Can exposure to import competition explain the growing share of votes for the Sweden Democrats?

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Abstract

Around the world the rise of populist and anti-globalization forces can be seen. In Sweden this movement is prevalent as well, as the populist party the Sweden Democrats is experiencing a substantial increase in support. The reason for this is a widely debated subject amongst scholars. One potential explanation for the rise of populism could be the increased imports from China in recent years. Previous studies show evidence that the Chinese import penetration has had an impact on the rise of populism in United States, yet no research on this topic exist for Sweden so far. Thus, this paper examines whether increased Chinese imports to the Swedish market has impacted the rise of the Sweden Democrats. This is accomplished by using the prominent framework developed by Autor et al. (2013) to calculate the so called "China Shock" and then regressing the Chinese import shock on change in the election results of the Sweden Democrats over the time period 1998-2018. The study takes into account both the short-term and long-term effects of the rise of the Sweden Democrats since it looks at time periods close to China's entry to the WTO and time periods that are further away from their entry. Our results indicate that there is some significant effect from the import shock on the votes for the Sweden Democrats both in the short-run and in the long-run. Moreover, we find that the long-term effects seem to have had a larger impact than the short-term effect. Although our data is too limited to assert anything, a cautionary estimate of the import shock indicates an impact of two percentage points between high-shock county and low-shock county 2010 to 2014.

Table of Contents

1. Introduction

In previous decades international cooperation, an experienced political elite and strong international political institutions have often been important to voters in the Western part of the world. Recent years, however, have shown an increased support for populist parties, anti-globalization forces and more authoritarian ways of rule. On top of this, well-educated politicians are no longer the clear choice to voters and they instead turn to parties who are against the establishment. In the United States for example, the presidential election of 2016 resulted in electing president Donald Trump who has no experience of politics and frequently critiques established media. Furthermore, many European countries have experienced an increase in similar forces as well. European countries that have not had prominent populist parties in the past such as Hungary, Greece, Italy and Sweden are seeing major increases in the support for populist parties in their countries (Statista, 2019). In Sweden, for example, the populist party the Sweden Democrats had so little support they did not make it into parliament ten years ago, yet in the latest parliament election of 2018 they became Sweden's third largest party according to Statistics Sweden (SCB) (SCB, 2019a). Furthermore, opinion polls presented by Demoskop in December of 2019, suggest that their support have grown even stronger since then, making them the largest party in Sweden (Santesson, 2019).

The reasons why populism is on the rise is a highly debated and researched subject among scholars. Inglehart and Norris (2016) propose that the prominent theories for the increase in support of populist parties have either cultural or economic explanations. They further describe that the cultural theories are usually connected to native individuals who do not approve of multiculturalism whereas the economic theories are often related to economic inequality and the effects of globalization. However, they also acknowledge that the cultural factors may have underlying economic implications. Therefore, the economic factors become essential to study in order to grasp why populism has risen.

One factor why economic conditions worldwide have changed over time is the increased free trade around the globe and that will be the focus of this essay. Economic integration has affected most countries in the world, in both positive and negative ways. Trade is usually given credit for increasing global welfare through greater efficiency, as when countries specialize to accommodate the global market production becomes more efficient and goods cheaper as a result. This is believed to benefit both producers and consumers. However, recently the adverse effects of trade have been made prominent. Especially labor market adjustments due to the shift in production patterns have gained a lot of attention. Moreover, the exponential rise of Chinese trade in the last two decades has gotten a lot of attention as it has significantly altered world trade. This is due to the fact that the increased Chinese trade has changed

the consumption and production patterns in many countries, as China has provided cheap imports that the rest of the world has been eager to buy.

Several studies have shown that the import shock from China has had an impact on numerous major economies' labor markets around the world. The United States for instance have according to Autor et al (2013) seen a negative effect on their labor market due to enhanced trade with China after China's accession to the World Trade Organization in 2001. In their paper, Autor et al (2013) develop a model for calculating the increased exposure to imports from China through the so called "China Shock". In a later paper, Autor et al (2016) use this model to examine the effect of the China Shock on voting, claiming that it had an effect on shifting votes to more extreme politicians. Subsequently, many researchers have used the method of Autor et al (2013) to examine the effect of the China Shock on the rise of populism. Many find that it indeed impacts votes for populist parties in Western countries (Autor et al, 2016; Dippel et al, 2015; Colantone and Stanig, 2018).

Although a lot of researchers have tried to examine what has caused the substantial rise of the Swedish populist party the Sweden Democrats, no one has yet explored the role of increased exposure to import competition in the rise of the Sweden Democrats. This paper hence contributes to existing literature as it tries to study if increased trade with China can be an explanatory factor of the rise of the Sweden Democrats. This is done by using the method of Autor et al (2013) for calculating the China Shock and then use the change in votes over time to examine the impact on votes cast for the Sweden Democrats. The strength of the study is that it encompasses both short-term and long-term effects on voting of the China Shock. We find that the China shock most likely had an effect on the increased support for the Sweden Democrats in the time period of 2006-2014, where the largest impact occurred in the time span 2010-2014. Furthermore, when comparing the highest import shock county with the lowest import shock county in 2010-2014, holding all control variables constant, the magnitude of the import shock could be translated to an increase of up to 2 percentage points in vote share. However, this number should be considered with a high degree of caution as the observations of our model are few.

The paper starts with a background of the growing populism worldwide and applies it to the Swedish case in particular. In this part, potential explanations for the resurgence of populism is presented, followed by theories about the rise of populism and then an overview of previous literature concerning populism. After, the empirical methodology, the data and the results will be presented and discussed. Lastly, a discussion of the general results and a conclusion is presented.

2. Growing populism

2.1 Defining populism

Kaltwasser and Mudde (2017) define populism as a "thin-centered ideology" which means that it follows an ideology that finds simplified solutions to complex issues. In this ideology two homogenous groups are put against each other, for example, the people and the corrupt elite (Kaltwasser and Mudde, 2017). Furthermore, Inglehart and Norris (2016) add that the most common form of populism is that there is a social elite that has the power in society, and that ordinary people are being suppressed by this elite. Thus, populism becomes anti-establishment, as people who have populist views believe that the political elite are working against them and that only those who do not belong to the elite can make the system fairer (Rodrik, 2018). In addition, Inglehart and Norris (2016) point out that the establishment is not limited to the political elite but can be targeted towards other actors in society such as multinational corporations, large banks and the media. They further explain that populist parties tend to turn to more authoritarian ways to rule society, where there is a strong charismatic leader representing the will of the people. Consequently, a feature they point out that is of utmost importance to the populists, is majority rule where the majority wins and minorities loose. Usually the majority will be the "ordinary people" who are native-born and are therefore feel like they are more entitled to the country (Inglehart and Norris, 2016). Furthermore, this supports Mudde's (2007) definition of populism that states that there are three components of populism, namely anti-establishment, tendencies of authoritarianism and nativism.

2.2 The growth of populism worldwide

Around the globe there is an upgoing trend for populist parties, especially in Europe, North America and South America. According to Rydgren (2018) this is one of the most substantial political changes to have happened during the last decades. Moreover, he says that these movements have generally gained electoral success and have thus been able to impact politics in a direct way. They have however also affected politics indirectly by influencing the politics of more mainstream parties and making them adhere to their agenda according to Rydgren. However, Rodrik (2018) claim that the agendas of the populist parties differ depending on where in the world they are active. According to the researcher Europe has seen a strong rise in radical right populist parties, South America in more left-wing populist parties and the U.S. have both.

In nearly every European country there has been a resurgence of populist radical right and extreme right parties. These parties according to van der Brug et al. (2014), are usually anti-immigration parties that

are upset with previous political leaders' decisions regarding immigration. Van der Brug et al. (2014) also distinguish between radical right parties and extreme right parties as the former are willing to play by the political rules and the latter on the other hand is authoritarian in its ways and therefore do not abide by the general rules of politics. Inglehart and Norris (2019) state that populistic parties in Europe have almost doubled their average vote share since the 1960s. For some countries populism is not a new phenomenon, yet in other countries it is not until recent years that populistic parties have gotten substantial support due to increased legitimacy to these parties (van der Brug et al, 2014). Statista's (2019) statistics on vote share of populist parties in parliament elections across EU countries show that Hungary is the European country where populism is most popular, as it generated 65.1 % of the vote share in 2018, compared to 43.7 % in 2008. Furthermore, in France numbers from Statista suggests that in 2008 there were 13.8 % of voters in the national elections who voted for a populist party and in 2018 this number was 27.1 % of the vote share. In the same survey Italy, the Czech Republic and Greece can be distinguished as having increased considerably in the time period. Their vote share for populist parties in 2008 was 8.3 %, 12.8 % and 17 % respectively and in 2018 all three countries' populist parties held support of about 50% of the vote share (Statista, 2019). Moreover, another sign of increased support for populism is the fact that the British voted in favor of Brexit in 2016. This is a good example as Brexit is an easy solution to more complex problems concerning globalization, immigration and national sovereignty. Thus, in all these cases there has been a substantial rise of populist movements all over Europe.

South American politics have been dominated by populism since the 1930s (De la Torre, 2017), yet contrary to modern European populism it has often been manifested in left-wing politics. De la Torre (2016) argues that Chavez, Carreo and Morales, politicians in Venezuela, Ecuador and Bolivia respectively, all ran on left-wing populist platforms promising to reduce corruption, increase redistributive policies and strengthen the role of the state. He argues that the people of these countries were discontent with neoliberal policies increasing social inequality and believed the political elite were allowing global institutions such as the International Monetary Fund and the U.S. government to interfere and introduce neoliberal policies. The populist leaders have thus won votes by promising to give back power to the people according to the author.

The United States has experienced tendencies of populism recently as well. One of the most obvious events where increased populism can be illustrated is when President Trump won the U.S presidential elections in 2016. President Trump's political views can be traced back to the populist movement the Tea Party Movement (Inglehart and Norris, 2019). The Tea Party Movement stems from a radical right view and have according to Inglehart and Norris (2016) pushed the Republican Party further to the right. Trump in himself can be seen as populistic as he challenges the established politicians without having prior experience with politics. Furthermore, Inglehart and Norris (2016) argue that one of the most

prominent presidential candidates for the Democrats in both the 2016 and 2020 presidential elections, Bernie Sanders, can also be seen as populistic. Sanders blames the establishment for not accomplishing enough and claims that there needs to be radical change in for example banks and corporations in order to improve society (Inglehart and Norris, 2016). Consequently, the United States has seen a rise in both left-wing and right-wing populism.

2.3 The Swedish context: The rise of the Sweden Democrats

The Sweden Democrats is a Swedish political party that was founded in 1988 (Widfeldt, 2018). The organization stemmed from the so-called Sweden Party that was founded in 1986 after merging the two racist and radical right political groups Bevara Sverige Svenskt and Framstegspartiet. (Elgenius and Rydgren, 2018). According to Widfeldt (2018) the party's initial members consisted of ex-criminals, Nazi war veterans from World War II and members of other Nazi organizations. He continues to point out that numerous of their early meetings were consequently very turbulent and members were allowed to wear offensive symbols. Furthermore, Elgenius and Rydgren (2018) highlight these radical leanings as the main reason to their unsuccessfulness in the early stage of their existence. Since 2005, however, when the current leader of the party Jimmie Åkesson took over, the party has managed to become more legitimate in many voters' eyes as they no longer allow the radical behavior that was once tolerated (Widfeldt, 2018). Jimmie Åkesson's success as a leader can be illustrated by the fact that the party has managed to, in under ten years, go from a party that was frowned upon, to a party that in 2014 was considered the third largest party in Sweden (Widfeldt, 2018).

Today, the Sweden Democrats is considered to be a nationalistic and socially conservative party, with populist tendencies (Dal Bó et al, 2019). A major part of their party identity is based on the belief that Sweden is heading in the wrong direction due to other parties making the wrong decisions over time (Sverigedemokraterna, 2019). As a result, the Sweden Democrats write that they are not afraid to go against the norm as they do not have to compromise with trade unions, journalists and party alliances in parliament (Sverigedemokraterna, 2019). They are in other words criticizing the establishment in terms of both other parties and the media, which is in line with the definition of populism above and thus reveals their populistic traits. In addition, they say that they strive to lower taxes and raise the standard of living for the elderly and invest in the healthcare system. This can be accomplished according to the Sweden Democrats by restricting immigration, especially for low-skilled labor. Consequently, the Sweden Democrats advocate for the simplified and easily understood solution of restricting immigration to the complex challenges of healthcare and elder care, which underlines their populist traits further. As the Sweden Democrats mostly promote limiting the influx of immigration of low-skilled labor, it is likely that they attract Swedish low-skilled labor to their voter base. In addition, they want to limit the benefits given by the state to non-citizens (Sverigedemokraterna, 2019). The idea of putting the native

born before other individuals show signs of nativism that Mudde (2007) stresses is an essential component in populism.

In Swedish politics the Sweden Democrats have not been part of any party coalition as other parties do not want to cooperate with them and consequently more established parties have tried to isolate them from power (Gummesson, 2018). According to Persson (2018) Swedish media has also been critical of them which has resulted in an underdog position that the Sweden Democrats willingly promote. He states that many of the supporters of the Sweden Democrats have as a result become more critical to the legitimacy of Swedish mainstream media. According to researcher Lars Nord however, the perceived underdog position is not entirely correct as the more frequent media reporting is a result of the Sweden Democrats having more scandals than other parties (Persson, 2018). Moreover, Nord claims that the Sweden Democrats' opinions about the media being subjective is a way of further imposing an anti-establishment and populistic mentality (Persson, 2018). This is once again in line with both Mudde's and Inglehart and Norris' research where they claim that media is a part of the establishment that is being questioned by populistic parties (Mudde, 2007; Inglehart & Norris, 2016).

To continue, the Sweden Democrats had 28,340 members in 2017, which can be compared to 15,871 members in 2014 (Heimesson, 2018). Consequently, the party has grown substantially over the last few years. The increase of members has also been followed by a growth in votes. Prior to 1998 they had no recorded result at Statistics Sweden, yet in 2010 they managed to get 5.7 % of the national vote, which allowed them to claim seats in parliament as the required threshold to enter parliament is 4 % of the total votes. After this they have steadily continued to increase their support in the last two parliamentary elections, making them the third largest party in 2018 (SCB, 2019a). The increase in votes nationally is presented in Table 1 below.

Table 1 The Sweden Democrats vote share in Swedish elections

Percentage of votes in parliament elections (of valid votes)						
1994	1998	2002	2006	2010	2014	2018
..	0.4	1.4	2.9	5.7	12.9	17.5

Source: SCB 2019a

3. Theoretical Considerations

To explain the rise of populism most scholars adhere to one of two underlying explanations, either revolving around economic or cultural reasons (Rodrik, 2019). In this chapter the theory behind the two different explanations to populism will be presented.

Inglehart and Norris (2016) present the cultural backlash theory which is one cultural explanation to the rise of populist parties. They theorize that older generations no longer feel at home in a more heterogeneous and tolerant world, where young people have become more open-minded when it comes to living diverse lifestyles, multiculturalism, gender identity and self-expression. These progressive values have according to the researchers started social movements that focus on social rights which in turn draws attention away from more classic redistributive economic issues. Inglehart and Norris argue that this has alienated older generations, especially older, white men who hold traditional values, making them feel marginalized in a society that previously privileged them. Hence, the researchers claim that his cultural backlash can explain the rising popularity of populist parties, as older generations vote against mainstream parties that have allowed this cultural change to happen. According to Inglehart and Norris, for this theory to hold true the voters of populist parties need to be the ones left behind from the change in society, such as lower-educated people, men and the older generation.

Further, Gidron and Hall (2017) propose that subjective social status may influence the vote for populist parties. They theorize that many white, working-class men in Western societies have a perceived sense of loss of social status, and hence vote for populist parties as they feel marginalized. According to the researchers, the reduction of decent-paying, low-skilled jobs, along with the promotion of entrepreneurial skills, making "working hard" insufficient, has deprived these groups of subjective social status. Moreover, they continue to explain that the increase of women in the labor market has further reduced these men's sense of social status as women's status has risen. These factors combined, make these men feel like they have lost social status which makes them vote for populistic parties Gidron and Hall argue. Hence, the researchers propose that the combination of economic and cultural events that have led to certain groups losing subjective social status have helped the rise of populism.

To continue, Inglehart and Norris (2016) position that economic developments, especially the rise of economic inequality, has led to the rise of populism. They believe that populism reflects the division of winners and losers in the current economy, and that stagnant wages, the loss of manufacturing jobs and increased economic inequality has led people to seek a scapegoat, which the populist parties readily provide and promise to solve the problem. Decreased economic conditions are also often linked to globalization and hence perceived worsened economic conditions due to trade may be an explanation of the rise of populism. Rodrik (2018) argues for example that the redistributive effects of trade, theoretically underscored by the Stolper-Samuelson theorem, is larger than the efficiency gains from trade today. He claims that this makes trade a politically sensitive issue, as instead of increasing an economy's size it redistributes the resources among different groups in the economy.

Furthermore, the redistributive effects of trade can be tied to the labor market as there is a risk of domestic workers suffering from the increased trade. As the Stolper-Samuelson theorem implies, this is due to increased trade often leading to specialization, resulting in more developed countries, which are assumed to be more endowed with high-skilled labor, focusing on industries using more high-skilled labor (van Marrewijk, 2012). Therefore, we can reasonably assume that industries that use a lot of low-skilled workers is often closed down as they cannot compete with developing countries that have much lower wages. Hence, low-skilled labor in developed countries might lose as they become unemployed when there is a higher focus on industries that produce goods that require the use of high-skilled labor. This is supported by Autor et al. (2013) who claim that rising imports result in lower wages and increased unemployment in local labor markets. Ebenstein et al. (2015) add to this and say that globalization has led to U.S. workers moving from high wage manufacturing jobs, to jobs in other sectors and occupations, consequently leading to lower wages for the workers who switch jobs.

An important argument in favor of increased trade has been that trade is beneficial by lowering consumer prices and increasing consumer choice by offering a wider array of products. This should result in increased welfare for consumers, including the workers who are worse off because of wage reduction or job loss. However, according to Rodrik (2018), research claim that certain trade agreements have only generated modest gains, and that some groups have even seen a substantial decrease in their income. Rodrik (2018) hence argues that these small efficiency gains from free trade agreements are not enough to make up for the redistributive effects from trade, resulting in sub-groups of the economy to lose in terms of employment and income. Therefore, increased globalization has resulted in a changed economic playing field, making groups of people worse off, which has contributed to increasing discontent and the rise of populism.

One expectation would then be that increased imports to Sweden has had similar results as it had on the United States. However, as Rodrik (2018) points out the Scandinavian countries may have less effect of an import shock on the labor market due to a well-developed social safety net in these countries. This theory is further confirmed by Balsvik et al. (2015) who claim that the Chinese import penetration has had a much lower effect on job displacement on low skilled labor in Norway than in the U.S. case, because of a difference in the structure of the two labor markets. Hence, it is unsure if the import shock would have an effect in Sweden or if the rise of populism can be better attributed to other factors.

To consider another aspect, Rodrik (2018) argues that populism has taken different forms over the world due to differing effects of increased globalization. This can explain the aforementioned difference between the left-wing populism of South America and the right-wing populism of Europe. For example, in South America, trade and foreign direct investment has had a larger effect on the economy and made

society more unequal. Therefore, he claims that it is easier for South American populists to mobilize against a rich elite class and protest the establishment on the basis of left-wing policies such as income inequality and wealth. On the other hand, in Europe the problems have sprung from a large influx of immigrants. Hence, Rodrik claims that in Europe it is easier to gain support on the basis of protecting the economic anxious groups by limiting the possibilities of foreigners to compete for jobs or social welfare. This can explain why populism in Europe is mostly exhibited in radical-right parties. Thus, he claims that even when it seems to be a protest on the basis of culture and nativism, the underlying causes of concern might be economic issues.

All in all, both cultural reasons and economic reasons might have some validity. Inglehart and Norris (2016) believe that making a distinction between culture and economics is artificial and that it is an interactive process wherein the globalized world and the corresponding structural changes to employment and social benefits increases economic inequality, producing a backlash to the new society which is expressed in cultural terms. Hence, they claim we need to consider both cultural and economic reasons.

4. Previous literature

The underlying reasons to rising populism is a well-studied field, researchers turn to either the culture aspect or economic implications to understand populism better, as mentioned above. In this section previous studies concerning the two factors are explored, both on an international and Swedish level.

4.1 Culture

Inglehart and Norris (2016) explore whether their theory of culture backlash is valid in Europe and North America by using data from the 2014 Chapel Hill Expert Survey. Their study looks at several relevant factors to measure the culture backlash theory such as education-level, gender, age and religious beliefs. They come to the conclusion that there is indeed evidence supporting the theory as they find that low-educated older men with a strong Christian belief tend to favor populist parties the most. This ultimately supports the culture backlash theory, as these people have become less of the norm in society. Likewise, Elgenius and Rydgren (2018) see that similar types of voters support the Sweden Democrats in Sweden. The study explores how the Sweden Democrats frame their rhetorics based on nostalgia to appeal to marginalized voters. Elgenius and Rydgren (2018) believe that this rhetoric constructs an idealized image of the past, pertaining to cultural heritage and national events. Hence, the nation in the past is seen as a unified community of people with a homogenous population, something which attracts conservative voters. Elgenius and Rydgren further propose that this makes it possible for the Sweden

Democrat to point to a decline of the Swedish nation and immigrants are singled out as a reason to why the cohesive, homogenous Swedish society does not exist anymore. Elgenius and Rydgren (2018) thus highlight the populist party's tactic of appealing to voters who no longer feel "at home" in their country anymore, which is a significant reason in the cultural backlash theory as to why people vote for populist parties.

Furthermore, Gidron and Hall (2017) also find that working-class, white men vote the most for populist parties. Similarly to the cultural backlash theory they tie this to these groups feeling marginalized, yet further emphasize the subjective loss of social status as a factor to support populist party. Using cross-national survey data from 20 developed countries they find that people with lower levels of subjective social status are more likely to vote for populist party. They also find that social and economic factors have contributed to the loss of social status, and that especially white men have lost social status since 1987 in many developed nations. Hence, they conclude that using subjective social status is a way to explain the rise of populist parties.

In addition, Sannerstedt (2016) looks at Sweden in particular by using data from the national surveys in 2013, 2014 and 2015 from the SOM-institute and reaches results that confirm the above mentioned studies (Inglehart and Norris, 2016; Elgenius and Rydgren, 2018; Gidron and Hall, 2017). More concretely, Sannerstedt finds that the Swedish populist party the Sweden Democrats had their strongest voter-base in the age group 40-75 years. Furthermore, he reaches the conclusion that the party is more appealing to men than to women in all age groups. On the other hand, he writes that the difference in support between the genders is greater for people under the age of 50. Lastly, he points to class belonging and education-level to be determining factors as well, where people with lower education and low-skilled jobs tend to favor the Sweden Democrats more. Hence, Sannerstedt's findings are in line with the aforementioned studies as the Sweden Democrats' supporters tend to be low-educated old men. His result can however also tie into the economic implications of the rise of populist forces as individuals with a low income, class and education level most likely are worse off economically in society. In the next section we will explore the economic factors further.

4.2 Economic Factors

Moving on to studies examining economic factors to the rise of populism, Algan et al. (2017) study the impact of the great recession on voting for populist parties. They collect regional European data on employment and voting and examines the correlation. Algan et al. (2017) find a strong relationship between increase in unemployment and voting for populist parties. In addition, Guiso et al. (2018) examine the impact of economic insecurity on voting for populist parties. They believe that economic

insecurity cannot only be captured by unemployment data. Instead, they also measure economic insecurity by analyzing answers from the European Social Survey about experiencing income difficulties and exposure to globalization based on the industry the participant works in. They find that a one standard deviation change in economic insecurity corresponds to 11.3 % increase in votes for populist parties.

Furthermore, in the Swedish context, Dal Bó et al (2019) propose that the enhanced support of the Sweden Democrats can be explained by economic events such as the financial crisis in 2008 and the political victory of the Swedish party Moderaterna in 2006. In consequence, they argue that these events have contributed to the creation of so called "insiders" and "outsiders" of the Swedish society, where the "outsiders" have less opportunity than the "insiders". According to the authors the Sweden Democrats tend to attract the "outsiders" as the other parties are inclined to accommodate "insiders" better. In addition, Dehdari (2018) claims that voting for the Sweden Democrats is positively correlated to layoffs amongst low-skilled workers with a Swedish heritage, and he suggests that this can account for 31% of the Sweden Democrats' increase in votes in parliament elections between 2006 and 2010. As increased imports might affect unemployment, and in turn higher levels of unemployment amongst the low-skilled labor can explain the growth of the Sweden Democrats, it is then reasonable to believe that the import shock might have contributed to the rise of the Sweden Democrats. This is further supported since the Sweden Democrats try to attract, and succeed in attracting, low-skilled workers as established above. Thus, a lot of the research ties back to the idea that populism can be a consequence of economic distress and that economic factors are important when exploring the underlying causes of the rise of populist parties such as the Sweden Democrats.

Another aspect to the economic implications, relevant for the European case, is immigration. Rodrik (2018) brings up that an influx of immigrants in Europe can lead to greater support for populist parties. Rydgren and Ruth (2011) examine this issue in Sweden and propose that there is a positive correlation between the number of immigrants in the local society and discontent with immigration politics. They also find that ethnic competition can make Swedes averse to immigrants when they are perceived as taking their jobs and social benefits. These results are calculated by using the Ordinary Least Squares multiple regression model on local elections in 2006 and 2010. Moreover, Mehic (2019) looks at the effect of placing refugees in different municipalities around Sweden on voting. He uses the fact that refugees are placed randomly in different municipalities to avoid endogeneity. His main result is that increased numbers of immigrants in a municipality after the Swedish immigration crisis in 2015 could have enhanced the support for the Sweden Democrats. However, he claims that decreased support for the Sweden Democrats was generated if the municipality was less attractive to move to. In that case he found that greater immigration to the municipality could be perceived as something positive. Mehic's research shows that the underlying roots might be economic, as immigration was not seen as a problem

when it can economically benefit the municipality. This is in line with the previously mentioned research by Rodrik (2018) that theorizes that the rise of populism is related to economic factors, even when taking the form of anti-immigration sentiments.

On the other hand, Colantone and Stanig (2018a) examine the outcome of another populist movement, Brexit, and find that immigration did not matter. They claim that support for the Leave side was stronger in areas more economically affected by globalization, but when controlling for immigration they do not find that the number of immigrants in a region affects the share of Leave votes. Hence, in the case of Brexit it seems that immigration did not affect the result, but that it was solely due to economic factors. Furthermore, Viskanic (2017) explores whether Polish immigration to the United Kingdom after 2004 can be an underlying reason for the Leave side winning the Brexit referendum. He does this by looking at regional differences in Polish settlement in the country, compared to regional variation in the results in the Brexit referendum. The paper finds that there is a correlation present, yet he explains this by pointing to the fact that Polish immigrants tend to move to areas that are worse off economically since these areas are more affordable. Thus, Viskanic (2017) also highlights that the economic implications are vital in understanding the outcome of the Brexit referendum correctly.

In other words, economic factors seem to be prominent in finding an explanation to the rise of populism. As globalization and enhanced trade may have resulted in an increase in economic inequality, it becomes essential to examine whether trade and populism can be tied together as well. One way of measuring this is by looking at the advancement of China in global trade. Autor et al. (2013) developed a seminal method in calculating the so-called China Shock which measures exposure to Chinese imports in different regions and sections. They originally use this study to examine the effect on local labor markets.

Multiple studies have taken advantage of the framework developed by Autor et al. (2013) and examined the effect of increased import exposure on the rise of populist parties in other countries. Autor et al. (2016) use the framework to study political effects, regressing increased exposure to Chinese imports on the effect on congressional elections, voting behavior and presidential elections. They find that in regions hit harder by increased trade more moderate candidates were not re-elected. Furthermore, they find that in regions already Republican or where the voters were predominantly white, conservative Republicans were significantly more likely to get elected. In regions originally held by a Democrat or where a majority of the population were a minority a more liberal Democrat was more likely to be elected according to Autor et al. (2016). Moreover, the researchers find that in the presidential elections examined, regions harder hit by Chinese trade exposure shifted to voting more for the Republican candidate. Furthermore, Dippel et al. (2015) examine how net trade exposure from China and Eastern Europe correlate with voting in Germany and find that increased trade integration has a positive

correlation with votes for extreme-right parties. They find no effect on any other parties except the extreme-right. However, measuring net exposure compromised of import competition and export opportunities, they see that it is only an increase in import competition that drives these results, and that an increase of export opportunities has a negative effect on votes for extreme-right parties. Thus, they claim that in Germany's case the positive effect of increased exports has lessened the rise of radical parties. Similarly, Colantone and Stanig (2018b) examine the Chinese import shock on fifteen European countries and come to similar conclusions as Dippel et al. They reach the conclusion that the larger the import shock from China the larger the support for nationalistic parties. The import shock from China has also generated a shift to more radical right parties over time according to the authors.

5. Empirical Methodology

The aim of this study is to examine the recent growth of populism around the world and the underlying reasons to its rise. As has been discussed, this is thought to have both cultural and economic reasons, and in this paper we examine the economic aspects. We use Sweden as a case study to look at how economic factors have impacted populism, specifically the increase of support of the Swedish populist party the Sweden Democrats. As a measure of changing economic conditions we look at increased import exposure and more specifically increased imports from China, that happened when China entered the World Trade Organization (WTO) in 2001 (WTO, n.d.), by using the so called "China Shock" framework developed by Autor et al. (2013). We use a cross-sectional model to regress the explanatory variable, the China Shock, on the dependent variable change in vote share for the Sweden Democrats over time, in different regions. Furthermore, we apply an instrumental variable approach to the model, following Autor et al. (2013), to avoid endogeneity.

In this chapter we start by presenting how the import shock is calculated and measured as well as the main regression used to examine the impact of the import shock on the Sweden Democrats' vote share. Next, control variables are explained and discussed to prevent omitted variable bias and hence acquire reliable results. After this, we present the time periods of the baseline results where the cross-sectional model looks at the change in the variables for the different regions over various time periods in order to capture the short-term and long-term effects of the China Shock. Lastly, this section ends with a presentation of various robustness checks made in order to confirm the outcome of the results further.

5.1 The China Shock model

To measure the impact of China joining the WTO and the resulting increase in cheap export goods from China that followed, Autor et al. (2013) has developed a model to measure increased import exposure from China and its effect on regional labor markets. The researchers propose that a region's change in exposure to import competition from China can be measured by looking at the share of sales in industries in that region in which productivity in imports from China is large relative to total output. They use employment as a proxy to sales output which cannot always be observed. To measure the explanatory variable, the China shock, we use the following equation:

$$Import\ Shock_{it} = \sum_j \frac{L_{ijt}}{L_{jt}} \frac{\Delta M_{sjt}}{L_{it}}$$

In this equation the change of imports from China to Sweden in industry *j* over time periods *t* is captured by ΔM_{sjt} and then divided by L_{it} to get the change in the amount of imports per worker in region *i*. The change of import is measured as the change of imported units from the start of the time period to the end of the time period. The change in import is then apportioned to the region by the region's share of total national employment in the industry, L_{ijt}/L_{jt}. Employment is measured as the employment levels at the start of every period in each region. We then regress the import shock on votes for SD to examine the impact a change in import shock has on votes for SD:

$$\Delta SD_{it} = \alpha_1 + \beta_1 \Delta ImportShock_{sit} + \gamma_1 Z_{it} + \varepsilon_{it}$$

ΔSD_{it} measures the change in the share of votes the Sweden Democrats got in region *i* over time period *t*. The change in import exposure is measured using the previously explained equation for the import shock. Z_{it} is a vector of control variables that might affect voting for the Sweden Democrats, which will be discussed further in section 5.3.

5.2 Instrumented Variable method

One problem arising from the specification of the model is that Chinese imports to Sweden might be correlated to the employment data if the level of imports affect the production in impacted industries. Autor et al. (2013) suggest using an instrument to examine Chinese imports without risking endogeneity in the model. Hence, Chinese imports to Sweden will be instrumented by measuring Chinese imports to other similar countries. Here, we use the EU-15 countries, except Sweden itself (hereafter only referred to as EU-15).[1] These countries are used because they have similar economic and cultural conditions as

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[1] The EU-15 consists of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom

Sweden and were also affected by Chinese exports. Furthermore, these countries are relevant since they are also members of the EU and thus have the same trade integration level as Sweden with China. Thus, with the help of the instrument we can test the impact of the import shock on votes for the Sweden Democrats, avoiding the endogeneity by replacing import shock from Sweden with an import shock from other EU countries. This is done by using a two-stage least squares equation (2SLS) that replaces the endogenous variable $Import\ Shock_s$ with the exogenous variable $Import\ Shock_{EU}$ in Stata.

The 2SLS regression will most likely convey more accurate results and is defined by:

$$\Delta SD_{it} = \alpha_2 + \beta_2 \Delta ImportShock_{EUit} + \gamma_2 Z_{it} + \mu_{it}$$

The equation for the new independent variable, the EU import shock used in the more accurate regression is calculated by:

$$Import\ Shock_{EUit} = \sum_j \frac{L_{ijt}}{L_{jt}} \frac{\Delta M_{EUjt}}{L_{it}}$$

where ΔM_{sjt} is replaced with ΔM_{EUjt}. Other than that, the equation remains the same.

5.3 Control variables

We add control variables in the regression in order to make sure that the results in the baseline regression is reliable. The control variables included are gender, age, education level, income, population density and the share of foreigners. According to the cultural backlash model that Inglehart and Norris (2016) introduced, older people, men and low-educated individuals will vote for populist parties more frequently which makes these control variables important in order to factor out any cultural effect on voting. Following the theory, it is then believed that regions with a higher share of elders, men and low-educated people will vote for the Sweden Democrats to a larger extent. Therefore, we control for these factors in our model. Moreover, Sannerstedt (2014) shows that people living in less densely populated areas are more prone to vote for the Sweden Democrats. Sannerstedt also finds that people with a higher income are less likely to vote for the Sweden Democrats. Thus, we include these controls as they may be important in understanding the rise of the Sweden Democrats. In addition, Rydgren and Ruth (2011) find a positive relationship between the votes for the Sweden Democrats and the number of foreigners in an area and hence we control for the share of foreigners in a region.

5.4 Time periods

The import shock is measured as the change in import shock over 2001-2008. 2001 marks the year when China entered the WTO, which coincided with their increased participation in international trade. The end year of 2008 is chosen following the method of Autor et al. (2013) but is adjusted by one year to fit the available data and to acquire a longer time period. We have also used a shorter time span, 2001-2006, for the import shock when looking at election data prior to 2008. Since our main import shock ends in 2008, we deem any effects up until the next election after the shock has ended, namely 2010, to be short-term effects, and any effects happening after 2010 to be long-term effects.

For the elections, we are interested in the years 2006 to 2018 and hence we examine all the parliament elections present in this period. The election data point of 2006 is relevant as it is the election before the Sweden Democrats were elected into parliament, meaning their popularity was on the rise. Moreover, this year is of significance since the import shock had been undergoing for a while at this point. The other subsequent elections up until the latest one, in 2018, are highly interesting for us as well as their support has kept increasing.

In order to measure the short-term effects we compare the change of the election results in 2006 and 2010 with the election results of 1998. In doing so, we can account for the entire rise in support of the Sweden Democrats as their first official election result was recorded by Statistics Sweden in 1998. Furthermore, the short-term effects are also captured as we look at the change in election results between 2006 and 2010. To measure long term effects, in other words the impact after 2010, an identical strategy was used. Therefore, the regressions use the time period 1998-2014 and 1998-2018 when measuring the effect from 1998 and 2010-2014 and 2014-2018 when exploring whether there was an impact of the China shock that was not accounted for in the election before.

5.5 Robustness checks

Our econometric strategy also involves robustness checks in order to ensure that we would get similar results if we used alternative models to our cross-sectional regressions. If this is the case, we can with stronger confidence rely on the results found, as we would know that regardless of chosen model the outcome of the baseline results are similar. First, we use a panel model instead of our baseline cross-sectional model. Second, we change the import shock to cover the year 2003-2008 instead of 2001-2008 to avoid using different classification indexes. Third, we test the model using an Ordinary Least Squares model instead of the Instrumented Variable model.

To start, in order to acquire more observations we use a panel model for the time periods encapsulating more than two points in time. The panel method differs from cross-sectional in that we can follow a unit of observation (here counties) over time. Hence, for every county all variables are recorded over multiple time periods, with the model being able to detect the data for a specific county over multiple year. Thus, in the panel model change over time is measured similarly to the cross-sectional model, but for multiple years. To clarify, for the time period 1998-2014 the panel data examines the change 1998-2006, 2006-2010 and 2010-2014. There are only three time spans which encapsulates more than two points in time: 1998-2010, 1998-2014 and 1998-2018. All these provide us with more observations, 42, 63 and 84 respectively, which is an improvement to our data.

Furthermore, we examine an alternative time period for the import shock, 2003-2008, due to having to use two different versions of the industrial classifications for our main import shock. To reduce the risk of faults in the data when having to convert it between two versions of the classification system we use the time period 2003-2008. This is beneficial as data using the SNI 2002 classification could be used for the entire span of the shock and no conversions between different classifications needed to be done. By doing this, we can check that our results from the shorter import shock corresponds to the results from the longer import shock and obtain a higher level of certainty that the classification conversions did not affect our results in a tenuous way. We applied this import shock on our baseline cross-sectional model, using the same time periods for the elections as before.

Lastly, we use the Ordinary Least Squares model as a check for the Instrumented Variable model in the baseline regressions. To correct for the suspected endogeneity in the model our baseline approach is to apply an instrumental variable method, but we also ran all the regressions as normal Ordinary Least Squares to see how the results would be affected had we not used an Instrumented Variable model.

6. Data

To perform our regressions, data on vote shares in the Swedish elections for the Sweden Democrats and data to measure the import shock is needed. In order to calculate the import shock, replicating the model of Autor et al. (2013), data on labor and trade is required. The data has to be classified by regions and industries in order to use the Autor et al. (2013) framework. As a result, the regional data is divided up according to Eurostat's (Eur-Lex, 2018) distinction Nomenclature of Territorial Units for Statistics level 3 (NUTS 3). In the Swedish case, NUTS 3 is classified through the 21 counties (län) in Sweden.2 NUTS 3 regions cover a population of about 150,000 to 800,000 people (Eur-Lex, 2018). Since the China shock supposedly hit the manufacturing industry the hardest, we look at manufacturing industries. The

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2 See map of counties in appendix A

manufacturing industry is divided up into sub-categories to find an effect on different industries.[3] Industries are classified using different measures depending on whether the data was published on a national or international level, either SNI, SPIN or ISIC. Conversion keys were used in order to make sure that the industrial data would correspond to each other and subsequently be comparable.[4]

6.1 Presentation of the Data

Election data

Election data that shows the Sweden Democrats' share of votes in Swedish parliament elections was retrieved from SCB (2019a). The data is divided up by "Valkretsar" which is roughly the same as the Swedish counties and the NUTS 3 regions. In a few instances this was not the case and the data was then matched with the NUTS 3 regions in order to have the same regions for every calculation made. For the election data, we have looked at the Sweden Democrats' results in the parliamentary elections 2006, 2010, 2014 and 2018. We also use election results from the year 1998 in order to have a reference point for the following elections.

Labor data

We use labor data by region (L_i), by industry (L_j) and by region and industry combined (L_{ij}) to construct the calculations. Following the method of Autor et al. (2013) we use start of period labor data, namely data from 2001 for the import shock starting in 2001. Later, when we use alternative time periods of the import shock in order to make sure the baseline result is robust, data from 2003 for the import shock 2003-2008 is used instead. The labor data is divided up in different time periods at SCB, therefore two different versions of the SNI-index is used. The SNI 92 index is used for 2001 (SCB, 2019b) and the SNI 2002 index is used for 2003 (SCB, 2019c). To match the different classification indexes a conversion key is used.[5] This data captures employment in the different manufacturing industries, both regionally and in Sweden as a whole. Data on total employment in each county at the start of every time period is also taken from SCB (2019b; 2019c). It was then possible to determine the share of working individuals in each county.

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[3] A list of included manufacturing industries can be found in appendix B

[4] Find conversion keys at https://ec.europa.eu/eurostat/ramon/index.cfm?TargetUrl=DSP_PUB_WELC and https://www.scb.se/dokumentation/klassifikationer-och-standarder/standard-for-svensk-produktindelning-efter-naringsgren-spin/

[5] Find conversion key at https://www.scb.se/dokumentation/klassifikationer-och-standarder/standard-for-svensk-naringsgrensindelning-sni/

Trade data

In order to find data on units imported per industry from China to Sweden 2001, 2006 and 2008 data from SCB was once again used (SCB, 2019d). We use the same division of manufacturing industries as the ones mentioned above. This data is classified in SPIN 2002 up until the year 2008. The data has been inflation adjusted with the inflation rates taken from OECD. The OECD uses 2015 as the base year for inflation adjustment, consequently all the import shocks are inflation adjusted with the base 2015 (OECD, 2019a). The import shock for Sweden is originally in SEK and the import shock for the EU instrument variable is in USD. We have therefore also taken the exchange rate into consideration to be able to make comparisons. Everything has then been calculated into USD using the exchange rates from Riksbanken (Riksbanken, 2019).

The data on imports from China to the EU-15 countries used to construct the instrumental variable can be found at OECD (OECD, 2019b). This data is classified according to ISIC rev. 3, so a conversion has been made to SNI.[6] The amount has been adjusted for inflation between the years, using the inflation rate from OECD (OECD, 2019a). As the EU trade data were already in USD no currency conversion has been made.

Control variables

The control variables used in the regression can be found at SCB as well and are all divided up by NUTS 3 level or converted to fit NUTS 3 level. These control variables were as mentioned above: age, education level, gender, foreigners, population density and income. When using the control variable for age we use the median age in each county (SCB, 2019e). For gender, the share of men over total population in each county was used (SCB, 2019f; SCB, 2019g). Education level is measured as the share of inhabitants in the county having higher than a secondary education (SCB, 2019h). When controlling for foreigners we look at the share of foreigners in the county (SCB, 2019i). Unfortunately, the data for this measure could only be found from 2002, consequently this variable is measured from a later start date. A foreigner is defined as an individual born outside of Sweden or born in Sweden to two foreign born parents. Moreover, to measure population density, we use the number of inhabitants per square kilometer in every county. Lastly, looking at income-level we take the average income of each county (SCB, 2019j). Income has only been reported until 2017 and is therefore only measured up until then. The income is adjusted for inflation with a base year of 2015 and converted to USD to correspond to the rest of the data. Furthermore, the income variable was logged due to the fact that income is believed to not follow a linear disposition, as one unit of currency does not carry the same weight for someone

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[6] Find conversion keys at https://ec.europa.eu/eurostat/ramon/index.cfm?TargetUrl=DSP_PUB_WELC and https://www.scb.se/dokumentation/klassifikationer-och-standarder/standard-for-svensk-produktindelning-efter-naringsgren-spin/

of lower wealth compared to someone very wealthy. Hence, income needs to be adjusted to fit into the same scale as the other variables and then the exponential form is better fitting.

6.2 Data limitations

Autor et al. (2013) suggest using lagged employment data to avoid anticipated changes in imports from China affecting employment. However, due to data restrictions this is not possible to achieve. Furthermore, it was challenging to find data with the same regional and industrial classifications for the trade data and the employment data over time. Due to a difference in classification versions for the Swedish employment data, we had to use both SNI 92 and SNI 2002 in the same trade shock, which could affect our results. SNI 92 captures the employment data up until 2002 and the data with SNI 2002 continues with 2003 onwards.

The import shock is measured until 2008 since the consecutive data available to us goes up until this year. This is close to the time period that Autor et al. (2013) use for their import shock. However, as we look at a more recent time period than Autor et al. (2013), it could have been valuable to use an import shock spanning over a longer time period. In that case it would have given a better idea of the length of the import shock. However, due to the changes in the structuring of the data we were unable to convert the data after 2008 to the proper classifications. Thus, a longer import shock could give unreliable results and therefore we decided that using the import shock up until 2008 was the best option in hand.

There is limitation to the regional data found for employment and the change in imports, more specifically using the NUTS 3 classification since it may not be disaggregated enough. As a result, we only have 21 observations for each time period, due to there only being 21 counties in Sweden. The result would have been even more reliable if we would have found all the data on a municipality level, which could only be found for the election data.

When it comes to the control variables it was difficult to find data over the entire time period examined in this study. For the control variable income there was only data on a regional level up until 2017 instead of 2018 which would have been ideal since all other data is recorded up until this year. When measuring the share of foreigners in each region, this data was first recorded in 2002. Therefore, our initial reference point is later for this variable than for the other variables which start in 1998.

6.3 Econometric considerations of the data

In this section, we would like to test for potential problems in our data. Detailed tables of the results of the various tests can be found in Appendix C. To be able to acquire results that we can feel confident about we want to make sure that they reflect the real population characteristics and give reliable estimates of the population characteristics (Dougherty, 2016). Hence, we want our estimators to be unbiased, efficient and consistent. To test for this and to avoid other problems we want to achieve exogeneity in the explanatory variables, homoscedasticity in the error terms, stationarity in the data, no autocorrelation in the error terms and avoid multicollinearity. Below we are therefore testing for all those assumptions.

To start, it has already been established that the model suffers from endogeneity and to correct it an instrumental variable (IV) approach has been used. In order to make sure that the IV model was in fact a good one we performed an endogeneity test and a first stage regression test.[7] Our conclusion is that the IV model is a suitable specification and that there is a strong correlation between the instrument and the endogenous variable. Since we used this tool, we can feel confident that the results from the IV model is reliable and it is less likely that our result has absorbed related factors to the import shock. Our model therefore becomes exogenous.

Moreover, if there is heteroscedasticity in the error terms the coefficients become harder to interpret and can generate a false result (Dougherty, 2016). We tested for heteroscedasticity in the panel data using a LR test and reject the null hypothesis of homoscedasticity in the regressions.[8] Consequently, we have heteroscedasticity in the data. In order to minimize the problems with heteroskedasticity robust standard errors can be applied (Dougherty, 2016). Hence, we apply robust standard errors on all regressions and in doing so we can be more certain that the results are accurate and easy to interpret.

Multicollinearity was examined in order to understand whether or not the x-variables were correlated with each other. This was conducted through a Variance Inflation Factor test (VIF test) in Stata.[9] The highest value of the test for all variables in all regressions was 5.15. A general limit in order to be able to use the results is about ten, otherwise they can be misleading as the multicollinearity is strong (Baum, 2006). As none of the regressions were anywhere near this result, we can use the regressions without worrying about multicollinearity. High correlation between the independent variables does not necessarily give an incorrect result of the coefficients (Dougherty, 2016). All variables can therefore be

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[7] See appendix C, table 1 and 2
[8] See appendix C, table 3
[9] See appendix C, table 4-10

used despite a somewhat high result for some explanatory variables illustrated in the correlation matrices that were also constructed.[10]

For our baseline results we use a cross-sectional model and hence do not need to worry about problems concerning time series. However, for the panel model used as a robustness check we need to make sure the data is stationarity and does not suffer from autocorrelation. A Levin-Lin-Chu test for stationarity in panel data was performed.[11] This test assumes the null hypothesis that there is no stationarity in the observations. The null hypothesis was ultimately rejected and therefore the data is stationary. The fact that the data is stationary tells us that the mean and the variance of the explanatory variables and the covariance of the variables are not time dependent (Dougherty, 2016).

Furthermore, a Wooldridge test was used to test the panel data for autocorrelation and we found the distribution suffers from autocorrelation.[12] The test contains a null hypothesis that there is no first order autocorrelation and in our case the test was rejected. This can be problematic since the error terms are inconsistent, which makes them unreliable (Asteriou and Hall, 2011). However, the autocorrelation in the panel data can be corrected using robust standard errors as well.

7. Results

7.1 Baseline results

The baseline results of this thesis were found by measuring the change over time in a cross-sectional model to examine the long- and short-term effects of the import shock on increased voting for the Sweden Democrats. As previously mentioned, the short-term effects go from 2006 until 2010 and the longer effects is after 2010. To capture the short term effects we use both 1998 as a reference point compared to election outcomes of 2006 and 2010, as well as the change in between elections of 2006 until 2010. The long-term effects use the same strategy as the short-term effects. The regressions that help absorb long-term effects are then 1998-2014, 1998-2018, 2010-2014 and 2014-2018. First our results for the short-term effects will be presented followed by the long-term effects.

7.1.1 Short-term effects

In this section the regression results for the time periods up until 2010 will be presented. With this we can analyze the short-term effects of the import shock as our measure of the import shock ends in 2008.

[10] See appendix C, table 11-17
[11] See appendix C, table 18
[12] See appendix C, table 19

Consequently, this will reveal any effects during or in the immediate aftermath of the import shock. First, table 2 and 3 will be presented which covers the longer time periods with the reference year 1998 and end year 2006 and 2010 respectively. Second, a shorter time span measuring the change between the elections of 2006 and 2010 will be presented in table 4.

Table 2 Chinese import shock effect on voting for SD 1998-2006

VARIABLES	(1) SD	(2) SD	(3) SD	(4) SD	(5) SD	(6) SD	(7) SD
Import Shock 2001-2006	0.0202***	0.0192***	0.0190***	0.0188***	0.0191***	0.0161*	0.0122
	(0.00328)	(0.00319)	(0.00422)	(0.00662)	(0.00235)	(0.0811)	(0.119)
Education		0.584	0.560	0.562	0.695	0.658	0.293
		(0.165)	(0.165)	(0.155)	(0.122)	(0.132)	(0.405)
Men			0.146	0.465	0.754	0.556	0.969
			(0.858)	(0.578)	(0.347)	(0.623)	(0.312)
logIncome				-0.0172	-0.00328	-0.00577	0.0186
				(0.462)	(0.876)	(0.782)	(0.495)
Population Density					-0.000817*	-0.000963***	-0.00117***
					(0.0644)	(0.00370)	(0.00621)
Age						-0.00495	0.00989
						(0.634)	(0.360)
Foreigners							1.818*
							(0.0509)
Constant	0.0134***	-0.0192	-0.0181	0.0760	-0.00782	0.0165	-0.137
	(0.000318)	(0.383)	(0.393)	(0.521)	(0.943)	(0.888)	(0.395)
Observations	21	21	21	21	21	21	21
R-squared	0.246	0.357	0.357	0.371	0.434	0.447	0.592

Robust p-values in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

From table 2 we can see that the import shock is statistically significant in all columns except column 7 where all control variables are added. However, as the control variables are generally not significant in most of the regressions, we suspect there might be a problem of too little variation in the data. As the significance of the import shock decreases as we add more control variables, there is an indication that the increase of the degrees of freedom reduces the significance level. Hence, we cannot conclude which specification is the most accurate, as the one with all control variables seems to have too many variables for the limited number of observations we have. For the control variables population density and foreigners are significant, which is probable, however seeing as we believe all control variables have an impact on their vote share it is unexpected that we do not see more significance in the control variables.

Table 3 Chinese import shock effect on voting for SD 1998-2010

VARIABLES	(1) SD	(2) SD	(3) SD	(4) SD	(5) SD	(6) SD	(7) SD
Import Shock 2001-2008	0.0308***	0.0294***	0.0297***	0.0275***	0.0275***	0.0269***	0.0218**
	(8.54e-06)	(9.12e-06)	(1.51e-05)	(0.000200)	(0.000200)	(0.00554)	(0.0127)
Education		0.475	0.481	0.683	0.687	0.673	0.393
		(0.290)	(0.297)	(0.111)	(0.112)	(0.144)	(0.312)
Men			0.0216	0.0695	0.0692	0.0643	0.0856
			(0.749)	(0.358)	(0.364)	(0.519)	(0.360)
logIncome				-0.0735**	-0.0722	-0.0713	-0.0308
				(0.0321)	(0.130)	(0.140)	(0.494)
Population Density					-1.78e-05	-4.65e-05	-0.000132
					(0.956)	(0.901)	(0.710)
Age						-0.000646	0.0122*
						(0.913)	(0.0720)
Foreigners							1.173**
							(0.0455)
Constant	0.0300***	-0.00575	-0.00662	0.429**	0.421	0.418	0.138
	(1.43e-08)	(0.859)	(0.847)	(0.0242)	(0.134)	(0.136)	(0.613)
Observations	21	21	21	21	21	21	21
R-squared	0.366	0.431	0.431	0.524	0.524	0.524	0.655

Robust p-values in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 3 presents the regression with reference year 1998 up to 2010, encapsulating one more election compared to table 2. Here, the import shock is significant in all regressions, but lose some significance in the last column. Comparing the coefficients of the import shock here to table 2 we see an increase in the coefficients, suggesting the effect is bigger when including one more election. Similarly to table 2 the control variables do not show a lot of significance either, which is unexpected as they are believed to affect the votes for the Sweden Democrats. Hence, we still suspect the model suffers from too little variation in the data. Here, the control variables age and foreigners are significant in column 7.

Table 4 Chinese import shock effect on voting for SD 2006-2010

VARIABLES	(1) SD	(2) SD	(3) SD	(4) SD	(5) SD	(6) SD	(7) SD
Import Shock 2001-2008	0.00149***	0.00150***	0.00148***	0.00138***	0.00138***	0.00131***	0.00104**
	(0.000340)	(0.000564)	(0.000881)	(0.00366)	(0.00337)	(0.00829)	(0.0278)
Education		-6.648	-8.754	-9.761	-19.51	-21.14	-27.38
		(0.849)	(0.816)	(0.781)	(0.585)	(0.551)	(0.349)
Men			-1.847	-1.270	-0.909	-1.698	1.421
			(0.652)	(0.765)	(0.832)	(0.750)	(0.760)
logIncome				-1.314	-1.826	-1.426	0.574
				(0.290)	(0.330)	(0.562)	(0.738)
Population Density					0.0172	0.00107	-0.0169
					(0.501)	(0.984)	(0.669)
Age						-0.317	1.111
						(0.710)	(0.200)
Foreigners							89.48*
							(0.0645)
Constant	1.680***	1.809***	1.882**	8.979	11.88	9.976	-2.574
	(1.69e-09)	(0.00709)	(0.0196)	(0.187)	(0.253)	(0.441)	(0.785)
Observations	21	21	21	21	21	21	21
R-squared	0.385	0.386	0.387	0.410	0.414	0.419	0.552

Robust p-values in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 4 shows the change between the elections in 2006 and 2010. Here, the import shock is significant in all regressions. However, the only control variable significant is foreigners in column 7. Moreover, the coefficient of the import shock is smaller than in table 2 and 3. This is probably due to the shorter time span, as this table shows the change between two elections, namely a change over four year, whilst table 2 and 3 show the change over longer time periods as those are measured from 1998. Hence, it is not surprising that this shorter time span would have less variation in the data resulting in less significance for the control variables.

In conclusion, from the regressions measuring the short-term effects of the import shock we find indications of there being some sort of effect of the import shock, as the import shock is the variable that almost always generates a significant effect. However, the lack of significance for the control variables point to the model lacking variation in the data. Hence, more research on a more disaggregated level would need to be performed to come to a more assertive answer.

7.1.2 Long-term effects

In this section we will examine time periods terminating after the end of the import shock to see if there are any signs of exposure to Chinese imports having had a delayed effect on the election results. As our import shock ends in 2008 we deem any effects taking place after 2010 to be long-term effects. Table 5 and 6 show the periods spanning from the reference year of 1998 up until the elections of 2014 and 2018

respectively. Additionally, we examine the change in between elections, namely between 2010-2014 and 2014-2018 which will be presented in table 7 and 8.

Table 5 Chinese import shock effect on voting for SD 1998-2014

VARIABLES	(1) SD	(2) SD	(3) SD	(4) SD	(5) SD	(6) SD	(7) SD
Import Shock 2001-2008	0.0603***	0.0603***	0.0604***	0.0539***	0.0539***	0.0506***	0.0380***
	(3.34e-07)	(2.84e-07)	(5.42e-07)	(5.11e-05)	(4.33e-05)	(0.000994)	(0.00798)
Education		0.0408	0.136	0.327	0.328	0.294	0.209
		(0.942)	(0.821)	(0.511)	(0.510)	(0.537)	(0.600)
Men			-0.578	0.796	0.794	0.793	1.139**
			(0.358)	(0.146)	(0.203)	(0.199)	(0.0133)
logIncome				-0.193***	-0.193*	-0.188*	-0.124
				(0.00651)	(0.0700)	(0.0668)	(0.105)
Population Density					-4.03e-06	-0.000105	-0.000273
					(0.991)	(0.800)	(0.421)
Age						-0.00278	0.0174**
						(0.691)	(0.0292)
Foreigners							1.438***
							(0.00896)
Constant	0.0841***	0.0799	0.0746	1.374***	1.369*	1.352*	0.812
	(0)	(0.135)	(0.179)	(0.00302)	(0.0560)	(0.0521)	(0.120)
Observations	21	21	21	21	21	21	21
R-squared	0.475	0.475	0.484	0.598	0.598	0.601	0.726

Robust p-values in parentheses
*** p<0.01, ** p<0.05, * p<0.1*

In table 5 it can be seen that for the time period 1998-2014 the import shock is significant for all regressions. It can be seen that the coefficients of the import shock have increased compared to the short-term time span of 1998-2010. In table 5, column 7, the control variables men, age and foreigners are significant.

Table 6 Chinese import shock effect on voting for SD 1998-2018

VARIABLES	(1) SD	(2) SD	(3) SD	(4) SD	(5) SD	(6) SD	(7) SD
Import Shock 2001-2008	0.0594***	0.0593***	0.0595***	0.0567***	0.0563***	0.0503**	0.0376**
	(8.97e-05)	(9.92e-05)	(0.000154)	(0.00127)	(0.00121)	(0.0125)	(0.0386)
Education		0.108	0.110	0.526	0.496	0.465	0.388
		(0.831)	(0.829)	(0.299)	(0.305)	(0.320)	(0.354)
Men			0.0417	0.411	0.420	0.457	0.587
			(0.873)	(0.171)	(0.193)	(0.168)	(0.108)
logIncome				-0.205**	-0.234	-0.230	-0.163
				(0.0164)	(0.105)	(0.103)	(0.205)
Population Density					0.000140	4.31e-05	-0.000100
					(0.730)	(0.915)	(0.783)
Age						-0.00408	0.0136
						(0.559)	(0.154)
Foreigners							1.095**
							(0.0114)
Constant	0.132***	0.118**	0.118**	1.537***	1.747*	1.734*	1.146
	(0)	(0.0377)	(0.0480)	(0.00669)	(0.0817)	(0.0795)	(0.207)
Observations	21	21	21	21	21	21	21
R-squared	0.376	0.378	0.378	0.494	0.496	0.503	0.630

Robust p-values in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6 shows the time period 1998-2018 and reveals that the import shock is significant for all regressions. Even though table 6 encapsulates four more years than table 5 there is not much of an increase in the coefficients. In table 6 only foreigners are significant in column 7. Generally, there is not a lot of significance in the control variables which is of concern.

Table 7 Chinese import shock effect on voting for SD 2010-2014

VARIABLES	(1) SD	(2) SD	(3) SD	(4) SD	(5) SD	(6) SD	(7) SD
Import Shock 2001-2008	0.0295***	0.0252***	0.0229***	0.0234***	0.0242***	0.0212***	0.0181***
	(4.92e-07)	(3.64e-06)	(9.03e-05)	(0.000141)	(3.57e-05)	(0.00844)	(0.00948)
Education		-1.365*	-1.618*	-0.850	-0.737	-0.612	-0.418
		(0.0855)	(0.0558)	(0.346)	(0.407)	(0.530)	(0.668)
Men			0.117	0.0748	0.0860	0.0979	0.0911
			(0.157)	(0.425)	(0.325)	(0.269)	(0.353)
logIncome				-0.0682**	-0.0444	-0.0455	-0.0227
				(0.0290)	(0.248)	(0.195)	(0.554)
Population Density					-0.000517	-0.000676	-0.00105**
					(0.248)	(0.241)	(0.0429)
Age						-0.00861	0.00465
						(0.576)	(0.820)
Foreigners							0.808
							(0.144)
Constant	0.0540***	0.0915***	0.0998***	0.503***	0.353	0.361*	0.198
	(0)	(6.59e-06)	(6.08e-06)	(0.00521)	(0.121)	(0.0814)	(0.388)
Observations	21	21	21	21	21	21	21
R-squared	0.479	0.541	0.553	0.620	0.631	0.638	0.663

Robust p-values in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In table 7 we see the regressions for the change between the elections 2010 and 2014. The import shock is significant in all columns but what differs from the other regressions, except for 1998-2014, is that also the last column has a significance level of less than one percent. Moreover, it can be seen that the coefficient of the import shock has decreased relative to regressions covering the time spans with base year 1998, which is natural as this measure the effect over a shorter time span. In column 7 the only significant control variable is population density.

Table 8 Chinese import shock effect on voting for SD 2014-2018

VARIABLES	(1) SD	(2) SD	(3) SD	(4) SD	(5) SD	(6) SD	(7) SD
Import Shock 2001-2008	-0.000843	-0.00128	-0.000962	-0.00100	-0.000745	-0.00465	-0.00621
	(0.842)	(0.766)	(0.828)	(0.820)	(0.872)	(0.360)	(0.188)
Education		0.307	0.362	0.402	0.468	0.574	0.648
		(0.506)	(0.461)	(0.499)	(0.464)	(0.284)	(0.216)
Men			0.0675	0.0660	0.0651	0.157**	0.220**
			(0.332)	(0.344)	(0.357)	(0.0490)	(0.0343)
logIncome				-0.00375	-0.0286	-0.0303	-0.0270
				(0.861)	(0.573)	(0.535)	(0.542)
Population Density					0.000364	0.000545	0.000265
					(0.496)	(0.338)	(0.599)
Age						-0.0142*	-0.00139
						(0.0939)	(0.900)
Foreigners							0.513
							(0.101)
Constant	0.0475***	0.0417***	0.0400***	0.0614	0.206	0.215	0.180
	(0)	(4.79e-06)	(0.000138)	(0.609)	(0.479)	(0.444)	(0.479)
Observations	21	21	21	21	21	21	21
R-squared	0.003	0.013	0.018	0.018	0.033	0.097	0.163

Robust p-values in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$*

In table 8 we see the change between the elections 2014 and 2018. We suddenly lose significance for the import shock for all regressions. However, we do not see a lot of significance for the control variables either. This, as has been pointed out before, suggests limited variation in the data, but as the import shock has been significant before with similarly limited data this indicates that the import shock did not have an effect between 2014-2018. This is reasonable, as the effect of an import shock having happened 2001-2008 can have stagnated by this time and the consequences of the import shock having stabilized.

To conclude, all our time spans show a mostly significant import shock, except for the time span 2014-2018. The coefficients for the time spans with base year 1998 is larger than for the in-between elections, which we deem natural as the former measure the effect over a longer time. However, we also see that

comparing the longer time spans with each other the coefficients for the import shock increases as we add more years. The same happens when looking at the in-between elections up until 2014. This suggests that the impact has gradually increased up until 2014 when it slowed down. Hence, even though we cannot say anything concrete due to the model having a small number of observations and probably too little variation in the data, we believe this to be an indication that the import shock could have had an effect, and that the effect increased from 2006 up until 2014.

Furthermore, the only control variable we see somewhat consistent significance of is foreigners. This is reasonable as it is believed that immigration affects the vote share of the Sweden Democrats. However, from the regressions one can grasp that a lot of the control variables are insignificant, which we do not believe is due to them not affecting the vote share but due to limited variation in the data. Unfortunately, this makes it empirically unclear which control variables actually have an impact on the votes for the Sweden Democrats. From a theoretical viewpoint we believe all of them matter and as such we cannot choose to take away a control variable to solve the degrees of freedom problem because we do not want to take away a control variable that has an impact on their vote share. We have then decided to keep all of our control variables as we suspect that all of them can have an impact on the vote share of the Sweden Democrats and eliminating any of them would increase the risk of omitted variable bias.

7.1.3 Economic significance

As concluded above our results indicate that the import shock had an effect. What is more important however, is to understand the size of the effect. Since we are not sure of the exact value of the coefficient this examination of the coefficient should be taken with a high degree of caution, and only act as a first indication to what the potential effect could have been and if it seems to be of relevance should be further researched.

Seeing as we have uncertain results it is difficult to comment on the magnitude of the import shock, but to get a sense of the potential effect, we looked at the impact on votes for the Sweden Democrats in the county with the highest import shock (Örebro) compared to the county with the lowest import shock (Uppsala). We use the coefficient of the import shock from the time period where we believe the import shock had the most effect, namely up until 2014. Hence, we examine the magnitude of the coefficient from the regressions 2010-2014 from the regression with all control variables included. However, as we do believe this is the time period when the China shock had most of its impact this should be considered as the maximum impact of the import shock, based on the results from our limited data. We multiply the coefficient of the import shock, 0.0181 with the difference in import exposure for the two countries, 1.1 thousand USD per worker, holding the control variables constant by multiplying the coefficients of

the control variables with their mean. This measure of the magnitude of the import shock translates to an additional 2 percentage points of votes for the Sweden Democrats in Örebro compared to Uppsala due to Örebro having higher exposure to Chinese imports. However, as our data set is limited and the coefficients vary vastly depending on which control variables we use we are uncertain that this is the actual impact of the import shock and that this subject should be further researched to find a more accurate impact estimate.

7.1 Robustness analysis

In order to further support the indication that the import shock have had an effect robustness checks have been performed to test the model. These have been made through looking at an alternative model and by using other time periods for the import shock than what was used for the baseline results. The different model we have used is to adopt a panel model, looking at changes over time. Moreover, we have also used our baseline cross-sectional model but instead used the import shock for the years 2003-2008. Finally, as our main model requires an IV estimation we also present the OLS results.

Panel model

To acquire more observations we use a panel model for the time periods encapsulating more than two points in time. Panel methods differ from cross-sectional in that we can follow a unit of observation (here counties) over time. Hence, for every county all variables are recorded over multiple time periods, with the model being able to detect the data for a specific county over multiple year. In the panel model change over time is measured, similarly to the cross-sectional model, but for multiple years. To clarify, for the time period 1998-2014 the panel data examines the change 1998-2006, 2006-2010 and 2010-2014. There are only three time spans which encapsulates more than two points in time: 1998-2010, 1998-2014 and 1998-2018. All these provide us with more observations, 42, 63 and 84 respectively, which is an improvement to our data. The regressions presented are without control variables (1), similar to column 1 in previous regression tables, or with all control variables (7), similar to column 7 in previous regression tables.

Table 9 Panel model for years 1998-2010, 1998-2014 and 1998-2018

VARIABLES	(1) 1998-2010 SD	(7) 1998-2010 SD	(1) 1998-2014 SD	(7) 1998-2014 SD	(1) 1998-2018 SD	(7) 1998-2018 SD
Import Shock 2001-2008	0.0154***	0.00769**	0.0201**	0.00894**	0.0149**	0.0152***
	(8.34e-06)	(0.0471)	(0.0219)	(0.0223)	(0.0295)	(0.000213)
Education		0.0576		-0.109		-0.154
		(0.716)		(0.488)		(0.411)
Men		0.0496		0.0715		-0.0190
		(0.455)		(0.271)		(0.640)
logIncome		0.0175		0.0543***		0.0516***
		(0.150)		(0)		(0)
Population Density		-0.000935***		-0.00166***		-0.000901***
		(0.00199)		(1.48e-07)		(6.88e-05)
Age		-0.00101		0.000252		-0.00438
		(0.839)		(0.963)		(0.453)
Foreigners		1.019***		1.395***		-0.120
		(0.00871)		(2.76e-06)		(0.558)
Constant	0.0151***	-0.0907	0.0280***	-0.290***	0.0329***	-0.252***
	(5.61e-10)	(0.187)	(4.01e-05)	(0)	(9.68e-10)	(0)
Observations	42	42	63	63	84	84
R-squared	0.265	0.481	0.070	0.891	0.049	0.725

Robust p-values in parentheses
*** p<0.01, ** p<0.05, * p<0.1

From table 9 it can be seen that the coefficients for the import shock is significant for all regressions in all time periods. This is reassuring as it supports the indication that the import shock had an effect, from our baseline results. However, the coefficients of the import shock are smaller in the panel model than in the cross-sectional model. As the panel model has more observations this indicates that the magnitude of the import shock might be smaller than the cross-sectional model implied. Moreover, as expected more control variables become significant as the number of observations has increased. However, we get unexpected results for the variable income, which shows a significantly positive effect on the vote share for the Sweden Democrats for the time periods 1998-2014 and 1998-2018, which is the opposite of what we believe. Hence, there still seems to be too little variation in the data and it seems like the augmented number of observations is still not large enough but that an optimal model would have even more observations.

Import Shock 2003-2008

As we had some issues converting some of the data into certain industrial classifications, we made sure to run the regressions where we would not need to convert the data at all. By doing this, we obtain a higher level of certainty that the classification conversions did not affect our results in a tenuous way. Hence, we calculated the import shock from 2003 instead of 2001. This is beneficial as data using the

SNI 2002 index could be used for the entire span of the shock and no conversions between indexes needed to be done. We applied this import shock on our baseline cross-sectional model, using the same time periods for the elections as before. The coefficients for the import shock for these years are presented in the table below. Column 1-7 indicates the adding of additional control variables, done in the same manner as for the baseline results. Results for the control variables are available upon request.

Table 10 Coefficient for the Import Shock, measured 2003-2008, all time periods

VARIABLES	(1) SD	(2) SD	(3) SD	(4) SD	(5) SD	(6) SD	(7) SD
Import Shock 1998-2006	0.0104***	0.00902***	0.00949***	0.00992***	0.00991***	0.00793**	0.00455
	(0.000832)	(0.00147)	(0.00688)	(0.00515)	(0.000648)	(0.0219)	(0.228)
Import Shock 1998-2010	0.0205***	0.0188***	0.0186***	0.0189***	0.0189***	0.0200***	0.0160***
	(1.27e-07)	(1.36e-07)	(6.00e-08)	(3.13e-08)	(2.87e-08)	(0.000144)	(0.00326)
Import Shock 2006-2010	0.00240***	0.00252***	0.00249***	0.00239***	0.00239***	0.00231***	0.00196***
	(1.58e-09)	(4.55e-09)	(8.91e-09)	(3.09e-08)	(1.13e-08)	(5.91e-06)	(0.000107)
Import Shock 1998-2014	0.0383***	0.0389***	0.0424***	0.0395***	0.0398***	0.0428***	0.0324***
	0	0	0	0	0	(2.30e-06)	(0.00109)
Import Shock 1998-2018	0.0402***	0.0404***	0.0403***	0.0438***	0.0437***	0.0486***	0.0393***
	(9.92e-09)	(4.35e-09)	(8.67e-09)	0	0	(1.53e-05)	(0.000361)
Import Shock 2010-2014	0.0178***	0.0158***	0.0143***	0.0172***	0.0176***	0.0176***	0.0163***
	(7.62e-11)	(3.94e-07)	(6.10e-06)	(5.70e-10)	0	(4.47e-05)	(1.18e-05)
Import Shock 2014-2018	0.00191	0.00170	0.00199	0.00212	0.00252	0.00124	0.000330
	(0.377)	(0.416)	(0.353)	(0.389)	(0.348)	(0.744)	(0.926)

Robust p-values in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

From these results it can be observed that the significance level of the import shock is the same as for the baseline cross-sectional results. This supports our inclination that the import shock had an effect, as the import shock is still significant when using data that we are sure are not hindered by potentially faulty index conversions. In addition, these regressions convey smaller coefficients for the import shock which is expected as the import shock naturally becomes smaller when two years are deducted.

Ordinary Least Squares

To correct for the suspected endogeneity in the model our baseline approach is to apply an instrumental variable method. We also ran all the regressions as normal Ordinary Least Squares (OLS) to see how the results would be affected had we not used an Instrumented Variable model. In the table below the coefficients for the import shock are presented. Column 1-7 indicates the adding of additional control variables, done in the same manner as for the baseline results. Results for the control variables are available upon request.

Table 11 Import shock coefficient, OLS, all time periods

VARIABLES	(1) SD	(2) SD	(3) SD	(4) SD	(5) SD	(6) SD	(7) SD
Import Shock 1998-2006	0.0205***	0.0189**	0.0188**	0.0189**	0.0177**	0.0139	0.0106
	(0.00849)	(0.0145)	(0.0202)	(0.0254)	(0.0280)	(0.209)	(0.254)
Import Shock 1998-2010	0.0299***	0.0287***	0.0289***	0.0263***	0.0263***	0.0250**	0.0197*
	(0.000253)	(0.000555)	(0.000965)	(0.00553)	(0.00729)	(0.0398)	(0.0617)
Import Shock 2006-2010	0.00144***	0.00145***	0.00142***	0.00131**	0.00131**	0.00123*	0.000947
	(0.00300)	(0.00511)	(0.00847)	(0.0250)	(0.0270)	(0.0549)	(0.111)
Import Shock 1998-2014	0.0603***	0.0604***	0.0606***	0.0525***	0.0525***	0.0483**	0.0344*
	(8.81e-05)	(0.000120)	(0.000231)	(0.00279)	(0.00366)	(0.0183)	(0.0599)
Import Shock 1998-2018	0.0590***	0.0589***	0.0591***	0.0548**	0.0547**	0.0474*	0.0336
	(0.00105)	(0.00155)	(0.00248)	(0.0126)	(0.0158)	(0.0635)	(0.141)
Import Shock 2010-2014	0.0304***	0.0259***	0.0237***	0.0236***	0.0242***	0.0210*	0.0176*
	(0.000131)	(0.000364)	(0.00186)	(0.00340)	(0.00315)	(0.0506)	(0.0676)
Import Shock 2014-2018	-0.00121	-0.00173	-0.00147	-0.00155	-0.00119	-0.00553	-0.00733
	(0.764)	(0.684)	(0.743)	(0.736)	(0.815)	(0.341)	(0.188)

Robust p-values in parentheses
*** $p<0.01$, ** $p<0.05$, * $p<0.1$

We conclude that the OLS regressions produce similar results when it comes to significance, with most regressions reaching the same level of significance as their respective IV regression. However, the coefficients differ slightly between the OLS and the IV regressions. This is normal as we suspect the OLS regressions suffer from endogeneity, and the IV regressions should solve this problem and be the more accurate coefficients.

7.2 Discussion of the results

The aim of this study was to examine whether a Chinese import shock on Sweden had an impact on the increased support for the populist party the Sweden Democrats.

All in all, by analyzing both the short-term effects and the long-term effects we come to the conclusions that the data indicates that the import shock had an effect. This was especially seen for 2010-2014. When examining how large this impact would be in terms of increased vote share we estimate an increase of two percentage points between the highest import shock county and the lowest for the change in vote share between 2010 and 2014. This is quite a lot considering the Sweden Democrats received slightly below 13 % of the total of votes in 2014. However, it is far from being the sole explanation of their rise. Moreover, our limited sample of data makes the analysis uncertain. Hence, we cannot draw any strong conclusions, instead we can only comment that the results indicate an effect of the import shock that

should be further researched to be able to draw any definite conclusions. Since our results for the long-term effects are more significant and has a larger impact, we conclude that there is a higher chance of there being an impact in the long run. As we conclude that there was most likely a greater effect in the later time period we see that the reaction on the China Shock on voting might be delayed. In the latest parliament election of 2018 we no longer find an effect which indicates that after 2014 other variables can explain the increased votes for the Sweden Democrats better than the import shock.

There are numerous potential explanations for the potential delayed effect on voting from the import shock. A reason could be that people have lost their jobs due to the trade integration and are struggling, either to find a new employer or to readjust at a new job. If they have still not rejoined the workforce after being laid off due to Chinese import penetration, they have gotten it worse economically and socially as they have no income. Voting against low-skilled immigrants who are also struggling is then appealing as they are competing for the same jobs and the same standing in society. The people that had to readjust to the labor market might also be worse off economically as the jobs available are limited for those without a higher-level education. Thus, as many lower paying jobs have disappeared the competition to get hired at those jobs are fierce. Furthermore, they may have to take multiple jobs to reach the level of earnings they once did working in an industry. These factors can make the individual feel marginally worse off than before as Gidron and Hall (2017) argue and therefore they can be against change. On top of this, low-skilled labor usually competes with uneducated immigrants for jobs, which can make the unemployed workers turn against this group even more. This is close to what Dehdari (2018) finds in his paper, namely that 31% of the increased support for the Sweden Democrats between 2006 to 2010 can be explained by layoffs of natively Swedish workers.

As our limited number of observations made our model inconclusive we do not want to neglect the possibility that the impact is smaller than what we found. Most importantly, we do believe there are more factors that influence the increased vote share of the Sweden Democrats than increased exposure to import penetration. As we fail to consistently get significance for our control variables we cannot deduce from this study which variables are relevant or how strong their effect is, but it is easy to imagine that other factors would play a role and reduce the importance of the import shock.

The variable share of foreigners seems to be the only control variable we can find a significance for in most of the regressions. It has a significantly positive effect on the vote share for the Sweden Democrats in most of the time periods we have examined, meaning that the share of foreigners in a region increases the vote share for the party. It is also noticeable that the size of the coefficients of the variable foreigners is larger than the other variables, including the import shock, in most of the regressions. This supports what Rydgren and Ruth (2011) find, which is that the higher the shares of foreigners, the steeper the increase in the votes for the Sweden Democrats. This is also in line with many of the cultural

explanations (Inglehart and Norris 2016; Elgenius and Rydgren, 2018), which posit that multiculturalism threatens the native born wanting to maintain their social status and familiar, conservative society. In 2018 when the impact of the import shock seems to have stagnated, the variable foreigners could become prominent in explaining the growth of the Sweden Democrats. Sweden experienced a major refugee crisis in 2015 which could not have affected any election before 2018 yet could potentially be an explanatory factor for the party's high vote share in 2018. However, our results for between the elections 2014-2018 are largely insignificant so this cannot be confirmed based on our results. On the other hand, as most variables are insignificant we believe it is the data that is the problem. Thus, for further research it would be interesting to examine if this effect has increased as Sweden experienced a major refugee crisis in 2015 that subsequently increased the percentage of foreigners in the regions.

Furthermore, there might be other factors that matter that we have not included in our regressions. One of these might be the increased economic inequality that has happened over the last few years in Sweden. According to SCB (2016) the income Gini coefficient in 2005 was 0.271, whilst the income Gini coefficient had grown to the highest recorded value of 0.320 in 2016. Consequently, it can tie back to the study by Gidron and Hall (2017) that point to the marginalizing effects amongst low-income workers in society. Furthermore, our research does not take into account the fact that the other parties in parliament have cooperated to keep the Sweden Democrats' out of power, resulting in them maintaining an underdog position, despite being one of the bigger parties.

This study aims to contribute to current research by examining whether there is a relationship between voting for the Sweden Democrats and the import shock. Our research shows indication that the import shock can have helped explain their rise, especially between 2010 and 2014. It also indicates that it could have contributed to increasing the vote share of up to two percentage points in a high shock county. However, more research is needed to come up with a more precise estimate, as our research is lacking in data.

8. Summary and Conclusion

The world today is seeing an increased support for political forces and movements that support populist standpoints, as a solution to the more and more complex problems that we are faced with. Some of these forces would like to prevent globalization through restricting trade integration and the movement of people. In doing so, they claim to have found solutions to complex issues. The Sweden Democrats is a prevalent force in the Swedish case as they are both considered populist and want to limit immigration.

The aim of our study was to explore whether there is a relationship between the increased votes for the Sweden Democrats and the import shock on Sweden, both in the short run and in the long run. In order to reach our results several regressions were performed, where the dependent variable measured the change in either votes from election to election or longer time spans with a reference point of 1998. The explanatory variables consist of the China Shock and several control variables that fit the time period. From our study we can draw three main conclusions.

First, we find indications that the import shock had a significant positive effect on the increase of voting for the Sweden Democrats. We see a significant effect for most regressions but find a stronger impact for the long-term effects up until 2014. The coefficient for the import shock 2010-2014 indicates that this affected the result of up to two percentage points.

Second, we do not find a lot of significance of our control variables, even though we have chosen control variables that previous research has shown to have had an effect on voting for populist parties. This points to the research suffering from the limited numbers of observations available to us. Hence, we conclude that a more in-depth study examining this question on a more disaggregated level is needed to produce more reliable and consistent results.

Third, a large effect can be seen on the variable foreigners in most of the regressions. This variable is significant in numerous of the time periods despite many of the other control variables not showing significance. Consequently, the control variable foreigners can likely contribute to explaining the enhanced vote share of the Sweden Democrats and should be further examined. Considering that Mehic (2019) found that individuals with a foreign background were seen as an asset in cities which needed population growth for economic reasons, yet in already populated regions these people were seen as a burden, it would be interesting to delve deeper into combining the cultural and economic theories and conduct studies where the two intertwine.

The study contributed to previous research as it examined the China Shock's effect on the rise of populism in Sweden. Similar studies have been conducted in other countries, yet none in the case of Sweden. Nonetheless, the increased support for the Sweden Democrats and the potential reasons behind it is a topic that has been widely researched amongst Swedish scholars. The strength of this study is that it addresses both the long term and short-term effects of the import shock for each election. This makes it easier to understand the reasons behind the rise of the Sweden Democrats for each election.

For further research in the field, one could examine the data on a more disaggregated level, such as looking at municipalities if possible. In doing so, one could take into account larger regional variations. Stockholm for example most likely have certain variations, and for our analysis the county of Stockholm was accounted for as one region. One should note that we did not have access to this data and hence NUTS 3 was as far as we could go. Since the import shock had some significance and marginalizing

effects, the economic factors still seem to have a prominent role in understanding the rise of populism. Hence, economic factors should not be excluded from further studies in the field. In addition, the cultural implications such as the influx of people with a foreign background and the party attracting new types of voters, also seems to be important in the Swedish case and therefore should be further examined. This combined could make for interesting results, as it is probable that the rise of populism has both economic and cultural explanations and it could be difficult to separate them.

8. References

Algan, Y., Guriev, S., Papaioannou, E., and Passari, E. (2017). The European Trust Crisis and the Rise of Populism. *Brookings Papers on Economic Activity*, vol. 2, pp. 309-400.

Asteriou, D. and Hall S., (2011). Applied Econometrics. Second Edition. New York: Palgrave Macmillan

Autor, D., Dorn, D. and Hanson, G. (2013). The China Syndrome: Local Labor Market Effects of Import Competition in the United States. *American Economic Review*, vol. 103, no. 6, pp. 2121-2168.

Autor, D., Dorn, D., Hanson, G. and Majlesi, K. (2016). Importing Political Polarization? The Electoral Consequences of Rising Trade Exposure. NBER Working Paper, No. 22637. Available online: http://www.nber.org/papers/w22637 [Accessed 10 Dec. 2019].

Balsvik, R., Jensen, S. and Salvanes, K. (2015). Made in China, Sold in Norway: Local labor market effects of an import shock. *Journal of Public Economics*, vol. 127, pp.137-144.

Baum, C. (2006). An Introduction to Modern Econometrics Using Stata. College Station, Texas: Stata Press.

Colantone, I. and Stanig, P. (2018a). Global Competition and Brexit. *American Political Science Review*, Vol 112, No. 2, pp. 201-218.

Colantone, I and Stanig, P. (2018b). The Trade Origins of Economic Nationalism: Import Competition and Voting Behavior in Western Europe. *American Journal of Political Science*, Vol 62, No. 4, pp. 936-953.

Dal Bó, E., Finan, F., Folke, O., Persson,T. and Rickne, J. (2019). Economic Losers and Political Winners: Sweden's Radical Right. working paper no. 190301, Institute for International Economic Studies Stockholm University. Available online: http://perseus.iies.su.se/~tpers/papers/CompleteDraft190301.pdf [Accessed 27 Nov. 2019].

Dougherty, C. (2016). Introduction to Econometrics. Fifth edition. Oxford: Oxford University Press.

Dehdari, S. (2018). Economic Distress and Support for Radical Right Parties - Evidence from Sweden, working paper, Available online: http://dx.doi.org/10.2139/ssrn.3160480 [Accessed 27 Nov. 2019]

De la Torre, C. (2016). Left-wing Populism: Inclusion and Authoritarianism in Venezuela, Bolivia, and Ecuador, *Brown Journal of World Affairs,* Vol. 23, No. 1, pp. 61-76.

De la Torre, C. (2017). Populism in Latin America, in C. Kaltwasser, P. Taggart, P. Ochoa Espejo, and P. Ostiguy (eds.), *The Oxford Handbook of Populism*, Available online: https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780198803560.001.0001/oxfordhb-9780198803560-e-8 [Accessed 2 Dec. 2019].

Dippel, C., Gold, R. and Heblich, S. (2015). Globalization and Its (Dis-)Content: Trade Shocks and Voting Behavior, NBER Working papers, no. 21812, Available online: http://www.nber.org/papers/w21812 [Accessed 27 Nov. 2019].

Ebenstein, A., Harrison, A. and McMillan, M. (2015). Why are American Workers getting Poorer? China, Trade and Offshoring, NBER Working Paper, no. 21027, Available online: http://www.nber.org/papers/w21027 [Accessed 27 Nov. 2019].

Elgenius, G. and Rydgren, J. (2018). Frames of Nostalgia and Belonging: the resurgence of ethno-nationalism in Sweden. *European Societies*, vol. 21, no. 4, pp. 583-602. Available online: https://www.tandfonline.com/doi/full/10.1080/14616696.2018.1494297# [Accessed 27 Nov. 2019].

Eur-lex (2018). Regulation (EC) No 1059/2003 of the European Parliament and of the Council of 26 May 2003 on the establishment of a common classification of territorial units for statistics (NUTS), available online: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:02003R1059-20180118&qid=1519136585935

Gidron, N. and Hall, P. (2017). The Politics of Social Status: Economic and cultural roots of the populist right. *The British Journal of Sociology*, vol. 68, no. 1, pp. s57-s84.

Guiso, L., Herrera, H., Morelli, M., and Sonno, T. (2017) Populism: Demand and Supply. CEPR Discussion Paper No. DP11871. Available online: https://ssrn.com/abstract=2924731 [Accessed 27 Nov. 2019]

Gummesson, J. (2018). *SD avgör alla frågor där blocken inte gör upp | SvD*. [online] SvD.se. Available online: https://www.svd.se/sd-avgor-alla-fragor-dar-blocken-inte-gor-upp [Accessed 27 Nov. 2019].

Heimesson, A. (2018). *Här är partierna vars medlemsantal ökar och minskar allra mest*-Dagens Arena. Dagens Arena. Available online: https://www.dagensarena.se/innehall/har-ar-partierna-vars-medlemstal-okar-och-minskar-mest/ [Accessed 3 Dec. 2019].

Inglehart, R. and Norris, P (2016). Trump, Brexit, and the Rise of Populism: Economic Have-Nots and Cultural Backlash, HKS working paper no. RWP16-026. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2818659 [Accessed 27 Nov. 2019]

Inglehart, R. and Norris, P (2019). Cultural Backlash: Trump, Brexit and Authoritarian Populism. New York: Cambridge University Press.

Kaltwasser, C. and Mudde, C. (2017). *Populism: A Very Short Introduction*. Oxford: Oxford University Press.

Mehic, A. (2019). Immigration and Right-Wing Populism: evidence from a natural experiment, working paper, no. 2019:5, Lund University Publications.

Mudde, C. (2007). Populist Radical Right Parties in Europe. Cambridge: Cambridge University Press.

OECD (2019a). Inflation. Available at: https://data.oecd.org/price/inflation-cpi.htm#indicator-chart [Accessed 27 Dec. 2019].

OECD (2019b). *Bilateral Trade in Goods by Industry and End-use (BTDIxE), ISIC Rev.3*. Available at: https://stats.oecd.org/Index.aspx?DataSetCode=BTDIXE_I3# [Accessed 27 Dec. 2019].

Persson, E. (2018). *SD allt mer som andra partier i medier – med roll som underdog - Dagens Arena*. Dagens Arena. Available online: https://www.dagensarena.se/innehall/sd-allt-mer-som-andra-partier-medier-med-roll-som-underdog/ [Accessed 27 Nov. 2019].

Riksbanken (2019). Årsgenomsnitt valutakurser. Available online: https://www.riksbank.se/sv/statistik/sok-rantor--valutakurser/arsgenomsnitt-valutakurser/?y=2006&m=12&s=Comma&f=y&fbclid=IwAR0a-BxY7tHA8hEcWeVunyQiw2IZ6efnBiA05OXTSFqvYPyVFAdOg45tDlU [Accessed 27 Dec. 2019].

Rodrik, D. (2018) Populism and the economics of globalization, *Journal of International Business Policy*, vol 1, No 1-2, pp 12-33.

Rodrik, D. (2019). Many forms of populism. Voxeu.org. Available online: https://voxeu.org/article/many-forms-populism [Accessed 10 Dec. 2019].

Rydgren, J. (2018). The Radical Right: an Introduction, in J. Rydgren (eds), *Oxford Handbook of the Radical Right,* Available online: https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780190274559.001.0001/oxfordhb-9780190274559-e-1 [Accessed 10 Dec. 2019]

Rydgren, J., and Ruth, P. (2011). Voting for the Radical Right in Swedish Municipalities: Social Marginality and Ethnic Competition?, *Scandinavian Political Studies*, vol 34, No 3, pp 202-225.

Santesson, P. (2019) Sverigedemokraterna fortsatt största parti i väljarbarometern. Available online: https://demoskop.se/aktuellt/valjarbarometern-december-2019/ [Accessed 23 Dec. 2019]

Sannerstedt, A. (2014). Sverigedemokraternas sympatisörer, Available online: https://som.gu.se/digitalAssets/1487/1487698_445-458-anders-sannerstedt.pdf [Accessed 18 Nov. 2019]

Sannerstedt, A. (2016) Sverigedemokraternas sympatisörer: fler än någonsin, Available online: https://som.gu.se/digitalAssets/1579/1579388_sverigedemokraternas-sympatis--rer-fler---n-n--gonsin.pdf [Accessed 18 Nov. 2019].

SCB. (2016) Slutliga inkomster och skatter 2016. Available Online: https://www.scb.se/hitta-statistik/statistik-efter-amne/hushallens-ekonomi/inkomster-och-inkomstfordelning/inkomster-och-skatter/pong/statistiknyhet/slutliga-inkomster-och-skatter-2016/ [Accessed 5. Jan. 2019].

SCB. (2019a). Riksdagsval - valresultat efter region och parti mm. Antal och andelar. Valår 1973 - 2018-Statistikdatabasen, Available online: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__ME__ME0104__ME0104C/ME0104T3/table/tableViewLayout1/ [Accessed 11 Nov. 2019].

SCB (2019b). Basfakta för verksamhetsnivå enligt Företagsstatistiken efter region och näringsgren SNI92. År 1997 - 2002- Statistikdatabasen, Available online: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__NV__NV0109__NV0109B/BasfaktaRegion/ [Accessed 5 Dec. 2019].

SCB. (2019c). Regionala basfakta för verksamhetsnivå enligt Företagens ekonomi efter region (län) och näringsgren SNI 2002. År 2003 - 2008- Statistikdatabasen, Available online: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__NV__NV0109__NV0109A/RegionalBasf/ [Accessed 5 Dec. 2019].

SCB. (2019d). Varuimport och varuexport efter produktgrupp SPIN 2002 och handelspartner, ej bortfallsjusterat. År 1998-2008 – Statistikdatabasen, Available online: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__HA__HA0201__HA0201H/ImpExpPSNI99Ar/ [Accessed 5 Dec. 2019]

SCB. (2019e). Befolkningens medelålder efter region och kön. År 1998 – 2018 – Statistikdatabasen, Available online: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__BE__BE0101__BE0101B/BefolkningMedelAlder/ [Accessed 5 Dec. 2019]

SCB. (2019f). Befolkningen 16+ år (RAMS) efter region, sysselsättning, ålder och kön. År 2004-2018 – Statistikdatabasen, Available online: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__AM__AM0207__AM0207H/BefSyssAldKonK/ [Accessed 5 Dec. 2019]

SCB. (2019g). Befolkningen 16+ år (RAMS) efter region, sysselsättning, ålder och kön. År 1993-2003 – Statistikdatabasen, Available online: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__AM__AM0207__AM0207A/AMPAK2/ [Accessed 5 Dec. 2019]

SCB. (2019h). Befolkning 16-74 år efter region, utbildningsnivå, ålder och kön. År 1985 – 2018 – Statistikdatabasen, Available online: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__UF__UF0506/Utbildning/ [Accessed 5 Dec. 2019]

SCB. (2019i). Antal personer med utländsk eller svensk bakgrund (grov indelning) efter region, ålder och kön. År 2002 – 2018 – Statistikdatabasen, Available online: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__BE__BE0101__BE0101Q/UtlSvBakgGrov/ [Accessed 5 Dec. 2019]

SCB. (2019j) Sammanräknad förvärvsinkomst för boende i Sverige den 31/12 resp år (antal personer, medel- och medianinkomst samt totalsumma) efter region, kön, ålder och inkomstklass. År 1991 – 2017 – Statistikdatabasen, Available online: http://www.statistikdatabasen.scb.se/pxweb/sv/ssd/START__HE__HE0110__HE0110A/SamForvInk2/ [Accessed 5 Dec. 2019]

Statista. (2019). *Populist vote share in European Union (EU) countries in 2018.* Available online: https://www.statista.com/statistics/883893/populism-in-europe/ [Accessed 3 Dec. 2019].

Sverigedemokraterna. (2019). *A till Ö.* Available online: https://sd.se/a-o/ [Accessed 27 Nov. 2019].

van der Brug, W., Fennema, M., van Heerden, S., and de Lange, S. (2014). Not that different after all: radical right parties and voters in Western Europe. In C. Sandelind (Ed.), *European populism and winning the immigration debate* Stockholm: ELF/Fores.

van Marrewijk, C. (2012). International Economics: theory, application, and policy. Oxford: Oxford University Press.

Viskanic, M. (2017) Fear and Loathing on the Campaign Trail: Did Immigration Cause Brexit?, working paper, Social Science Research Network. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2941611 [Accessed 11 Jan. 2020].

Widfeldt, A. (2018) The Radical Right in the Nordic Countries in. J. Rydgren (eds), *Oxford Handbook of the Radical Right,* Available online: https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780190274559.001.0001/oxfordhb-9780190274559 [Accessed Dec 11. 2019].

WTO. (n.d.). China – Member information, Available online: https://www.wto.org/english/thewto_e/countries_e/china_e.htm [Accessed 27 Nov. 2019]

9. Appendix

Appendix A NUTS 3 Map

Map of Sweden divided according to NUTS 3

Karta över
NUTS-indelningen
i Sverige (fr.o.m. 2008-01-01)
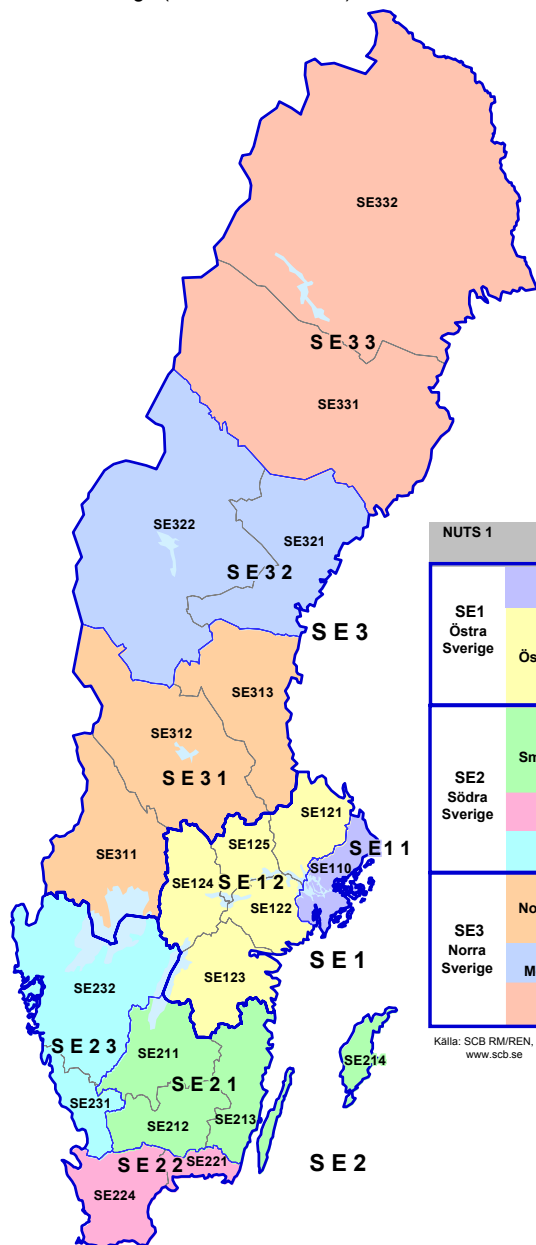
NUTS är den regionala indelning som används inom EU för statistikredovisning. I Sverige utgörs NUTS 1 av tre landsdelar, NUTS 2 av riksområden och NUTS 3 av län.

Koden för NUTS 3 består av 5 positioner: den inleds med bokstavsförkortning för landet, därefter följer en position för varje nivå.

NUTS 1	NUTS 2	NUTS 3	Län	Länskod
SE1 Östra Sverige	SE11 Stockholm	SE110	Stockholms	01
	SE12 Östra Mellansverige	SE121	Uppsala	03
		SE122	Södermanlands	04
		SE123	Östergötlands	05
		SE124	Örebro	18
		SE125	Västmanlands	19
SE2 Södra Sverige	SE21 Småland med öarna	SE211	Jönköpings	06
		SE212	Kronobergs	07
		SE213	Kalmar	08
		SE214	Gotlands	09
	SE22 Sydsverige	SE221	Blekinge	10
		SE224	Skåne	12
	SE23 Västsverige	SE231	Hallands	13
		SE232	Västra Götalands	14
SE3 Norra Sverige	SE31 Norra Mellansverige	SE311	Värmlands	17
		SE312	Dalarnas	20
		SE313	Gävleborgs	21
	SE32 Mellersta Norrland	SE321	Västernorrlands	22
		SE322	Jämtlands	23
	SE33 Övre Norrland	SE331	Västerbottens	24
		SE332	Norrbottens	25

Källa: SCB RM/REN, 2008
www.scb.se

Appendix B Manufacturing Industries

List of included manufacturing industries and their SNI number.

INDUSTRY ACTIVITY

15-16	Food products, Beverages and Tobacco
17-19	Textiles, Textile Products, Leather and Footwear
20	Wood and Products of Wood and Cork
22	Printing and Publishing
23-24	Coke, Refined Petroleum Products and Nuclear Fuel; Chemicals and Chemical Products
25	Rubber and Plastics Products
26	Other Non-Metallic Mineral Products
27-28	Basic Metals and Fabricated Metal Products
29	Machinery and Equipment, not elsewhere classified
30-33	Electrical and Optical Equipment
34-35	Transport Equipment

Appendix C Econometric tests

Table 1 Test of endogeneity

```
Tests of endogeneity
Ho: variables are exogenous

Durbin (score) chi2(1)          =  .883232  (p = 0.3473)
Wu-Hausman F(1,12)              =  .526863  (p = 0.4818)
```

Table 2 Test of first stage regression

```
First-stage regression summary statistics
```

Variable	R-sq.	Adjusted R-sq.	Partial R-sq.	F(1,13)	Prob > F
ImpShoc~0106	0.9616	0.9410	0.9331	181.261	0.0000

```
Minimum eigenvalue statistic = 181.261

Critical Values                  # of endogenous regressors:   1
Ho: Instruments are weak         # of excluded instruments:    1
```

	5%	10%	20%	30%
2SLS relative bias		(not available)		

	10%	15%	20%	25%
2SLS Size of nominal 5% Wald test	16.38	8.96	6.66	5.53
LIML Size of nominal 5% Wald test	16.38	8.96	6.66	5.53

Table 3 LR test for homoscedasticity

```
Likelihood-ratio test                      LR chi2(20) =      88.56
(Assumption: . nested in hetero)           Prob > chi2 =     0.0000
```

Table 4 – 10 Variance Inflation Factor tests for multicollinearity

Table 4 VIF 1998-2006

Variable	VIF	1/VIF
Age_19982006	4.90	0.203991
For~20022006	3.73	0.268380
Inc~19982006	2.99	0.334449
pop~19982006	2.65	0.377520
Imp~20012008	1.78	0.561623
Edu~19982006	1.64	0.608480
Men_20061998	1.10	0.906400
Mean VIF	2.68	

Table 5 VIF 1998-2010

Variable	VIF	1/VIF
Age_19982010	4.91	0.203735
pop~19982010	4.34	0.230261
For~20022010	4.02	0.248842
Inc~19982010	3.50	0.286033
Imp~20012008	1.84	0.543654
Edu~19982010	1.71	0.583618
Men_20101998	1.28	0.784286
Mean VIF	3.08	

Table6 VIF 1998-2014

Variable	VIF	1/VIF
Age_19982014	4.94	0.202551
For~20022014	4.48	0.223048
Inc~19982014	3.90	0.256307
pop~19982014	3.76	0.265640
Imp~20012008	1.86	0.537710
Men_20141998	1.78	0.560233
Edu~19982014	1.44	0.692991
Mean VIF	3.17	

Table 7 VIF 1998-2018 *Table 8 VIF 2006-2010* *Table 9 VIF 2010-2014*

Variable	VIF	1/VIF
Age_19982018	4.15	0.240765
pop~19982018	4.06	0.246091
For~20022018	3.97	0.251890
Inc~19982017	3.54	0.282710
Imp~20012008	1.93	0.518264
Edu~19982018	1.63	0.613387
Men_20181998	1.60	0.625843
Mean VIF	2.98	

Variable	VIF	1/VIF
pop~20062010	5.15	0.194076
Age_20062010	4.36	0.229096
For~20062010	4.12	0.243003
Inc~20062010	3.40	0.293822
Edu~20062010	1.68	0.596209
Imp~20012008	1.63	0.613353
Men_20102006	1.23	0.814003
Mean VIF	3.08	

Variable	VIF	1/VIF
For~20102014	5.09	0.196492
Age_20102014	3.55	0.281377
Inc~20102014	2.41	0.414458
Imp~20012008	2.25	0.444994
Edu~20102014	2.08	0.481314
pop~20102014	1.64	0.609148
Men_20102014	1.29	0.774735
Mean VIF	2.62	

Table 10 VIF 2014-2018

Variable	VIF	1/VIF
Age_20142018	3.47	0.288470
For~20142018	2.93	0.341215
Inc~20142017	2.80	0.356507
pop~20142018	2.29	0.436532
Edu~20142018	2.26	0.441777
Imp~20012008	1.79	0.559724
Men_20142018	1.38	0.727139
Mean VIF	2.42	

Table 11 - 17 Correlation Matrices

Table 11 Correlation Matrix 1998-2006

	ImpS~006	Educ_1~6	Me~61998	pop_de~6	Age_19~6	Foreig~6	Income~6
Imp~20012006	1.0000						
Edu~19982006	0.0686	1.0000					
Men_20061998	0.2266	-0.0222	1.0000				
pop~19982006	0.1014	0.4119	-0.0299	1.0000			
Age_19982006	-0.5200	-0.4591	-0.1571	-0.5848	1.0000		
For~20022006	0.4854	0.5588	0.1071	0.4454	-0.7583	1.0000	
Inc~19982006	0.0928	0.2306	0.1025	0.6979	-0.5749	0.2048	1.0000

Table 12 Correlation Matrix, 1998-2010

	ImpS~008	Educ_1~0	Me~01998	po~82010	Age_19~0	Fo~22010	In~82010
Imp~20012008	1.0000						
Edu~19982010	0.1083	1.0000					
Men_20101998	-0.2642	-0.1988	1.0000				
pop~19982010	-0.0152	0.4292	-0.0210	1.0000			
Age_19982010	-0.4547	-0.5323	0.0349	-0.6012	1.0000		
For~20022010	0.5129	0.5407	-0.1582	0.3702	-0.8070	1.0000	
Inc~19982010	-0.0671	0.2896	0.1401	0.8037	-0.4272	0.1252	1.0000

Table 13 Correlation Matrix, 1998-2014

```
              | ImpS~008 Educ_1~4 Me~41998 po~82014 Age_19~4 Fo~22014 In~82014
--------------+----------------------------------------------------------------
Imp~20012008  |  1.0000
Edu~19982014  | -0.0093    1.0000
Men_20141998  |  0.0101    0.3533    1.0000
pop~19982014  | -0.0247    0.4632    0.3665    1.0000
Age_19982014  | -0.5101   -0.3897   -0.2114   -0.5383   1.0000
For~20022014  |  0.5998    0.2705    0.0087    0.3260  -0.8342    1.0000
Inc~19982014  | -0.1562    0.3599    0.5991    0.7596  -0.2844    0.0092   1.0000
```

Table 14 Correlation Matrix, 1998-2018

```
              | ImpS~008 Educ_1~8 Me~81998 po~82018 Age_19~8 Fo~22018 In~82017
--------------+----------------------------------------------------------------
Imp~20012008  |  1.0000
Edu~19982018  |  0.0284    1.0000
Men_20181998  |  0.2565   -0.3511    1.0000
pop~19982018  | -0.0281    0.4612   -0.0294    1.0000
Age_19982018  | -0.5802   -0.3243   -0.1195   -0.4160   1.0000
For~20022018  |  0.6251    0.2539    0.2536    0.2547  -0.8294    1.0000
Inc~19982017  | -0.1286    0.4133   -0.2827    0.7986  -0.2344    0.0397   1.0000
```

Table 15 Correlation Matrix, 2006-2010

```
              | ImpS~006 Educ_2~0 Men_20~6 po~62010 Age_20~0 Fo~62010 In~62010
--------------+----------------------------------------------------------------
Imp~20012006  |  1.0000
Edu~20062010  |  0.1590    1.0000
Men_20102006  | -0.3088   -0.2806    1.0000
pop~20062010  | -0.0475    0.4273    0.0131    1.0000
Age_20062010  | -0.3448   -0.5025    0.0959   -0.6109   1.0000
For~20062010  |  0.4898    0.4890   -0.1621    0.3440  -0.7953    1.0000
Inc~20062010  | -0.2734   -0.0427    0.1445    0.6281  -0.0169   -0.2821   1.0000
```

Table 16 Correlation Matrix, 2010-2014

```
              | ImpS~008 Educ_2~4 Me~41998 po~02014 Age_20~4 Fo~02014 In~02014
--------------+----------------------------------------------------------------
Imp~20012008  |  1.0000
Edu~20102014  | -0.3581    1.0000
Men_20141998  |  0.0101    0.2672    1.0000
pop~20102014  | -0.0427    0.4370    0.3779    1.0000
Age_20102014  | -0.6066    0.2696   -0.0953   -0.2646   1.0000
For~20102014  |  0.6570   -0.3475   -0.0423    0.2057  -0.8012    1.0000
Inc~20102014  | -0.4912    0.5141    0.2583    0.0668   0.3919   -0.6618   1.0000
```

Table 17 Correlation Matrix, 2014-2018

```
              | ImpS~008 Educ_2~8 Men_2~18 po~42018 Age_20~8 Fo~42018 In~42017
--------------+----------------------------------------------------------------
Imp~20012008  |  1.0000
Edu~20142018  |  0.1828    1.0000
Men_20142018  |  0.2503   -0.3861    1.0000
pop~20142018  | -0.0372    0.2903   -0.0434    1.0000
Age_20142018  | -0.5608   -0.0116   -0.1347    0.3360   1.0000
For~20142018  |  0.5499    0.1143    0.1744    0.0900  -0.7206    1.0000
Inc~20142017  |  0.0854    0.6758   -0.2494    0.5952   0.0543    0.1732   1.0000
```

Table 18 Levin-Lin-Chu test for stationarity

```
Levin-Lin-Chu unit-root test for SD

Ho: Panels contain unit roots          Number of panels  =     21
Ha: Panels are stationary              Number of periods =      6

AR parameter: Common                   Asymptotics: N/T -> 0
Panel means:  Included
Time trend:   Not included

ADF regressions: 1 lag
LR variance:     Bartlett kernel, 5.00 lags average (chosen by LLC)

                    Statistic      p-value

Unadjusted t        10.9318
Adjusted t*         17.3669        1.0000
```

Table 19 Wooldridge test for autocorrelation

```
Wooldridge test for autocorrelation in panel data
H0: no first-order autocorrelation
    F(  1,     20) =      4.834
           Prob > F =      0.0398
```