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The Impact of the 1981 Automobile Voluntary Export Restraint on Commuting Zone Level within the United States

A thesis submitted in partial fulfillment of the requirement for the degree of Bachelor of Arts in Economics from The College of William and Mary

by

Owen Lyons Giordano

Accepted for Honors

John Lopresti, Director

Nathaniel Throckmorton

Rani D. Mullen

Williamsburg, VA
May 1, 2020
The Impact of the 1981 Automobile Voluntary Export Restraint on Commuting Zone Level within the United States

Owen Giordano*
May 1, 2020

Abstract:

This paper analyzes the impacts of the 1981 voluntary export restraint (VER) on important economic welfare indicators. The indicators include employment shares, average wages, and population growth measured on a commuting zone (CZ) level and were utilized as a means to assess trade-flow exposure. CZ level data allows us to capture the effects of a national policy on local economies. In addition, this paper evaluates the impact of the 1981 VER on Japanese exports to the United States (US). Two regression models use census data as well trade-flow data from 1970s to 1980s. A trade-flow exposure model shows that the flow of automobiles from Japan to US, had a small, but statistically significant, impact on an average CZ’s employment share and population growth. However, there was no significant change in average wages, across all industries or within manufacturing industries. Following the VER, the trade-flow model demonstrates that there was a significant increase in the real value of passenger cars from Japan to the US.

*Special thanks to Professor Lopresti for advising me throughout this endeavor, as well as to Professor Throckmorton and Professor Mullen for serving on my committee.
Section 1: Introduction

Automotive vehicles have been a key component of the American Dream since Henry Ford first rolled out the Model T on October 1st, 1907. In the hundred plus years since then, the United States (US) automotive industry has exploded in both scale and revenue. According to a 2018 report by the American Automotive Policy Council (AAPC), the automotive industry supports jobs for roughly 7.25 million Americans, accounts for approximately 3% of US Gross Domestic Product (GDP) and generates over $692 billion dollars in exports alone. Despite such lofty economic statistics, the US automotive industry faces risks stemming from a globally competitive marketplace. Global automotive production, according to Ward’s Data, has increased dramatically with added manufacturing from multiple countries, since 1950 when the US accounted for roughly 80% of the 10.5 million automobiles produced. Ultimately, the global increase in production has given rise to three dominant countries in automotive production, while compromising US ascendance. As of 2018, the US, Japan, and China produced 11.3 million (11.8%), 9.7 million (10.2%), and 27.8 million (29.1%) of the world’s motor vehicles, respectively, and accounted for 48.8 million (51.1%) of production collectively.

Presently, the big three US manufacturers, “[Fiat Chrysler Automobiles] FCA US, Ford and General Motors [GM,]” contribute more to the United States’ economy than any of their foreign competitors. The three automakers buy more of their vehicle parts and conduct more of their

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research and development in the United States than any other automakers. In turn, FCA US, Ford, and General Motors employ two out of three of America’s autoworkers, and operate three out of five of the automotive assembly plants in the United States”. Nonetheless, US plants owned by foreign manufacturers have “helped double foreign automakers' share of the American market over the past 30 years -- more than half of the vehicles sold in the United States are now made by foreign automakers”. Importantly, in 2018, Chinese automaker, Volvo, opened its first US auto plant, making it “the first Chinese-owned automaker to own a U.S. production facility”. Collectively, the transplant market poses a serious threat to the US automotive industry’s viability via foreign vehicle sales success in the US marketplace.

In February 2019, US President Donald Trump announced his intentions to place a 25% tariff on both car and car part imports in an effort to increase the number of cars built on US soil. Trump’s plan has since been derided by some US politicians as “‘jeopardiz[ing] the health of our own economy’”, since it is expected that “imposing Section 232 tariffs on imported cars will cause 366,900 US jobs to be lost; raise prices of US ‘light duty’ vehicles by $2,750 on average, and force many consumers into the used car market”. Given such severity in potential outcome, it is important to understand the significance of the US automotive industry to the overall US economy and to explore how tariffs have impacted the US automotive industry historically.

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9 Ibid.
To this end, I provide a literature review of the sociopolitical and economic environment before and after the passage of the voluntary export restraint (VER) on passenger cars implemented in 1981 by President Reagan. A VER “is a trade restriction on the quantity of a good that an exporting country is allowed to export to another country… [which] is self-imposed by the exporting country”.\(^\text{10}\) The 1981 VER was passed in response to the perceived effects of Japanese automobile manufacturers on the US automobile industry. Additionally, I analyze the impacts of the 1981 VER on important economic welfare indicators, including employment shares, average wages, and population growth as means to assess trade flow exposure. All of these indicators are measured on a commuting zone (CZ) level. The CZ level was chosen in order to capture the effects of a national policy on local economies.\(^\text{11}\) In addition, the impact of the 1981 VER on the trade flow of Japanese exports to the US was evaluated. Analyses were conducted using regression models employing census data as well trade flow data from 1970s to 1980s. Using the exposure model, I found that the trade flow of automobiles from Japan to US, had a small, but statistically significant, impact on an average CZ’s employment share and percentage change in population size. There was no significant change in average wages, both overall in a CZ and within manufacturing industries in a CZ. The trade flow model demonstrates that there was a significant increase in real value of passenger cars from Japan subsequent to the VER. It should be noted that these results cannot be decisively attributed to the VER. Ultimately, the analyses of these indicators around the time of this unique protectionist policy in US history provides data consistent


with the previously published economic literature that purport the inefficiencies of protectionist policies, especially as related to the 1981 VER and the US automobile industry.\textsuperscript{12,13,14}

Section 2: Literature Review

The export of manufactured goods plays a strong role in driving the US economy. With the US currently (September 2019) engaging China in a trade war, it is important to look back at the decisive points in US trade history in order to gain insight into what might be the proper course of action. The automobile industry historically has been, and remains, an important component of US Gross Domestic Product (GDP).\textsuperscript{15} Protectionist policies in the early 1980s were driven by financial crises within this industry. Thus, I will provide a comprehensive analysis of the US automobile industry and the protectionist practices enacted in the 1980s.

The late 1970s recession was detrimental to the US automobile industry, which in turn exacerbated the recession. This exacerbation is evidenced by the rise of the unemployment for automotive workers from 4.8 percent “in the second quarter of 1979... to an all-time high of 24.7 percent a year later”.\textsuperscript{16} Additionally during this time, several Japanese auto firms, most notably Honda, Nissan, and Toyota, began to cut into US car sales in a small, but politically significant way. Figure 1 demonstrates the increase in market share for these Japanese companies concomitant

with the decline in market share of the “Big Three” firms (Fiat Chrysler Automobiles (FCA), Ford, and General Motors (GM)) in the US. The composite increase in market share amongst the major Japanese auto firms at this time does not fully account for the composite decrease in US automotive firm sales. This suggests that other, larger factors adversely impacted US automotive sales and, by extension, affected the peak unemployment in the industry.

![Figure 1: US Car Sales by Select US and Japanese Manufacturers, 1975-1984](image)

Between 1970 and 1990, manufacturing's share of the US GDP fell from 24 to 18 percent, despite increases in output. This percentage reduction reflects many events in the US during this era, including the dollar appreciation and its eventual stability, an energy crises-fueled recession.

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and recovery, and a general shift away from an industrial economy to a service-oriented one. With the collapse of the fixed exchange rate under the Bretton Woods System, which was replaced by a floating rate system in the early 70s, the competitiveness of many US products in overseas markets, including automobiles, was questioned as the price of US goods rose significantly on both domestic and international markets. Conversely, because the US dollar’s value appreciated higher relative to other foreign currencies (i.e. the Japanese Yen, most importantly), foreign products were cheaper in US markets. These swings in currency values likely fueled the success of Japanese automobile sales in the US at this time. This rise in Japan’s market share is evident in Figure 1, which shows increases in the market shares for Toyota, Honda, and Nissan occurring in the late 1970s. This increase in Japanese vehicle imports is explored more extensively in Sections 4 and 5. Concomitantly, a change in US consumer automobile preferences occurred. Specifically, given the US energy crises of 1973 and 1979, more consumers began desiring smaller, fuel efficient cars rather than the large, less efficient cars classically produced by US manufacturers. Thus, it is not surprising that an increasing number of US consumers desired the compact fuel efficient cars offered by Japanese firms. Nonetheless, even under the duress of the energy crises, the best-selling car in the US during the late 1970s and early 1980s was the Oldsmobile Cutlass, which may reflect jingoism and, by extension, a desire for protectionist policy, amongst the US population. Ultimately, during this time millions of US workers for iconic American brands were laid off, including workers within the automotive industry.

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19 Ibid, 565, 571.
20 Ibid, 566.
21 Ibid, 567.
Although President Reagan ran on a platform promoting a free-market economy involving limited government intervention, which included a “strong commitment(ed) to free trade”, his legacy is one of protectionism.\textsuperscript{24} When President Ronald Reagan assumed office in 1981, he was confronted with economic crises. Centerstage in the US political debate was the perceived downfall of the industry that was to blame for large trade imbalances.\textsuperscript{25} The pressure of foreign competition, especially from Japan, as well as Reagan's “desire to help out American industries and their workers”, propelled the adoption of protectionist strategies within certain industries, including automobiles.\textsuperscript{26} This is best seen with Japan's acceptance of a three year VER of 1.68 million cars (per year) in 1981.\textsuperscript{27} Reagan’s strategy seemed like a politically viable one. Firstly, Japan was viewed by many US automotive workers as undermining the welfare of the US automotive industry, with the Union of Auto Workers (UAW) “demanding that import quotas be imposed and that Japanese firms begin building cars in the United States” since the 1970s. Additionally, the “voluntary” aspect of the VER suited the Reagan administration’s rhetoric of limited government intervention within the economy.\textsuperscript{28} Furthermore, Japan’s positive history associated with VERs, with the country setting multiple ones in the 1950s on various products, as well as the fact that Japanese exporters would still stand to profit under the conditions, made Japan more willing to accept the terms of the policy, rather than if a quota or tariff were imposed.\textsuperscript{29} Today, with the advantage of hindsight, economists have more thoroughly evaluated the real

\textsuperscript{24} Ibid, 573.
\textsuperscript{26} Ibid, 573.
\textsuperscript{27} Ibid, 577.
\textsuperscript{28} Ibid, 574.
\textsuperscript{29} Ibid. 577.
economic benefits of this politically astute policy. And, despite the political advantages of the VER, this protectionism is generally viewed as costly. In a report on the effects of the VER on US welfare by Economists Steven Berry, James Levinsohn, and Ariel Pakes, it was estimated the VER cost the US $12.4 billion dollars in domestic consumer welfare.\textsuperscript{30} Conversely, the economists projected that a tariff would have raised welfare within the country by $10 billion dollars. Other economists also point out flaws within the program, with Elias Dinopoulus and Mordecai E. Kreinin reporting that “[e]ach U.S. job saved by the VER in the auto industry cost the country over $180,000 in real income per year for 1981 and 1982”.\textsuperscript{31} This is considerably more than the average auto worker’s wage of $35,000 during these years.\textsuperscript{32} Additionally, given that the VER was more of a quota, the income usually received by the US government under a tariff went instead to Japanese firms who were able to export the vehicles. Crucially, Professor Douglas A. Irwin notes how the VER also failed “to create more jobs” in the US, which led the UAW to demand that Japanese firms open manufacturing plants in the US, and thus helped to “stabilize the import share [of Japanese cars] by the end” of the 1980s.\textsuperscript{33} This again suggests the weakness of the VER as a policy. Additionally, it should be noted that, during this decade, foreign (aside from Japan) market share remained fairly constant as well, ranging from roughly 3.8 to 5.2 percent of the US market share.\textsuperscript{34} Nonetheless, the VER was renewed by Japan in 1984, so its effects continued to be felt throughout the decade.\textsuperscript{35}


\textsuperscript{32} Ibid, 490.


political ambitions. Specifically, 1984 was a presidential election year, and the incumbent president “did not wish to alienate large numbers of voters in the industrial Midwest by lifting the restriction”.\textsuperscript{36} Although the VER was politically advantageous, in retrospect, protectionist policies are not viewed as the most economically viable solutions. As Dinopoulos and Kreinin conclude, “protection is a costly way to save jobs”.\textsuperscript{37}

**Section 3: Summary Statistics**

**Section 3.1: The Data**

- **Labor Market Data\textsuperscript{38}**

  For this project, data concerning the labor market were extracted from the Integrated Public Use Microdata Series (IPUMS) website. The data draw from four samples: the 1970 1% form 1 Metro, the 1980 5% State, the 1990 5% State, and 2000 5% National Censuses. The harmonized variables measured across these samples include a person’s weight within a CZ (how many people they represent within said CZ), their wage/salary earned per year, industry of employment, occupation, and education attainment level and poverty status.

- **Concordance Data\textsuperscript{39}**

  The labor market data, while thorough, were not recorded by CZ, but rather by county group, a variable that fluctuates over time. Luckily, the observations were carried over to


a harmonized CZ thanks to concordance data provided by Professors John Lopresti and Peter McHenry of the College of William and Mary.

- US Trade Flow Data

US trade flow patterns from 1974 to 1994 were downloaded from the University of California – Davis’ Center for International Data. The data were “assembled” by Robert Feenstra, a professor in the Department of Economics at the university. The observations, which segments in its recording in 1989, include product descriptions, value, quantity, Tariff Codes of the United States Annotated (TSUSA), Standardized Industrial Classification (SIC) code, and country of origin. The segmentation of this data, the existence of noticeable data errors, as well the desire to look in depth at a select few years, led me to analyze trade flows for all imports between Japan and the US from 1974 to 1988. The specific analysis of automobile trade flow ended in 1986 due to data errors. In designating automobile trade flows for the regressions, TSUSA and SIC codes that signified passenger cars were used to isolate and utilize relevant observations.

- Automobile Production Data (by Country and Time)

These data, while not pertinent to regressions built, were used in the creation of certain figures to help demonstrate the US’ declining share of global automobile production, as well as Japan’s rise within the industry, over time. The data were downloaded from the records offered by Wards Auto.

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Section 3.2: The Environment

As cited in the literature review, the US, during this time period, was going through unprecedented changes socially and economically. As the post-war boom came to a close by the late 1960s and early 1970s, the US dominance in many manufacturing industries, including the automobile industry, waned. By the mid to late 1970s, the US faced economic stagnation, with the country going through economic recession and appreciation of its currency. The latter hit manufacturing industries especially hard, as the rising price of US goods made them less competitive in international markets. This opened the door for many foreign companies to operate successfully in US markets. While the US economy began to recover starting in the 1980s, due to the adoption of more neoliberal and laissez-faire policies, manufacturing industries never quite reached their pre-1970s prominence partly due to factors like foreign competition and the country’s general shift to a service economy. This can be glimpsed in Figure 2, which show how trade with Japan, in general, impacted various CZs in 1970, 1980, and 1990.
Figure 2: Trade Shock Caused by Import of automobiles from Japan to US by CZ (1970, 1980, and 1990, darker = higher level of exposure)

Section 3.3: Trade

As globalization occurred at unprecedented rates, the international trade of goods concomitantly increased. As evident in Figure 3, the country at the forefront of this (and at the
center of the dart board, for many) was Japan, with automobiles becoming a crown jewel for its
growing trade empire and taking a sizable share of production. Japan’s automobile industry’s
growing prominence is evident in Figure 3, which documents the rise in automobile imports from
Japan and the US from 1974 to 1986. Interestingly, despite the VER (as represented by the green
vertical line in Figure 4) going into effect during this period, the number of automobiles that
entered this country still rose, at least according to this trade data.

Figure 3: Motor Vehicle Production by Top Producing Countries (1961, 1971, 1981)42

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Figure 4: Global Automobile Exports to US (Red) vs. Japanese Automobile Exports to US (Blue), Segmented by the Passage of the VER in 1981 (Green), 1974-1986

Section 4: The Labor Market and Exposure to Trade

4.1: The Data

In the effort to understand if and how the VER impacted CZs in the US, I found it important to measure trade flow shocks potentially stemming from this policy that impacted employment shares, average wages, and population size within said CZs. As such, I analyzed census data downloaded from the IPUMS website in conjunction with import data constructed by Professor Feenstra to see if there was any statistically significant relationship between the two. The results
produced in this regression provide insight into changes in a CZ’s welfare that occurred during the
time that the VER was active.

The IPUMS census data, which pulls from the 1970 1% form 1, 1980 5% state, and 1990
5% state, were recorded by county group, instead of harmonized CZ.\textsuperscript{43} Thankfully, concordance
equations, which convert the county groups into CZs, were available and, thus, utilized for this
project. The 1970 concordance equation was generated by Professor John Lopresti of The College
of William and Mary, and the 1980 and 1990 concordance equations were provided by Professor
Peter McHenry, also of William and Mary.\textsuperscript{44}

After concordance, the data were then “collapsed” by census year, employment status,
occupation, industry of occupation, level of education attainment, and CZ. This process essentially
sums the given specifics of observations by given inputs. In this case, each observation’s “weight”
(i.e. how many people this particular person represents) and their wage/salary income were
summed in order to create an average as dictated by the inputted characteristics.\textsuperscript{45} This process is
then repeated, albeit by year and CZ only, in order to generate the dependent and control variables
that this regression utilizes, which will be discussed later in the “Regressions” section (4.2).

\begin{footnotesize}
\begin{itemize}
\item[\textsuperscript{43}]Steven Ruggles, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas and Matthew Sobek. 
\item[\textsuperscript{44}]David H. Autor, David Dorn, and Gordon H. Hanson. “The China Syndrome: Local labor market effects of import
\item[\textsuperscript{45}]Steven Ruggles, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas and Matthew Sobek. 
\end{itemize}
\end{footnotesize}
In order to replicate any effects caused by trade flow shocks, I generated “shock variables” that analyzed changes between employee shares and changes in imports over a 10-year period within a CZ. The following function presented in Figure 5 best represents this model.

\[ \Delta IPW_{uit} = \sum_j \frac{L_{ijt}}{L_{ujt}} \frac{\Delta M_{ujt}}{L_{it}} \]

**Figure 5:** Change in Imports Per Worker\(^{46}\)

The function is pulled from research done by Autor et al (2013) and Batistich and Bond (2019). It measures changes in imports per worker (IPW) in the US (\(u\)) across individual CZs (\(i\)) across census years (\(t\)) 1970, 1980, and 1990. The change (“shock”) is generated by multiplying the quotient of workers (\(L\)) within a given CZ, industry (\(j\)) and census year and all workers within same given industry and year by the quotient of the change in imports in a given industry and census year across the US and workers in a given CZ and census year. The resulting fraction is then summed across all industries. Additionally, to create a point of comparison between general change in all imports from Japan to the US and the import of passenger cars from Japan to the US (what the VER specifically targets), two separate shock variables were created: one that is generated by measuring all industries and one that measures solely the automobile industry (which are identified by the ind1990 code “351”).\(^{47}\)


4.2: The Regression

The exposure regression for this paper was done in standard Ordinary Least Squares (OLS) format, which was chosen because of my own personal familiarity with the model as well as its acceptance within the field of Economics. Additionally, census year and CZ fixed effects were devised as parameters for the regression, and robust standard deviations were used to combat heteroskedasticity. While only one regression was developed for this section, 40 variations of the model were generated based on the “shock variable” used, the dependent variable measured, and the control variables utilized. One such variation is seen in Figure 6.

\[
\Delta Employment Share_{it} = \beta_0 + \beta_1 \cdot \Delta IPW_{ uit} + \beta_2 \cdot Census Year_{t} + \beta_3 \cdot MFG Employment Share_{it} + 4 \cdot Poverty Rate_{it} + \beta_5 \cdot Education Level_{it} + CZ Fixed Effects + Census Year Fixed Effects + \mu
\]

**Figure 6:** A Variation of the Exposure Regression

The dependent variable measures changes in employment share within a CZ between two given census years (1970-1980 and 1980-1990). \( \beta_0 \) represents the constant used in a given variation of the regression. \( \beta_1 \) represents the coefficient of the shock variable used in this regression, which varies to focus on either all imports from Japan to US or only automobiles from Japan to the US. All variations of the regression utilize these two factors. Additional variations within the regression stem from the amount of control variables accounted for. \( \beta_2 \) represents the coefficient for the census year dummy variable (the first dummy is 1970, the second is 1980, and the third is 1990). \( \beta_3, \beta_4, \) and \( \beta_5 \) are the coefficients for the control variables that measure, within

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a given year, a given CZ’s employment share of those who are in manufacturing industries, a
given’s CZ’s poverty rate, and a given CZ’s percentage of population who do not have a high
school degree, respectively. Finally, \( \mu \) represents all other effects unaccounted for by the model.
Naturally, it differs by variation of the model run. Other dependent variables that regression
measures include the percentage change in average wages, average wages in the manufacturing
industry and in population size within a given CZ between two subsequent census years (again,

I found it to be of utmost importance to measure the trade shock effects against a variety
of dependent variables and controls in order to create a comprehensive picture of the economic
health of all CZs before the VER went active, as well as after the first few years the policy went
into effect. The results from all these variations, which will be discussed in the following
subsection, provide interesting insights into how quality of life changed during the first few years
of the VER.

4.3: The Results

Given the number of variations associated with this model. I divided this subsection of the
paper into smaller ones that focus on the dependent variable that is being measured. They appear
in this order: changes in employment shares (4.3.1), percentage changes in average wages (4.3.2),
percentage changes in average wages within manufacturing industries (4.3.3), and percentage
changes in population size (4.3.4). Across all of these sections, the “A” Table focuses on the shock
variable that captures all imports from Japan to the US; whereas the “B” table focuses on the shock
variable that captures automobile imports from Japan to the US.
### 4.3.1: Changes in Employment Shares

**Table 1A: All Imports Variable & Changes in Employment Share**

<table>
<thead>
<tr>
<th></th>
<th>(1) Change in Employment Share</th>
<th>(2) Change in Employment Share</th>
<th>(3) Change in Employment Share</th>
<th>(4) Change in Employment Share</th>
<th>(5) Change in Employment Share</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All Imports</strong></td>
<td>-0.0134***</td>
<td>-0.0108***</td>
<td>-0.00365</td>
<td>0.000110</td>
<td>-0.000181</td>
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<td></td>
<td>(-3.87)</td>
<td>(-3.50)</td>
<td>(-1.20)</td>
<td>(0.04)</td>
<td>(-0.06)</td>
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<td>1970</td>
<td>0.0143***</td>
<td>0.0109***</td>
<td>0.00438**</td>
<td>-0.0331***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(9.90)</td>
<td>(6.99)</td>
<td>(2.61)</td>
<td>(-6.14)</td>
<td></td>
</tr>
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<td>1980</td>
<td>0</td>
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<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Emp. Share in Mfg.</strong></td>
<td>-0.443***</td>
<td>-0.303***</td>
<td>-0.430***</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>(-5.42)</td>
<td>(-3.39)</td>
<td>(-5.47)</td>
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<tr>
<td><strong>Poverty Rate</strong></td>
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<td>0.0993***</td>
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<tr>
<td></td>
<td>(6.02)</td>
<td>(3.67)</td>
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<td><strong>Education</strong></td>
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<td></td>
<td>(7.38)</td>
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<td><em>cons</em></td>
<td>0.0424***</td>
<td>0.0343***</td>
<td>0.0666***</td>
<td>0.0269**</td>
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<td></td>
<td>(35.24)</td>
<td>(26.17)</td>
<td>(10.76)</td>
<td>(2.76)</td>
<td>(-5.33)</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
</tr>
</tbody>
</table>

*t statistics in parentheses
* $p < 0.05$, **$p < 0.01$, ***$p < 0.001$
### Table 1B: Auto Imports Only Variable & Change in Employment Share

<table>
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<tr>
<th></th>
<th>(1) Change in Employment Share</th>
<th>(2) Change in Employment Share</th>
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<th>(4) Change in Employment Share</th>
<th>(5) Change in Employment Share</th>
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</thead>
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<tr>
<td>Auto Imports</td>
<td>-0.0155*</td>
<td>-0.0376***</td>
<td>-0.0300***</td>
<td>-0.0239**</td>
<td>-0.0309***</td>
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<td></td>
<td>(-2.42)</td>
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<td>(-3.36)</td>
<td>(-2.85)</td>
<td>(-3.41)</td>
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<td>1970</td>
<td>0.0165***</td>
<td>0.0129***</td>
<td>0.00654***</td>
<td>-0.0324***</td>
<td>-0.0309***</td>
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<tr>
<td></td>
<td>(10.78)</td>
<td>(7.61)</td>
<td>(3.59)</td>
<td>(-6.07)</td>
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<tr>
<td>1980</td>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1990</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Emp. Share in Mfg.</td>
<td>-0.404***</td>
<td>-0.266**</td>
<td>-0.391***</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>(-5.14)</td>
<td>(-3.05)</td>
<td>(-5.15)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty Rate</td>
<td>0.168***</td>
<td>0.0757**</td>
<td></td>
<td>(2.80)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.59)</td>
<td>(2.80)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>0.359***</td>
<td></td>
<td>0.359***</td>
<td></td>
<td>(7.75)</td>
</tr>
<tr>
<td>_cons</td>
<td>0.0392***</td>
<td>0.0332***</td>
<td>0.0643***</td>
<td>0.0280**</td>
<td>-0.145***</td>
</tr>
<tr>
<td></td>
<td>(62.95)</td>
<td>(33.15)</td>
<td>(10.57)</td>
<td>(2.89)</td>
<td>(-5.64)</td>
</tr>
<tr>
<td>N</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
</tr>
</tbody>
</table>

* $t$ statistics in parentheses  
** $p < 0.05$, *** $p < 0.01$, **** $p < 0.001$

Tables 1A and 1B map the change in imports per worker shock variables to changes in employment shares in a given CZ, with dummy and control variables being added in subsequent versions. Generally speaking, the model suggests that imports from Japan, both imports and automobiles, are negatively correlated to a given CZ’s employment share over time. However, the all imports shock variable, while remaining negative (for the most part) as more variables are controlled for, becomes less statistically significant in the process. Instead, it appears that a CZ’s manufacturing employment share, poverty rate, and education are more statistically significant in
a CZ’s employment share. This makes sense, as all of these factors play key roles in employment. \(^{49}\) Conversely, the auto shock variable, while also negatively correlated with changes in employment share, becomes more statistically significant when control variables are added then when calculated on its own, and remains so as more and more control variables are added. Finally, it should be noted that, throughout all variations of the model, the auto shock variable’s coefficient is multiple times greater than the all imports shock variable’s shock coefficient. Thus, this model suggests that the trade shock of automobiles from Japan to the US played a larger, and more statistically significant, role in affecting a CZ’s employment share than the general trade shock of imports from Japan to US from a per worker standpoint between 1970 and 1990. That being said, both trade shock variables have smaller coefficients than the control variables, suggesting that trade shocks generally play a limited role in changing employment shares within CZs. This makes sense for the autos only shock variable, as it was during this time that Japan began overseas production of passenger cars in the US. Thus, the job creation in the US automobile industry stemming from foreign manufacturers during this time, an indirect effect of the VER, seems to have counteracted the negative effects to the average CZ’s employment share that have been documented in this model.

4.3.2: Percentage Changes in Average Wages

**Table 2A: All Imports Variable & Percent Change in Average Wage**

<table>
<thead>
<tr>
<th></th>
<th>(1) Percent Change in Average Wages</th>
<th>(2) Percent Change in Average Wages</th>
<th>(3) Percent Change in Average Wages</th>
<th>(4) Percent Change in Average Wages</th>
<th>(5) Percent Change in Average Wages</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Imports</td>
<td>-0.312 (-1.67)</td>
<td>-0.0481 (-1.63)</td>
<td>-0.0445 (-1.46)</td>
<td>-0.0318 (-1.04)</td>
<td>-0.0314 (-1.02)</td>
</tr>
<tr>
<td>1970</td>
<td>1.441*** (174.78)</td>
<td>1.439*** (152.15)</td>
<td>1.417*** (125.59)</td>
<td>1.464*** (42.09)</td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>0 (. )</td>
<td>0 (. )</td>
<td>0 (. )</td>
<td>0 (. )</td>
<td>0 (. )</td>
</tr>
<tr>
<td>1990</td>
<td>0 (. )</td>
<td>0 (. )</td>
<td>0 (. )</td>
<td>0 (. )</td>
<td>0 (. )</td>
</tr>
<tr>
<td>Emp. Share in Mfg.</td>
<td>-0.224 (. )</td>
<td>0.253 (. )</td>
<td>0.414 (. )</td>
<td>0.77 (. )</td>
<td></td>
</tr>
<tr>
<td>Poverty Rate</td>
<td>0.622*** (. )</td>
<td>0.729*** (. )</td>
<td>3.64 (. )</td>
<td>4.29 (. )</td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>-0.43 (-0.43)</td>
<td>(0.46)</td>
<td>(0.77)</td>
<td>(-1.47)</td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>0.950*** (14.66)</td>
<td>0.138*** (11.71)</td>
<td>0.154*** (3.90)</td>
<td>0.0197 (.33)</td>
<td>0.227 (1.41)</td>
</tr>
<tr>
<td>N</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
</tr>
</tbody>
</table>

*t statistics in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001
### Table 2B: Auto Imports Only Variable & Percent Change in Average Wage

<table>
<thead>
<tr>
<th></th>
<th>(1) Percent Change in Average Wage</th>
<th>(2) Percent Change in Average Wage</th>
<th>(3) Percent Change in Average Wage</th>
<th>(4) Percent Change in Average Wage</th>
<th>(5) Percent Change in Average Wage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto Imports</td>
<td>1.930***</td>
<td>0.00836</td>
<td>0.00114</td>
<td>0.0255</td>
<td>0.0344</td>
</tr>
<tr>
<td>1970</td>
<td>(6.08) (-0.16) (0.02) (0.50) (0.68)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>0 (. ) (. ) (. ) (. )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>0 (. ) (. ) (. ) (. )</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emp. Share in Mfg.</td>
<td>-0.499</td>
<td>0.0523</td>
<td>0.210</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty Rate</td>
<td></td>
<td>0.675***</td>
<td>0.792***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td>(3.97)</td>
<td>(4.68)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>0.653***</td>
<td>0.121***</td>
<td>0.160***</td>
<td>0.0143</td>
<td>0.233</td>
</tr>
<tr>
<td></td>
<td>(21.11) (20.73) (4.03) (0.24) (1.44)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| N         | 1444                              | 1444                              | 1444                              | 1444                              | 1444                              |

_t statistics in parentheses  
* _p < 0.05, ** _p < 0.01, *** _p < 0.001

Tables 2A and 2B map the change in imports per worker shock variables to percentage changes in average wages in a given CZ, with dummy and control variables being added in subsequent versions. In analyzing the percentage changes in average wages in comparison to the imports per worker shock variables, there is a notable difference in the correlation depending on which imports per worker shock variable is used. The model suggests that while the change in imports per worker from Japan to the US across all industries played a (generally) negative and more statistically significant role in the percentage change of a given CZ’s average wage as opposed to solely automobile imports per worker from Japan to US. In fact, the model suggests that the per worker change in automobiles imports from Japan to US caused the average wage in
a given CZ to rise (albeit in a statistically insignificant manner). Overall, the models suggest that trade shocks stemming from trade with Japan played a largely insignificant role in driving changes in average wages CZs from 1970 to 1990. In fact, both models show that changes in the poverty rate played a larger and much more statistically significant role in affecting the percentage change in average wages within a given CZ. As to why this regression suggests trade shocks did not play a major role in affecting change in average wages. It could potentially be due to the large variance in average wages across industries in the US in conjunction with the spike in trade the US had with Japan at the time (esp. in manufactured goods). Additionally, the minor increase in average wages stemming from the autos only shock variable may be consequently to the opening of new manufacturing centers in the US by Japanese brands, which created more jobs, and/or because of union-influence and bargaining power, which drove wages up slightly. Also, inflation was not accounted for in this model. Ergo, the changes would likely be even smaller across this variation of the regression. Thus, it would be interesting to see if the trade shocks impacted percentage changes in average wages within specific industries in a more significant manner.

4.3.3: Percentage Changes in Average Wage within Manufacturing Industries

Table 3A: All Imports Variable & Percent Change in Average Wages in Manufacturing Industries

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent Change in Average Wages in Mfg. Industries</td>
<td>Percent Change in Average Wages in Mfg. Industries</td>
<td>Percent Change in Average Wages in Mfg. Industries</td>
<td>Percent Change in Average Wages in Mfg. Industries</td>
<td>Percent Change in Average Wages in Mfg. Industries</td>
</tr>
<tr>
<td>All Imports</td>
<td>-0.280 (-1.33)</td>
<td>0.0270 (0.89)</td>
<td>0.0628* (2.17)</td>
<td>0.0955*** (3.31)</td>
<td>0.0940*** (3.36)</td>
</tr>
<tr>
<td>1970</td>
<td>1.680*** (160.40)</td>
<td>1.663*** (136.67)</td>
<td>1.606*** (119.65)</td>
<td>1.401*** (38.76)</td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>0 (.0)</td>
<td>0 (.0)</td>
<td>0 (.0)</td>
<td>0 (.0)</td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>0 (.0)</td>
<td>0 (.0)</td>
<td>0 (.0)</td>
<td>0 (.0)</td>
<td></td>
</tr>
<tr>
<td>Emp. Share in Mfg.</td>
<td>-2.220*** (-3.78)</td>
<td>-0.996 (-1.68)</td>
<td>-1.691** (-2.82)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty Rate</td>
<td>1.598*** (7.67)</td>
<td>1.138*** (5.37)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>1.863*** (5.86)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>1.579*** (21.61)</td>
<td>0.632*** (49.48)</td>
<td>0.793*** (17.18)</td>
<td>0.447*** (6.83)</td>
<td>-0.450* (-2.51)</td>
</tr>
<tr>
<td>N</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
</tr>
</tbody>
</table>

t statistics in parentheses
* p < 0.05, ** p < 0.01, *** p < 0.001
Table 3B: Auto Imports Only Variable & Percent Change in Average Wages in Mfg. Industries

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Change in Average Wages in Mfg. Industries</td>
<td>2.228***</td>
<td>-0.0310</td>
<td>0.00410</td>
<td>0.0591</td>
<td>0.0226</td>
</tr>
<tr>
<td></td>
<td>(6.13)</td>
<td>(-0.52)</td>
<td>(0.08)</td>
<td>(1.10)</td>
<td>(0.40)</td>
</tr>
<tr>
<td></td>
<td>(156.62)</td>
<td>(129.09)</td>
<td>(110.85)</td>
<td>(39.15)</td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.</td>
<td>(.</td>
<td>(.</td>
<td>(.</td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.</td>
<td>(.</td>
<td>(.</td>
<td>(.</td>
<td></td>
</tr>
<tr>
<td>Emp. Share in Mfg.</td>
<td>-1.844**</td>
<td>-0.598</td>
<td>-1.244*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-3.23)</td>
<td>(-1.03)</td>
<td>(-2.11)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poverty Rate</td>
<td></td>
<td>1.524***</td>
<td>1.044***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(7.23)</td>
<td>(4.82)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td>1.858***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(5.81)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>_cons</td>
<td>1.264***</td>
<td>0.644***</td>
<td>0.786***</td>
<td>0.457***</td>
<td>-0.436*</td>
</tr>
<tr>
<td></td>
<td>(35.60)</td>
<td>(95.17)</td>
<td>(17.12)</td>
<td>(7.00)</td>
<td>(-2.45)</td>
</tr>
<tr>
<td>N</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
</tr>
</tbody>
</table>

*t statistics in parentheses

* p < 0.05, ** p < 0.01, *** p < 0.001
Tables 3A and 3B map the change in imports per worker shock variables to percentage changes in average wages in manufacturing industries in a given CZ, with dummy and control variables being added in subsequent versions. Interestingly, the models suggest that both trade shock variables positively correlate to percentage changes in manufacturing industries, albeit in a limited and largely statistically insignificant way. The larger size in the coefficients of all imports per worker shock variable compared to that of the auto imports per worker suggest that, on a macro level, all imports from Japan played the larger role in driving wage changes within the manufacturing industry. The statistical significance of each of the shock variables varies as other variables are controlled for. The all imports shock variable becomes more statistically significant; whereas the autos import shock variable starts statistically significant but loses any significance as soon as a single variable is controlled for. In explaining why the auto imports shock variable played a limited and largely insignificant role in changing the average wage within manufacturing industries, I argue that union presence in manufacturing industries is the explanation, given the heavily unionized nature of manufacturing industries within the US, especially within the steel and auto industries at this time. This explanation is also supported by the fact that the variable that controls for CZ’s share of those employed in manufacturing industries is both larger in magnitude and more statistically significant than the trade shock variables, as employment within industries drives the bargaining power of workers, and, thus, the wage they’ll receive. This is again backed by the opening of new automobile manufacturing plants by Japanese brands in the US, which created new jobs within the industry. Also, much like the average wage variation analyzed

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before, this variation does not control for inflation. As such, the changes would likely be smaller in magnitude because of it.\footnote{Steven Ruggles, Sarah Flood, Ronald Goeken, Josiah Grover, Erin Meyer, Jose Pacas and Matthew Sobek. IPUMS USA: Version 10.0 [dataset]. Minneapolis, MN: IPUMS, 2020.} Overall this model and the model interpreted in the section before suggest trade shocks played a limited, and rarely statistically significant role, in affecting the average wages within CZs on both a general and intra-industry scale between 1970 and 1990.

### 4.3.4: Percentage Changes in Population Sizes

**Table 4A: All Imports Variable & Percent Change in Population Size**

<table>
<thead>
<tr>
<th>Year</th>
<th>(1) Percent Change in Population Size</th>
<th>(2) Percent Change in Population Size</th>
<th>(3) Percent Change in Population Size</th>
<th>(4) Percent Change in Population Size</th>
<th>(5) Percent Change in Population Size</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>All Imports</td>
<td>-0.0361</td>
<td>-0.00714</td>
<td>-0.0206</td>
<td>-0.0121</td>
</tr>
<tr>
<td></td>
<td>1970</td>
<td>(-0.39)</td>
<td>(-1.05)</td>
<td>(-0.61)</td>
<td>(-0.58)</td>
</tr>
<tr>
<td></td>
<td>1980</td>
<td>0.159***</td>
<td>0.165***</td>
<td>0.150***</td>
<td>0.234***</td>
</tr>
<tr>
<td></td>
<td>1990</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Emp. Share in Mfg.</td>
<td>0.833</td>
<td>1.149*</td>
<td>1.434**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poverty Rate</td>
<td>0.413*</td>
<td>0.602**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Education</td>
<td>0.104***</td>
<td>0.0142</td>
<td>-0.0464</td>
<td>-0.136*</td>
</tr>
<tr>
<td></td>
<td>_cons</td>
<td>(13.02)</td>
<td>(1.80)</td>
<td>(-1.26)</td>
<td>(-2.22)</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
<td>1444</td>
</tr>
</tbody>
</table>

\(t\) statistics in parentheses

\* \(p < 0.05\), \** \(p < 0.01\), \*** \(p < 0.001\)
Tables 4A and 4B map the change in imports per worker shock variables to percentage changes in population sizes win a given CZ, with dummy and control variables being added in subsequent versions. Interestingly, the models suggest that both trade shock variables are negatively correlated with percentage change in population size in a given CZ. In comparing the all imports trade shock variable to the autos only trade shock variable, the latter is both larger in size and far more statistically significant than the former, even with the addition of multiple control variables. Thus, this suggests that the auto trade shock generated by imports from Japan to the US played a multiple-times larger and more statistically significant role in affecting the growth. Historically, it is during this time period that Japanese manufacturing industries achieved...
successful market penetration within the US. Additionally, this aligns with the economic decline of the Rust Belt region of the Old Northwest, with Detroit, a city known for its deeply entrenched connection to the US automobile industry, going into a period of decline during this time. This decrease in population growth within regions like Detroit is also reinforced by the large and statistically significant coefficient of CZ’s share of employed in manufacturing industries. Ultimately, these models strongly imply that between 1970 and 1990, trade shocks generated by trade with Japan (especially within the automobile industry) inversely impacted the growth rates of CZs.

Section 4.4: Shock Variable Statistics

<table>
<thead>
<tr>
<th>Table 5A: Summary Statistics of All Imports Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
</tr>
<tr>
<td>All Imports</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>1168.114</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 5B: Summary Statistics of Autos Only Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
</tr>
<tr>
<td>Autos Only</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>326.1925</td>
</tr>
</tbody>
</table>

As glimpsed from the summary statistics presented in Tables 5A and 5B, the all imports shock variable is generally larger in magnitude than the autos only shock variable. Their respective

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interquartile ranges for both variables reflect this as well. This is sensible, since the all imports variable is far larger in scale than the autos only variable. In explaining the results, the difference between the 50th to 75th percentile is far larger than the 25th to 50th percentile difference. This suggests that more observations were concentrated in the latter zone than the former. Thus, one can extrapolate from this that the auto only trade shock was fairly limited in impacting a CZ’s economy across the average CZ.

Section 4.5: Final Thoughts abouts About Exposure

With regards to CZ’s, the VER’s exposure impact did vary. Areas with high exposure from the shock were either negatively impacted economically, as seen with Detroit, or benefitted greatly through job creation consequent to the opening of manufacturing plants for Japanese brands, such as around Smyrna, Tennessee and Georgetown, Kentucky. This variance in effect demonstrates how the impacts of trade policy differ between on a local and a national one. This variance should be heavily considered in drafting future policies.

Section 5: Trade Flow Regression

5.1: The Data

In analyzing the validity of the VER, I sought to see if the customs value (measured in real US dollars (2000)) of passenger cars from Japan to the US correlated in any significant way in the years following its passage. As such, I utilized the University of California-Davis trade data organized by Professor Feenstra to build a regression that maps import value to a variable that represents passenger car imports from Japan post 1981.

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The data used in this model classifies observations thoroughly. To start, the data provide basic information, such as the description of the product, its country of origin, customs value, and quantity. In addition, however, the data include important components that were used in the isolation of certain products. Specifically, Tariff Schedule of the United States Annotated (TSUSA) codes were used to isolate passenger cars that were targeted by the VER. The codes in question, as noted in the historic paperwork regarding the measure, are TSUSA codes “6921010”, “6921015”, “6921030”, and “6921035”.59

5.2: The Regression

The regression analyzes trade data from 1974 to 1988 to create a point of comparison: trade seven years before the start of the VER and trade seven years after the policy’s enaction. Additionally, the model follows the Poisson pseudo-maximum likelihood with multiple high-dimensional fixed effects (ppmlhdfe) format. This format was chosen because it combats heteroskedasticity, incorporates large amounts of fixed effects, and accounts for “0” in trade flows, all of which help immensely in accurately interpreting trade flow data.60 Fixed effects that measured the impacts of countries by year, sectors by year, and countries by sector were included as parameters, and the models were run with robust standard deviations to combat heteroskedasticity. Like in the previous section, only one regression was developed for this particular section, multiple variations exist depending on the control variables accounted for. As such, three variations exist. Fixed effects that measured the impacts of countries by year, sectors

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by year, and countries by sector were included as parameters. A variation of the regression function is seen in Figure 7.

\[
\text{Customs Value}_t = \beta_0 + \beta_1 \cdot \text{Japanese Passenger Car Imports Post VER}_t + \\
\beta_2 \cdot \text{Passenger Car Imports Post VER}_t + \beta_3 \cdot \text{Japanese Imports Post VER}_t + \\
\text{Country Year Fixed Effects} + \text{Sector Year Fixed Effects} + \\
\text{Country Sector Fixed Effects} + \mu
\]

**Figure 7:** The Trade Flow Regression

The dependent variable measures the customs value of goods in year \( t \). \( \beta_0 \) represents the constant used in this regression. Importantly, \( \beta_1 \) represents the coefficient of the that calculates the relation between the dependent variable and products identified as passenger cars (as identified by TSUSA codes) imports from Japan arriving in any year between 1981 and 1988 inclusive. \( \beta_2 \) and \( \beta_3 \) represent the coefficients for the control variables that account for passenger cars imported to the US post 1981 and Japanese imports to the US post 1981, respectively. Finally, \( \mu \) accounts for all effects unaccounted for by the model. While it was initially planned for the model to take quantity as a dependent variable as well, I was unable to create a variation model that was of similar quality to the one that measures customs value.

5.3: The Results

This section has one subsection (5.3.1). It focuses on the customs value of imports and includes a table with results from the regression as well as interpretation of said results.
5.3.1: Customs Value

Table 6: Trade Flow & Customs Value (in Real US Dollars)

<table>
<thead>
<tr>
<th></th>
<th>(1) Customs Value (in Real US Dollars)</th>
<th>(2) Customs Value (in Real US Dollars)</th>
<th>(3) Customs Value (in Real US Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japanese Automobile</td>
<td>1.400***</td>
<td>1.400***</td>
<td>1.400***</td>
</tr>
<tr>
<td>Global Automobile</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Imports</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japanese Imports</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-1981</td>
<td>(.0)</td>
<td>(.0)</td>
<td>0</td>
</tr>
<tr>
<td>_cons</td>
<td>18.20***</td>
<td>18.20***</td>
<td>18.20***</td>
</tr>
<tr>
<td></td>
<td>(1402.53)</td>
<td>(1402.53)</td>
<td>(1402.53)</td>
</tr>
<tr>
<td>N</td>
<td>21398676</td>
<td>21398676</td>
<td>21398676</td>
</tr>
</tbody>
</table>

$t$ statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6 maps observations identified as automobiles hailing from Japan from 1981 onward to Customs Value (in real US Dollars from 2000), with control and dummy variables being added in subsequent versions. This regression suggests that the imports of Japanese passenger cars post VER had a positive and statistically significant effect on the customs value of all imports to the US. Given the omission of control variables for all passenger imports and Japanese imports at this time, one might infer the singular effect of passenger car imports from Japan on customs value of imports during this time. However, it should be noted that these variables were dropped due to collinearity, and thus the full impact cannot be adequately gauged with this model. Additionally, the regression does not account for quality change. Previous literature on the subject suggests that the price increase in Japanese passenger cars during the VER era was primarily due to qualitative
improvements. As such, the statistically significant rise here may not solely be due to the trade policy with Japan during this era.

Section 6: Conclusion

As suggested by the models, there were noticeable changes in the economic health of CZs during the early years the VER was active, albeit mostly from a statistical significance standpoint. In most variations of the model, it is shown that other factors, such as the poverty rate and education attainment, played fundamentally stronger roles in both statistical significance and magnitude. However, I believe that the change in a CZ’s population growth was caused by the auto trade shock, since the coefficients for the shock in those variations were in the double-digit percentage points. Additionally, this change aligns with historic events, including the economic decline of Detroit. Additionally, while the trade flow model does suggest that Japanese passenger car imports rose in quality, I acknowledge it is likely not from changes in demand wrought by trade alone. That being said, the growing import of passenger cars from Japan to the US during this time does suggest the rising demand for them.

Ultimately, the models built for this investigation support the conclusions in previous publications about the VER, that it was both costly and largely ineffective. Many Japanese automakers worked around the VER by opening manufacturing centers within the Southern US, creating geographic competition for the heavily unionized rust belt region. Additionally, the fact that the number of passenger car imports increased during this time aligns with the concomitant easing of the VER’s cap. The increase in imports further negatively impacted the economic health

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of many CZs located in the Rust Belt. Ultimately, by showing the effects of the VER on a micro level, the studies herein suggest that trade policies and restrictions are not clear cut and universal in their impact. Their effects must be scrutinized on a local level (be it county, state, or CZ) in order to truly weigh the benefits against the cost.
References


Association 56, no. 3 (Summer, 1990): 297.


  http://www.oica.net/category/production-statistics/.


