on self-employment, as our results do not pass the robustness checks.

There is a growing literature researching the impact of net capital taxes, mainly the wealth tax, but our paper differs by using the synthetic control method rather than difference-in-difference. Using a synthetic control has the benefit of providing a more reliable and robust counterfactual with fewer binding assumptions, which are necessary for causal inference.

Moreover, our paper analyses the repeal of taxes, which provides interesting insight into the impact of the total removal of a tax, compared to most papers that are only able to measure the impact of a change in the tax rate. A repeal can have different behavioural effects because it often involves a more considerable reduction in taxes and is more likely to be perceived as a permanent change. In addition, we are able to analyse the impact of removing multiple capital taxes, which can also result in greater incentives to change behaviour due to a more significant overall tax reduction.

All in all, our results of savings rate being sensitive to net capital taxes goes along with results found by Jakobsen et al. (2020) and Brühlhart et al. (2017). Other papers find different results, but many propose that it could be due to tax evasion impacting official data. As we study a repeal, tax evasion is not a big concern as there is no incentive to

hide capital to avoid paying capital taxes. However, as we only have access to aggregate data, we would need more detailed data to investigate this effect. In general, to uncover the mechanisms behind our results, micro-data is needed that specifies individuals' wealth holdings and income. Hopefully, future research can detect this relationship.

As capital taxes have gained more public recognition lately, primarily as a potential solution to tackle the growing wealth inequality in society, the impact of capital taxes needs to be further studied to make well-founded policy choices. Our study contributes to this by suggesting that capital taxes have an impact on savings behaviour, and thus this channel of effect should be considered before enacting policies. An increased savings rate could be a positive outcome to ensure stable life-time consumption or contribute to increased investments in businesses. But on the other hand, an increase in savings rate with income could accelerate wealth inequality in the society. Thus, to reach policy conclusions decision makers also need to consider the outcome of an increased savings rate. However, as the literature on the impact and the underlying mechanisms is inconclusive, it is important to conduct more extensive research to understand all the different policy implications.

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A Exclusion Restriction

The following table illustrates the prevalence of various taxes net capital taxes in different OECD countries. This information has been used to enforce the exclusion restriction described in the paper, the countries that have had treatment-like changes in the time-period relevant to the study are excluded. The countries with an X fail the exclusion restriction and are moved into the donor pool for further verification on data availability.

Countries	Wealth Tax	Property Tax	Inheritance Tax	Selection
Australia	Never had a wealth tax	Present and had no major changes in the time period relevant to the paper	Not present in the time period relevant to the paper	X
Austria		Present	Abolished in 2008	
Belgium	Introduced a wealth tax in 2017	Present and differs slightly by region. Increased around 2005 but tax revenue stable throughout the period relevant to the paper	Present without breaks in the time period of relevance to paper. Share as part of tax revenue has steadily increased over the years.	X
Canada	Never had a wealth tax	High property tax compared to OECD average. Differs by region.	Repealed in 1972	X

Countries	Wealth Tax	Property Tax	Inheritance Tax	Selection
Chile	Never had a wealth tax	Present and differs slightly between urban and rural property	Present throughout the period. No exemptions for children.	X
Colou- mbia	Abolished in 1992 but reinstated in 2002	Present and tax rates decided by the municiplaity	Not present	
Costa Rica	Never had a wealth tax	Present	Not present	X
Czechia		Present and collected at the municiplaity level	Repealed in 2014	X
Denmark	Abolished in 1997	Present. Introduced a near identical property value tax in 2000 to replace the existing tax	Present and the current level of taxation implemented in 1995	X
Estonia	Never had wealth tax	Present and introduced in 1993. Tax revenue is low compared to the OECD average.	Not present in the time period revelant to the paper	X
Finland	Abolished in 2006	Present and first introduced in 1993	Present throughtout the time period revelant to the paper	

Countries	Wealth Tax	Property Tax	Inheritance Tax	Selection
France	Modified in 2017 to exclude many assets, but still counts as net wealth tax but only a small part of personal wealth. Only calculates real estate wealth over a higher threshold.	Present	Present. Threshold mostly constant, but the tax rate changed in 2010. Tax revenue has increased with increased marginal rates	X
Germany	Abolished in 1996	Present	Present throughout the period relevant to the paper. Exemption thresholds changed a couple of times in 1997 and 2009, but the the tax rate was reduced in 1995. Tax collection seems to be stable (increasing slowly), even with the increase in exemption threshold. Tax revenue has been present all the years.	X

Countries	Wealth Tax	Property Tax	Inheritance Tax	Selection
Greece		Present and the tax rate increased through the period of relevance to the study		
Hungary	Never had a wealth tax	Present and is collected at the municipality level	Implemented in 1918 and hasn't been changed. Children are exempt from the schedule	X
Iceland	Abolished in 2006 due, but reinstated it again from 2010 to 2015	Present	Present and the current scehdule implemented in 2006	
Ireland	Abolished in 1978	Introduced in 2013	Present throughout the period relevant to the paper	
Israel	Never had a wealth tax	Not present during the time period revelant to the paper	The tax was abolished in 1981. Not present during out period relevant to the study	X
Italy	No separate specific wealth tax; however there exists a wealth tax on assets held abroad	Present	Present but was paused from 2001 to 2006	

Countries	Wealth Tax	Property Tax	Inheritance Tax	Selection
Japan	Abolished their wealth tax in 1953	Present	Present throughout the time period relevant to the paper	X
Korea	Never had a wealth tax	Present	Present throughout the time period relevant to the paper	X
Latvia	Never had a wealth tax	Present and first introduced in 1997	Not present throughout the period relevant to the paper	
Lithuania	Never had a wealth tax	Present and first introduced in 1992	First introduced in 1996, and amended in 2002. But the tax revenue data shows zero inheritance tax collected.	X
Luxembourg	Abolished wealth tax in 2006	Present and collected by the municipality	Present throughout the time period relevant to the study with no changes in the tax rate. Direct heirs not taxed	
Mexico	Wealth tax abolished in 1989	Present	Not present throughout the period relevant to the paper	

Countries	Wealth Tax	Property Tax	Inheritance Tax	Selection
Nether-lands	Altered in 2001 and replaced by 30% income tax on a fictitious return of 4% on financial assets (corresponds to a net wealth tax of 1.2%)	Present	First introduced in 1975 and has never been paused/eliminated.	X
Norway		Present and collected at the municipality level	Repleaded in 2017	X
New Zealand	Never had a wealth tax	Present and collected by the municipality	Repleaded in 1992. Not present during the time period relevant to the study	X
Poland	Never had a wealth tax	Present and introduced in 1991	The current schedule was implemented in 1983. Present throughout the years, even though the OECD tax revenue data indicates no tax revenue.	X

Countries	Wealth Tax	Property Tax	Inheritance Tax	Selection
Portugal	Never had a wealth tax	Present and collected by the municipality	Repealed in 2004	
Slovak Republic	Never had a wealth tax	Present and introduced in 1993	Repealed in 2004	
Slovenia	Never had a wealth tax	Present and collected by the municipality	First introduced in 1988, the current schedule was implemented in 2006. Children are exempt from the tax	X
Spain	A 100 % tax credit was given in 2007, effectively taking away the wealth tax between 2008-2010. The tax rate depends on the region. International assets also are taken into account	Present and is collected by the municipality	Present throughout the time period relevant to the paper. But the tax schedule is decided by the region and varies widely	X

Countries	Wealth Tax	Property Tax	Inheritance Tax	Selection
Switzerland	Imposed by cantons. Some regions have zero taxation but almost all of the cantons have a wealth tax. Has been present throughout the time period relevant to the paper	Collected at the Canton (municipality level), however, the total tax revenue at the country level is quite stable based on OECD tax revenue data.	The tax schedule is decided in each canton (regions). Rates and thresholds vary quite a bit. Tax revenue increased in the 1990s but then decreased post-2000.	X
Turkey	Never had a wealth tax at least during the period that is relevant to us	Lack of confirmed sources about the history of the tax, OECD tax revenue data indicate that the tax might have been introduced in 1998.	Implemented in 1959. Present without major changes in the time period relevant to the study	X

Countries	Wealth Tax	Property Tax	Inheritance Tax	Selection
United Kingdom	Never had a wealth tax atleast during the period that is relevant to us	Introduced in 1993 and present without major changes throughout the time period relevant to the paper.	Present throughout the time period relevant to the paper. The exemption threshold changed each year, but the tax rate has been the same since 1990	X

B Data Collection and Availability

From the countries that have been selected to be part of the donor pool after establishing the exclusion restriction, check the data availability of the outcome variables and predictor variables. Countries that have missing values in the time-period of consideration are excluded. Again, countries in bold are the one that finally make up the final control group to carry out the synthetic control method.

Country	Net Household Savings Rate		Self-employment	
Australia	Complete	X	Complete	X
Belgium	Complete	X	Complete	X
Canada	Data missing for In-kind Transfer		Data missing for multiple predictor variable	
Chile	Data missing for NHSR		Data missing for multiple predictor variables	

Country	Net Household Savings Rate		Self-employment	
Costa Rica	Data missing for NHSR		Data missing for multiple predictor variable	
Estonia	Complete	X	Data missing for multiple predictor variables	
France	Complete	X	Complete	X
Hungary	Complete	X	Complete	X
Israel	Complete	X	Complete	X
Japan	Data missing for NHSR		Complete	X
Korea, Rep.	Complete	X	Complete	X
Lithuania	Data missing for NHSR		Data missing for multiple predictor variable	
Netherlands	Complete	X	Complete	X
New Zealand	Complete	X	Complete	X
Poland	Data missing for NHSR		Data missing for multiple predictor variables	
Slovenia	Complete	X	Complete	X
Switzerland	Complete	X	Complete	X
Turkey	Data Missing for NHSR		Data missing for multiple predictor variables	
United Kingdom	Complete	X	Complete	X
Norway	Complete	X	Complete	X
Spain	Complete	X	Complete	X
Denmark	Complete	X	Complete	X
Germany	Complete	X	Complete	X

C Evolution of Net capital taxes in the Counterfactual

To quantify that the counterfactual has not undergone any treatment-like changes i.e major changes to their capital tax policies, we have constructed the net capital tax revenue from the country weights decided by the synthetic control method in each of the analysis. The variable is not an equivalent to the treatment studied, it gives us a measurable approximation to check the validity of the counterfactual. The presence of any irregularities in the trend would indicate that the counterfactual is biased and cast doubt on the treatment effect estimated.

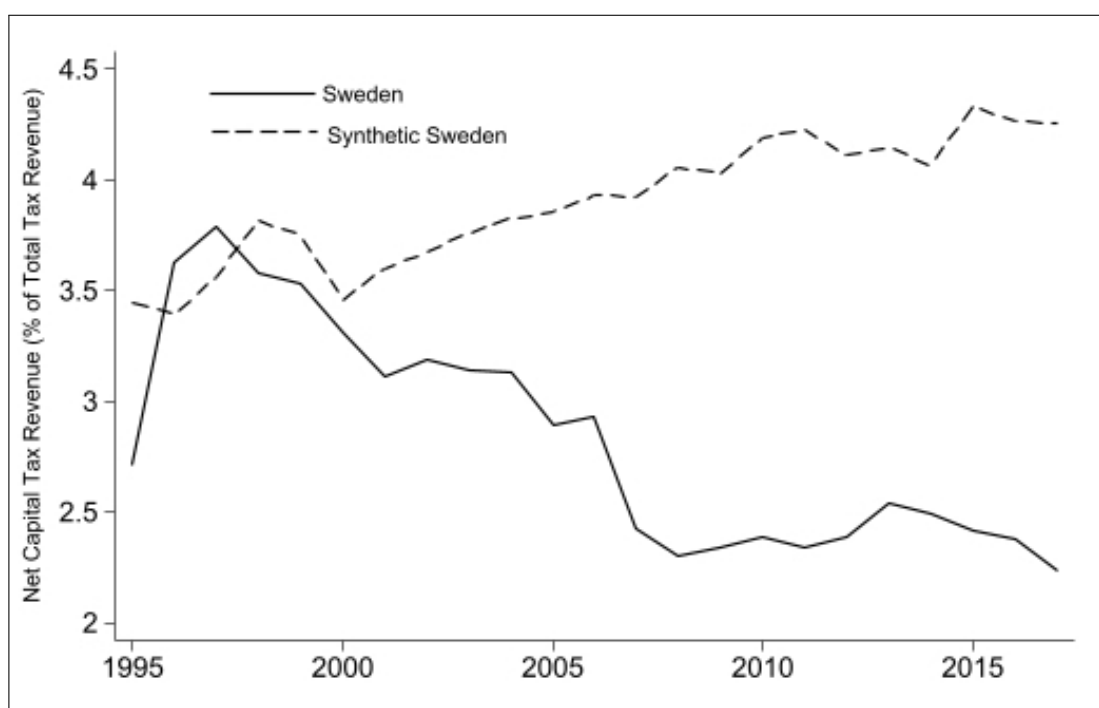


Figure 10: Plot of % of Net Capital Tax Revenue in Sweden and Synthetic Sweden: Net Household Savings Rate

From both the graphs it is clear that the counterfactuals have not had any major shocks or changes to their net capital tax revenue.

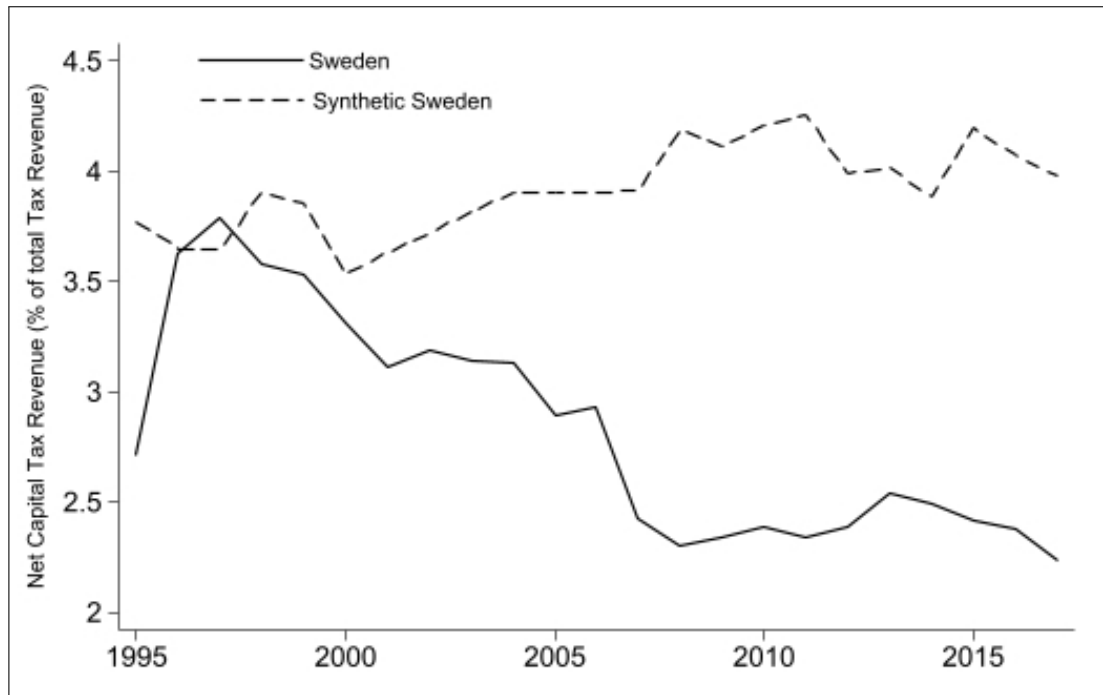


Figure 11: Plot of % of Net Capital Tax Revenue in Sweden and Synthetic Sweden:
%Self-employed

D Plots of In-time Placebo Test

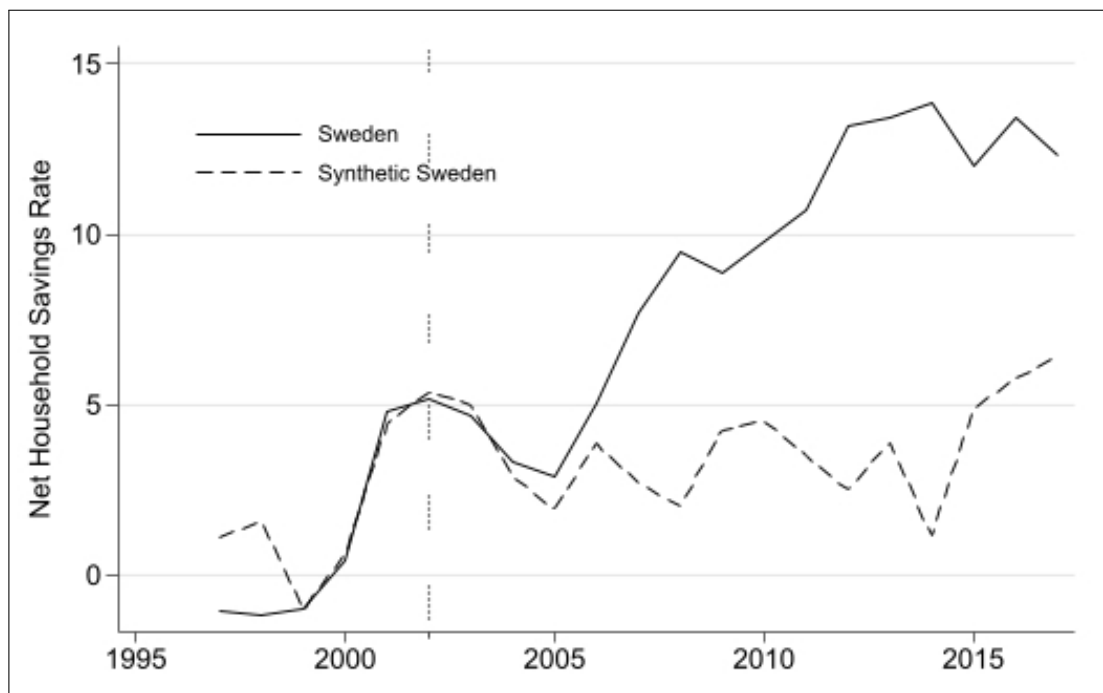


Figure 12: In-time Robustness Test: Net Household Savings Rate

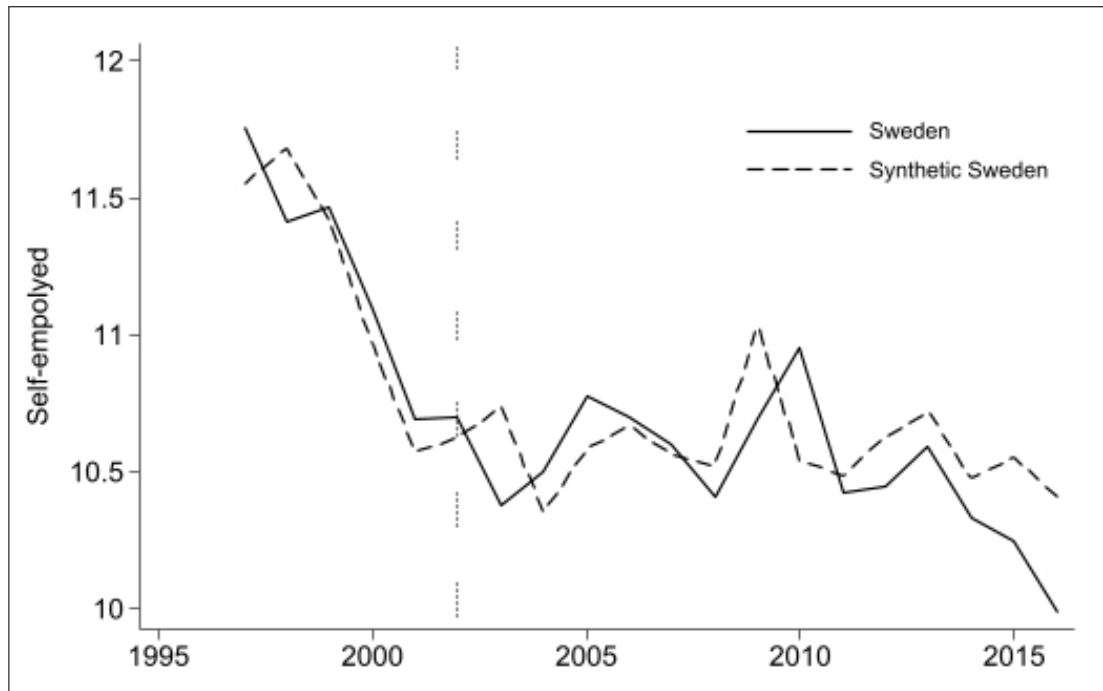


Figure 13: In-time Robustness Test: % Self-employed