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Bachelor Thesis [programme International Bachelor of Economics and Business Economics]

The Impact of The Single European Act on Income Inequality in The Netherlands: evidence from a Synthetic Control approach

Name student: Alexandru–Stefan Lumina

Student ID number: 596495

Supervisor: Agnieszka Markiewicz

Second assessor: Elliott Weder

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1. Introduction

Within-country income inequality is one of the most important indicators of prosperity and well-being of society (Lee & Chang, 2016). In literature, it is prominently assessed using measures such as the Gini coefficient and refers to the degree in which income is disproportionately dispersed among the various individuals and segments of a population in each geographical area. This issue has garnered widespread attention from both researchers and policymakers, largely due to the 10th Sustainable Development Goal endorsed by the United Nations General Assembly in 2015, which aims at "reducing inequality within and among countries".

Since World War II, we have witnessed several initiatives aimed at fostering cooperation among countries worldwide, which in the public opinion was refereed to extensively as "globalization." Nonetheless, the effects of economic integration from a distributional perspective are still widely debated among economists and policymakers. It looks like there is a consensus among many researchers that economic globalisation and income inequality have at least some types of relationship (Heimberger, 2020). However, the magnitude and sign of this interaction remains unclear. While others say this phenomenon makes the rich richer and the poor poorer, others argue that it can lead to overall economic growth, potentially benefitting all segments of society. Theoretical models such as Stolper-Samuelson (Stolper & Samuelson, 1941) and empirical studies point in opposite directions regarding the impact of globalisation on income inequality in both developed and developing countries. Even among leading empirical research on income inequality there seems to be opposing views on the interplay between these two factors, differences that are mainly generated by how data is measured, as well as the methods employed for the analyses (Naanwaab, 2022).

My thesis will have at the forefront the Single European Act (SEA), which came into force on the 1st of July 1987, representing one of the biggest shocks to how European economies currently operate. After 37 years since its ratification, it seems like there is a large strand of people that still put into question the benefits of this project (Lehtimäki et al., 2020). As the first major revision of the Treaty of Rome, it aimed at fostering economic integration in Europe by creating a single, common market among its founding members, among which was also The Netherlands. This legislative change had several profound implications, including the removal of trade and fiscal barriers, therefore intensifying the competition among European businesses. The harmonization of national legislatures facilitated cross-border business operations and

helped integrate peripheral economies into a broader market. Papers such as Lehtimäki et al. (2020) examined the role of the Single European Market on GDP Per Capita and found that Member States realized a significant growth premium due to their increased economic integration, although this benefit differs depending on whether countries are relatively larger or smaller. Nonetheless, one can also ask themselves to what extent welfare was affected by this policy.

My research will add to previous empirical literature concerning the Single European Act by only focusing on its welfare effects rather than on GDP Per Capita. Therefore, in this thesis, I use the novel Synthetic Control Method developed by Abadie et al. (2010) to find the causal effect of adhering to the Single European Act and being part of the Integrated Market on income inequality in The Netherlands, which, to my knowledge, is the first in this direction. I will focus on the two dimensions that globalization can affect within-country income inequality, mainly trade and financial openness. The literature on the interplay between globalization and income inequality through the lenses of a single country is vast: China (Wei et al., 2001), South Korea (Mah, 2003), Mexico (Borraz and Lopez-Cordova, 2007), and Turkey (Ucal et al., 2016). Consequently, the results of this research can shape public opinion about the role of the European Union and its most important projects on our livelihood.

To construct the Synthetic Control, I use countries that did not join any single market initiatives in the period of my analysis. Multiple predictor variables of income inequality, as well as outcome lags ensure the similarity of the counterfactual with the treated unit, in this case, The Netherlands. After the main analysis, the robustness of the results will be put to test. Since my method is extremely sensitive to the way my variables are measured, I try to see whether the sign and the magnitude of my initial analysis are consistent in the case that I change the way income inequality is measured. Initially, I use the Gini coefficient extracted from the Estimated Household Income Inequality (EHII) Database computed by the University of Texas Inequality Project. Then, I use the Market Gini coefficient from the Standardized Income Inequality Database (SWIID) of Solt (2016). Lastly, I use "In-Time" placebo tests to check for anticipation effects, as well as "In-Space" placebo tests to compute the significance of my results.

For The Netherlands, I find no significant impact of the Single European Act on income inequality as measured by the EHII Gini coefficient. Income inequality initially increases in the first 3 years post the implementation of the Single Market policy, and afterwards it decreases sharply compared to the Synthetic counterfactual. The difference is mainly negative,

although it fluctuates substantially over the first 13 years post-intervention. Overall, I see a 40% improvement in equality in The Netherlands due to adhering to the Single European Act. The "In-time" placebo test shows that there are no anticipation effects of the SEA on income distribution, however the "In-Space" placebo test indicates that these results are not significant for any of the years after the policy took effect. However, the significance improves the longer the time passes, indicating that there might be longer-term effects to be further explored. My robustness proves that changing the dataset does affect the outcome, although the sign and the significance of the results were consistent with the initial analysis.

The rest of the paper is structured as follows: Chapter 2 describes previous literature in the way economic openness affects income inequality. Before, I define the main mechanisms that the Single European Act can affect income inequality and describe the main political and economic factors that led to the establishment of an Integrated Market in Europe. Chapter 3 discusses the data used for my main analysis, while Chapter 4 delves into the Synthetic Control Method and its potential benefits over traditional econometric models for comparative analyses. This will be followed by Chapter 5 with the presentation of the results and Chapter 6 with my robustness check. Lastly, Chapter 7 will further discuss the main findings and limitations of the paper, as well as the conclusion.

2. Literature review

2.1 Defining globalization

This paper will take the same approach as Heimberger (2020) in only limiting the analysis to the economic component of globalization as captured by trade and financial openness. Any other aspects pertaining to the multifaced nature of globalization, such as labour mobility or institutional effects, are beyond the scope of this paper and the further analysis presented in the following chapters. When talking about trade openness, the most widely used measure is the sum of imports and exports as a percentage of GDP. Financial Openness is measured using FDI flows or other indices for capital account liberalization (Heimberger, 2020). The stock or flow of FDI relative to GDP reflects the degree of foreign ownership and investment in domestic enterprises and is a key measure for financial openness that was also promoted by research such as Gräbner et al. (2018).

2.2 Political and economic background for the formation of the Single European Market

The next part aims to underline the political background for the establishment of a Single European Market, which was the consequence of several economic and political factors that had been prevalent within the European continent for the past four decades before its formation. The need for an integrated and collaborative European community dates to 1945, which saw the termination of one of the bloodiest and most destructive conflicts in history: World War II. The economic context that all nations were facing, where trade links had been completely cut off and manufacturing plants were running below capacity, seemed beyond repair (*The Provisions of the Single European Act - Subject Files - CVCE Website*, n.d.). Despite the conflict spreading worldwide, it was the European continent that endured the most casualties, half of them being citizens. Nearly 20 million people were displaced, leaving a very limited human capital available to rebuild the extensive ruins. The economic crisis was backed up by political instability, with new political groupings emerging from the conflict, such as the Communists and the Christian Democrats (*The Provisions of the Single European Act - Subject Files - CVCE Website*, n.d.). Considering all these aspects, there were several key issues that had to be addressed. First, how could economic activity be restored on the continent? Secondly, how could the reignition of a similar incident be prevented. This led to the need for a general mobilisation and promotion of the idea of European unification. Consequently, starting with 1948, the steps for more cooperation within the continent emerged with the creation of the European Movement in Brussels. This movement helped lay the groundwork for the establishment of institutions that advocated for democracy, human rights, rule of law, and economic cooperation among European nations.

In the aftermath of the Second World War, several projects that aimed at forming regional customs unions emerged in Western Europe. For instance, in 1947, Denmark, Sweden, Norway, and Iceland considered creating a customs union to overcome the limitations of their domestic markets. In 1949, the three Scandinavian countries, alongside the United Kingdom, began negotiations for a regional economic union called Uniscan, while France and Italy discussed a tariff union treaty, which ultimately was never ratified. Furthermore, none of these projects advanced beyond the exploratory stage due to more grandiose projects being in progress at that time, such as the European Payments Union. This union played a crucial role in stabilising exchange rates and promoting trade among the Member States, although it faced its own logistical challenges.

Hafner et al. (2014) puts forward the key milestones that led to the formation of the Single Market, which will be delved into in more detail in the next part. The most important advancement for the formation of the Single European Market commenced with the concomitant establishment of the European Coal and Steel Community (ECSC) and the Treaty of Rome, giving rise to the European Economic Community (EEC) in 1957. One of the most important aims of this community was the free movement of goods, services, capital, and labour among the founding members: Belgium, France, West Germany, Italy, Luxembourg, and The Netherlands. Moreover, it provided for the gradual reduction of customs duties, while also creating a unified trading area by establishing a common external tariff. However, several measures such as the harmonisation of national laws were met with resistance from the founding members, which ultimately hindered the completion of the European common market (Straathof et al., 2008).

The Treaty of Rome laid the foundation for a project eliminating customs duties and establishing a common external tariff, namely the European Customs Union. The increasing need for more economic cooperation between nations generated by growing global competition led to the need of a better way to facilitate and encourage the exchange of good across borders (Hafner et al., (2014). While the main goal of the Customs Union was to eliminate tariffs on goods such as duties on imported goods form other member states, non-tariff barriers such as quality and safety requirements remained in place (Hafner et al., 2014) Ultimately, the successful implementation of this policy was a crucial step towards the creation of the Single European Market, laying the groundwork for broader economic integration.

The European Commission's White Paper on Completing the Single Market re-initiated the process of European economic integration in 1985, putting forward over 300 directives aimed at amending the Treaty of Rome. These amendments were key in finalising the establishment of the Internal Market without any physical barriers of border controls, as well as technical barriers such as different product standards (Lehtimäki et al., 2020). Consequently, the Single European Act (SEA) was enforced on the 1st of July 1987 to promote economic, political, and social integration between the initial 10 member states: Belgium, Britain, France, Germany, Ireland, Spain, Luxembourg, The Netherlands, West Germany, and Portugal. The SEA advocated for the finalisation of a Single Economic Area by the 1st of January 1993, representing the first substantive amendment to the Treaty of Rome (Liargovas & Papageorgiou, 2023). This market was defined as "an area without internal frontiers in which the free movement of goods, persons, services and capital is ensured", developing free

competition and ensuring economic development among member states (Liargovas & Papageorgiou, 2023).

One critical aspect concerning the functioning of the Internal Market relates to the process of harmonization of national legislations. This policy was of utmost importance for the reduction of costs related to the pre-existing heterogeneity in national legislations between nations, which served as a major impediment to economic integration. Differences in regulations between states imposed additional costs to firms that wanted to sell products abroad in the form of adhering to the distinct national legal, financial, and fiscal regulations (Hafner et al., 2014). Therefore, the Single European Act set a minimum regulatory standard for all the Member States, aimed at enhancing the free movement of goods and services and facilitating the access to each other's internal markets through common decision-making (Lehtimäki et al., 2020). Moreover, it is equally important to acknowledge that, in this case, national legislation is not completely discarded. Founding members were still allowed to introduce harsher rules than the ones prescribed by the Act, being free to pursue their own domestic agenda for advancing a specific social or welfare interest (Dougan and Kluwer Law International, 2000).

2.3 The directions in which economic globalization affects income inequality

Standard trade theory such as the Hecksher-Ohlin (HO) and Stolper-Samuelson (SS) models illustrate this by means of simplifying assumptions, showing how trade impacts the relative returns of different factors of production. According to the HO and SS theorems, trade openness, whether through decreased tariffs or increased trade openness, increases the return of the products using the abundant factor while diminishing the returns of the ones from the scarce factor. This allows for predicting a country's pattern of trade. Accordingly, nations will choose to export the abundant factor goods and import the scarce abundant ones because of facing different relative prices on the international sphere. When looking at how this model can affect incomes, it is crucial to differentiate between developed countries, which are overflowed with skilled labour, and developing nations, which have an abundance in unskilled labour. Consequently, in developing nations, international trade will increase the wage of unskilled people, therefore narrowing the income inequality. In developed countries the situation is the opposite. Skilled labour will benefit at the expense of unskilled workers, therefore widening the wake gap between those two groups. Therefore, the SS and HO theorems would suggest increased income inequality in developed nations because of trade openness.

Since the 1990s, many studies tried to address the implications of the overly simplistic assumptions inherent in the basic Stolper Samuelson and Heckscher Ohlin models, therefore explaining why inequality patterns may not follow the ones predicted by these theorems (Dorn et al., 2021). As a result, the relationship between trade openness and income inequality has proven more difficult than anticipated to demonstrate empirically (Harjes, 2007). Firstly, there is a substantial amount of research indicating a negative relationship between income distribution and trade policy. Using panel data on 27 EU countries over the period 1995-2009, Asteriou et al. (2014) found that income inequality decreases with trade openness, while FDI and capital account openness has exacerbated inequality in the countries analysed. Furthermore, Agnello and Sousa (2014) found out that trade openness was negatively related to income inequality in 18 industrialised countries from 1978 until 2009. Another example is the more recent paper of Villanthenkodath et al. (2023). The authors show that trade openness reduces income inequality for high- and middle-income countries, nonetheless it increases it for low-income ones, a finding that is in total contrast with the prediction of the Heckscher-Ohlin and Stolper-Samuelson theorems. Using a panel fixed effects methodology and 74 developed and developing countries from all continents, Naanwaab (2022) shows that trade openness decreases income inequality in both high- and low-income countries. Moreover, the paper also demonstrated that the direction of trade is crucial when evaluating the effects of trade liberalisation on income inequality. Accordingly, trade between regions at similar levels of economic development, such as North-North or South-South trade, is inequality reducing, whereas trade between regions at different levels of economic development increases inequality. In the case of the Single European Market, this means that the harmonisation of national legislatures and the removal of barriers to trade and labour movement within the European continent should ultimately decrease income inequality.

The mechanism through which trade within similarly advanced countries might be inequality reducing stems from the resulting increased competition between firms. Openness to international trade puts companies in the position to compete internationally, a mechanism that boosts efficiency by forcing firms to adopt advanced production methods and technologies, which leads to increased profits and higher wages for all workers (Beaton et al., 2021). Another mechanism that might lead to reduced income inequality due to trade liberalisation was put forward by Birdsall (1998), where the increased efficiency driven by international competition is also reflected in the prices of consumption goods and services. Essentially, trade liberalisation reduces overall price levels, which benefits the lower income people

disproportionately since they spend a large share of their income on basic consumption goods. On the other spectrum, competition reduces the domestic monopoly power enjoyed by the upper class, therefore decreasing overall income inequality (Birdsall, 1998). Lastly, even if trade reduces the wages of workers as many economists argued, this incentivises unskilled people to invest in their human capital by acquiring more skills through education. This gives them access to better paying jobs, therefore reducing overall income inequality (Blanchard, 2000).

Now the section will turn the attention to the dimension of financial openness. One theoretical view about increased financial globalization is that it improves the allocation of resources within societies. Protective domestic financial systems policies often involve credit constraints for households with relatively lower incomes. Opening financial markets will unleash these constraints and therefore benefit disproportionately the poor, reducing income inequality (Aghion & Bolton, 1997). However, other empirical studies tend to find opposite effects and come up with different explanations of the relationship between financial openness and income inequality. Furceri et al. (2019) uses panel data from 149 advanced and developing countries from 1970 to 2010. The interesting results of this study come from the country-level analysis on the impact of capital account liberalization on output and inequality, which was shown to be significantly positive. Moreover, the effect is larger in countries with weaker financial institutions and when liberalization was followed by a financial crisis. Furthermore Jaumotte et al. (2013) examines the relationship between technological progress, trade, and financial globalization on income inequality. The paper finds that trade openness is associated with reduces levels of income inequality, mainly since export growth tends to benefit the bottom four quintiles of the population and reduces the share of the richest quintile. However, financial openness particularly through Foreign Direct Investment (FDI), is linked to increased inequality. Essentially, the returns to capital driven by financial globalization tend to benefit the richest 20% who own most of these resources. Moreover, financial openness increases the demand for skilled labour, therefore disproportionately benefitting the workers with a higher education and skillset and widening the income gap. Lastly, an analysis on all EU Member States done by Asteriou (2014) shows that financial openness generates benefits that mostly accrue to the people who already have access to this type of resources, mainly investors and large corporations. Since only the richest people are the ones involved in this domain, a widening in the income gap between the rich and the poor is inevitable.

Concluding, although theoretical frameworks and empirical studies do not agree of the direction of either trade or financial openness on income inequality, given the summarized papers presented in this section, the effect of globalization on income distribution can be seen as twofold. Firstly, it was shown empirically that trade openness is bound to reduce income gaps between countries through increased competition and productivity, which ultimately reduces the overall prices and raises wages of workers. On the other hand, financial openness, openness of capital markets, and the capitalization of the stock market have had a positive effect on income inequality, especially when looking at all EU Member States (Asteriou, 2014). As a result, it would be intriguing to examine the overall impact of events like the Single European Act on income inequality, and to determine whether the influence of trade openness on inequality is greater than that of the financial openness, or vice versa.

2.4 Predictors of income inequality

a. Economic growth

Now this paper turns its attention to the theoretical and empirical evidence exploring the factors influencing income inequality. Firstly, one key determinant of income inequality is economic growth, a relationship that has been theoretically explored by authors such as Kuznets (1955). Kuznets formulated this relationship as an inverted U-curve, wherein the former stages of development are associated with higher income inequality due to the transition from rural to urban and industrialized sectors. Consequently, the gains of industrialization are usually reaped by capital owners, representing a small segment of the population, therefore increasing overall inequality. In later stages of development, the benefits of economic growth are more dispersed across society, with more general investments in aspects such as education and employment opportunities, therefore reducing the earnings gap across the country. Empirically, given the strong theoretical foundation established by Kuznets (1955), the conclusion that economic growth reduces inequality is supported by many researchers. For example, Dollar and Kray (2002) find a strong positive relationship between economic growth and poverty reduction. Panel data from countries over several decades points towards a proportional increase of the incomes of the poor relative to overall economic growth, concluding that economic growth is a powerful tool for reducing poverty. Moreover, studies such as Persson and Tabellini (1991) show that in 56 countries over the period 1960-1985, high levels of income inequality are associated with a negative level of growth. Lastly, Perotti (1996) in an analysis of 67 countries

revealed that nations with low levels of income inequality are more prone to invest in human capital, which subsequently led to economic growth.

b. Population

The mechanism in which the population level affects income inequality is explained in Bloom & Freeman (1986). The extent to which population may affect the distribution of income lies in the dynamics of the labour market. Rapid population growth will undoubtedly increase labour supply, which can lead to higher levels of unemployment if labour demand does not keep pace. This is particularly relevant for low-skilled jobs, therefore leading to increased income inequality. Additionally, population growth often generates increased migration from rural to urban centres by people seeking better job opportunities. This can lead to overcrowded cities, which ultimately increases the cost of living in urban areas while job opportunities remain limited (Butler et al., 2020). Another relevant paper addressing the relationship between population and income inequality comes from Sitthiyot and Holasut (2016). In light with the consensus in research that the best unit of measurement for income inequality is the Gini coefficient, the author argues that, in practice, the maximum level of Gini coefficient lies between zero and (P-1)/P, where P is the population level. Therefore, using 2012 data from 69 countries, the study finds a nonlinear relationship between the Gini coefficient and the natural logarithm of population size. The paper suggests that, to achieve better economic growth and well-being, countries should aim for a specific optimal income inequality level that is positively correlated with their respective population size.

c. Fertility

When it comes to how fertility rate affects income inequality, it is important to comprehend the decision process of people to have children. Typically, the lower-income families tend to have more children compared to higher-income ones. This is either because they have lower access to family planning services, or because children are often seen as economic assets that can contribute to household income. Consequently, the higher the income disparity in a nation, the higher the fertility rate will be. Furthermore, higher fertility rates are also associated with lower investments per child, perpetuating further the poverty and inequality (Becker et al., 1990). Moreover, Bulíř (2001) finds that higher income inequality is associated with higher fertility rates among lower-income groups. This is because people respond to economically unequal environments by having more children, which they see as a method increase their social status and future economic prospects. Accordingly, more equal societies tend to have a lower fertility

rate since the economic security dispersed all over the society disincentives people to compete for status through reproduction. Ultimately, the key difference between how the fertility rate and population affect income inequality stems from what factors they directly affect. Fertility rates primarily influence inequality through family-level decision-making, whereas population growth impact broader economic factors and public resource allocation. Therefore, it is important to include both factors in the analysis to ensure that it includes the diverse and interconnected mechanisms that drive income disparities.

d. Human Development

High levels of income inequality often generate disparities in terms of access to healthcare services, therefore generating differences in overall health outcomes and life expectancy. Moreover, it can limit the access to quality education for lower-income groups, therefore perpetuating the cycle of poverty by reducing the opportunities for upward mobility. In light with this explanations, Castells-Quintana et al. (2022) in a fixed-effects and instrumental variable analyses of over 150 countries over the period 1960-2019 indicates that income concentrations at the top and bottom of the distribution negatively affects human development. Moreover, it was found that more equitable societies, namely the ones where the middle-class takes a higher proportion of the income distribution, tend to have better human development outcomes. In line with these findings, Castells-Quintana et al. (2018), using panel data of 117 countries over the period 1970-2010 shows that there is a negative long-run relationship between income inequality and human development. Furthermore, in the short-run, inequality negatively affects educational outcomes, hindering the access to quality education for lower-income groups. Nonetheless, the negative association between unequal income distribution and human development is more pronounced in countries with lower levels of development.

e. Inflation

The role of inflation in exacerbating inequality stems from the income channel. High inflation leads to an erosion in the real value of wages and savings, which disproportionately affect lower-income households who typically have less access to inflation-protected investments. This leads to a higher disparity in earnings of high-income and low-income households. Here, past inflation was found to significantly influence current income inequality. Nonetheless, this relationship is nonlinear. A reduction in hyperinflation tends to decrease inequality more than a marginal reduction at a very low inflation level. These results are depicted using a cross-country database of 75 nations where income inequality is measured by the Gini coefficient

while also controlling for fiscal redistribution to ensure that the effects are not conflated with the ones from government policies aimed at income redistribution. A more recent study conducted by Glawe and Wagner (2024) suggests that inflation below 6% does not have a significant impact on income inequality, nonetheless once it surpasses this threshold is it associated with higher income inequality. This suggests that relatively lower levels of inflation should not be a cause of concern when one evaluates how income distribution will be affected.

f. Trade Openness

Trade openness refers to the degree in which a country engages in trade (both exports and imports) with other countries. It is a component of economic openness, which, as discussed in the previous subsection of this paper, has a complex and ambiguous impact on income inequality. In this part, I will extend the empirical literature presented before regarding how trade openness affects income inequality. Using and Instrumental Variable (IV) approach and including 139 countries over the period 1970-2014, Dorn et al. (2021) provide evidence for the Stolper Samuelson and Heckscher Ohlin theorems. The paper finds that, in advanced economies, trade openness increases income inequality, whereas in developing one, it reduces extreme poverty. In developed countries, high-skilled jobs gain more from trade than low-skilled ones because they are more competitive on the global market, leading to higher demand and increased wages for these positions. On the other hand, low-skilled workers face increased competition from abroad, which due to their lack of education and proper training often results to reduced wages. There is also a substantial amount of research pointing towards an improvement in income inequality because of trade openness. Jaumotte et al. (2013) finds that trade openness is linked to a reduction in income inequality, a conclusion that is derived from analysing data of a small sample of 31 developing and 20 developed countries spanning the period from 1981 to 2003. However, not separating developed countries from developing ones does not give a clear indication that there is no heterogeneity in the effects of trade between these two types of countries such as in the paper of Dorn et al. (2021). Concluding, even though trade openness ins a complex topic in research, it is also a key variable in theoretical frameworks previously established, therefore providing a good basis for its inclusion in this analysis.

g. Foreign Direct Investment

The impact of Foreign Direct Investment (FDI) on income inequality was discussed previously, therefore the relationship will not be explained here much further. Like for Trade Openness, I

will extend on other existing literature in this direction. Nguyen (2023) examines the relationship between Foreign Direct Investment and income inequality in 30 developed and 35 developing nations from 2002 to 2019, showing that FDI increases inequality in developed countries, nonetheless it decreases it in developing ones. Furthermore, Wang et al. (2023) shows that, even though FDI promotes economic growth and technological progress, it is also associated with an increase in income inequality in developed countries. The explanation can be attributed to the fact that FDI is unevenly distributed within society, therefore and increase in the inflows of FDI will unevenly favour skilled workers, capital owners, and investors. This paper also supports the findings of Nguyen (2023) that the effect of FDI is the opposite in developing countries. Lastly, Cruz et al. (2023) looked at the relationship between FDI and its impact on skilled versus unskilled workers' wages. They found that FDI tends to increase the wage gap between these two groups of people, as FDI increases the demand for skilled workers in general. Therefore, given previous empirical studies, it is possible to conclude that FDI tends to have an adverse effect on income inequality.

h. Technological progress

Technological progress, by nature, tends to be skill biased (Aghion et al., 2018b). More specifically, it increases the demand for skilled labour at the expense of the one for unskilled labour. In turn, this leads to higher wages for those possessing the necessary skills to utilize new technologies effectively, thereby widening the gap between skilled and unskilled workers. DeBacker et al. (2011) shows this using a panel data of U.S. household incomes over nearly two decades and concludes that technological progress and other factors led to long-lasting changes in the labour market, widening the income distribution as measured by the Gini coefficient. Lastly, Acemoglu (2002) provides another similar way of looking at this relationship. The paper argues that most technological advancements are directed at improving the productivity of the skilled while replacing low-skill jobs. For example, the use of computers has increased the productivity of jobs requiring analytical skills, automating routine manual tasks, and therefore reducing the demand for those low-skilled services. This in turn leads to a higher widening of the wake gap between the two types of workers.

3. Data

The methods used in this paper are based on annual country-level panel data from 1973-2000. This time interval was chosen due to data availability, while equally adhering to the guidelines

necessary for the Synthetic Control Method (SCM) to produce robust results. The Single European Act (SEA) come into force on the 1st of July 1987 and was finalized on the 1st of January 1993. The first step is to define the appropriate event year for the further analysis. Although research such as Lehtimäki et al. (2020) chose the 1st of January 1993, since that is the moment when all the founding members finalized the programme for the completion of the Internal Market, this paper will divert from this approach and choose 1987 as the treatment year to avoid dealing with anticipation effects, which would undermine one of the assumptions of the model. Therefore, the estimates from 1987 onwards will provide much better information on both initial and medium-term impacts of the Internal Market on income inequality. Thus, there will be in total 14 years pre-intervention. This is roughly in line with the benchmark set by Abadie et al. (2010) that used 19 years pre-treatment for the computation of the Synthetic counterfactual. The period before the integration of The Netherlands in the Single Market was the maximum of years that could be used without encountering issues with missing values in the dependent variable given the final choice of countries. Furthermore, there might be longer term effects on income inequality, therefore 13 years post-intervention seem like a reasonable time frame to include in the analysis.

The counterfactual is constructed in such a way as to replicate to the best extent possible The Netherlands. To do so, several predictor variables will be employed. The mechanism through which the SCM assures this specification will be further discussed in the Methodology section of this paper. For now, the choice of these variables and their source will be described. Table 1 shows this final selection. The sources of all these variables are one of the most trustworthy in research. Furthermore, as the datapoints were extracted from roughly the same databases, the reliability and validity of the selection is ensured, aspects that are essential for the Synthetic Control Method to yield credible estimates. The outcome variable is the Gini coefficient, which is the most widely used measure of income inequality. This is obtained using the Estimated Household Income Inequality (EHII) database compiled by the University of Texas Inequality Project. It takes values from 0, which depicts perfect equality, to 100, meaning perfect inequality. This database was preferred over other popular one among income inequality research such as the World Income Inequality Database (WIID) and Standardized World Income Inequality Database (SWIID) due to its extended coverage of countries and time periods. This comes on top of the main database only including homogenous data, unlike the other two that mainly incorporate mixed data (gross and net, as well as household and

individual). The rest of the variables were extracted either from the Penn World Table, or The World Bank.

Table 1: Data sources overview

Data	Definition	Source
Dependent Variables		
Gini coefficient	Calculated using wage inequality data, survey data, and national accounts, expressed as a unitless index ranging from 0 to 100, where 0 indicates perfect equality and 100 indicates maximal inequality	Estimated Household Income Inequality (EHII) Database
Independent Variables		
GDP Growth	Annual percentage growth rate of GDP at market prices based on local currency, expressed as a percentage	The World Bank
Population Growth	Exponential rate of growth of midyear population from year t-1 to t, expressed as a percentage	The World Bank
Fertility	The number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with age-specific fertility rates of the specified year, expressed as a continuous value.	The World Bank
Human Development	Human Capital Index based on the average years of school from Barro and Lee (2013) and rate of return to education based on Mincer equation estimates around the world (Psacharopoulos, 1994)	Penn World Table
Inflation	Measured by the consumer price index (CPI) and reflects the annual percentage	The World Bank

	change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed on a yearly basis, expressed as a percentage	
Trade Openness	Sum of imports and exports of goods and services as a share of GDP, expressed as a percentage	The World Bank
FDI	New investment inflows less disinvestment in the reporting economy from foreign investors, divided by GDP, expressed as a percentage	The World Bank
Technological Advancements	Total Factor Productivity at current PPP (USA = 1), expressed as a continuous variable	Penn World Table

Notes: The table depicts the variables used in the Synthetic Control Method. The left column shows the name of the variables, the middle column the definition and the measurement unit of the data, and the right column the source of the respective variables.

To get a better understanding of the data, Table 2 presents descriptive statistics of all the variables that will be used further in the models. In total, there were 17 countries used, among which The Netherlands is the treated unit, while 16 were used to compute the counterfactual. There are 28 datapoints per country corresponding to each of the year between 1973 and 2000, giving out 476 total observations. Inflation only has 467 due to missing values. Regarding the interpretation of the Gini coefficient, as it was explained before, a value of 0 indicates perfect equality, whereas a value of 100 represents perfect inequality, where only one person receives income and the rest of the population nothing. The average Gini coefficient within this sample was 42.676, the minimum value being recorded in Hong Kong in 1980 and the maximum one in Bolivia in 1984. Concerning the rest of the variables present in the analysis, the average GDP growth was approximately 4.624%. It is also notable that this value varies significantly both between and within countries. One reason for these major disparities stems from the fact that, throughout this period, countries underwent significant economic progress, mainly due to aspects such as natural resource discoveries (Hartwell et al., 2021), investment in education

and health (Maitra & Mukhopadhyay, 2012), as well as adoption of new technologies that boosted productivity (Çalışkan, 2015). This aspect in striking given this paper's sample. Moreover, since the sample is comprised of both developing and developed nations, the levels of GDP growth are affected by their respective stage of development. In line with influential theoretical models in this direction, looking at the sample, the most developed countries exhibit the lowest levels of GDP growth whereas the developing ones reveal the highest levels.

Table 2: Descriptive statistics

Variable	Obs.	Mean	Std. dev.	Min	Max
EHII Gini coefficient	476	42.676	6.763	20.971	53.250
GDP Growth	476	4.624	3.939	-13.127	16.164
Population Growth	476	1.814	0.845	-0.094	5.465
Fertility	476	3.189	1.568	0.981	7.939
HCI	476	2.300	0.617	1.21	3.58
Inflation	467	49.406	547.344	-7.634	11749.64
Trade Openness	476	75.661	80.894	8.932	410.937
FDI	476	2.179	3.588	-2.757	41.065
Total Factor Productivity	476	0.743	0.243	0.293	1.298

Notes: The table shows descriptive statistics of the dependent variable (first row), as well as the covariates used for computing the Synthetic Control Group. The number of observations per variable, mean, standard deviation, minimum and maximum values are displayed. All units are measured in accordance with Table 1

Moving on, within the sample, the average annual population growth was roughly 1.814% million, the highest value being recorded in Hong Kong in 1979 and the lowest in Singapore in 1986. The mean fertility rate was 3.189, the minimum value being in Hong Kong in 1999 and the maximum one in Kenya in 1973. The average HCI value was 2.300 and 49.406 for inflation. The largest inflation level can be found in Bolivia in 1985. Lastly, within the sample, the sum of exports and imports accounted on average for 75.66% of the nations' GDP, while FDI to 2.179% of the GDP and total factor productivity with a value of 0.743.

4. Methodology

For the evaluation of the panel data discussed in the previous chapter, a Synthetic Control Methodology (SCM) in accordance with Abadie et al. (2003) and extended in Abadie et al. (2010) was chosen. To find the causal effect of the Single European Act on income inequality in The Netherlands, we must compare the observed Gini coefficient post intervention to the hypothetical situation in which the treated unit did not sign the act. Accordingly, this data driven approach constructs the counterfactual using a set of countries that will be referred to in the following sections of the paper as the donor pool. Furthermore, the weights are calculated based on each country's pre-treatment characteristics, assigning a higher value to the nations that most resemble the characteristics of The Netherlands. Ultimately, this combination of untreated units represents the "Synthetic Control."

The Synthetic Control Method is based on multiple assumptions that ultimately dictated the final choice of the data to be further examined. Firstly, the synthetic control is meant to represent what would have happened to income inequality in The Netherlands if it did not adhere to the Single European Act. Therefore, the countries that are going to be used to compute this counterfactual should be ones that themselves did not join this act or any other internal market policies in any of the years included in this evaluation. Therefore, the final country choice for the analysis will be Canada, Chile, India, Indonesia, Japan, South Korea, Singapore, Turkey, United States, Bolivia, Colombia, Ecuador, Hong Kong, Kenya, Malaysia, Mexico.

Secondly, regarding the treatment unit, another assumption that needs to be fulfilled is that there are not anticipation effects of adhering to the Single Market on income inequality. This means that there are no striking changes in this variable in the proximity before the intervention took place in The Netherlands. I will test this assumption empirically through an "In-Time" placebo test, which will be further explained in the Results section. For now, a visual inspection of Figure 1 suggests that there is a slight decrease in income inequality approximately one year before the policy was signed, however this change is not striking. Therefore, it is credible to conclude that this assumption holds. Another interesting aspect that can be depicted in the figure is the sharp increase in the Gini coefficient in the late 1990s, followed by an abrupt decline immediately after. While there can be many explanations for this phenomenon, the most plausible one comes from the Maastricht Treaty being signed in 1992, seeing the formation of the European Monetary Union (EMU) and the introduction of the euro as an accounting currency on January 1st 1999. Accordingly, this treaty mandated fiscal and

economic policies that most likely had a substantial effect on income inequality in The Netherlands, just like the Single European Act. For instance, to meet the conditions required by the Treaty of Maastricht, the Dutch government reduced the corporate taxes to attract investments and stimulate economic growth. This disproportionally benefitted higher-income individuals and businesses, therefore contributing to increased income inequality (*The Netherlands--Transforming a Market Economy, OP 181 - Table of Contents*, 1999). This is backed up by research such as Kerschbaumer et al. (2020), which used the Synthetic Control Method to analyse the impact on the European Monetary Union on income inequality in 34 countries over 1975-2006. The authors found that EMU overall increased inequality immediately after 1999 in export-oriented countries such as Germany. Although The Netherlands was not included in the analysis, given its export-oriented nature, I assume a similar effect due to this policy. Despite this short-term increase in inequality, in can also be argued that the EMU led to more economic growth, which benefitted the broader population, therefore sharply reducing income inequality afterwards. Ultimately, for this research setting specifically, the presence of events such as the Maastricht Treaty post-intervention may hinder the results obtained in the further analysis. This aspect will be discussed in the last section of this paper.

Figure 1: Income Inequality Trends in The Netherlands. The blue line represents the time-series of the dependent variable, Gini coefficient. The red line depicts the year of the intervention.

The next part will focus on explaining how the Synthetic Control Method (SCM) functions. Consider a sample of J+1 countries. Suppose the first country, J=1, is the one for which the Synthetic Counterfactual will be constructed. This means that the remaining J countries in the dataset form the donor pool, used to compute the Synthetic Control Group. Let Y_{1t} be the value of the Gini coefficient for country 1 in the donor pool recorded at point t. The values for the Gini coefficient are documented for each country over a period of T years. Let T_0 be the pre-intervention period and T_1 the post-intervention one, with $T_0 + T_1 = T$. Therefore, in this study, T_0 spans from 1973 to 1987 and T_1 from 1987 until 2000, 1987 being the year that the Single European Act came into force. The vector of weights assigned to the countries in the donor pool is selected as to minimize the root mean squared percentage error (RMSPE) in characteristics between the treated unit and the Synthetic Control. These weights are constrained to be non-negative $0 \leq w_k \leq 1$ and to sum up to one $\sum w_j = 1$. Therefore, the outcome of the Synthetic group and the effect of the policy I try to estimate is $\hat{\beta}_{1t} = Y_{1t} - \sum_{j=2}^{J+1} w_j * Y_{jt}$, which is the difference in the Gini coefficient between The Netherlands and its Synthetic counterfactual in each year t over T_1. This is the estimated treatment effect of adhering to the Single European Act in period t for The Netherlands. Y_{1t} is the observed outcome for The Netherlands in period t, while J is the total number of countries. w_j is the weight assigned to each country (Abadie et al., 2010)

The Synthetic Control Method comes with multiple advantages for the research setting presented. Firstly, this study aims to follow the characteristics of comparative case studies analysing the impact of a specific policy or event on an outcome. Traditional methods such as Difference-in-Difference can generate ambiguity when it comes to the selection of the control unit meant to serve as the counterfactual. This leads to uncertainty about how suited a control unit is to replicate what would have happened to the treated unit in the absence of the intervention. Consequently, SCM, through its data-driven nature, provide a better means of finding this unit and therefore yield robust causal effects. Secondly, the Synthetic Control Method relaxes the parallel trends assumption of the Difference in Difference, as well as the requirement of a high volume of data points for each country to compute robust effects of the policy on the outcome in methods such as the Ordinary Least Squares (OLS). This reduces the data availability issues prevalent in typical comparative case studies.

One possible limitation of this technique is that it does not allow for assessing the significance of its estimates. Abadie et al. (2010) proposes a method based on permutations, namely placebo

experiments, whereby both the treated units and the treatment times are randomly changed using the donor pool. Then, the Synthetic Control Methodology is applied to each one of these situations, and the new results are compared to the initial ones. This method will be used in the further analysis and is meant to evaluate whether the baseline effects are large compared to the ones estimated for each of the countries in the donor pool. However, due to the limited number of units in the control pool, for the initial effects to be significant, they must be larger than all the others observed in each one of the permutations. Therefore, this will be a limitation to this paper and the methodology itself that will be addressed further in the paper.

Another limitation of the Synthetic Control Method is that it relies heavily on the type of data used. Consequently, I will also perform robustness checks to make sure that my estimates are consistent to changes in the estimation methods. Accordingly, I will redo the same analysis but with a different measure for income inequality, namely the Market Gini coefficient from the Standardized World Income Inequality Database (SWIID) computed by Solt (2016). I expect to obtain the same sign of the effect of the Single European Act on income inequality in each year post intervention after making this adjustment, otherwise the validity of my results can be questioned.

5. Results

This section outlines the results of the SCM used in this paper. Firstly, the objective of this method is to construct a Synthetic group that best resembles the values of the predictors and the trend of the Gini coefficient before the Single European Act was signed in 1987. More technically, the goal of the SCM is to minimize the root mean square prediction error (RSMPE) in the pre-intervention period. The respective weights are depicted in Table 3, where it is evident that Japan received the biggest weight among all the countries, 40%, followed by Canada with 36.8% and lastly Hong Kong with 23.2%. The other states mentioned were assigned 0 weights. All these weights sum to 100%. Here, it is equally important to discuss why only 3 of the countries used in the donor pool received weights. Looking at the final selection of the countries for this analysis, it is plausible to conclude that most of them differ substantially from the treated unit. This selection includes many nations that were doing poorly economically, at least in comparison to The Netherlands, which can believably be correlated with a drastic difference in the demographic factors predicting income inequality. Among the states included, the ones who are more closely related with The Netherlands are Canada, Hong

Kong, and Japan. Appendix A presents further clarification as to why these countries were chosen by the Synthetic Control Method. It is noticeable that in most predictor variables the trends of these countries are close to the ones of The Netherlands. The closest ones can be found in Canada and Japan, the reason why they were assigned the largest weights in the first place.

Table 3: Relative Weights for Donor Countries

Donor country	Unit Weight
Canada	0.368
Japan	0.400
Hong Kong	0.232

Notes: The table depicts the weights given by the Synthetic Control Methodology to all the countries being part of the donor pool. It is noticeable that only 3 countries received positive weights in the computation of the Synthetic counterfactual.

Table 4 compares the pretreatment characteristics of The Netherlands with the Synthetic group, as well as an average of all the countries in the donor pool. The values of the Synthetic counterfactual are averaged from 1973 until 1987 and show similarities with The Netherlands in most characteristics, except GDP growth, where the Synthetic group exhibits more than double the value, as well as Trade Openness, which is 30% higher. Moreover, it is noticeable that the Synthetic Netherlands provides a much better comparison for The Netherlands compared to the average of all the nations included. This can be noticed most clearly by looking at the inflation of the Synthetic counterfactual compared to the average of all the nations. Lastly, pre-intervention, the Synthetic Netherlands is very similar to The Netherlands in aspects such as FDI, fertility rate, HCI, and total factor productivity.

Table 4: Balance Test: Treated vs. Synthetic vs. Average

	Treated	Synthetic	Average
EHII Gini (1980)	32.038	32.414	41.673
EHII Gini (1977)	32.350	32.740	42.650
EHII Gini (1973)	33.726	33.328	41.835

GDP Growth	2.171	4.684	4.706
Population Growth	0.637	1.266	1.93
HCI	2.831	2.841	2.119
Inflation	5.637	7.391	82.617
Fertility Rate	1.597	1.874	3.655
Trade Openness	103.833	76.912	76.783
FDI	1.031	1.229	1.319
Total Factor Productivity	1.096	0.907	0.776

Notes: The table displays the values of each of the variables predicting the outcome for 3 comparison groups: the treatment, the Synthetic group, as well as an average of all the countries in the donor pool. All values above except Gini are averaged for the 1973-1987 period.

The causal effect can be understood as the difference between the trend of income inequality between The Netherlands and its Synthetic counterpart post-treatment. The success of the balance test in replicating the characteristics of The Netherlands by the Synthetic group deems this comparison worthwhile. A visual analysis of Figure 1 suggests that, in the first 3 years following the implementation of the Single Market, income inequality in The Netherlands increased at a higher rate compared to the Synthetic Netherlands. However, after 1990, this value remained relatively stable, while the Gini coefficient in the Synthetic group continued to rise steadily throughout the entire post-intervention period. Overall, despite The Netherlands experiencing a drastic increase in the late 1990s in the outcome variable due to the adoption of the euro, throughout most of the period, it has generally maintained a lower Gini coefficient compared to Synthetic Netherlands. This is indicative of the negative effect of the Single European Market on income inequality. These differences can be better visualized in Figure 2, where the blue line depicts the disparities between the treated and the Synthetic units in the Gini coefficient before and after the treatment happened. Building on the argument, after treatment, the difference between the 2 trends is mostly negative. Nonetheless, looking at the differences before treatment, it is noticeable that the matching is quite poor before 1987, as the line never touches the value 0, and there are substantial differences especially in the years close to the intervention.

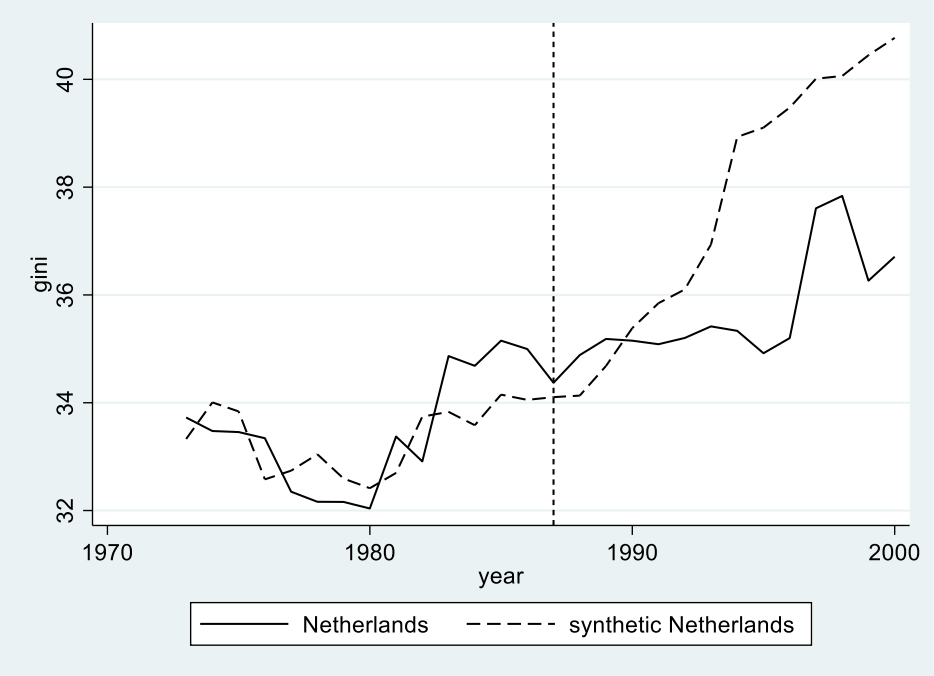

Figure 1: Netherlands vs Synthetic Netherlands: Gini coefficient.

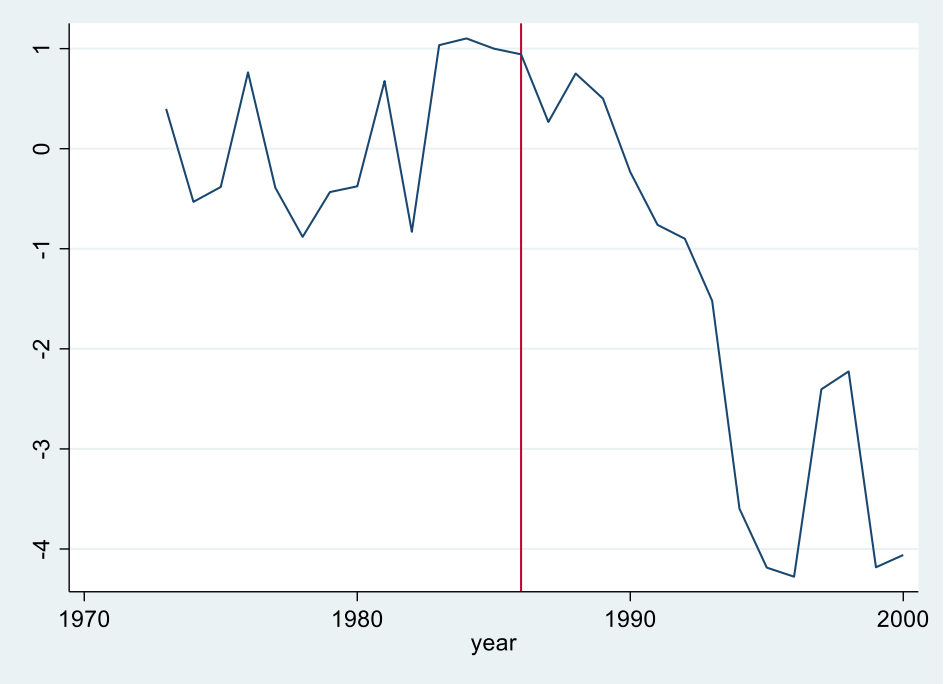

Figure 2: Temporal differences between Netherlands and Synthetic Netherlands in the Gini coefficient. The year where the intervention happened is depicted by the vertical red line.

a. Placebo Test

To evaluate the credibility of the results, this paper turns to the evaluation of the significance of the results presented previously. The main goal of this section is to assess whether the negative effect was entirely driven by chance, therefore assessing how often the size and magnitude of this impact will be obtained if another state or another time was chosen for the analysis. To this end, we run "In-Space" and "In-Time" placebo tests by changing both the time pre-intervention and the treated unit to other nations belonging to the donor pool. If any of these changes lead to noticeable gaps of similar magnitude to the ones estimated for The Netherlands, then the analysis does not yield significant negative effect of signing the Single European Act on income inequality.

i. In Time Placebo Test

In Time placebo tests artificially assign the treatment to a year that has not seen any intervention. In line with the methodology used by Abadie et al. (2010), the new treatment period will be roughly in the middle of the pre-intervention period, in this case 1983. Subsequently, the Synthetic Control Method will be applied as if the intervention occurred at this time. This is to ensure that the SCM does not falsely detect an effect in a period where no actual intervention took place. Then, the counterfactual will be constructed by lagging all the predictor variables accordingly. The results are shown in Figure 3 below. It is noticeable that in the period 1983-1987 there were no substantial differences between Netherlands and Synthetic Netherlands. While there is a slight difference between the trends after 1983, its magnitude is relatively small compared to the one recorded post 1987 when the actual treatment took place. Ultimately, this finding further increases the robustness of the Synthetic Control Method.

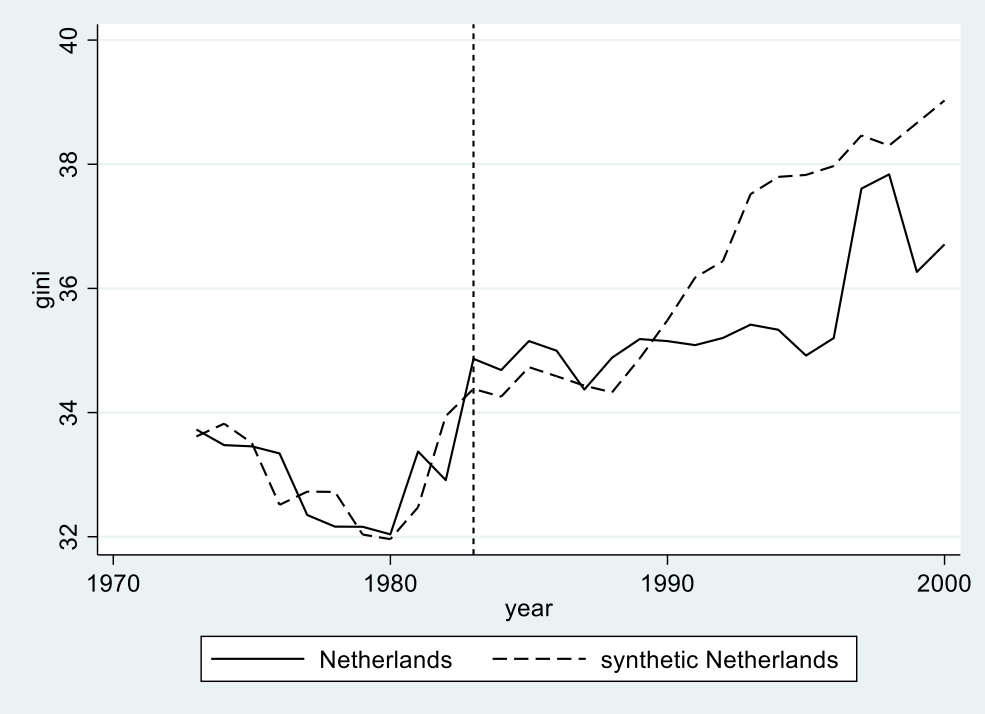

Figure 3: In Time placebo test, treatment assigned to 1983.

ii. In Space Placebo Test

Similarly, In Space Placebo Tests randomly apply the treatment and the Synthetic Control Method to every country in the donor pool. This allows us to evaluate whether the estimated effect for The Netherlands is large compared to the distribution of effects obtained from substituting the treated unit with all the untreated countries employed to compute the Synthetic counterfactual. If this impact is relatively abnormal, then it is possible to conclude that the results are robust. Accordingly, this method runs in-space placebo tests for every country in the donor pool and obtains their respective post-intervention effect. All the estimates higher than the one obtained for The Netherlands will be divided by the total number of countries to find the p-values that reflect the significance of the result for every of the year post-treatment. The main null hypothesis in this regard is that there is no effect of adhering to the Common European Market on income inequality as measured by the Gini coefficient in The Netherlands. The results are shown in Table 5.

Carefully analyzing all the results leads to the conclusion that for all the post-intervention years the estimates are not significant at a 5% level. The only years that come close to this value are 1995, 1996, and 1999, which are also the ones having the highest magnitude. These p-values

can be further visualized using Figure 4 below. Therefore, we cannot reject the null hypothesis that there is no effect of the implementation of this policy on income inequality in The Netherlands. Unpacking the results obtained, one possible reason for the outcome is that the donor pool used for the analysis is too small. Specifically, with only 16 countries in total, the maximum p-value achievable is 1/16 = 0.0625. Therefore, the effect in The Netherlands would have needed to be very strong to produce a significant estimate. Furthermore, it is equally important to acknowledge that income inequality is a very complex aspect that may by influenced by a plethora of aspects that are not fully captured by the predictors included in this analysis. Therefore, there are good reasons to believe that the Synthetic group may not replicate to the maximum extent the trends visible in The Netherlands. Although the initial choice of variables was carefully considered given previous research in this area, this might ultimately be a limitation of this paper.

Table 5: Post-treatment results; Effects, p-values, standardized p-values

Year	Estimates	pvals	pvals_std
1987	0.2669833	0.9375	0.9375
1988	0.7512548	0.6875	0.625
1989	0.5009561	0.625	0.6875
1990	-0.2329632	0.9375	0.9375
1991	-0.7613656	0.8125	0.75
1992	- 0.8996834	0.875	0.625
1993	- 1.520084	0.8125	0.5
1994	- 3.597251	0.1875	0.125
1995	- 4.185805	0.125	0.0625
1996	- 4.276716	0.125	0.0625
1997	- 2.403798	0.5	0.4375
1998	- 2.225441	0.25	0.3125
1999	- 4.18269	0.125	0.0625
2000	-4.05981	0.125	0.125

Notes: The table showcases the differences in the Gini coefficient between The Netherlands and its Synthetic counterpart post 1987 intervention. P-values and standardized p-values depict the significance of the estimated results for each of the years post treatment.

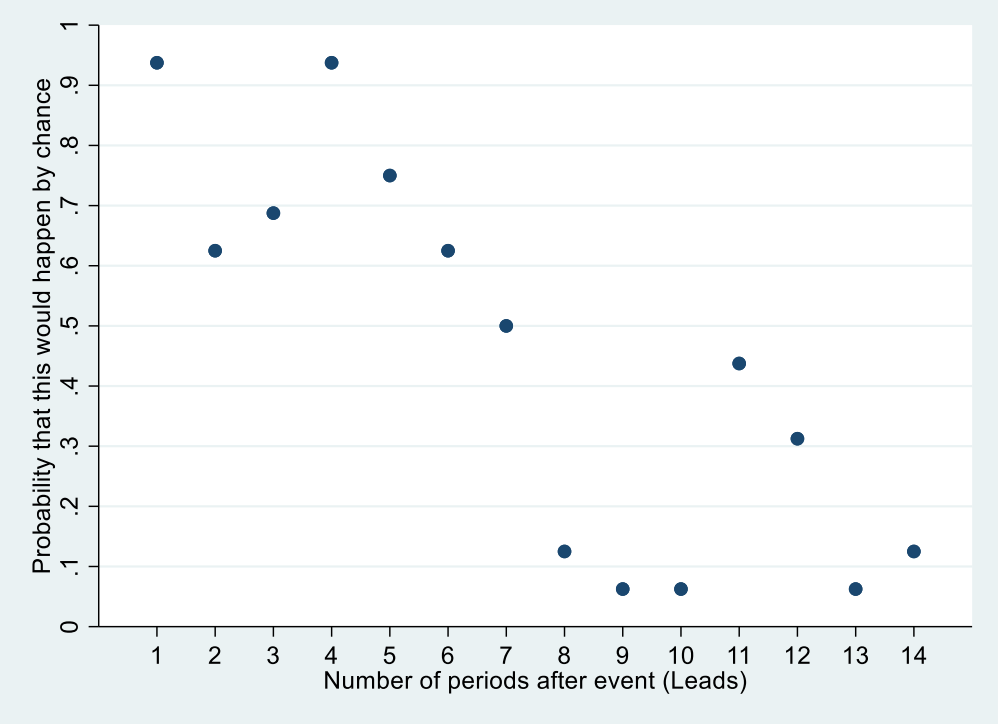

Figure 4: Standardized p-values for every year post intervention. The values are in line with the third column presented in Table 4.

Another key observation from the estimated results column in Table 5 is that the longer the time since the implementation of the Single European Act, the greater the magnitude of the Gini coefficient estimate. This trend is also correlated with a decrease in the standardized p-values as we move further from the treatment year, which can be further visualized by means of Figure 4, where a downward trend is clear. This is indicative of a long-term effect of the Single Market on income inequality. This conclusion is unsurprising given the gradual implementation of this policy. Starting in 1987, all founding members began to slowly eliminate barriers to trade and investment, with a final target date in 1993. Considering the slow nature of policymaking, where it takes months or even years for laws to be passed and integrated into national legislation, it is plausible to think that the effects of the Single Market came at a later stage. Nonetheless, the overall change in income inequality during the analyzed post-treatment period is staggering. Given that The Netherlands had a Gini coefficient of approximately 34.37 in 1987, by 2000, it has decreased by more than 40%. This can be considered a substantial progress in income inequality post-intervention. The interpretation of

the results and a further discussion of this phenomenon can be found in the discussion section of this paper.

6. Robustness

The next section turns its attention to the robustness of the results obtained previously. A significant drawback of the Synthetic Control Method is its sensitivity to how the outcome variable is measured. The SCM can sometimes produce substantially different results for the same intervention depending on the measurement approaches for the outcome of interest or the predictor variables. Therefore, to check whether this issue is prominent in my analysis, I will use an alternative measure of the Gini coefficient sourced from the Standardized World Income Inequality Database (SWIID) developed by Solt (2016). More specifically, this income inequality index considers the level of income inequality before the effects of taxes and subsidies from various data sources. In the context of the Standardized World Income Inequality Database (SWIID), this measure is used to analyze the distribution of income that households receive from market sources such as wages, investments, prior to any governmental redistribution policies being in place (Solt, 2016). If the Synthetic Control Method (SCM) is not sensitive to how the data is computed, considering that my Gini coefficients in both the Estimated Household Income Inequality and the Standardized World Income Inequality Databases are measured before taxes and subsidies, I would expect both the direction and the yearly estimates to closely resemble the ones in the main analysis. In the case of my research setting, the main disadvantage of using this dataset is the relatively more restrictive time and space coverage compared to the Estimated Household Income Inequality Database. More specifically, I had to drop Turkey, Bolivia, and Ecuador from the donor pool, which might ultimately reduce the significance of the results from the In-Space Placebo test. Moreover, the pre-treatment period will start from 1977 compared to 1973 in the previous section, a roughly 30% reduction in pre-treatment observations compared to the main analysis. Nonetheless, even though the first dataset may be better in terms of both time and space coverage, I do not consider these aspects to be major drawbacks to the reliability of this robustness check.

The results of the Synthetic Control Method are reported in Appendix B. The first difference from the main analysis can be found in the weights that countries received, as shown from Table 1B. At first glance, it can be depicted that Canada still received a positive weight, although substantially smaller compared to the initial main results. Interestingly, the other 2

countries that were recorded with positive weights, instead of Japan and Hong Kong, were Chile and ultimately the Unites States, which is seen to have the biggest weight in the entire donor pool. This is a major change in the composition of the Synthetic Control, although not surprising given the way the SCM works. Changes in the unit of measurement and the length of the pre-intervention period affect the optimization process that assigns weights to the control units by minimizing the root mean squared prediction error (RMSPE). Therefore, a change in the weight composition of the counterfactual was predictable. Moving on, as illustrated in Figure 1B, the trends for the Synthetic Control and The Netherlands align almost perfectly in the immediate pre-treatment years. However, there is a clear deviation between the two graphs in the initial pre-intervention years. I do not find this difference substantial enough to hinder the results of the Synthetic Control Method, since the overall direction of the trend is matched relatively well. In 1987 the two graphs intersect, after which a significant discrepancy in trends between the two groups becomes evident. The results indicate a clear favorable effect of the Single European Market on income inequality as measured by the SWIID Market Gini coefficient. Additionally, this effect becomes more pronounced the more time passes since the Single European Act was enforced. In line with the initial analysis results, this increased effect is associated with an overall decline in the p-values of the yearly estimates, pointing again to a longer-term effect of the Single Market on income inequality.

While the overall direction of the effect aligns with the one found in the initial analysis using the Gini coefficient extracted from the Estimated Household Income Inequality Database, there are some differences worth exploring. Firstly, the initial analysis indicated an increase in income inequality in the years immediately following the Single European Act, after which a negative effect would be seen. Moreover, the negative impact diminished in magnitude due to the euro coming into force in 1999. The main explanation for this discrepancy can be found by looking at the different ways the two Gini coefficients are computed. Firstly, the Estimated Household Income Inequality (EHII) is based on survey data conducted by national statistical offices, which are ultimately used to calculate the Gini coefficient. On the other hand, the Standardized World Income Inequality Database (SWIID) standardizes Gini coefficients from multiple sources such as the Luxembourg Income Study, or national surveys. Afterwards, it uses various statistical methods to integrate data from these sources, after adjusting them to a common metric, and fills in the missing values based on the observed values from the proximate years and comparable countries (Solt, 2016). Accordingly, it can be argued that the EHII, being solely based on unstandardized national survey data, is better in capturing short-

term fluctuations compared to the standardized and smoothed dataset of SWIID. A visual examination of Figure 1 and Figure 1B provides strong evidence in this direction, showing that the trend in income inequality measured by the EHII Gini coefficient fluctuates much more prominently compared to the one of SWIID both before and after the treatment happened. Therefore, although the sign and significance of the estimates are consistent with the main analysis, it can be concluded that the Synthetic Control Method is indeed sensitive to the dataset used to measure the outcome variable, aspect that further hinders the credibility of the SCM to generate robust and consistent results in my research setting.

7. Discussion & Conclusion

Well-established theoretical frameworks such as Heckscher-Ohlin and Stolper-Samuelson predict the intensification of income inequality in developed countries due to trade openness. Goods that use the abundant factor intensively tend to benefit disproportionately when they are exposed to the international market, while the goods that use the less intensive factor are bound to suffer the most. More precisely, this would mean that, in developed countries, the wages of the skilled labor will increase, while the ones of the less-skilled workers will plumet. My research further backs previous literature telling us that theoretical models, oversimplifying the intricate mechanisms of economic globalization, may not always predict reality accurately. Accordingly, given that previous empirical studies failed to reach a consensus, this can indicate that delving deeper into the mechanisms that economic integration affects within-country income inequality is of utmost importance. I limit myself to trade and financial openness, thus looking at other mechanisms such as how labor mobility or institutional changes impact inequality could improve upon my findings.

As it was seen in Table 5, the Single European Market initially increases income inequality as measured by the Gini coefficient, after which it decreases compared to its counterfactual. As shown by (Kraay and Ventura, 2000), a possible explanation can be that economic integration initially benefits capital owners due to more capital mobility, which results in higher returns for owners and investors, mostly represented by the wealthiest within the society. Over time, the benefits of integration further disperse throughout the economy, therefore benefiting the other segments of the population and reducing inequality. Another argument revolves around the one also presented in Chapter 2.3 concerning the process of technological diffusion and innovation. The Single European Market fosters an environment conducive to technological

advancement and adaptation generated by the increased competition due to international market exposure. Initially, the advantages of these technologies are reaped by the most skilled, as their demand substantially increases. As more time passes, this technology is diffused further in the society by becoming more accessible, increasing productivity across various sectors, and therefore reducing inequality (Aghion et al, 2015).

The Synthetic Control Method is a recent development introduced by Abadie et al. (2010). It aims to circumvent the limitations of traditional econometric methods such as Difference-In-Difference in adequately determining the causal effects of policies on aggregate outcomes in comparative studies. Accordingly, the method allows for the parallel trends assumption to be relaxed by computing the counterfactual as the weighted average of units that were unaffected by the intervention and did not experience any idiosyncratic shocks during the period of the analysis. By doing so, a donor pool of units with similar characteristics to the treated group is created, each one of them being assigned different weights depending on how well they predict the outcome variable prior to the intervention and their similarity to the actual treated unit of interest. Firstly, spillover effects are not a prominent issue since neither in the main analysis nor in the robustness check any European countries received positive weights. However, a clear limitation to my research is that the treated unit experiences an event post-intervention that substantially impacts the outcome variable: the introduction of the euro in 1999. This can lead to the question whether there might be any other idiosyncratic shocks happening in the countries in my donor pool that affect income inequality in the period of my analysis. The presence of such shocks is much harder to check for and can be present in any country regardless of their geographical location. If they do exist, this would either exacerbate or mitigate the results obtained depending on the direction of the shocks at hand. Therefore, using previous literature on historical events in this time frame, a further analysis in this direction is advisable.

The" In-Time" placebo test points towards no anticipation effects of the Single Market on income inequality, as there was no significant difference in the trends of the treatment and the counterfactual due to arbitrarily changing the time of the intervention. Moreover, the "In-Space placebo test indicates that the results are not significant. This is another limitation of this paper, namely the trade-off between an extended donor pool and an increased pre-intervention time frame. Given the datasets available, I selected a maximum of 14 years pre-intervention to balance the number of countries and the duration of the observation. As outlined before, 16 countries in the donor pool are not enough to extract a significant effect of the policy on income

inequality, making the statistical power of my estimation method very weak. Nonetheless, Table 5 indicated that the estimates become more significant as more time progresses. This is logically compelling, as it is very likely that the effect of the ratification of the Single European Act on income inequality is lagged since it takes time for political and economic integration to show impact, as mentioned previously. Ideally, there would be a database available containing perfect information for all variables, so that more observations pre-intervention can be acquired to improve even further the fit of the Synthetic counterfactual. Moreover, more years after 2000 can further provide evidence for the argument of longer-term effects of economic globalization on income inequality in The Netherlands.

The similarity of the Synthetic Control Group to the treatment unit should not just be limited to the pre-intervention trend in income inequality as measured by the Gini coefficient, but rather extended to other characteristics that predict the outcome variable. These characteristics are called predictor variables and are meant to be of similar magnitude between the two groups, heavily influencing the way that countries receive weights. This analysis uses a total of 8 predictors of inequality, which is in line with the standard put forward by Abadie et al. (2010). Table 4 presents the balance test and proves that the Synthetic counterfactual represents a better comparison to The Netherlands compared to an average of all the countries in the donor pool. Nonetheless, given that income inequality is a very complex phenomenon and is influenced by a multitude of aspects, both observable and unobservable, it might be advisable that, in future research settings, an extension of this list to much more factors will certainly ensure that the counterfactual is indeed as similar as possible to the treatment group.

My robustness check indicates a clear limitation of the Synthetic Control Method: the way it is heavily influenced by the measurement of the outcome variable. It is often the case that the SCM yields substantially different results based on how the data is estimated. This is a prominent issue in my analysis. It was seen that switching the dataset leads to substantial changes in the effect of the policy. The Market Gini coefficient from the Standardized World Income Inequality Dataset (SWIID) indicated towards an overall negative impact on income inequality due to economic integration, which only becomes larger and more significant overtime, a result that is different compared to the main analysis. Therefore, given the plethora of methods that income inequality can be measured, it would be interesting to see whether using other indices such as the share of income held by the first 1% or 10% will lead to results that are consistent to those that I found.

This paper provides a good base for further research into the effects of economic globalization and increased cooperation in Europe on welfare measures such as within-country inequality for developed countries. In line with previous empirical and theoretical research in this direction, one further improvement upon my analysis pertains to a decomposition of the effect of the SEA on income inequality given that trade openness and financial globalization generally have opposing effects on inequality as clarified in Chapter 2. Moreover, given that I only include 16 countries to compute the Synthetic counterfactual, it might be advisable to include more control countries to improve the statistical power of the results. It would be interesting to see whether this will yield significant results and whether the magnitude of the effect will be consistent with my analysis. Additionally, since my results point to a long-term effect of the Single European Act on Income Inequality due to a delayed policy effect, it would be interesting to include more years post-intervention. Furthermore, given the complexity of income inequality and the extensive research in this direction, it is advisable to include more predictor variables to compute the Synthetic Control. Lastly, my paper aims to contribute to a new set of research focusing on the welfare effects of this Single Market policy. Therefore, further analyses can focus on other dimensions of welfare rather than within-country income inequality.

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9. Appendix

Appendix A: Trends in descriptive statistics

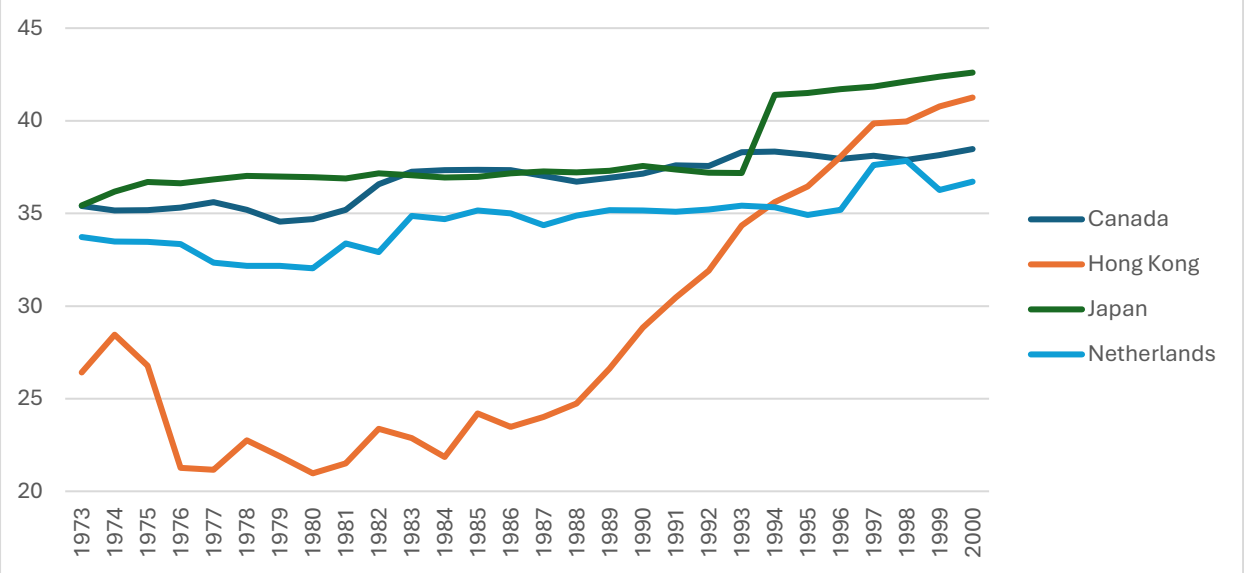

Figure 1A: EHII Gini Coefficient Trends

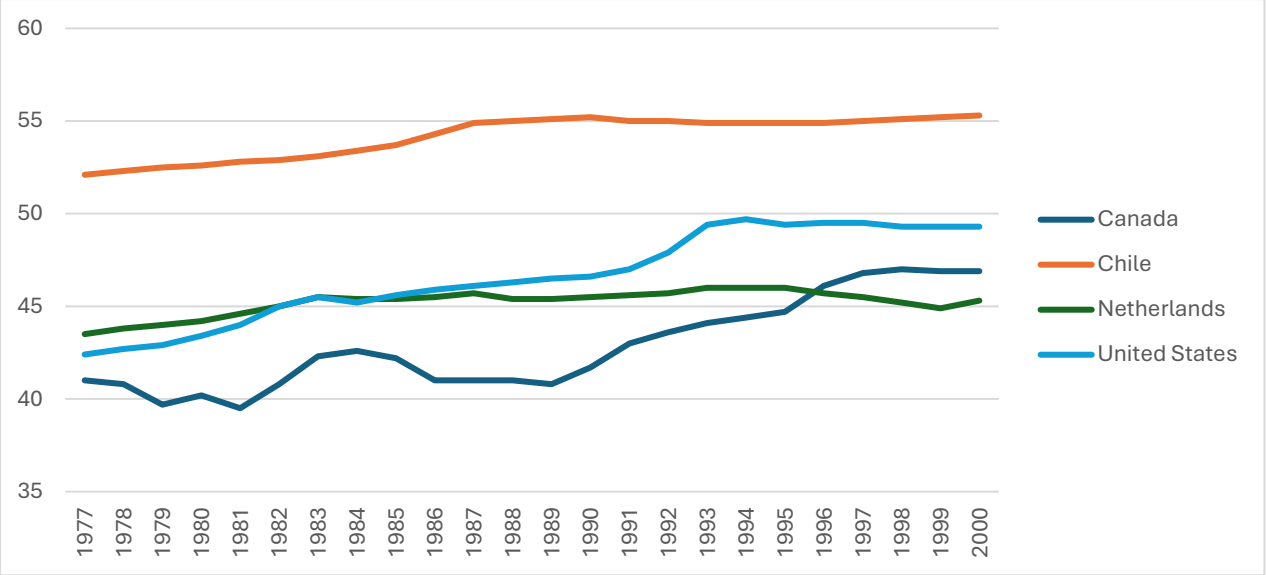

Figure 2A: SWIID Gini Coefficient Trends

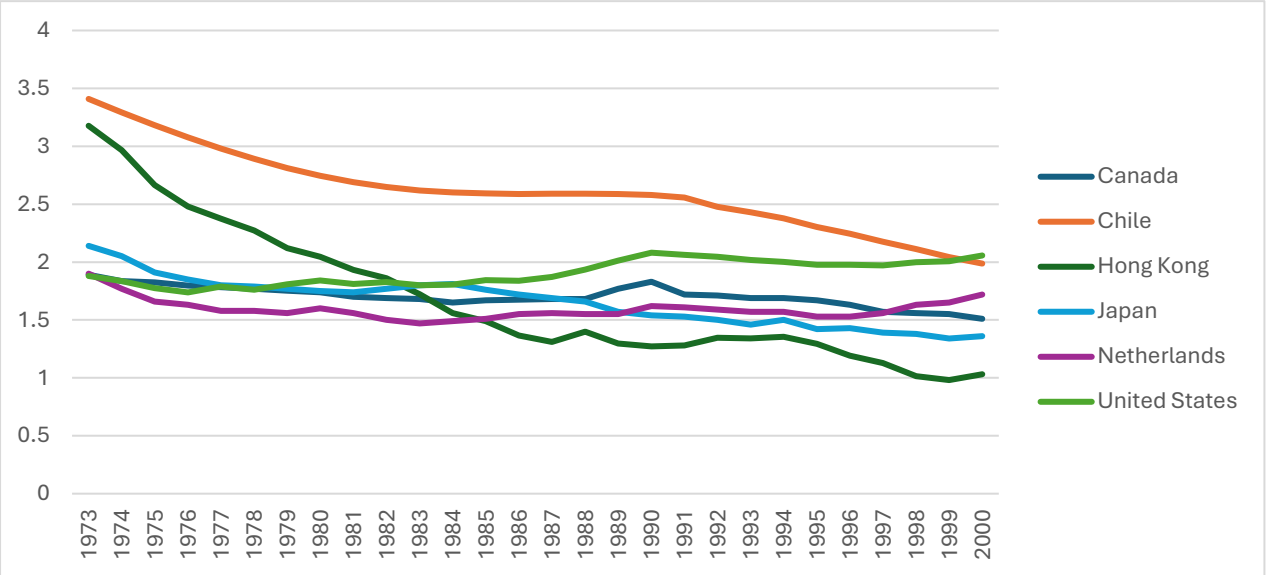

Figure 3A: Fertility Trends

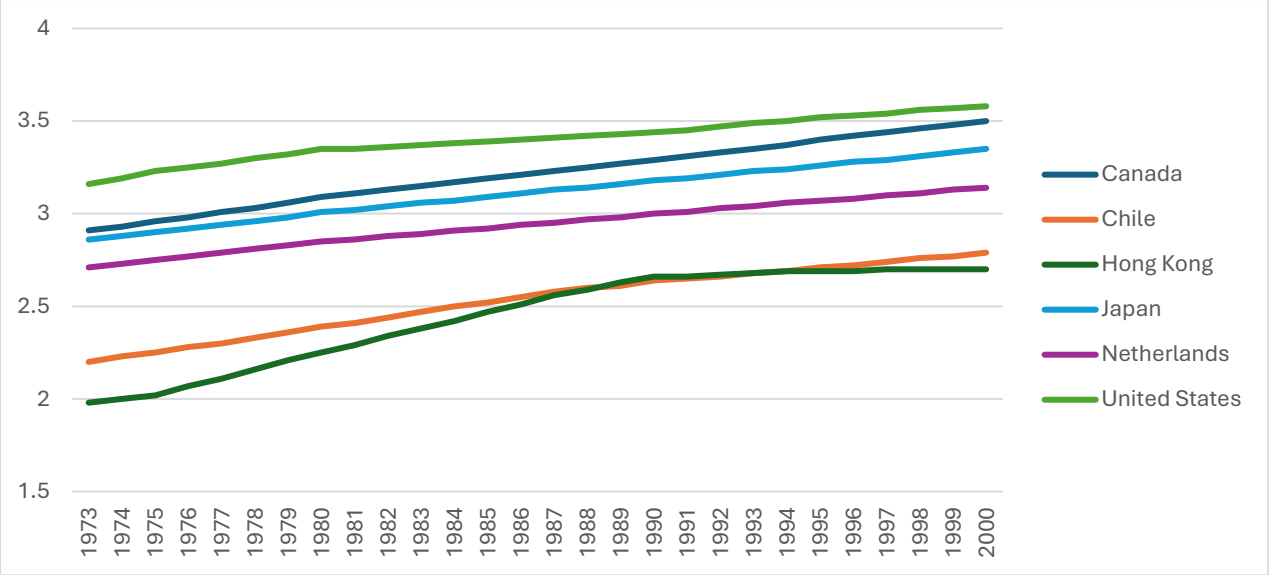

Figure 4A: HCI Trends

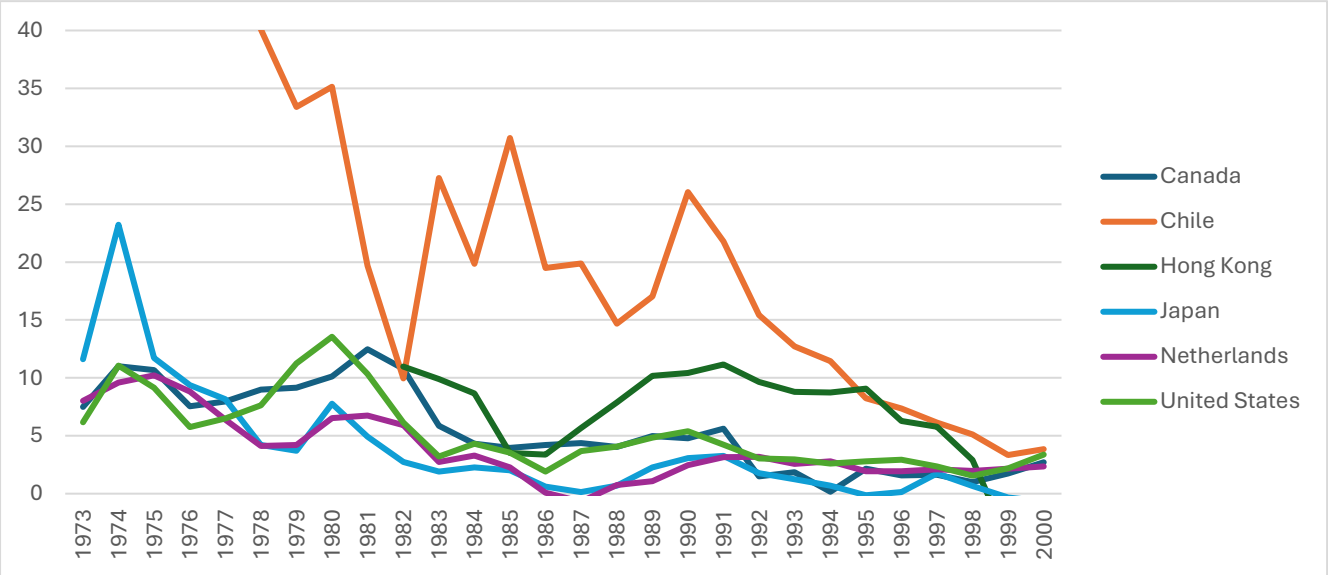

Figure 5A: Inflation Trends

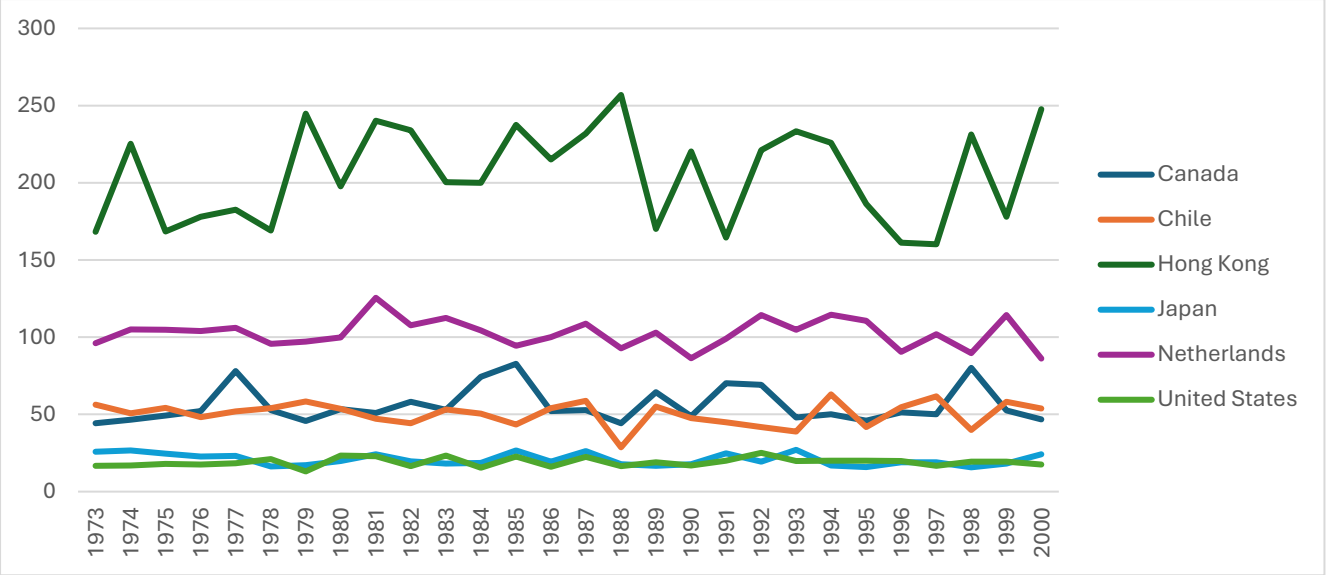

Figure 6A: Trade openness Trends

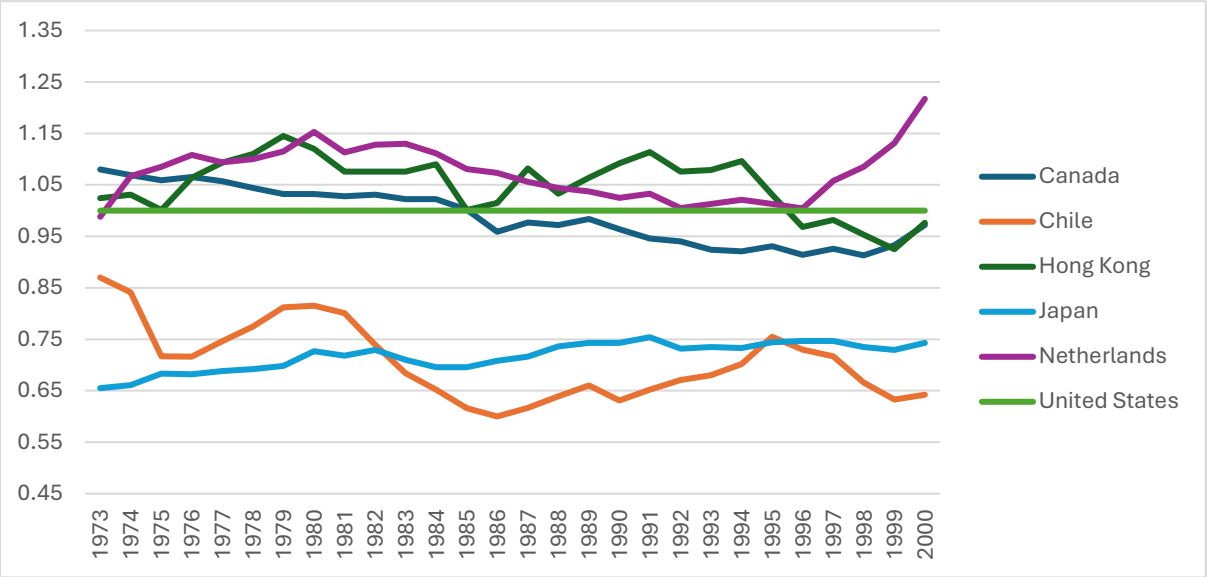

Figure 7A: Total Factor Productivity Trends

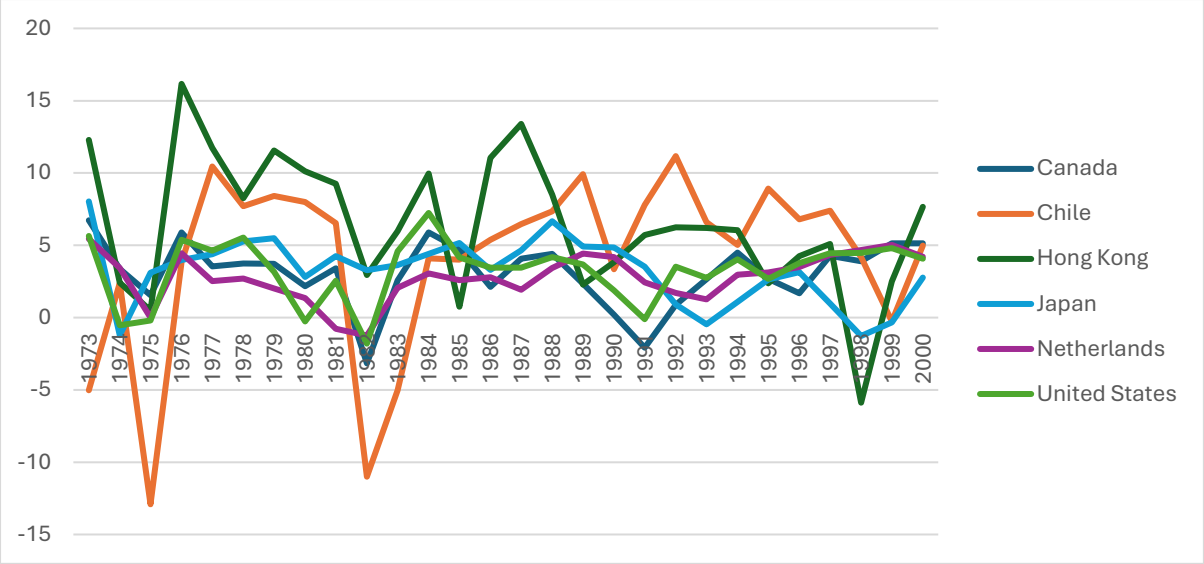

Figure 8A: GDP Growth Trends

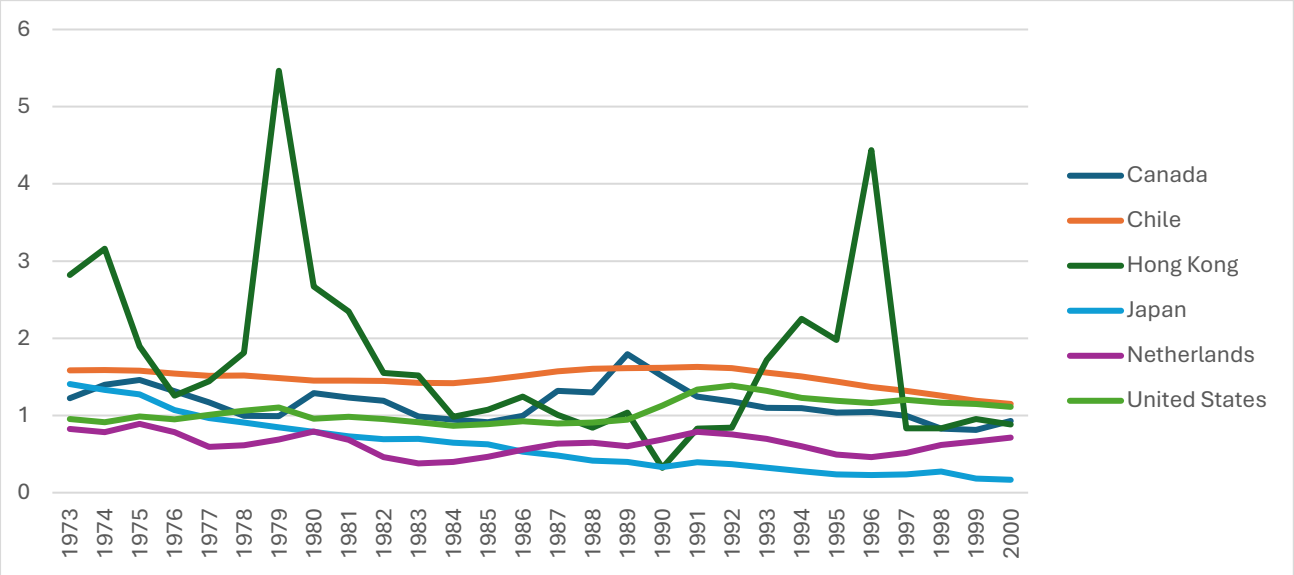

Figure 9A: Population Growth Trends

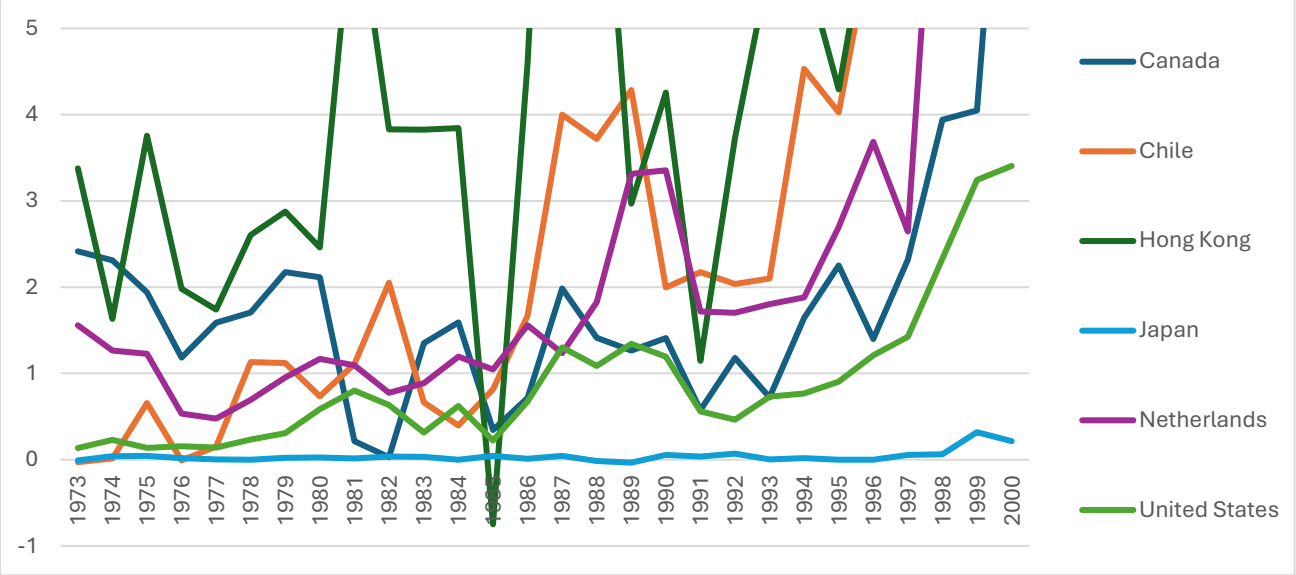

Figure 10A: FDI Trends

Appendix B: Effect of the Single European Market on Income Inequality based on the Standardized World Income Inequality Database (SWIID)

Table 1B: Relative Weights for Donor Countries

Donor country	Unit Weight
Canada	0.288
Chile	0.116
United States	0.596

Notes: The table depicts the weights given by the Synthetic Control Methodology to all the countries being part of the donor pool. It is noticeable that only 3 countries received positive weights in the computation of the Synthetic Counterfactual.

Table 2B: Balance Test: Treated vs. Synthetic vs. Average

	Treated	Synthetic	Average
SWIID Gini (1985)	45.4	45.560	44.736
SWIID Gini (1978)	43.8	43.266	40.885
GDP Growth	1.705	3.257	4.939
Population Growth	0.563	1.054	1.809
HCI	2.868	3.175	2.241

Inflation	4.226	10.114	14.931
Fertility Rate	1.540	1.888	3.148
Trade Openness	104.361	34.737	84.745
FDI	0.985	0.726	1.519
Total Factor Productivity	1.109	0.975	0.788

Notes: The table displays the values of each of the variables predicting the outcome for 3 comparison groups: the treatment, the Synthetic group, as well as an average of all the countries in the donor pool. All values above except Gini are averaged for the 1973-1987 period.

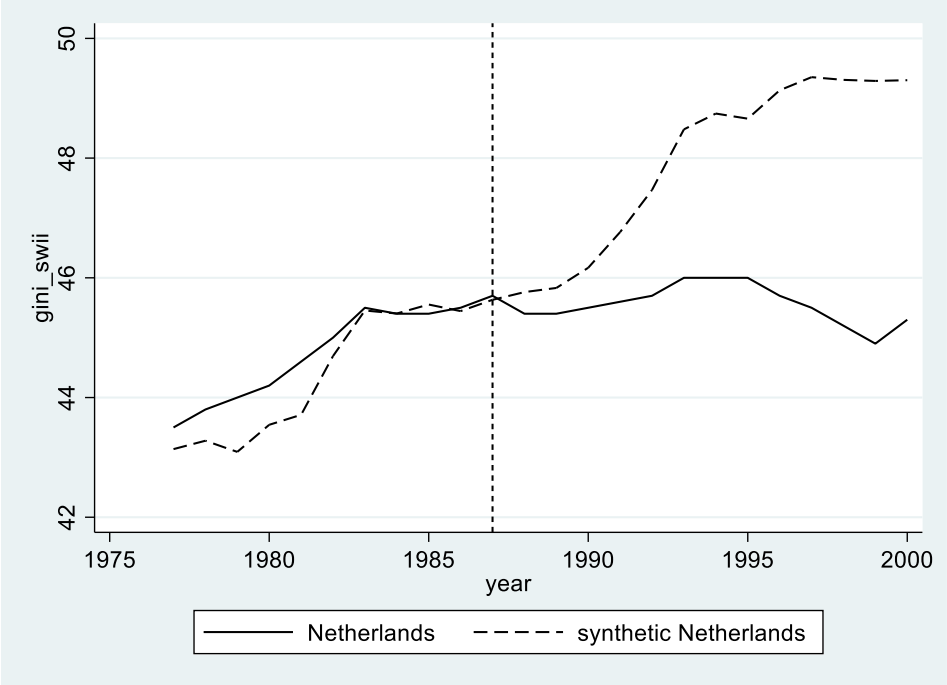

Figure 1B: Netherlands vs Synthetic Netherlands: Gini coefficient.

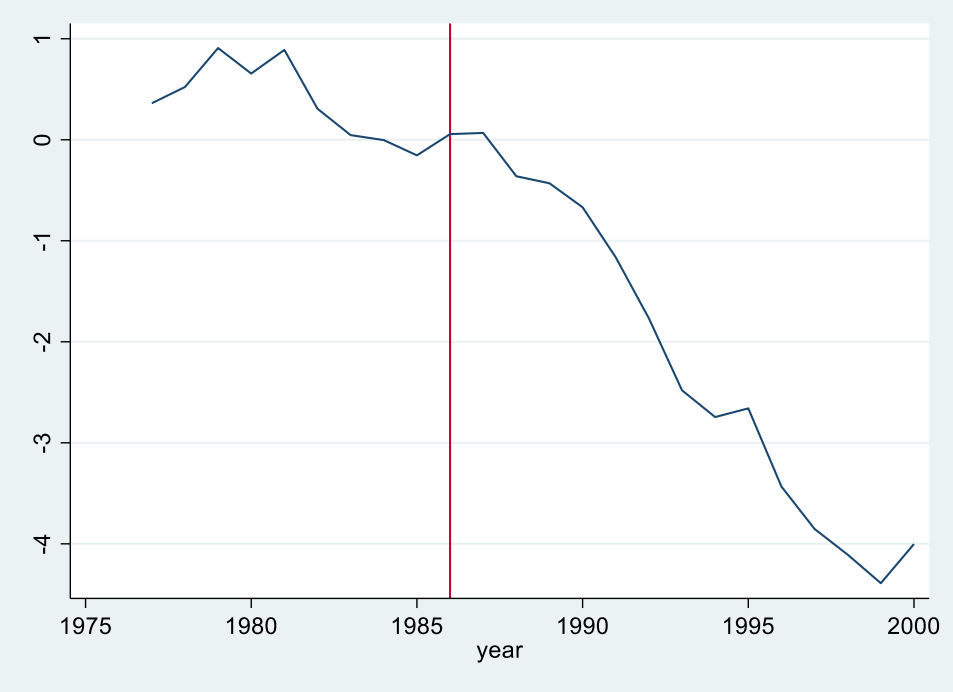

Figure 2B: Temporal differences between Netherlands and Synthetic Netherlands in the Gini coefficient. The year where the intervention happened is depicted by the vertical red line.

Table 3B: Post-treatment results; Effects, p-values, standardized p-values

Year	Estimates	pvals	pvals_std
1987	0.0675015	0.846	0.923
1988	-0.361198	0.538	0.615
1989	-0.4304981	0.615	0.692
1990	-0.6680994	0.538	0.692
1991	-1.164002	0.538	0.385
1992	-1.7678	0.462	0.308
1993	-2.480401	0.231	0.231
1994	-2.744701	0.231	0.231
1995	-2.658601	0.308	0.231
1996	-3.432799	0.154	0.231
1997	-3.8526	0.154	0.154
1998	-4.107099	0.154	0.154
1999	-4.389298	0.154	0.077
2000	-4.001201	0.154	0.154

Notes: The table showcases the differences in the Gini coefficient between The Netherlands and its Synthetic counterpart post 1987 intervention. P-values and standardized p-values depict the significance of the estimated results for each of the years post treatment.

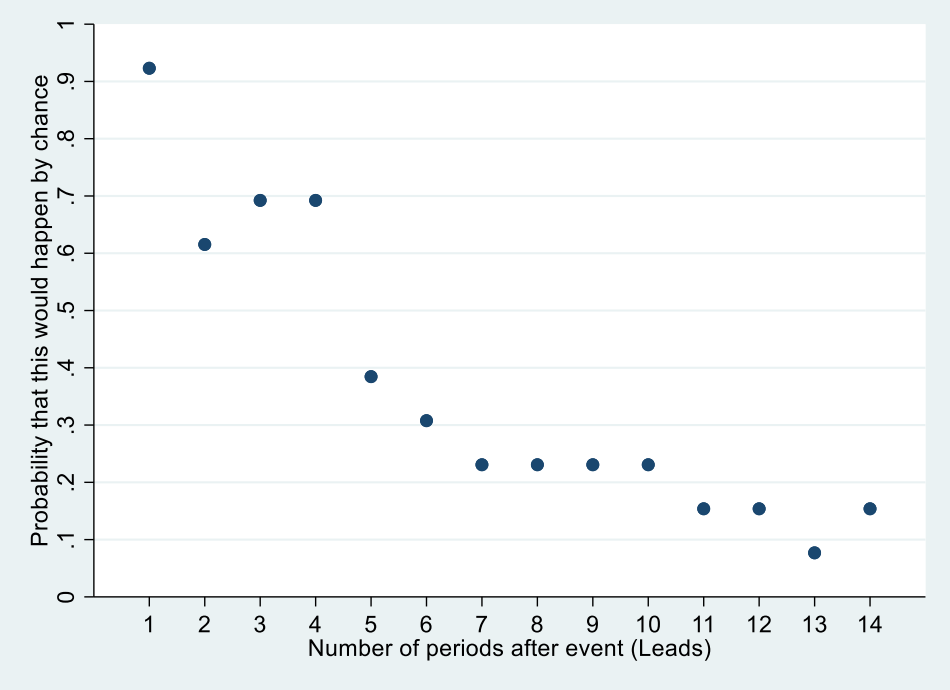

Figure 3B: Standardized p-values for every year post intervention. The values are in line with the third column presented in Table 3B.