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# Can attitudes towards globalization be explained by who perceive themselves to be losers from trade?

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Bachelor thesis

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## Abstract

Several events have occurred recently that can be interpreted as springing from increased anti-globalization attitudes. Given this trend, it is of importance to investigate what causes this opposition. This study therefore analyzes if those who are predicted to be perceived losers from trade, according to the Heckscher-Ohlin trade theory, can explain globalization attitudes. The methodology is based on an econometrical regression which uses data from the 50 U.S states, as well as District of Columbia. The empirical assessment finds significant and robust results for that limited education and exposure to manufacture imports have a negative impact on globalization attitudes. Therefore, it would seem as if perceived losers from trade do affect attitudes in this context. The result suggests the importance of efficiently functioning compensation policies to those negatively affected by trade, where those who are the perceived losers depend on the empirical context in which they occur.



*Keywords: Globalization attitudes, United States, Heckscher-Ohlin, Stolper-Samuelson, losers, trade*

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# 1. Introduction

Since the end of the 1800s, the world has experienced three waves of globalization, broadly defined as integration of societies. The third wave, beginning in the 1980s, has differentiated itself by the pace at which it has impacted the world (Dollar & Collier, 2002). Trade has had an important role in this development through changes in trade policies and organizations working for increased trade liberalization. During the 1990s, trade volumes increased at an extraordinary rapid pace, and several Preferential Trade Agreements (PTA) were being negotiated. Today, the climate on increased integration seems to be very far from the standing point in the end of the 1990s. Political parties with anti-globalization sentiments are gaining ground across several European countries, and recently Donald Trump who has expressed the desire for protectionist policies and decreased migration flow was elected president of the United States. In this study, we define attitudes as the tendency to act towards ideas. Because of this, we can interpret these recent actions as springing from anti-globalization attitudes. The stance on globalization seems evidently to have been broken. It is therefore highly relevant to seek what might have caused this disruption.

One of the most prominent trade theories, the Heckscher-Ohlin model, states that groups within countries are differently affected by the effects that occur when trading. It will therefore cause the emergence of winners and losers of trade. The question we will seek to investigate in this study is if attitudes towards globalization can be explained by who perceive themselves to be losers from trade. In doing so, we will examine if the perceived losers from trade as predicted by the Heckscher-Ohlin theory can explain attitude on globalization. We have limited the concept of globalization in our study by defining it as the integration of goods and people through trade and immigration. Thereby, we are leaving services and capital out of our definition, which otherwise commonly is included. There is currently no model on what determines attitudes in this context, which further motivates our thesis. Our study should therefore be seen as exploratory. In our endeavor to investigate this, we will do an econometric cross-sectional study of the U.S states and the District of Columbia (DC). There is currently a gap within the field of observing attitudes towards globalization through this type of methodological approach, as most previous studies are focusing on an international comparison. More explicitly, the study will seek to investigate whether our three chosen main independent variables have a significant impact on our dependent variable globalization attitude, as approximated by attitude on immigration. The first main variable is the

share in each observation lacking experience from higher education.[1] The second main variable is manufacturing workers' exposure to manufacture imports from the rest of the world. The third main variable is Trade Adjustment Assistance (TAA) spendings. TAA is a program in the U.S that is specifically aimed at compensating those who have become unemployed, or faces likelihood of being so, because of trade. The main variables have been chosen in respect to those who we interpret as being the losers of trade in the U.S. Our main result is that both those who we perceive to be low educated and manufacturing import exposure have a negative impact on globalization attitudes. The regression gave insignificant results for the spendings of the TAA program, which could be interpreted as a failure of the U.S government to compensate the perceived losers from trade.

This paper will be structured by the following disposition: (2) by introducing the reader to the motivation behind this study and the concept of globalization and attitudes, as well as a presentation of the main variables; (3) present previous studies done within areas closely linked to ours; (4) introduce the trade theory of Heckscher-Ohlin, on whose theoretical predictions the research is based; (5) go through the empirical strategy used in order to reach our results; (6) the results obtained from our work; (7) conclusions from the paper; (8) bibliography and (9) appendix.

## 2. Background

In this section, we will motivate our study by problematize the concepts which our thesis is based on, and make more explicit what our definitions of these concepts are. The aim is to more precisely discuss and illustrate the connection between our definition of globalization and attitudes towards it. The main variables used to capture these concepts in our examination will be presented and motivated, in relation to our thesis.

### 2.1 Introducing globalization

The word globalization contains many different definitions. In 2006, the then director-general of the World Trade Organization (WTO), Pascal Lamy, defined it as "historical stage of accelerated expansion of market capitalism, like the one experienced in the 19th century with the industrial revolution [...] It is a fundamental transformation in societies because of the recent technological

[1] With higher education, we refer to college or university experience.

revolution" (WTO, 2016). The World Bank's former director of development policy, David Dollar, stated in 2004 that globalization is "the growing integration of economies and societies around the world resulting from increased flows of goods, services, capital, technology, and ideas" (World Bank, 2016). Whatever the definition might be, most of them would agree that the world has experienced increased interconnectedness for the last decades. During the current wave of globalization, there has been a rapid increase of the economic globalization, defined by Dollar and Collier (2002) as migration, capital and trade flows.[2] For some decades, world trade has increased almost twice as fast as the produced output, meaning that products that were not traded before are now being so. It has also brought on new possibilities for developing countries which have increased their share of the world exports by 10% (WTO, 2013). Several factors have contributed to this trade development, for example advancements in communication (Scheve & Slaughter, 2001a) and organizations such as e.g. the WTO which has contributed to decreased trade costs by lowering tariffs (Hoekman & Kostecki 2009). This development has been facilitated through the increased commitment to deeper integration, observed partly by the increased number of preferential trade agreements (PTA) (WTO, 2011). Foreign Direct Investment (FDI) has been made more logistically possible due to technological advancements, and parts of a production stream is now able to be operated in another geographical area (Sjöholm, 2012). Another part of globalization, is the movement of people. In the Organisation of Economic Co-operation and Development (OECD) area, immigration increased by 3.1% yearly between 1998-2008 (Hedberg & Malmberg, 2008). The ability to move across borders may also facilitate the transmission of innovation and ideas, along with multinational corporations, which are an important part of globalization and economic development (Hedberg & Malmberg, 2008).

In many aspects, this increased globalization has been positive. World poverty has decreased and economic growth have been achieved in many regions and countries, including areas that might otherwise not have seen such development (WTO, 2013). Although, globalization has also led to an economic concentration in largely integrated areas, e.g. the U.S, creating winners and losers from it (Sjöholm, 2012). It is as such possible to argue that these groups have different stands on globalization. For some time, we have seen a development towards higher support for anti-globalization establishments (Autor, Dorn, Hanson, Majlesi, 2016). In the summer of 2016, the first

[2] The current wave of globalization began around 1980 (Dollar & Collier, 2002).

case of a country leaving[3] the European Union (EU) was observed in Britain[4] by what is referred to as Brexit (Hunt & Wheeler, 2016). The arguments on the Brexit-side prior to the referendum, partly concerned the desire to regain sovereignty over their economy and trade deals, as well as concerns regarding immigration (Riley-Smith, 2016).

We have seen a similar development in the U.S prior to the presidential election, which more than previously observed has circuited around the subject of trade agreements (Autor, Dorn, Hanson, Majlesi, 2016). Both republican Donald Trump and democratic Hillary Clinton expressed negative views on the Trans Pacific Partnership (TPP) trade agreement, which they both stated they would not be in favor of. Trump further on stated the desire to withdraw from the over 20 year long North American Free Trade Agreement (NAFTA) (Mauldin, 2016). Additionally, Trump also has taken a radical view on immigration (Adamy, 2016). Trump's desire for protectionism is evident by his proposal of high tariffs to China as well as Mexico, aspiring to deter domestic jobs from being negatively affected by trade (Gillespie, 2016). One reason as to why we might see this development in the U.S, may be due to an alteration in trade patterns. In 2001, China became a member of the WTO. This brought on structural changes in the trade with the U.S, which at the mean time began trading more with other low-wage countries than it historically had done. The increased import of manufactures from low-skilled labor abundant China, and other similar countries, to the U.S has coincided with the decrease in manufacturing employment in the U.S as depicted in figure 1 (Autor, Dorn, Hanson, 2013).

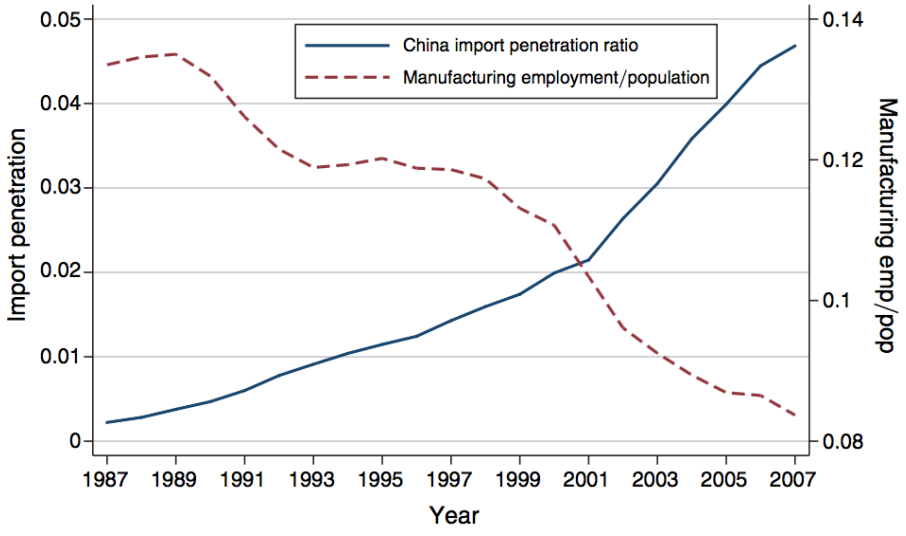


*Figure 1: Import Penetration ratio for imports from China to the U.S & population of working age employed in the manufacturing sector. Source: Autor, Dorn, Hanson (2013)*

[3] Greenland was forced to enter into the EU in 1973 after Denmark became a member and later left the EU in 1984 (Bodkin, 2016).

[4] Formally, the U.K has not left before invoking Article 50 of the treaty on European Union (Ruparel, 2015).

When defining globalization in this thesis paper, we proceed on the basis of certain predictions that will occur according to the Heckscher-Ohlin trade theory. It emphasizes factor endowments as the main source of trade in goods across borders, and assumes the inter sectoral mobility of factors of production[5]. If such factors of production are low respectively high skilled workers, the mobility assumption therefore concerns the movement of people. On that basis, we will define globalization as the increased integration of goods and people between countries through trade and immigration (Scheve & Slaughter, 2001a), leaving Foreign Direct Investments (FDI) out of our definition.[6] By adopting the proposed definition, it allows us to capture the development in the U.S and the policy changes on trade agreements and immigration that were suggested in the recent presidential election, and interpret it as an increased opposition towards globalization.

### 2.2 Introducing attitudes

Another concept vital for our thesis is attitudes. We want to examine if globalization attitudes in the U.S can be explained by the perceived losers from trade, i.e. those who are disadvantaged from increased trade. If this is the case, then trade's impact on attitudes might be the reason for the anti-globalization actions that have been presented earlier in this section. The Heckscher-Ohlin trade theory, which will be thoroughly presented in the theory section, states that there will be aggregate gains for a country from international trade, but that redistributional effects create winners and losers of trade within the country (Van Marrewijk, 2012). In our study, we will link these predictions to attitudes on globalization, where perceived losers of trade are more likely to have greater anti-globalization sentiments than winners. Attitudes will in this study be defined as feelings, beliefs and tendency to act towards ideas, other people and groups. This is in line with the three-component model of Katz and Stotland, which is a common definition of attitudes since 1959 (Fazio & Olson, 2003). We assume that people base their globalization attitudes on how trade and immigration affect their individual welfare, as opposed to the aggregate national welfare.

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[5] We are aware of the fact that the Heckscher-Ohlin model assumes that labor is not mobile across countries. It also states through the Factor Price Equalization (FPE) theorem that trade in goods substitute international labor mobility. Given that their assumption do not hold in practice, we have therefore included it into our definition of globalization.

[6] As Scheve and Slaughter (2001a) resonate, including FDI brings many macroeconomic aspects into the definition, making it less precise in regards to our thesis. Additionally, if FDI affects people's attitude on globalization through labor market concerns, such are included in our import exposure variable.

### 2.3 Motivation for choice of variables

In this section, we will motivate the main variables used in our regressions. The dependent variable is an attitude measurement on globalization, which will be further explained below. The main independent variables in our first model are manufacturing workers' exposure to manufacture imports, the share without any experience from higher education and the amount of TAA spendings. These are selected to capture the perceived losers from trade according to the Heckscher-Ohlin trade theory.

#### 2.3.1 Dependent variable: Globalization attitude

Our dependent variable is attitude towards globalization.[7] To the best of our knowledge, there is no survey that measures such attitudes in the U.S on state level. Because of this, we are using attitude on immigration as a proxy for globalization attitude. This means that attitude on immigration will work as a substitute for the missing variable of globalization attitude. Our measure of this is derived using a survey conducted in 2015 from the Public Religion Research Institute (PRRI). The question asked in the survey is the following:

"*Which statement comes closest to your own view...the growing number of newcomers from other countries threatens traditional American customs and values, or strengthens American society?*" (PRRI, 2016)

As will be further described in the theory section, Heckscher-Ohlin recognizes differences in factor endowments as the main source of trade. Given that factor endowments of low respectively high skilled workers alter due to immigration, it may theoretically alter trade patterns. Because of this, discussing immigration and trade jointly is highly relevant and their co-dependence. Furthermore, the Factor Price Equalization (FPE) theorem, which is part of the Heckscher-Ohlin theory, states that factor prices in two countries will equalize when they trade in goods. It assumes that labor is immobile across countries, which would otherwise give rise to the same effect (Markusen, 1995). Additionally, O'Rourke (2003) states that people deem protectionism and anti-immigration policies as complements. Therefore, our proxy aligns with our definition of globalization as the increased

[7] We are aware of the difficult aspects of measuring attitudes. Since public attitudes usually are measured by surveys, answers on a subject can differ a lot depending on how a question is formulated. One needs to take this issue into account when using attitudes in a research and when interpreting the results from them.

integration of goods and people across countries. One alternative to our approach would be to measure attitude on trade agreements, but due to lack of data on this subject on state level in the U.S, this is not a valid alternative in our thesis.[8] In our regression, we will focus on the share positive towards immigration, i.e. what percentage of those asked who answered that immigrants strengthens the American society. Figure 2 illustrates this data by presenting the U.S states', including District of Columbia's, attitude on globalization, measured as the share positive towards immigration. The least positive state is West Virginia where only 35% deem immigrants to strengthen the American society, compared to District of Columbia where 66% are of that opinion.

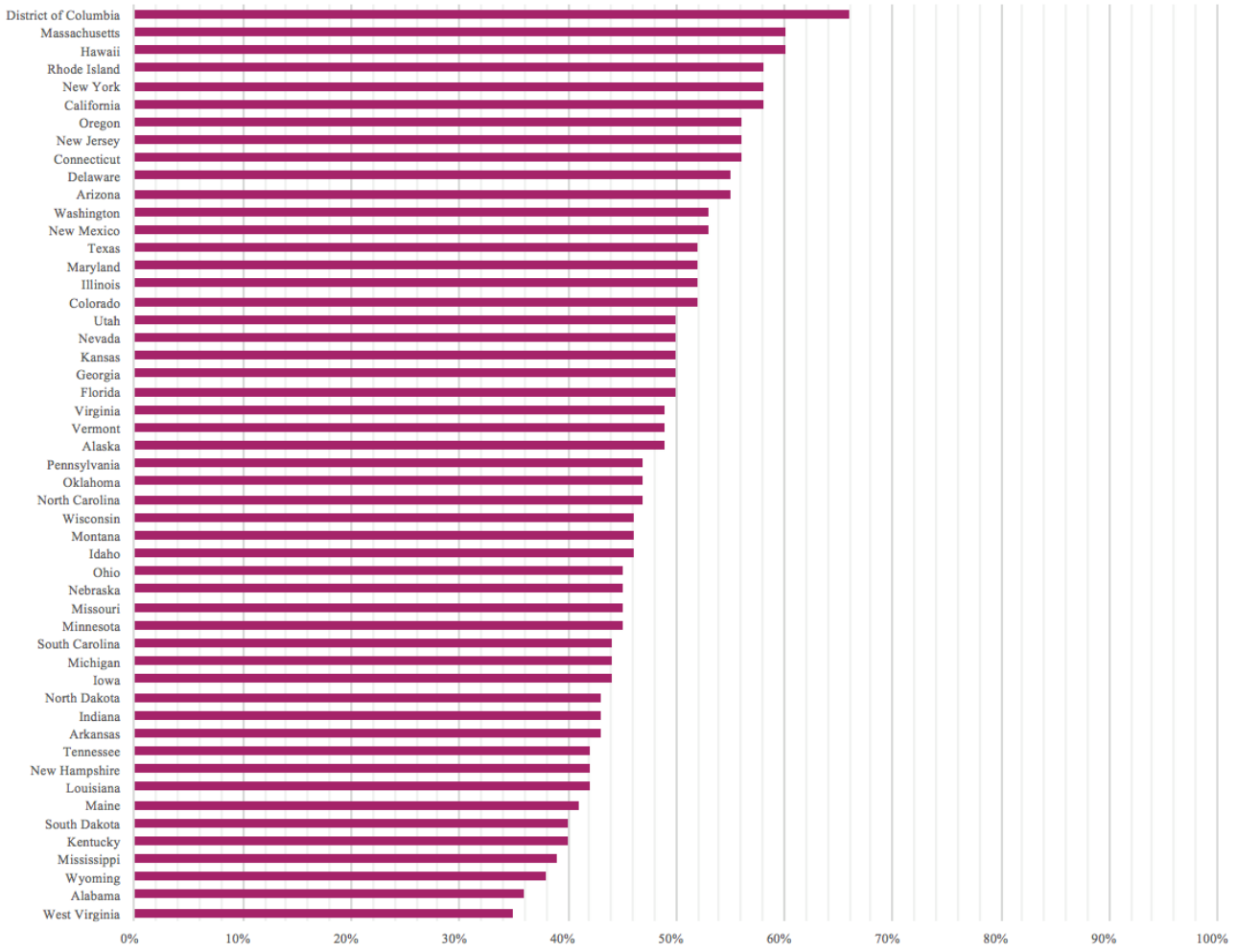


*Figure 2: The share of each state's population positive towards immigration, i.e. globalization*

### 2.3.2 Independent variable: Share lacking experience from higher education

A variable that is of great importance when assessing perceived losers from trade is the level of education attained by a person. In both Brexit and the U.S presidential campaign, examples of the

[8] To the best of our knowledge, there exists no such data on state level for the U.S for 2015.

trend towards anti-globalization attitudes, education seems to have been a main factor contributing to people's choice of actions (Kirk & Scott, 2016). The level of educational attainment gives insight into whether a worker belongs to the high- or low-skilled labor force, and as such if that worker belongs to the abundant or scarce factor of production, as described by the Heckscher-Ohlin trade theory.[9] We have therefore created a variable of the share without any experience from higher education in each state. Figure 3 illustrates the educational attainment in each state where the share of those with no college experience is the smallest in District of Columbia, only 28% compared to 54% in West Virginia.

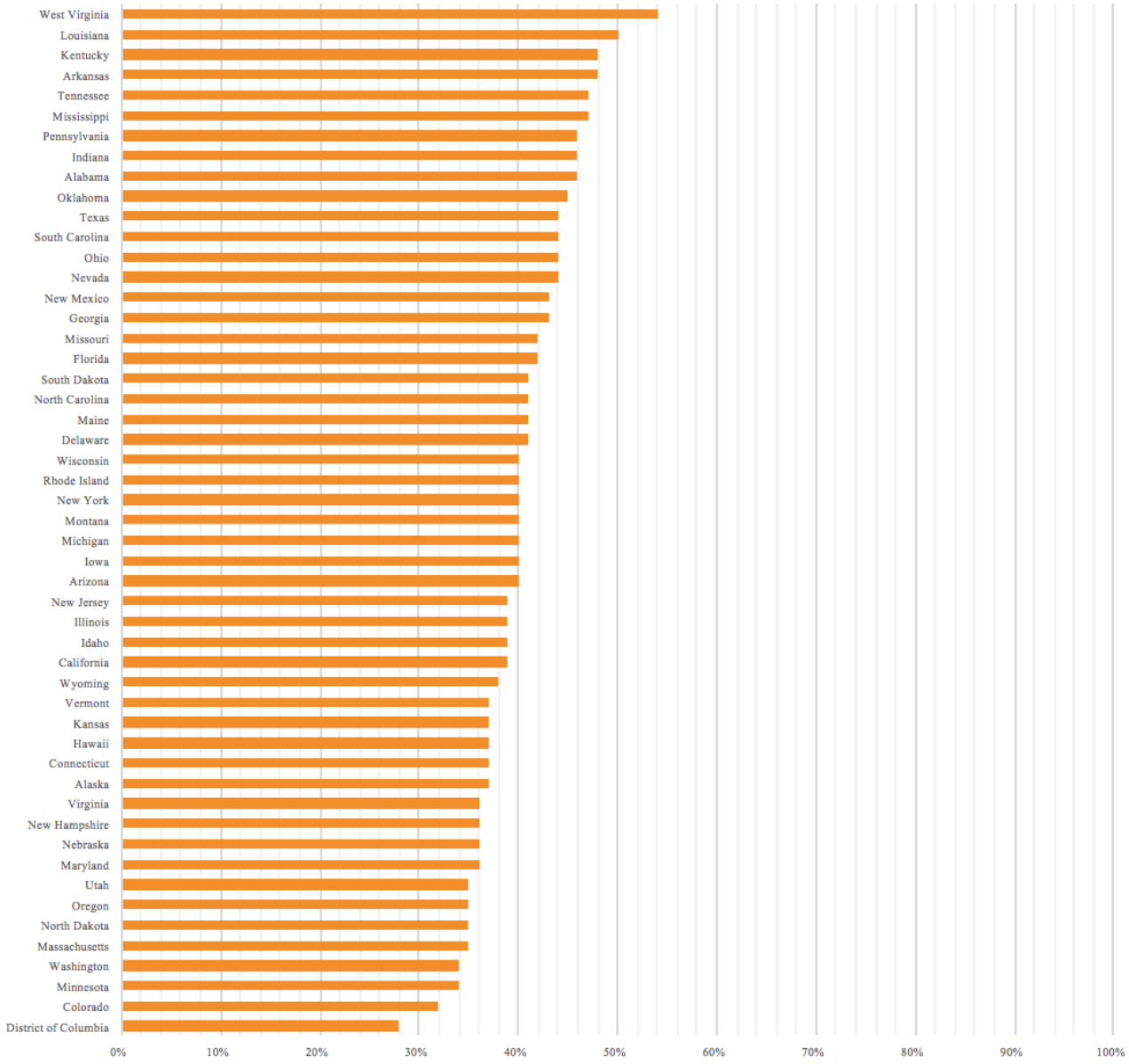


*Figure 3: The share of each observation's population without any experience from higher education*

[9] We are aware of that people with work experience can be categorized as a high-skilled worker due to obtained human capital, but will not take this group into consideration in our analysis.

### 2.3.3 Independent variable: Import exposure

In order to examine whether or not globalization attitudes are connected to the redistributional effects from trade, we will include the variable of manufacture import exposure to our regression. Previous studies on globalization attitudes have argued that labor market concerns shape people's attitude towards trade, which will be presented in section 3. Labor market effects have more lately been linked to increased manufacture imports from China (Autor, Dorn, Hanson, 2013). Combining these results, we can as such investigate whether import exposure actually has an impact on globalization attitudes. Given the rapid increase of manufacture imports that has been taking place for more than a decade (Autor, Dorn, Hanson, 2013), it is of interest to see if the perceived trade induced changes are a reason for the opposition towards globalization. We focus specifically on manufacture imports, since the U.S increasingly trade with countries in relation to which they have a comparative disadvantage in that production. The study by Autor, Dorn and Hanson (2013) conclude that it is specifically the manufacturing sector that seems to lose from trade in the U.S in terms of lower wages and a smaller proportion employed within the sector. Reports from the trade adjustment assistance program (TAA) also predicts that it is the workers within the manufacturing sector that are likely losers from trade in the U.S. This is shown by the fact that in order to apply for TAA, one needs to be in the manufacturing sector or the service sector, as well as that most of the TAA spendings in the U.S goes to workers from the manufacturing sector (United States Department of Labor, 2015). Theoretically, attitudes towards globalization could be affected by increased exposure from other types of imports. However, given our focus on the perceived losers from trade we make the simplification to solely observe manufacture imports, since it seems as if a great deal of the perceived losers arise in that sector. The difference in import exposure is illustrated below in Figure 4, where Indiana is the most exposed state and DC is the least exposed one.

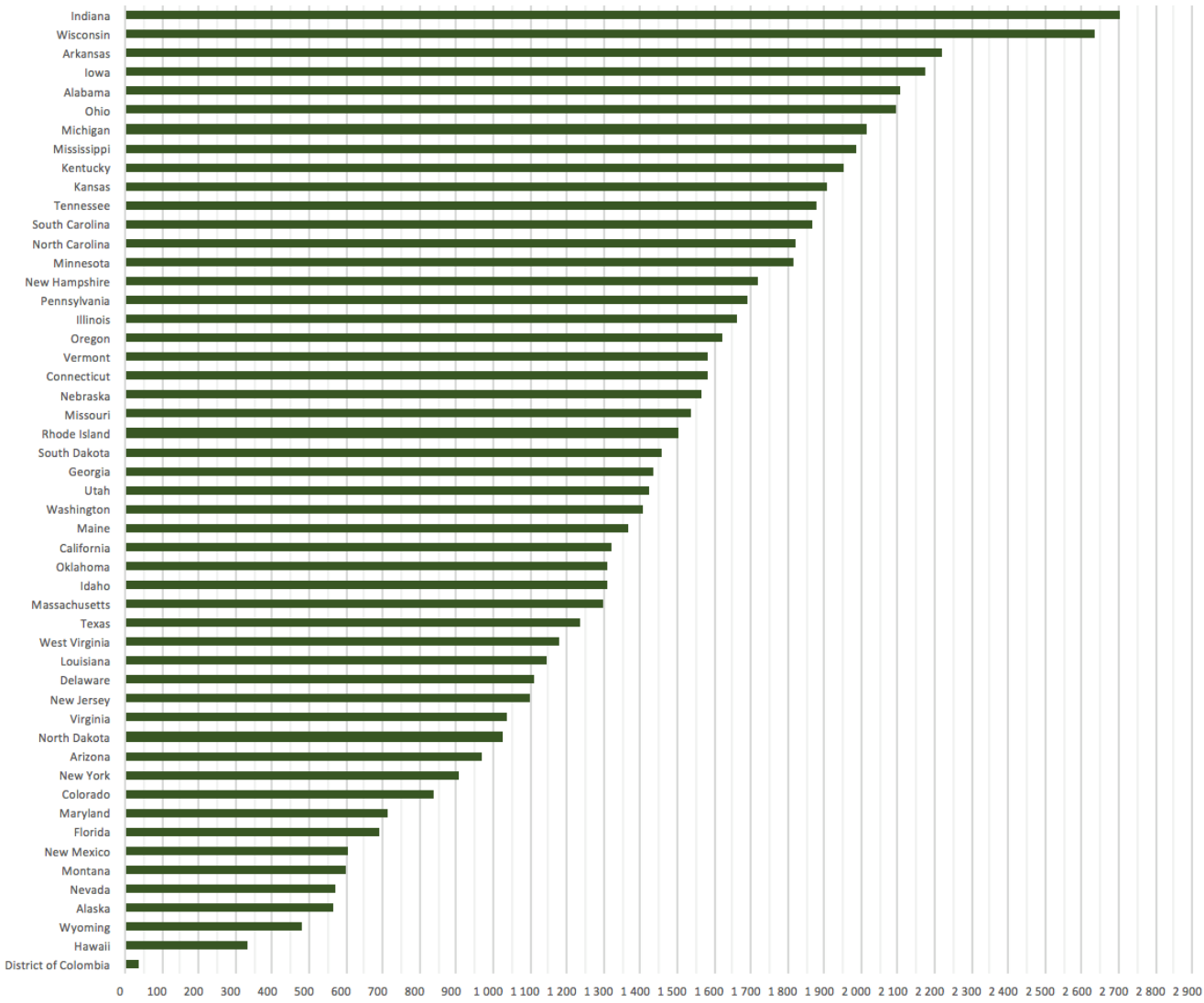


*Figure 4: Manufacturing workers' exposure to manufacture imports from the rest of the world, measured in U.S $*

### 2.3.4 Independent variable: Trade Adjustment Assistance

The government's ability to compensate losers from trade has been said to affect attitudes on trade policies (Asatryan, Braun, Lechthaler, Mileva, Montagna, 2014), and is as such of great importance to attitude formation. One can therefore wonder whether the U.S government has succeeded in doing so and thereby deterring a reverse effect on globalization attitudes that otherwise is expected from those negatively affected by trade. Failing in this important task may cause the perceived losers from trade to believe that further liberalization will hurt them even more.

Due to the former mentioned reasons, we have chosen to include TAA as a variable. TAA is a federal program in the U.S that specifically offers services and benefits to workers within the

manufacturing sector who have lost their jobs, or is threatened by it, because of foreign trade.[10] The program helps workers to obtain certain skills by funding activities such as e.g. training and relocation. In order to be eligible for TAA, a petition needs to be filed by a group consisting of at least three workers, if it is not filed by a company official or some authorized representative e.g. a union. An investigation will thereafter take place on whether or not foreign trade is the reason for the workers being unemployed, or might be in the near future. Given the criteria for being eligible for the program, there is a risk that TAA do not cover all of those who have been negatively affected by trade.[11] Because of the fact that TAA specifically is aimed at the manufacturing sector, which we have already defined as being a group subject to large perceived losses from trade, it is highly relevant to include this variable in our analysis. It might also be of interest to take other public transfers, such as the Social security disability insurance (SSDI), into account, but we will solely assess the impact of TAA given its more precise focus on what we define as perceived losers from trade. In Figure 5, TAA spendings adjusted to GDP are presented. Arkansas has the largest TAA spendings in relation to its GDP and Hawaii has the smallest with a value of zero.

[10] The program also covers workers in the service sector since 2011.

[11] In 2015, the year from which we are using the TAA data, a selection from the criteria for receiving funds from the program were the following: (1) The firm has experienced sales and/or production decreases (2) Imports of like or similar products has increased, for which the firm produces finished articles; or (3) in which the firm produces component parts or services (4) Shift of the whole or part of the production to another country (5) The firm is identified in the U.S by ITC as a firm that will be injured or be subject to market disruption (United States Department of Labor, 2015).

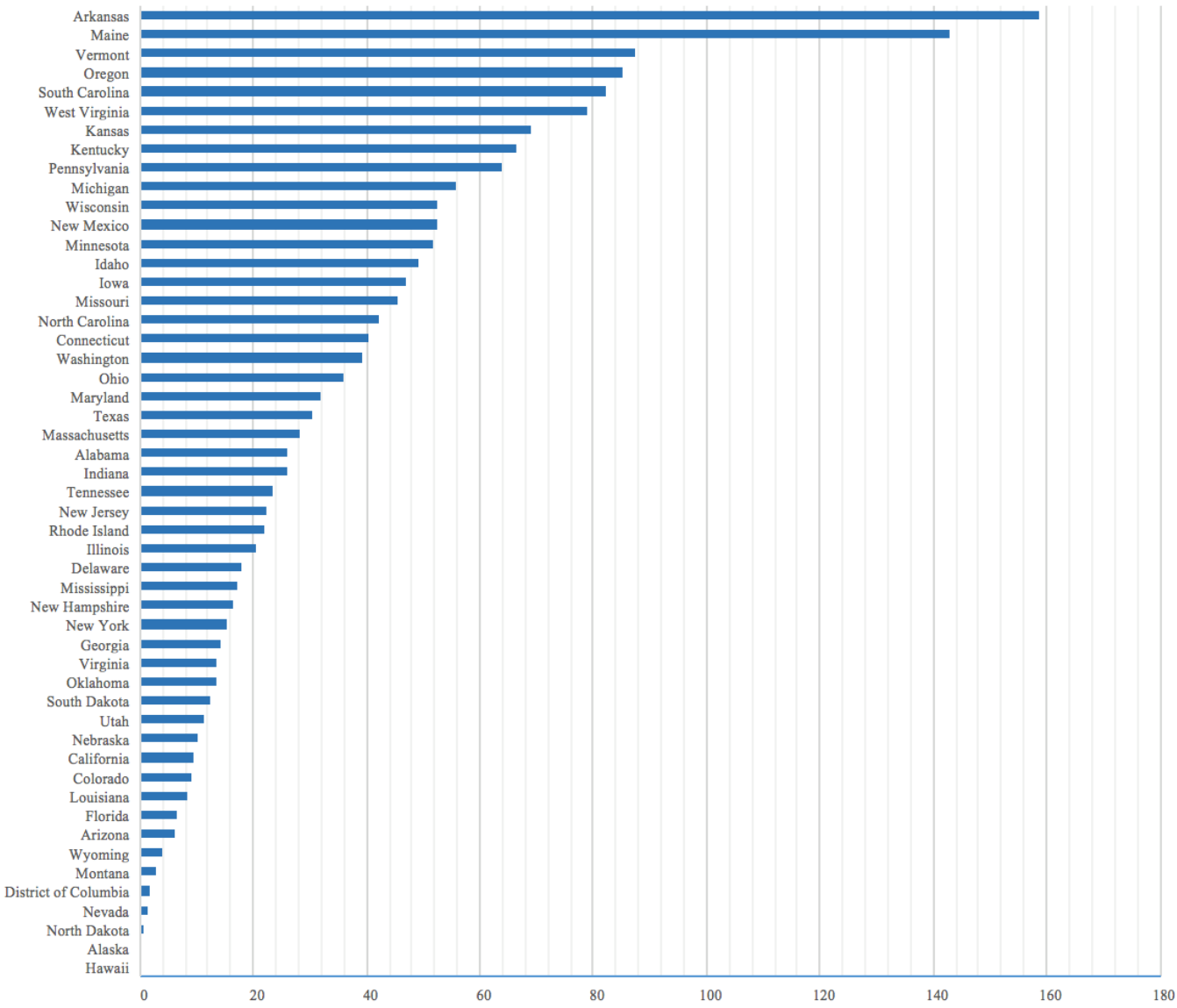


*Figure 5: TAA spendings divided with each state's GDP, measured in U.S $*

*Note: Following state's number is not zero as might be interpreted by the diagram; Alaska: 0,19*

## 3. Previous studies

Studies on globalization attitudes, by our definition, have most commonly observed attitudes on either immigration or trade in relation to economic and non-economic variables on a cross-country level. Because of the absence of an existing model on what determines attitudes towards globalization, we have combined different sets of earlier literature in our attempt to investigate this matter and fill the current gap. We have partly looked at studies which investigate globalization attitudes, as well as studies which observe trade's impact on dependent variables other than attitude. Combining these fields, allows us to use independent variables explicitly assessing perceived losers from trade and their effect on globalization attitude.

Mayda and Rodrik (2005), Jäkel and Smolka (2013), O'Rourke and Sinnott (2001) and Scheve and Slaughter (1998) examine the correlation between trade policy attitudes and economic and non-economic variables on a cross-country level. All mentioned studies link their results to the predictions of the Heckscher-Ohlin model and potential pressure on local labor markets. They all come to the conclusion that their results aligned with the predictions of the Heckscher-Ohlin trade theory and the Stolper-Samuelson theorem. This means that high-skilled workers in advanced economies are more likely to support free trade than low-skilled workers, and the opposite for developing economies. Hainmueller and Hiscox (2006) too argue for a positive relationship between education and trade attitude. As opposed to the above literature, the authors do not assume that this inconclusively support the Stolper-Samuelson theorem. Instead, they find support for the fact that educated people are more likely to support free trade independently from whether or not they are active or not in the labor market. As such, the effect of labor market concerns on attitudes and confirmation of Heckscher-Ohlin predictions is a subject of divided opinions.

Another area of studies that simultaneously is linked to the attitudes on trade, is the effect of economic variables on immigration attitudes. Scheve and Slaughter (1999) and O'Rourke (2003) observe these attitudes' consistency with Heckscher-Ohlin predictions. The later states that globalization attitudes, focusing on trade and immigration, follow the predictions of trade according to the above mentioned trade theory. O'Rourke also concludes that people deem protectionism and anti-immigration policies to be complements to one another. Scheve and Slaughter (2001) have a similar study in which they do not test the validity of a theoretical model. Their focus is solely on the U.S and the result is that high-skilled workers are more positive towards immigration as well as trade than low-skilled workers. They argue it is due to concerns of labor market pressure on U.S workers as a result of technological alterations and because of globalization. Mayda (2005) reaches a similar conclusion on the correlation between skill and immigration attitude. Hainmueller, Hiscox and Margalit (2015) come to another conclusion in their study, and state that labor market concerns do not shape attitudes on immigration and as such that skill level do not matter in shaping such opinions.

Scheve and Slaughter (2001b) also find some support for the hypothesis that there is a need for government compensation, such as the Trade Adjustment Assistance (TAA) program, to the factor of production which has a comparative disadvantage in order to sustain support for trade. Their

results are reached by multiple imputation methodology and data from several data sets such as Gallup and Roper. Ehrlich and Hearn (2014) similarly argue that there is a need for compensation through specifically the TAA program for maintaining trade support. Further on, they examine whether knowledge of being compensated increases support for trade. This seems to be true for certain groups, such as those with low-income. Their methodology differs from Scheve and Slaughter by being done econometrically.

There is also recent work on the domestic effects in the U.S from increased imports from low income countries. These studies specifically focus on imports from China, which is said to have a similar effect as from other low-income countries. Autor, Dorn, Hanson and Majlesi (2016) examine the impact from rising import competition from China on electoral outcome in the United States. They compare the electoral results in 2002 and 2010 respectively, to the local labor markets' exposure to Chinese imports. One of their conclusions is that increased trade exposure at local labor markets increases political polarization.

Another study that similarly examines the effects from increased Chinese imports, so called import shocks, but instead uses domestic U.S labor markets as their dependent variable, is Autor, Dorn and Hanson (2013). They relate the increased import effects on earnings, manufacturing employment, manufacturing non-employment and transfer payment programs across U.S commuting zones (CZ). They measure labor market exposure to Chinese import competition as the difference in Chinese import per worker under a certain time limit and within a certain area, and also adjust the regional employment share to the total national industry employment. Their conclusion is that labor markets which have experienced increased import exposure from China in manufacturing industries will face higher unemployment as well as reduced wages. Furthermore, they find a positive relationship between imports from China and the level of federal transfer payments. They conclude that TAA does not account for a substantial part of those transfer payments, despite that it has the largest proportionate increase. The study concludes that the labor market effects from increased imports are due to distributional effects from trade. The study as such provides information on the effects on perceived losers in the U.S due to increased imports.

In conclusion, there is a broad field of studies investigating the impact of economic and non-economic variables on either trade or immigration policies on a cross-country level. A few have instead observed attitudes using a cross-sectional methodology of observations within the U.S.

Many found a positive impact from education on attitudes on either immigration or trade, linking it to the Stolper-Samuelson theorem. Additionally, there are some studies on compensation to those adversely affected by trade in the U.S, but none of the above mentioned studies have taking the effects of imports into account in measuring attitudes on what we interpret as globalization. Imports have instead been observed in more recent studies, but not along with attitudes as the dependent variable. Combining these sets of works, allows us to more explicitly assess trade's effect on attitudes towards globalization, which none of the mentioned previous studies have done.

## 4. The Heckscher-Ohlin trade theory and empirical predictions

Most trade theories recognize that there are mutual net gains for countries which trade with each other. Despite this, the Heckscher-Ohlin model recognizes that being involved in trade will create winners and losers within countries. In order to examine whether or not it is people who personally have been negatively affected by trade that are now increasingly opposing globalization, it is appropriate to examine the situation from a Heckscher-Ohlin perspective and what empirical results we would expect from the theoretical predictions.

Beginning from a strictly theoretical point of view, the model makes certain assumptions which need to be stated. Firstly, the model only allows for two factors of production, two countries that trade with each other and two goods that are being produced. In our study, this will be the U.S and the part of the world which has a comparative advantage in the production of manufacturing, trading high-skill or low-skill intensive goods, produced with high- or low-skilled factors of production. Secondly, the model assumes perfect competition, constant return to scale and that the countries have the same technology. Furthermore, it assumes that workers are fully mobile. The pattern of trade is determined by comparative advantages, a country will to some degree specialize, and export, the good in which it has a comparative advantage, and import the other good. Consequently, a redistribution of workers will occur within a country to be able to match the increased production of a certain good and the decrease of another (Van Marrewijk, 2012). Even though this redistribution will occur, the model predicts that the net-employment will remain unchanged (Van Marrewijk, 2012). A country has a comparative advantage in the production of the good that uses that country's abundant factor of production intensively in its production. However, the assumptions made by the theory may not hold in practice. For example, the model succeeds in describing trade within the northern part of the world and within the southern part, because within

these areas the countries are deemed to have similar technological development. Although, a large part of the world's trade flows is between north and south, with different technological standards. Therefore, the assumption regarding the same technology does not hold in practice. In this sense, the Heckscher-Ohlin trade theory fails to explain a large part of the world's trade patterns, which is a defect of the model (Trefler, 1995). Additionally, the assumption that workers are fully mobile between sectors may not be true in the short run which is also a flaw. Intertwined with the Heckscher-Ohlin theory is also the Stolper-Samuelson theorem. It states that when the price of a good increases, the return to the factor of production used intensively in the production of that good will also increase, while the return to the factor of production used intensively in the other good will decrease. This means that the workers in the export sector will receive higher returns as the relative price of that good increases because of trade. The opposite turn of events will be experienced by the workers in the import competing sector (Van Marrewijk, 2012). It is therefore, according to Heckscher-Ohlin, possible to state that winners and losers are being created within a country. The export industry is expected to benefit more from trade liberalization while the import industry would benefit from protection.

If we apply the predictions of the model empirically to our thesis, we get several interesting expectations. In the U.S, which is an advanced, high-skill abundant economy (Autor, Dorn, Hanson, 2016), we would expect most part of the high-skilled workers to benefit from increased trade. In this study this will be the people that most likely are outside of the manufacturing sector since we are making the simplification that the manufacturing sector is the only one that the U.S has a comparative disadvantage in, as motivated in the background of this thesis. Workers who belong to the abundant factor of production, i.e. high-skilled ones, would experience an increase in their returns. Given that we earlier have made the assumption that attitudes are based on self-interest as opposed to aggregate welfare, we would expect them to be in favor of trade. As for low-skilled workers which we empirically have interpreted as manufacturing workers, which then are the scarce factor of production, their rewards would decrease as predicted by the Stolper-Samuelson theorem.[12] This implies that high-skilled workers, i.e. people with at least experience from higher education, are expected to be positive toward globalization whilst low-skilled to a larger extent would oppose it. Furthermore, the import competing sector will according to the theory contract from increased trade, while the exporting sector will expand. The import competing sector, which

[12] We recognize that not all manufacturing workers are low skilled, but uses this simplification which is motivated in section 2.3.3, independent variable: *import exposure.*

has relatively more low-skilled workers than the export sector, will supposedly therefore be exposed to adverse labor market effects and by that contain more perceived losers from trade. Despite that not all manufacturing workers can be deemed to be low skilled, it is as such possible that even though receiving higher returns as predicted by Stolper-Samuelson, they are negatively affected if they work in the import competing sector. Therefore, we would also expect that the observations in the U.S that are subject to larger import exposure, would have a less positive view on globalization than the states that are less exposed to imports. One could also expect that if the government's compensation to the losers from trade is successful, the previously discussed effects would be counteracted to some extent.

From a Heckscher-Ohlin perspective, the theoretical interpretation implies that our result should indicate that the increasingly negative attitude on globalization can be explained by perceived losers from trade, who themselves have been negatively affected by it.

## 5. Empirical strategy

### 5.1 Method

In order to investigate trade's impact on globalization attitudes, we have had to conduct an exploratory study. There is no specified existing model on what variables that affect attitudes in this context, because of which we have decided to solely rely on theoretical interpretations presented in the former section. This study uses cross-sectional data on 51 observations, i.e. the 50 states in the U.S as well as DC. This stands in contrast to former studies which mostly have conducted analysis from an international cross-sectional data. It is conducted by using an econometric method performed in STATA 14.0.

#### 5.1.1 Specification of models and expected results

Because of the fact that there are no concrete guidelines, we have performed several models in order to retrieve the most reliable results. These results were achieved by running six different models using four different estimation methods. Model 1, which is also our main model, is depicted below and the rest will be described further down in this section.

$$Y_i = \alpha_i + \beta_1(Share\_lacking\_experience\_from\_higher\_education)_i + \beta_2(ImportExposure)_i + \beta_3(TAA)_i + \varepsilon_i$$

The intercept and the error term for observation $i$ are depicted as $\alpha_i$ and $\varepsilon_i$ respectively, for all of the models. The marginal effect for each of the variables is presented by $\beta_i$. Our dependent variable $Y_i$ is the globalization attitude for observation $i$. This is measured using attitudes on immigration as a proxy. The variable is constructed as the percentage in each state that believe immigrants will strengthen the American society, thereby making $Y_i$ a number between 0 and 1. The closer the dependent variable is to 0, the worse is the globalization attitude.

Model 1 contains our three main variables. These are the share in an observation who do not have any experience from either college or university, manufacturing workers' exposure to manufacture imports and spendings aimed at compensating those negatively affected by trade. The variable of the share who do not have experience from higher education is used to represent the low-skilled workers referred to in the Heckscher-Ohlin model. It is constructed by dividing the number of people without any experience from either college or university in a particular observation, with the total population in that same observation, as can be seen in equation (1) below.

(1) $$Share\ lacking\ experience\ from\ higher\ education = \frac{Max\_highschool\_\mathrm{degree}_i}{State\_pop_i}$$

Educational attainment as a variable impacting globalization attitude has to the best of our knowledge not been used in a cross-sectional study of the states within the U.S earlier. We base our argument of those who we deem to be low skilled workers, i.e. the perceived losers from trade, on a study of Hainmueller and Hiscox (2006) stating that taking just one class at college or university will have a positive impact on a person's view on trade policies. If the empirical evidence were to accord with the theoretical predictions made by the theory, we would expect this variable to have a negative impact on globalization attitude. The higher the share of those who have not attended any classes at either college or university in a certain observation, the less positive should its view on globalization be.

The second main variable of manufacturing import exposure is derived from the method used by Autor, Dorn and Hanson (2013) when measuring import exposure per worker.[13] Unlike their study, we solely observe manufacturing imports and the manufacturing sector. Such data has to our knowledge not been used in the context examined in this study, but we nevertheless argue that this is relevant when assessing losers from trade and their impact on globalization attitudes[14]. The equation of manufacturing workers' exposure to manufacture imports is depicted below in equation (2).

$$\text{Im\_exp} = \frac{L_{imt}}{L_{umt}} * \frac{\Delta \text{Im}_{uwmt}}{L_{it}} \quad (2)$$

In the equation, $L_{imt}$ is those employed in the manufacturing sector in 2008 for observation $i$. This is divided with $L_{umt}$ which is the total U.S employment number in the manufacturing sector for the same year. The right hand side of the equation shows $\Delta \text{Im}_{uwmt}$, the change in U.S manufacturing imports from the rest of the world from 2008 to 2013, divided by $L_{it}$ which is those employed in all sectors in observation $i$ in 2008. The calculation in equation (2) gives us a value of how exposed workers in a certain state are to imports of manufacturing. By using the change in import exposure from 2008-2013, we allow time for people's attitudes to adapt to alterations in import exposure and the effects it gives rise to. This is done since we assume that the effects from an increase in imports of manufacturing will be somewhat delayed on a person's feelings towards globalization. The coefficient for this variable is expected to be negative, meaning that more exposed states are likely to have a less positive view on globalization than states which are less exposed. These results would align with the predictions of the Heckscher-Ohlin theory, that trade creates redistributional effects which then causes more perceived losers from trade in more exposed areas.

Our third and last main variable measures TAA spendings. Specifically *spendings* of the TAA program in the U.S has to the best of our knowledge not been used earlier to examine attitudes, which made it a challenge to find data on how to measure this direct form of compensation to perceived losers from trade. In order to achieve a more accurate measurement of TAA spendings in relation to the size of a certain observation, we have divided the total TAA spendings for a specific

[13] Autor, Dorn and Hanson (2013) use two prefixes in their equation which they do not specify. Therefore, our interpretation is based on our own assumption that the prefixes u and c stand for the U.S and China respectively.

[14] See motivation for this variable under section 2.3.3, *Independent variable: Import exposure.*

state by its GDP, as shown in equation (3) below. Given that government compensations might counteract redistributional effects from trade, the TAA variable is expected to affect globalization attitude positively. However, the variation in the TAA dataset is very high, which might create difficulties in getting proper results from our regressions. Furthermore, the TAA variable would, if the program worked correctly and compensated those negatively affected by trade, be correlated with the import exposure variable. These potential issues need to be taken into account when interpreting the results.

$$TAA = \frac{TAA\_spendings_i}{GDP_i} \tag{3}$$

To obtain robust results, we have included one or more control variables following model 1. These control variables are gini index, personal expenditures, GDP per capita and the dummy variable governor stating whether or not the governor in observation i is republican or democrat, where republican will be classified as group 1. In model 2, we have included gini index to our main variables in the regression. The gini index measures how equal a certain states' distribution of incomes are among individuals and households. The variable will take on a number between 0 and 1 where a number close to one indicates a more unequal distribution (World Bank, 2016). Suggestively, this variable has a negative impact on globalization attitude, given that greater inequality proves the emergence of more perceived losers and winners which may or may not have arised from trade. Model 3 instead includes personal expenditures along with our main variables. The variable measures consumption expenditures per capita in a certain observation and is extracted to capture the approximate wealth of the households within a state, which we would expect to have a positive impact on globalization attitude. The most reliable result was retrieved when logging this variable. Model 4 contains both of the variables discussed above. In model 5, logged GDP per capita is added to our main model. GDP per capita is fairly similar to the personal consumption expenditure variable and has the same expected result, but it does not take the households' fixed costs into account. Finally, model 6 contains the main variables as well as all the presented control variables. Here the dummy on whether a state governor is a republican or a democrat is introduced. Keeping the recent U.S presidential election in mind, we have chosen to include this variable, despite that it explicitly is not linked to perceived losers from trade. The states that are run by a democratic governor belong to group 0. Deriving on the result of Autor, Dorn, Hanson and Majlesi (2016), we make a simplified assumption that democrats are more pro globalization than

republicans which then are classified as group 1.[15] Given this notation, we expect that the governor variable has a negative impact on globalization attitude. Including these additional variables, allows us to control the robustness of the main variables.

### 5.1.2 Regression models

We believe that our dependent variable is affected by more variables than just one, which is why we are using a multiple regression model for our analysis. Due to the fact that our dependent variable is a number between 0 and 1, we performed several regressions in order to reach a more accurate estimation. We started by running a linear regression with Ordinary Least Squares (OLS) which enabled us to perform tests on our data, followed by three regressions named beta, fractional logit and fractional probit. The last three regressions go under the group of fractional regressions. These are most appropriate to use when the dependent variable is a fractional number and are therefore more accurate to use when estimating our dependent variable which is a proportion. There are a few differences between these regressions making the beta regression most suitable for using as our baseline. Both the fractional logit and probit regression allow for the dependent variable to be a number between or including 0 and 1 (STATA, 2016a). The beta regression on the other hand, can only be selected when it is excluded that the variable will demonstrate either one of the endpoints. In those cases, the beta regression is more preferable because it is more flexible in the distribution of the mean of the dependent variable (STATA, 2016b). Given that our dependent variable, attitudes towards globalization, never takes on either of the endpoints 0 and 1, the beta regression is the most appropriate for us to use and will therefore be our baseline regression.

### 5.1.3 Data tests

Several tests have been performed in order to control our data and find the most fitting model. Firstly, we did a Breusch-Pagan heteroskedasticity test.[16] It checks for the hypothesis that the standard errors are consistent. Given the large deviations in population among our observations, we would expect our data to show signs of heteroskedasticity and so is the case among most of our

[15] Autor, Dorn, Hanson and Majlesi (2016) conclude that trade shocks imply net gains in congressional seats for republicans. They discuss that the Republican Establishment are ideologically more likely to be in favor of free trade than democrats, but that empirically republican voters seem to oppose trade more than democratic voters.

[16] Results of the Breusch-Pagan heteroskedasticity tests are shown in Table 13 in Appendix.

models. Because of this, the regressions will be corrected using vce robust standard errors.[17] Furthermore, the data was controlled for multicollinearity and correlation. In STATA, this was done by conducting a vif test and as well as a correlation command.[18] Given that the data showed low correlation and multicollinearity, no further actions were taken to contravene such patterns. Lastly, a test for model specification was executed through a linktest.[19] This demonstrated different degrees of misspecification for several of our six models. This is expected, given that our study is an exploratory one and that the true theoretical model specification is unknown.

### 5.2 Data

The dependent variable in our regression, attitudes towards globalization, was obtained from the 2015 American Values Atlas, which is a survey conducted by the PRRI.[20] Our data on educational attainment in 2015 was derived from the United States Census Bureau.[21] The manufacture import data was obtained from the International Trade Administration (ITA) under the U.S department of commerce, where a dataset consisting of NAICS manufacture imports to the U.S between 2008-2013 was retrieved.[22] Data on total TAA spendings for each observation was obtained from the United States Department of Labor and the Employment and Training Administration through their 2015 TAA report. Data on GDP was extracted from the Bureau of Economic Analysis, U.S Department of Commerce, by choosing Annual GDP by State and Per capita real GDP.[23] The data used for the gini index variable was extracted from the United States Census Bureau.[24] Personal consumption expenditures data was obtained through the U.S Bureau of Economic Analysis, U.S

[17] Robust is White's correction of standard errors when the data is heteroskedastic. Vce is a common variance estimation in STATA which estimates the variance-covariance matrix (STATA, 2016c).

[18] Results of the multicollinearity and correlation tests are shown in Table 5-11 in Appendix.

[19] Results of the linktests on misspecification are shown in Table 12 in Appendix.

[20] (PRRI, 2016)

[21] (Census, 2016a)

[22] (ITA, 2016)

[23] (BEA, 2016a)

[24] (Census, 2016b)

Department of Commerce.[25] Data on political party belonging for all state governors was retrieved from the website of National Governors Association.[26]

# 6. Empirical results

## 6.1 Baseline beta regressions

The results in this section are based on our baseline beta regression. As can be seen in Table 1, our independent variable measuring the absence of experience from either college or university has a negative impact on globalization attitude. This result is significant at the 1 % level for all of the models and is stable throughout the regressions, demonstrating a robust result. The outcome is consistent with our expectations derived from the Heckscher-Ohlin trade theory and the Stolper-Samuelson theorem, as discussed in the theory section. The fact that the variable shows results of having a negative impact on globalization attitude, aligns with a majority of previous studies which also point to the connection between factor of production belonging and attitudes. Although, the result do not necessarily need to confirm the Stolper-Samuelson theorem, as discussed by Hainmueller and Hiscox (2006). If their conclusion were to be true, we would expect people to have the same attitude regardless if they are employed or unemployed. Given that we obtain significant as well as robust result of the negative impact on attitudes from being exposed to manufacturing imports, it would seem as if people's attitudes depend on how they are affected individually from labor market alterations that occur when trading. As such, our result is more in line with the Stolper-Samuelson theorem, and that belonging to the scarce factor of production has an impact on globalization attitude.

[25] (BEA, 2016b)

[26] (NGA, 2015)

*Table 1: Results from our baseline beta regressions for model 1-6*

| Variables | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
|---|---|---|---|---|---|---|
| Share lacking experience from higher education | -2.559571*** [0.5354964 ] | -3.043336*** [0.4789627] | -1.942303*** [0.6621743] | -2.718362*** [0.5972002] | -2.617153*** [0.5321657] | -2.750049*** [0.6308227] |
| Import exposure | -0.0001355** [0.0000581] | -0.000098 [0.00006] | -0.0001136* [0.0000641] | -0.0000879 [0.0000612] | -0.0001279** [0.000058] | -0.0000787 [0.000062] |
| TAA | -0.000082 [0.0009349 ] | -1.49e-06 [0.0007557] | -0.0001473 [0.0010208] | -0.0000352 [0.0007895] | -0.0000228 [0.0009471] | -0.0000752 [0.0007402] |
| Gini | - | 5.439725*** [1.435367] | - | 5.314697*** [ 1.44955] | - | 5.067226*** [1.466754] |
| Log(Personal expenditures) | - | - | 0.3325588 [0.2877868] | 0.1685641 0.2325544 | - | 0.098339 [0.2588629] |
| Log(GDP/capita) | - | - | - | - | 0.1161648 [0.0926237] | 0.0620305 [0.0800631] |
| Dummy: Governor | - | - | - | - | - | -0.0612203 [0.064472] |
| Number of observations | 51 | 51 | 51 | 51 | 51 | 51 |

Note: ***P<0,01, **P<0,05, *P<0,1. The robust standard errors are shown within brackets.

The results from the measure of manufacturing workers' exposure to manufacture imports also aligns with our prediction, as the coefficient consistently is negative. This result is significant at the 5% level for model 1 when only the main variables are included, as well as in model 5 when adding GDP per capita. In model 3, it is significant at the 10 % level. In model 2, 4 and 6, it does not show a significant result.[27] Nevertheless, we can say that there is some empirical support in favor of the hypothesis that the more exposed a state is to manufacture imports, the less positive are people in that state towards globalization. Given that the Heckscher-Ohlin theory not explicitly define those in the import competing sector as losers, this results is particularly interesting. As have been mentioned earlier, the manufacturing sector can still contain high skilled workers, which theoretically would benefit from trade. Despite this, the result indicates that the manufacturing workers' exposure to manufacture imports has had a negative impact on globalization attitudes in 2015. One explanation could be that even if a worker in the manufacturing sector is high skilled, that person can still be negatively affected by trade if the sector contracts and is exposed to labor market effects such as e.g. unemployment. The fact that some individuals are negatively affected by the labor market restructuring that occur from manufacture imports, seems to be part of the explanation for the tendency towards anti-globalization sentiments. These results are likely to coincide with the result of Autor, Dorn and Hanson (2013), from whom we derived our import

[27] In model 2, the result was close to being significant at the 10% level, having a value of 10,2%.

exposure variable. They obtained the result that areas with a higher degree of import competition had higher unemployment as well as reduced wages.

Our third and last main independent variable, TAA, is the only one that is not significant in any of the models. This contradicts our expectations that were based on the theoretical predictions made by the Heckscher-Ohlin trade theory. Given that trade causes the emergence of winners and losers, compensating the losers may contravene anti-globalization attitudes, as has been mentioned earlier in this study. By providing funds, the TAA program can be deemed to make workers more mobile, which is a condition for workers to be able to move between sectors as is assumed in the above mentioned theory. If such compensation is successful, we would expect that the states in which workers are subject to larger import exposure, would have higher TAA spendings. As such, we would expect spendings of the TAA program and the exposure of manufacturing workers to manufacture imports to be correlated.[28] Given that this is not the case, it might be possible to state that compensating the perceived losers of trade in the U.S has failed. The fact that the variable does not have a significant impact on globalization attitudes, could indicate that people do not care if they are compensated or not, although this is not likely given the result of the variable measuring manufacturing import exposure. It could also, as discussed in Ehrlich and Hearn (2014) be because people do not have knowledge about that the program exists. It is also possible that the program's complex application conditions and eligibility criteria contribute to the failure of reaching all of those negatively affected by trade. It would seem as if the current structure of the TAA program fails to contravene the reverse effect on globalization attitudes that otherwise seems to occur.

Among our control variables, the gini index was the only one that gave a significant and result at a 1 % level in all of the models where it appears. The gini index has a consistently positive and robust impact on attitude towards globalization, which is hard to apply to the theoretical predictions. We expected the impact to be negative, as a higher gini index would reveal the existence of more perceived losers, be that of trade or any other reason. The rest of the control variables were insignificant for all of the concerned models. By including them, we observed the robust result for two of our main variables, uneducated and import exposure.

Overall, the results point at some connection between those who are perceived losers from trade and attitudes towards globalization. The fact that the share lacking any previous experience from either

[28] See Table 6-11 in Appendix for details on correlation.

university or college, as well as manufacturing workers' exposure to manufacture imports, have a significant negative impact on globalization attitude aligns with what we expect from the Heckscher-Ohlin predictions. It suggests that trade's impact on those who we have interpreted as the low-skilled factor of production, might be one part of the explanation for the adverse attitudes on globalization that have been previously discussed in the study. Furthermore, the contraction of the import competing sector and the negative labor market effects arising due to this seem also to be a reason for the adverse attitudes on globalization. The fact that compensation to those negatively affected by trade through TAA spendings shows insignificant results, suggestively depends on the complexity of the TAA program. This was otherwise predicted to be positive, and thereby counteract the predicted negative result by the former two main variables.

### 6.2 Additional regressions

The results from our additional regressions besides our baseline will briefly be presented below. These are a linear, fractional- probit respectively logit regression. As can be seen in Table 2-4, the significance level as well as the sign of the coefficients, coincide with those obtained through our baseline regression. These results further validate the conclusion drawn from the previous section.

*Table 2: Results from the linear regressions for model 1-6*

| **Variables** | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 5** | **Model 6** |
|---|---|---|---|---|---|---|
| Share lacking experience from higher education | -0.6366421*** [.1370364] | -0.7459164*** [0.1224214] | -0.482713*** [0.1716892] | -0.6644355*** [0.1553536] | -0.6505446*** [0.1374161] | -0.6723208*** [0.1683191] |
| Import exposure | -0.0000339** [0.0000148] | -0.000024 [0.0000154] | -0.0000285* [0.0000165] | -0.0000215 [0.0000159] | -0.000032** [0.0000149] | -0.0000192 [.0000165] |
| TAA | - 0.0000191 [0.0002386] | -4.44e-06 [0.0001957] | -0.000034 [0.0002624] | -0.0000124 [0.0002066] | -3.89e-06 [0.0002444] | -0.0000225 [0.0001983] |
| Gini | - | 1.32223*** [0.3686843] | - | 1.290661*** [0.3766364] | - | 1.228713*** [0.3893733] |
| Log(Personal expenditures) | - | - | 0.0827778 [0.0747245] | 0.0424146 [0.061193] | - | 0.0248321 [0.0697706] |
| Log(GDP/capita) | - | - | - | - | 0.0288905 [0.0239925] | 0.0153378 [0.0213438] |
| Dummy: Governor | - | - | - | - | - | -0.0152168 [.0173902] |
| $R^2$ [Adjusted $R^2$ ] | 0.4046 [0.3665] | 0.5614[0.5232] | 0.4192[0.3687] | 0.5651[0.5168] | 0.4155[0.3646] | 0.5762[0.5072] |
| Number of observations | 51 | 51 | 51 | 51 | 51 | 51 |

Note: ***P<0,01, **P<0,05, *P<0,1. The robust standard errors are shown within brackets.

*Table 3: Results from the fractional probit regressions for model 1-6*

| Variables | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
|---|---|---|---|---|---|---|
| Share lacking experience from higher education | -1.609585*** [0.3388305] | -1.90108*** [0.2981836] | -1.221982*** [0.417783] | -1.697376*** [0.3740108] | -1.645194*** [0.3363155] | -1.715233*** [0.3955036] |
| Import exposure | -0.0000854** [0.0000363] | -0.0000609 [0.0000373] | -0.000072* [0.00004] | -0.0000546 [0.000038] | -0.0000808** [0.0000363] | -0.0000489 [0.0000385] |
| TAA | -0.0000484 [0.0005848] | -9.20e-06 [0 [0.0004736] | -0.0000855 [0.0006361] | -0.0000288 [0.0004943] | -0.0000103 [0.0005925] | -0.0000537 [0.0004642] |
| Gini | - | 3.385005*** [0.8876866] | - | 3.305996*** [0.8973165] | - | 3.149966*** [0.9080698] |
| Log(Personal expenditures) | - | - | 0.2083423 [0.1804832] | 0.1058397 [0.1461691] | - | 0.0622366 [0.1626444] |
| Log(GDP/capita) | - | - | - | - | 0.0728573 [0.0579526] | 0.0386904 [0.0500781] |
| Dummy: Governor | - | - | - | - | - | -0.0380677 [0.040595] |
| Number of observations | 51 | 51 | 51 | 51 | 51 | 51 |

Note: ***P<0,01, **P<0,05, *P<0,1. The robust standard errors are shown within brackets.

*Table 4: Results from fractional logit regressions for model 1-6*

| Variables | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
|---|---|---|---|---|---|---|
| Share lacking experience from higher education | -2.569396*** [0.5421113] | -3.051123*** [0.4796799] | -1.950182*** [0.6676468] | -2.726687*** [0.6001547] | -2.626751*** [0.5382975] | -2.754313*** [0.6336564] |
| Import exposure | -0.0001365** [0.0000582] | -0.0000981 [0.0000598] | -0.0001151* [0.000064] | -0.0000881 [0.0000609] | -0.0001291** [0.0000581] | -0.000079 [0.0000617] |
| TAA | -0.000079 [0.0009371] | -9.88e-06 [0.0007576] | -0.0001398 [0.0010202] | -0.0000416 [0.0007909] | -0.000019 [0.0009491] | -0.0000811 [0.0007424] |
| Gini | - | 5.454175*** [1.423116] | - | 5.328471*** [1.438184] | - | 5.078405*** [1.45608] |
| Log(Personal expenditures) | - | - | 0.3327879 [0.2885686] | 0.1682923 [0.2334366] | - | 0.098737 [0.2596373] |
| Log(GDP/capita) | - | - | - | - | 0.1164742 [0.0927331] | 0.0621167 [0.0803457] |
| Dummy: Governor | - | - | - | - | - | -0.0609596 [0.0648096] |
| Number of observations | 51 | 51 | 51 | 51 | 51 | 51 |

Note: ***P<0,01, **P<0,05, *P<0,1. The robust standard errors are shown within brackets.

## 8. Conclusion

The purpose of this study was to investigate if the attitudes towards globalization could be explained by who perceive themselves to be losers from trade, as predicted by the Heckscher-Ohlin model. As has been presented in the study, there have been several events during the last couple of years, and more specifically in 2016, that could be interpreted as anti-globalization acts. By defining attitudes as the tendency to act towards ideas,[29] it would seem as if these events can be interpreted as an increasingly negative attitude towards globalization. Due to the relevance of investigating what the reason for this may be, we wanted to analyze if the perceived losers from trade, from a Heckscher-Ohlin framework, may contribute to this change in attitudes. By doing econometric regressions, using cross-sectional data on the 50 U.S states and DC, we have examined what impact the perceived losers from trade have on the dependent variable globalization attitudes. To our knowledge, this area has earlier not been covered. The study is thereby a contribution to the assessment of adverse attitudes towards globalization. By using the theoretical predictions of the Heckscher-Ohlin trade theory and applying it empirically to the U.S, we have captured the perceived losers from trade in three main variables. These variables measured the share in an observation who lack experience from college or university, the exposure of manufacturing workers to manufacture imports, and the spendings distributed by the compensation program TAA.

The results suggest that educational attainment matters a great deal in forming one's attitude towards globalization. Those whose educational attainment is less than or including high school experience, have a significantly negative impact on globalization attitudes. This is in line with our predictions based on the Heckscher-Ohlin trade theory and the Stolper-Samuelson theorem, that belonging to the scarce factor of production should impact globalization attitudes negatively. The same negative effect was found for exposure to imports. The more exposed manufacturing workers are to manufacture imports within a certain observation, the less positive is that state’s attitude towards globalization. The third main variable TAA spendings, which captures the government's ability to compensate the perceived losers from increased trade, showed an insignificant result in all of the six models and all regressions. This may be due to the fact that the government fails to compensate the losers from trade, which in turn could counteract some of the adverse effect on

[29] Full definition is found in section 2.2, *introducing attitudes*.

globalization attitude. Conclusively from these results, the perceived losers from trade seem to significantly affect globalization attitude negatively, as predicted by the Heckscher-Ohlin model.

It should be noted that the interpretation of these results are specific to the empirical context in which they occur. Higher education among the citizens could in the case of the U.S have a positive impact on attitudes towards globalization, since they would then belong to the abundant high skilled factor of production. On the other hand, in a country where high skilled workers belong to the scarce factor of production, the results suggest that higher education would not have a positive impact on globalization attitude, as high skilled workers would in fact be the perceived losers from trade. The same is true for the manufacturing workers, which according to our result suggestively have been negatively affected by trade and is therefore opposing it. In a low-skilled abundant country, the manufacturing sector would theoretically expand and therefore there would not be any adverse labor market effects for the workers within. Because of this, we would not expect them to oppose to increased globalization. As such, our results present how attitudes towards globalization are affected in the U.S and regions with similar factor endowments. Nevertheless, it seems as if the actions recently observed in both the U.S and in other regions which we have interpreted as based on anti-globalization attitudes, might partly be due to those who perceive themselves to be losers from trade. For this reason, policies aiming at compensating those who are negatively affected by trade seem to be an essential component in deterring a reverse effect on globalization attitudes. Ideally, the TAA program and similar policies would more efficiently reach all of those negatively affected by trade, and by that have a positive impact on the attitude formation.

Given the absence of an existing model in this area, further investigations on what variables to include need to be done. Despite obtaining robust and significant results for two of our main variables, the models still show signs of misspecification.[30] Data regarding attitudes towards globalization at state-level in the U.S could present a better alternative to our method of using immigration as a proxy. To further investigate what determines attitudes towards globalization is of great importance for future integration, and a sustainable development towards continued interaction between the world's economies.

[30] See Appendix Table 12 for details on misspecification for model 1-6.

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# 10. Appendix

*Table 5: Vif-test for multicollinearity*

| Variables | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 | Model 6 |
|---|---|---|---|---|---|---|
| Share lacking experience from higher education | 1.16 [0.863347] | 1.20 [0.833632] | 2.04 [0.491026] | 2.16 [0.463125] | 1.17 [0.856204] | 2.18 [0.458898] |
| Import exposure | 1.37 [0.730675] | 1.41 [0.707035] | 1.51 [0.660766] | 1.54 [0.650082] | 1.39 [0.718464] | 1.59 [0.630558] |
| TAA | 1.30 [0.772146] | 1.30 [0.771938] | 1.30 [0.769865] | 1.30 [0.769384] | 1.30 [0.768917] | 1.31 [0.763581] |
| Gini | - | 1.06 [0.944569] | - | 1.08 [0.922583] | - | 1.15 [0.872965] |
| Log(Personal expenditures) | - | - | 2.22 [0.449831] | 2.28 [0.439360] | - | 2.58 [0.386984] |
| Log(GDP/capita) | - | - | - | - | 1.03 [0.966732] | 1.12 [0.891746] |
| Dummy: Governor | - | - | - | - | - | 1.28 [0.782794] |
| Mean vif | 1.27 | 1.24 | 1.77 | 1.67 | 1.22 | 1.60 |

Note: the numbers present the vif value, 1/vif are shown within brackets.

*Table 6: Correlation test for model 1*

| Model 1 | | | |
|---|---|---|---|
| | Share lacking experience from higher education | Import exposure | TAA |
| Share lacking experience from higher education | 1.0000 | | |
| Import exposure | 0.3494 | 1.0000 | |
| TAA | 0.2688 | 0.4635 | 1.0000 |

*Table 7: Correlation test for model 2*

| **Model 2** | | | | |
|---|---|---|---|---|
| | Share lacking experience from higher education | Import exposure | TAA | Gini |
| Share lacking experience from higher education | 1.0000 | | | |
| Import exposure | 0.3494 | 1.0000 | | |
| TAA | 0.2688 | 0.4635 | 1.0000 | |
| Gini | 0.1199 | -0.1473 | -0.0614 | 1.0000 |

*Table 8: Correlation test for model 3*

| **Model 3** | | | | |
|---|---|---|---|---|
| | Share lacking experience from higher education | Import exposure | TAA | Log(Personal expenditures) |
| Share lacking experience from higher education | 1.0000 | | | |
| Import exposure | 0.3494 | 1.0000 | | |
| TAA | 0.2688 | 0.4635 | 1.0000 | |
| Log(Personal expenditures) | -0.7066 | -0.4556 | -0.2457 | 1.0000 |

*Table 9: Correlation test for model 4*

| **Model 4** | | | | | |
|---|---|---|---|---|---|
| | Share lacking experience from higher education | Import exposure | TAA | Gini | Log(Personal expenditures) |
| Share lacking experience from higher education | 1.0000 | | | | |
| Import exposure | 0.3494 | 1.0000 | | | |
| TAA | 0.2688 | 0.4635 | 1.0000 | | |
| Gini | 0.1199 | -0.1473 | -0.0614 | 1.0000 | |
| Log(Personal expenditures) | -0.7066 | -0.4556 | -0.2437 | 0.0591 | 1.0000 |

*Table 10: Correlation test for model 5*

| **Model 5** | | | | |
|---|---|---|---|---|
| | Share lacking experience from higher education | Import exposure | TAA | Log(GDP/capita) |
| Share lacking experience from higher education | 1.0000 | | | |
| Import exposure | 0.3494 | 1.0000 | | |
| TAA | 0.2688 | 0.4635 | 1.0000 | |
| Log(GDP/capita) | 0.0248 | -0.1498 | -0.1160 | 1.0000 |

*Table 11: Correlation test for model 6*

| **Model 6** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Share lacking experience from higher education | Import exposure | TAA | Gini | Log(Personal expenditures) | Log (GDP/capita) | Dummy: Governor |
| Share lacking experience from higher education | 1.0000 | | | | | | |
| Import exposure | 0.3494 | 1.0000 | | | | | |
| TAA | 0.2688 | 0.4635 | 1.0000 | | | | |
| Gini | 0.1199 | -0.1473 | -0.0614 | 1.0000 | | | |
| Log(Personal expenditures) | -0.7066 | -0.4556 | -0.2457 | 0.0591 | 1.000 | | |
| Log(GDP/capita) | 0.0248 | -0.1498 | -0.1160 | 0.2183 | -0.0667 | 1.000 | |
| Dummy: Governor | 0.2361 | 0.2489 | 0.0605 | -0.1128 | -0.4268 | 0.1231 | 1.000 |

*Table 12: Linktest for misspecification*

| Attitude | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 5** | **Model 6** |
|---|---|---|---|---|---|---|
| _hat | 0.598 | 0.068 | 0.606 | 0.056 | 0.658 | 0.045** |
| _hatsq | 0.869 | 0.323 | 0.890 | 0.276 | 0.956 | 0.237 |

Note: The model is not misspecified if the _hat value is significant while the _hatsq is insignificant.

*Table 13: Breusch-Pagan test for heteroskedasticity*

| **Breusch-Pagan** | **Model 1** | **Model 2** | **Model 3** | **Model 4** | **Model 5** | **Model 6** |
|---|---|---|---|---|---|---|
| Prob > chi2 | 0.0316 | 0.5138 | 0.0187 | 0.4635 | 0.0760 | 0.4684 |