Chapter 2

Import Competition and Crime: A Study of US Top Trading Partners

Abstract

This paper analyzes the effects of increasing import exposure from the top 6 trading partners of the US (China, Canada, Mexico, Germany, Japan and Korea) on property and violent crimes for the period 1992-2006 at the commuting zone level. My results indicate that a $1000 increase in Chinese exposure increases the property crimes by about 3 percent. On the other hand, the same amount of increase in import exposure from three other developed country trading partners, Germany, Japan and Korea, reduces the property crimes between 2 to 4 percent. Exposure from Canada has a negative effect, and exposure from Mexico has a positive effect on property crimes, but they're not statistically significant. I find no evidence on the change of violent crimes from any of the countries.

1 Introduction

In the past few decades, there has been a phenomenal growth in world trade. Lowering of trade barriers, advancement in information technology and reduction in transportation costs have all contributed to the growth of trade among countries. As a result, the effect of trade on workers and local labor markets has been a fiercely debated topic. This has picked up further steam in the US especially because of the the North American Free Trade Agreement (NAFTA) and the tremendous rise of China in the global market. This has resulted in an increased import share of the US as a fraction of its GDP as shown in Figure 1. From 1991 to 2006, the import share of the US has increased from 10 percent to 18 percent. Most of this increase can be attributed to its top six trading partners: Canada, China, Mexico, Germany, Japan and South Korea.[1]

As a result of such an increase in US imports, a large number of growing literature has looked at the direct and indirect consequences of trade on labor markets. Recent empirical literature has shown that increase in import competition leads to reduction in wages and employment for workers that are more exposed to import competition.[2] In addition, the worsening labor market outcomes in terms of wages and employment for a large number of workers may lead to other negative ancillary effects. This paper aims to study the effect of these increase in import competition on property and violent crimes at the local labor market level.[3]

The most recent wave of literature has mostly focused on the effects of Chinese import exposure. The economic reforms carried out in China after 1979 has significantly increased the exports industry in China. Chinese exports received a further bolstering after it joined the World Trade Organization (WTO) in 2001. This has resulted in a rapid growth of Chinese imports in the US. Furthermore, Chinese imports have been increasing at a faster pace compared to imports from other low-income countries. Autor et al. (2013) calls this the

[1] Figure 2 shows the trend of imports from these countries.
[2] See Borjas et al. (1992), Ebenstein et al. (2014), Pierce and Schott (2012)
[3] I define local labor markets in terms of commuting zones in this study.

"China Syndrome" and their study shows that the import competition from China explains about one-quarter of the aggregate decline in U.S. manufacturing industry and also leads to an increase in government benefits payments in markets that have high exposure to Chinese imports. Likewise, Pierce and Schott (2012) exploit the accession of China to the WTO and show that the industries that had a higher exposure to Chinese imports experienced employment loss as plants shifted their labor intensive production process to China.

This has led to a spike in studies analyzing the ancillary consequences of increasing import competition from China. For instance, Feler and Senses (2015) show that Chinese import competition leads to a lower quality of public good provision, reduces business activities, decreases housing prices and increases property crimes. Likewise, Che and Xu (2015) find that the number of violent and property crimes at the county level increases as China's import exposure increases. This paper contributes to the growing literature on the ancillary effect of import competition by comparing the impact of the import exposure of China with the other top five import partners of the US on crime rates. To my knowledge, this is the first study that looks at the effect of import exposure on crime of these other countries at the local labor market level.

My study builds on the approach of Autor et al. (2013) by exploiting the variation in import exposure because of the differences in industry specialization across local labor markets. I examine three four year periods: 1992-1996, 1997-2001, 2002-2006, to study the effect of increasing import competition on property crimes (burglary, larceny, motor vehicle theft, and arson) and violent crimes (murder, rape, assault and robberies) at the commuting zone level in the US. I find that a $1000 increase in Chinese import competition per worker increases the property crime rates by about 3 percent. In contrast, I find a negative relation for import exposure from Germany, Japan and Korea, but the evidence is not strong. In addition, I find no effect on violent crimes from increasing import exposure from any of the countries in the study.

The remainder of the paper is structured as follows: section 2 discusses the import

competition from the six countries of interest, section 3 talks about the literature on import competition and crime, section 4 looks at the identification and empirical specification. Section 5 provides the results and section 6 looks at the possible channel of the effect. Robustness checks are provided in section 7 and section 8 concludes.

2 Import Competition

According to the World Development Indicators database, in the 1990s, exports grew nearly 140 percent faster than global GDP. The globalized nature of trade has also changed the trade patterns of the US. Its import share of GDP has increased over the past two decades. Among other aspects, this increase in import share can be attributed to several initiatives US has undertaken on trade negotiations such as the North American Free Trade Agreement (NAFTA) in the early 1990s, and inclusion of more countries in the World Trade Organization(WTO). The higher share of imports to GDP to the US is mainly attributable to its six largest trading partners: Canada, China, Mexico, Germany, Japan and South Korea. This section will look at the changes in the imports of the US from these six countries.

2.1 China

China instituted a series of economic reforms beginning in 1979.[4] It allowed for special economic zones (SEZ) along its coast that helped attract foreign investment and boosted its exports. The number of SEZs increased from 20 in 1991 to 150 by 2010 (Autor et al., 2016). As a result, according to World Bank, their share of inflows of foreign direct investment increased from an average of 0.7% of GDP in the 1980's to about 4.2% of its GDP in 2000's. Their share of world manufacturing exports has also risen from about 2.3% in 1991 to about 15% in 2007. Consequently, there has been a rapid increase in U.S. imports from China which stood at about $26 billion in 1992 to over $350 billion in 2008. The rate of imports

[4]Some of these reforms were ownership incentives for farmers, and economic control of enterprises to provincial and local governments (Morrison, 2013)

from China has grown faster after it joined the WTO as shown in Figure 2. However, it is important to note that the increase in imports across industries is not uniform – some industries imports has increased substantially more compared to other industries. One of the highest imports in 1991 was in the Games, toys and dolls manufacturing industry. Its imports was $3.2 billion in 1991, which rose to $11.8 billion in 2000 and to $20.2 billion in 2007. Likewise, machinery and apparel industry has seen a massive growth in Chinese exports.

2.2 Canada

The US and Canada agreed on a free trade agreement in 1987 which was signed by the leaders of both the countries in early 1988. This agreement came to be known as the Canada-US Free Trade Agreement (CUSTA). The agreement planned to phase out various trade restrictions in different phases over a ten year period. In 1994, Mexico joined the agreement with the signing of NAFTA. Canadian imports increases from 91 billion in 1991 to about 310 billion in 2006. Panel C of Table 1 shows the highest and lowest import industries for the years 1992, 2001 and 2006. For all those years, crude petroleum and natural gas and motor vehicles and passenger car bodies were the top exporting industries for Canda to the US.[5] The lowest imports were mainly from the labaratory apparatus and lace and warp knit fabric mills. Furthermore, ice-cream and frozen desserts saw the highest growth in imports, whereas cellulosic manmade fibers saw a decline in imports.

2.3 Mexico

The signing of NAFTA in 1992 eliminated many tariffs and non-tariff barriers to trade between Mexico and the US. The domestic reform in Mexico in the mid-1980s after the peso crisis saw an increase in Mexican export industries. The US has always been Mexico's biggest trading partner. For instance, in 1993, 83.3 percent of Mexico's exports and 71.2 percent of

[5]For these years, motor vehicle parts and accessories was the third highest import industry.

Mexico's imports were with the US.[6]. For the US, from 1991 to 2006, imports from Mexico rose by 393% from about 40 billion in 1993 to 201 billion in 2006. Crude petroleum and natural gas and motor vehicles and passenger car bodies has been the highest importing industries of the US in the past two decades as shown in panel B of Table 1.[7] During that period, one of its fastest growing industries was the gypsum products, whereas industries such as cottonseed oil mills and printing trades machinery and equipments saw a decline. However, it is important to note that the growth rate of imports from Mexico declined in the later years, accounting for only 46 percent growth from 2000 to 2006.

2.4 Germany

After the Berlin wall fell, the reunification of East and West Germany started a new era of partnership between the US and Germany. In 1992, BMW opened its first factory in the US. During the period of 1991-2006, imports from Germany increased from about 27 billion to 91 billion, a factor of more than 230%.[8] For my period of interest, the highest importing industries were motor vehicle and passenger car bodies followed by motor vehicles part and accessories as shown in panel D of table 1. In addition, truck and bus bodies industries saw the highest growth in imports, whereas knit outwear mills saw a decline in imports.

2.5 South Korea

Korea has seen a massive growth in its GDP in the past four decades. In the 1960s, its GDP per capita was comparable to other poor countries; however, by 2004, its nominal GDP was over a trillion dollars. The depreciation of the South Korean Won after the Asian financial crisis in 1997 increased the exports from South Korea. It is the sixth largest trading partner of the US, with the imports from the country increasing by more than 160% from about 18 billion in 1992 to 48 billion in 2006. The highest import industry of the US for South

[6]This, however, accounted for less than 10 percent of U.S. imports and exports (Burfisher et al., 2001)
[7]In all these years, household audio and video equipment was the third highest importing industry.
[8]By 2015, US took over France as Germany's biggest trading partner.

Korean good was the semiconductors and related devices in 1992, but was overtaken by motor vehicle and passenger car bodies by 2000.

2.6 Japan

Trade relations between Japan and US has not always been a smooth ride. The late 70s and early 80s saw a massive increase in imports of Japanese-made vehicles to the US. The competing pressure and falling sales of the US auto industry motivated the Reagan administration to persuade Japan to agree on voluntary export restraints in 1981. The Plaza Accord agreement in 1985 agreed on depreciating the US dollars to the Japanese Yen and other countries to ease import competition on US industries. Japan responded by establishing manufacturing plants in the US. These issue had been a major area of trade negotiations in the 1990s, with the Clinton administration negotiating the "United States-Japan Framework for a New Economic Partnership". Nonetheless, Japan remains one of the major trading partners of the US. Japanese exports to the US rose by 56% from 96 billion in 1991 to 150 billion in 2006. Compared to the other trading partners of the US, the growth of Japanese imports has been modest.[9] However, Cooper (2010) argues the relative importance of the US to Japan's trade because the Chinese exports to the US uses a significant portion of Japanese exports to China. As with most of the other developed countries, industries with the highest Japanese imports are motor vehicle and passenger car bodies and motor vehicle parts and accessories. It is also interesting to note that textile bags saw the highest growth in exports, whereas prefabricated metal buildings and components saw a decline in their imports.

3 Import Competition and Crime

For the US, on average, the crime rates have been declining. Levitt (2004) pointed out four possible reasons for the decline in crime rates since the 1990s: 1) Increase in the number

[9] One of the major reasons for this is the sluggish growth of the Japanese economy for the past two decades

of police, 2) rising prison population, 3) receding crack epidemic, and 4) legalization of abortion. However, a lot of variation still exists at the local level.

Among other things, this variation in the local level can be attributed to unemployment rate. Most early studies that studied the relationship between unemployment and crime rates have found a small positive impact of unemployment on property crimes but not violent crimes (Freeman, 1999; Piehl, 1998). Raphael and Winter-Ebmer (2001) look at the variation in state level and find that a 1 percentage point increase in unemployment leads to an increase in property crime rates between 2.8 percent and 5 percent. Likewise, Gould et al. (2002) using a panel of US counties look at the "at risk" group of young, unskilled and low-educated males and find that one percentage point increase in unemployment would lead to a 1-2 percent increase in property crimes.

A number of recent literature focuses on the ancillary effect of trade liberalization and import competition. Carneiro et al. (2015) look at the effects of trade liberalization in Brazil and crime rates at the local labor market. They find that regions that experienced more import shocks also experienced large relative increase in crime rates in the medium term. However, they find that the effects disappeared in the long-term. Likewise, Iyer and Topalova (2014) study the case of trade shocks and crime in India. They find that trade shocks increased relative poverty, which also increased the incidence of violent crimes and property crimes. Furthermore, many studies have built on the study of Autor et al. (2013) by looking at the effect of Chinese import exposure. Feler and Senses (2015) find negative effect on public good provision and business activity and a positive effect on property crimes as a result of increasing Chinese import exposure. Specifically, they find that an increase of $1000 in Chinese import exposure increases property crimes by 3 percent. Similar to the study, Che and Xu (2015) also looks at the effect on property and violent crimes and find a positive impact on both violent and property crimes at the county level. This paper builds on these papers and looks at the effect of import exposure of other top trading partners of the US.

4 Identification and Empirical Specification

4.1 Commuting Zones

Commuting zone encompasses the idea of local labor markets. As Topel (1986) pointed out, local labor markets should be motivated by the idea that both the employers and workers interact within a space bounded by places of work and places of residence. Thus, the ideal geographical definition of a local labor market should be determined by the strong commuting ties within the local labor market, and weak commuting ties across the local labor market.

Empirical studies look at various geographical delineation to study the local labor markets. For instance, Raphael and Winter-Ebmer (2001) studies the effect of unemployment on crime at the state level. This geographic delineation provides various drawbacks because it is not evident why local labor market dynamics should be bounded by state lines.[10] Furthermore, many states are large enough to be characterized with within-state heterogeneity.

As a result, most studies also look at the Metropolitan Statistical Areas (MSAs) to study local labor markets because it may overlap state and county boundries as it covers a city and their suburbs. Although it has an economic appeal, it only covers major urban population centers and does not cover rural areas. Likewise, looking at counties may provide a greater geographic detail, but it limits the market to be within a single state and maybe too small to define one labor market as many different counties may cluster to form a single labor market.

Thus, for the purpose of my analysis, I use the concept of commuting zones(c-zone) to define local labor markets as they are not limited to any political boundaries and cover both rural and urban areas. They have been defined by Tolbert and Sizer (1996) as clusters of counties that are characterized by strong commuting ties within the c-zone. For the mainland US, the 1990 data provides 741 commuting zones, with the average commuting

[10]There are many urban areas overlapping with the state lines (e.g. New York City/Jersey City and Washington D.C/Arlington, Kansas City MO/Kansas city MS), notably because cities developed on both sides of rivers that serve as state boundaries(Dorn, 2009).

zone consisting of four counties (Dorn, 2009). Further, given that c-zones are based on commuting distance, it provides with the notion that employers and workers should be located within commuting distances to be affected by any changes in the labor market.

For my study, I get a variation in import exposure across c-zones based on the industry specialization and employment across the c-zones. As a result, I hypothesize that c-zones that are specialized in industries with high import competition should see an increasing rates of crime if import competition deteriorates labor market conditions. Likewise, if the import competition improves the labor market conditions, I expect to see declining crime rates.

4.2 Measuring Import Exposure

Data on imports to the US are collected at the industry level and are not available at the local labor market level. I employ the method used by Autor et al. (2013) to study exposure to import competition at the c-zone level. The exposure to import competition is defined as the change in import exposure per worker in a commuting zone, where imports are apportioned to a commuting zone based on its share of national industry employment. Mathematically, it can be written as:

$$\Delta Exposure_{ct} = \sum_{j} \frac{L_{jct}}{L_{ct}} * \frac{\Delta imports_{jt}}{L_{jt}} \tag{1}$$

where L_{jct} is the total employment of industry j in c-zone c in year t, L_{ct} is the total employment of the c-zone c at time t, L_{jt} is the national employment of industry j in time t, and $\Delta imports_{jt}$ is the change in national U.S. imports in industry j between time t and $t+5$. The measure weights national changes in national imports per worker between time t and $t+5$ in industry j by the share of a c-zone employment accounted for by industry j. This is then aggregated over all industries, which will yield a c-zone specific measure of change in import competition. The variation across c-zone results from the variation in imports across different industries, and the variation in industry specialization and industry employment structure of the c-zone. A higher value of $\Delta Exposure_{ct}$ indicates a greater exposure per

worker to import competition.

4.3 Instrumental Variable

One of the concerns in estimating the effect of import exposure on local labor markets is that the rise in imports may be correlated with the industry import demand shocks. This may result in a biased OLS estimate. Therefore, to correctly identify the casual effect and to isolate the supply-side channel, I apply the instrumental variable approach. Here, I follow Autor et al. (2013) by instrumenting the import exposure by looking at the exports of the country of interest to other high income countries over the same time period and lagging employment by five years to mitigate the effect of any anticipated response to contemporaneous employment levels to future Chinese imports and thus reducing simultaneity bias. The instrument can be represented as

$$\Delta IV_{ct} = \sum_{j} \frac{L_{jct-5}}{L_{jt-5}} * \frac{\Delta imports_{jt}^{others}}{L_{ct-5}} \tag{2}$$

where the subscripts represent the same meanings as used to define the change in exposure in equation 1. The only two difference with equation 1 is that the change in exports now consists of imports of other high-income countries, and the start of period employment is now lagged by five years.

4.4 Data and Summary Statistics

For my analysis, I aggregate the county level data at the c-zone level to study the impact on local labor market level. I then link the import exposure measure with the county-level violent and property crimes aggregated at the c-zone level. I use the crosswalk developed by Autor et al. (2013) to match the county-level data with the commuting zones.

My crime data comes from the Uniform Crime Reports (UCR) database issued by the Federal Bureau of Investigation (FBI). These data are collected at the reporting agency level

and then aggregated to the county level. The county level data includes crimes divided into various subcategories. I divide the crimes into two categories: i) violent and ii) property. Violent crimes include murder and non-negligent manslaughter, forcible rape, robberies and aggravated assaults. The property crimes include burglary, larceny, motor vehicle theft and arson. The crime data is computed at per 1000 population for standardization. I aggregate the county level data to commuting zone level. However, it is important to note the two major limitations of the data. First, the program administered by the FBI is voluntary, therefore some agencies may not report the crimes. This leads to many missing observations. Second, it only contains data that were either reported or discovered by the agency; hence, I cannot account for crimes that were not reported. Nonetheless, the crime literature uses the data source extensively. For my analysis, I only include the commuting zones that has complete crime data. Therefore, for the time periods in my analysis, 1992-1996, 1997-2001, and 2002-2006, I only include those c-zones if all the counties within that c-zone report crime data (both violent and property) at the start of the period and at the end of the period. My dependent variable is constructed by taking the difference of log of crime at the end of the period and the log of crime at the beginning of the period.

The trade data comes from the UN Comtrade database that provides information on the product at the six-digit Harmonized System (HS 1992). I match these data with the SIC87 industry code by using the crosswalk provided by Autor et al. (2013). To create the import exposure measure, I need data on total employment of industry j at the national level, total employment of the commuting zone, and the total employment for each industry j in a commuting zone. I get data for the above measures from the Census County of Business Pattern (CBP) at the county-level. I then aggregate this at the commuting-zone level.[11]

[11]CBP provides the information for each year starting from 1986. However, for the years in my sample, they define industries initially at the SIC87 level, and later at different NAICS level based on the year. Thus, following Autor et al. (2013), I convert all industry into SIC87 code. For instance, the CBP data from 1992-1997 uses SIC 87 industry classification, NAICS97 industry code is used for years 1998-2002, and NAICS02 code is used for data 2003-2007. Therefore, I initially convert all NAICS02 code to NAICS97 using concordance table provided by the Census Bureau. I then use the concordance file provided by Dorn that creates weight for NAICS97 codes to be split into two or more SIC87 groups and use the same weights to calculate the employment at the SIC87 industry level. Therefore, my data will have consistent SIC87 level

I also control for various county level demographic measures that may affect the crime rates. Following Levitt (1997), I control for the percentage of population that are college educated, the percentage of people that are below 25 years of age, and the percentage of people that are black. The data for all these variables comes from the census. For education, I only have data on decennial census; therefore, I interpolate to get the data for in-between years.

Table 2 provides the summary statistics which illustrates considerable variation in import exposure and percentage change in property and violent crimes across commuting zones. Both property and violent crime has been decreasing during my sample period. Property crime have fallen by about 8 percent whereas violent crime has decreased by 4.3 percent. The average c-zone experienced a $1047, $599 and $570 per worker import exposure from Canada, Mexico and China respectively. Likewise average c-zone exposure from both Germany and Japan were over $100 per worker, with the 75th percentile of c-zones exposure being over $200 per worker.

I also report my subsamples with top 20 percent and bottom 20 percent c-zone exposure with respect to Chinese and Canadian import exposure separately as seen in Table 3 and 4.[12] The top 20 percentile commuting zone exposures to Chinese imports had a mean exposure of $2834, whereas the the top 20 percentile c-zones for Canadian import exposure had an average exposure of $5786. However, it is interesting to note that both property crimes and violent crimes was increasing for the top 20 percentile c-zones with exposures to Chinese imports, but the crimes were decreasing for the top 20 percentile c-zones with exposure to Canadian imports. Likewise, the bottom 20 percentile c-zone of Chinese import exposure had a higher exposure to import competition than the bottom 20 percentile c-zones with exposure to Chinese import competition. Furthermore, property crimes have been decreasing for the c-zones, while there is a slight increase in violent crimes for both set of bottom 20 percentile c-zones. Also, comparing the bottom and top exposure c-zones for Chinese imports, we

for all industries in different years

[12]The choice of these countries were based on the mean exposure of import competition.

see that the property crimes has been increasing for c-zones with more exposure, whereas property crimes have been decreasing for c-zones with low exposure.

4.5 First-Difference specification

For my analysis I use the first-difference approach, which elinimates any unobserved time-invariant hetereogeneity among the c-zones. I then stack the first differences of the three time periods (1992-1996, 1997-2001, and 2002-2006), and include separate time dummies for each period. The stacked first difference model is similar to fixed-effect models with slightly less restrictive assumption made on the error term.[13] Furthermore, this method also removes any time invariant heterogeneity between import competition and crime; thus, ruling out any time-invariant factors that affect crime rates within a given c-zone. The inclusion of time dummy captures factors that have a time-varying effect on crime common to all c-zones.

My primary regression specification takes the following form:

$$\Delta crime_{ct} = \beta_0 + \beta_1 \Delta Exposure_{ct} + \beta_2 M_{ct} + \beta_3 X_{ct} + \delta_{reg} + \gamma_t + \epsilon_{ct} \tag{3}$$

where $\Delta crime_{ct}$ is the difference of crime rate for c-zone c between beginning of period and end of period. $\Delta Exposure_{ct}$ is the key explanatory variable of interest and represents the change in exposure per-worker of c-zone c to import competition, M_{ct} is the start of the period c-zone employment that was accounted for by manufacturing, γ_t indicates time-dummies for each period, and δ_{reg} controls for census region fixed effects. The vector X_{ct} controls for the c-zone's start of the period demographic variables. These include the percentage of population that is college educated, the share of population between 18-25 years, and the share of population that is black.

During my period of analysis, a host of studies has talked about the changes in the broader economy, specifically the declining manufacturing employment as a result of technological

[13]Please see footnote 26 of Autor et al. (2013)

changes (Acemoglu and Autor, 2011; Dorn et al., 2015). Thus, all of these controls allow the changes in outcomes to be a function of initial conditions, time trends to vary by geographic regions, and the aggregate time period to vary by five years. I cluster my standard errors at the state level.

5 Result

In this section, I discuss my findings on the impact of import exposure from the top six trading partner for the US on crime at the c-zone level. In discussing the magnitude of the findings, I evaluate coefficient estimates for a $1000 increase in import exposure per worker at the c-zone. I will first present the OLS results, then look at the IV results for the case of China. I will then highlight the potential mechanism through which import exposure affects crime.

5.1 OLS Result

I present my OLS findings in table 5 and 6. For both the tables, the dependent variables is the change in log of property crime rates in columns 1 and 2, and the change in the log violent crime rates in columns 2 and 3 between 1992-1996, 1997-2001, and 2002-2006. Columns 1 and 3 controls for share of manufacturing employment in the c-zone, time fixed effects and census region fixed effects. I introduce additional demographic controls in column 2 and 4 that may potentially impact crime such as the share of population under 25, share of population that is black and the share of population that has a college degree. All the standard errors are clustered at the state level.

Panel A of Table 5 shows the results for China. The first column, with baseline controls, show that a $1000 increase in import exposure per worker increased the c-zone property crime rate by about 2.06 percent. Introducing demographic controls in column 2, I find that it slightly decreases my point estimates, but the results are still significant at the 5

percent level. For Canada and Mexico the results are presented in Panel B and C in Table 5. For Mexico, the results show that an increase in Mexican import exposure increases the property crimes by 0.2 percent with the baseline controls. The estimate decreases to 0.08 percent for property crimes when I introduce additional demographic controls in the model. However, the estimates are not statistically significant. The effect for Canada for property crimes decreases by 0.3 percent, but I can not reject the null hypothesis of no effect.

The estimation for Germany, Japan and Korea show the opposite effect for property crimes compared to China. Panel A of Table 6 shows the results for Germany in Panel A. I find that a $1000 increase in exposure from Germany reduces the c-zone property crimes by 4.8 percent with my baseline controls. The inclusion of demographic controls reduces the point estimate to 4.5 percent, but the result is still significant at the 5 percent level. In addition, the results for Japan, as presented in Panel B, shows that a $1000 increase in Japanese import exposure decreases property crimes by 2.8 percent with baseline controls, which decreases slightly to 2.7 percent with the inclusion of demographic controls. The estimation for Korea is reported in Panel C, and it is comparable to that of Germany. Increase in import exposure from Korea reduces the property crimes by 4.5 percent in column 1. In column 2, when I introduce additional demographic controls, the point estimate decreases slightly to 4.0 percent, but it is still statistically significant at the 5 percent level.

Columns 3 and 4 of Table 5 and 6 shows the point estimates for violent crimes. The magnitude of the effect are small for China, Canada and Mexico as compared to their effect on property crimes. Further, violent crimes are negatively correlated with the import exposure of China and Canada, and positively correlated with those of Mexico. However, none of the estimates are statistically significant. In comparision, the magnitude of the effect for Germany, Japan and Korea are considerably larger than those for Chiana, Canada and Mexico. The results are presented in Panel A, B and C of Table 6. Similar to the effect on property crimes, I find a negative effect on violent crimes as a result of exposure from the three countries. The magnitude is slightly higher for Germany and Korea compared to

that for Japan. For instance, a $1000 increase in Germany import exposure, reduces violent crimes by 6 percent compared to 4.2 percent for Korea and 1.5 percent for Japan. However, none of the estimates are significant even at the 10 percent level.

The results are interesting as I only find effect on property crimes but not violent crimes. This give further plausibility to my hypothesis that people resort to criminal behavior as a result of financial pressures of lower cumulative earnings and job loss as the potential financial benefit of property crimes are higher than those for violent crimes.

5.2 Instrumental Variable and 2SLS Results

One of the concerns when working with the import exposure from China is that there maybe a reverse causality problem. For instance, c-zones with deteriorating economic potential and higher inclination for crime growth may be the ones that experience more exposure from Chinese import competition. Therefore, to mitigate the problem of demand shocks on Chinese imports, I need to emphasize the growth in imports from China to the US was supply-driven and not US demand-driven. To resolve this issue, I employ the plausible exogenous variation developed by Autor et al. (2013). I look at the change in other high income countries imports of Chinese goods as an instrument for US changes in imports per worker as shows in equation 2. It has also been lagged with five year employment levels to mitigate the possibility that employment would adjust to an anticipated increase in Chinese imports.

The findings are presented in the table 7. In column 1, I show the second stage estimated results, controlling for my baseline controls. I find a positive effect of a 3 percent increase in property crimes. I also present my first stage F-statistics and the partial R-square, which confirms the validity of the model. In column 2, I include additional demographic controls. My results are similar to column 1, with only a slight increase in point estimate. Likewise, the result from the first stage estimate of the F-stat and the partial R-square confirms the validity of the model. Hence, even when I employ an instrumental variable approach, I

do find that property crimes increased by about 3 percent as a result of $1000 increase in exposure from Chinese imports.

6 Potential Channel

One of the potential channels through which the trade induced shocks can increase the property crime rates is through financial pressures on worker through lower cumulative earnings. Recently, a number of studies have pointed out the negative effects on employment and earnings of Chinese import competition.[14] Thus, it is a possibility that I find a positive effect on property crimes as a result of Chinese import exposure because of either i) the resulting loss of jobs , which results in higher unemployment or ii) a reduction in wages, which lowers the workers lifetime cumulative earnings. Both these possibilities would induce a person to commit property crimes as it then increases their relative benefit of it.

I test the first channel in this paper: the increase in crime is because the exposure of import competition increases unemployment at the c-zone level.[15] I provide the regression results using the following estimation equation:

$$\Delta crime_{ct} = \beta_0 + \beta_1 \Delta URate_{ct} + \beta_2 X_{ct} + \delta_{reg} + \gamma_t + \epsilon_{ct} \tag{4}$$

where $\Delta crime_{ct}$ is the difference in the log of property crime rate for c-zone c between beginning of period and end of period. $\Delta URate_{ct}$ is the average change in unemployment rate in the c-zone γ_t indicates time-dummies for each period, and δ_{reg} controls for census region fixed effects. The vector X_{ct} controls for the c-zone's start of the period demographic variables. These include the percentage of population that is college educated, the share of population between 18-25 years, and the share of population that is black.

The findings are reported in table 8. In the first column, I do find a positive effect on

[14]Please see Autor et al. (2013), Acemoglu and Autor (2011)

[15]The data available to look at the effect on wages at a commuting zone is not reliable (Autor et al., 2013), therefore it will be a subject of further study

property crimes as a result of increasing unemployment, however these are not statistically significant. In column 2, I include controls for various demographic variables and find that unemployment rate has a statistically significant positive effect on property crimes. This leads credibility to my mechanism.

Therefore, I need to look at the effect of import exposure from the country of interest on the unemployment rate. I do that by estimating the following equation:

$$\Delta URate_{ct} = \beta_0 + \beta_1 \Delta Exposure_{ct} + \beta_2 X_{ct} + \delta_{reg} + \gamma_t + \epsilon_{ct} \tag{5}$$

where $\Delta URate_{ct}$ is the change in unemployment rate in the commuting zone, $\Delta Exposure_{ct}$ is the commuting zone exposure to import competition as specified in equation 1, and all other controls are the same as specified in equation 4.

The estimation is provided in table 9 and table 10. Here I summarize the results in terms of Chinese exposure and 'other' countries exposure given that Chinese exposure had a positive impact on crime and 'other' countries had a negative impact on crime.[16].

China Panel A of table 9 shows the result for China. Including only the baseline controls in column 1, I find a positive effect on unemployment as a result of increasing Chinese exposure, but these are not statistically significant. In column 2, I include further demographic controls. This increases my point estimate and the results are statistically significant. Hence, I can conclude that increasing Chinese exposure resulted in increasing property crimes through the unemployment channel.

Other Countries Panel B of table 5 shows my results for Canada. Including only the baseline controls in column 1, I find a statistically significant negative impact on employment as a result of Canadian import exposure; however the statistical significance no longer exists when I include demographic controls in column 2. For the case of Mexico, I do not find any significant impact on unemployment. Estimates for Germany, Japan and Korea is presented in panels A, B and C, respestively, in table 10. For all the three countries, I do not find any

[16]Ohter countries here include Canada, Mexico, Germany, Japan and Korea

significant results for unemployment. Therefore, there is a possibility that the decrease in property crime rates as a result of increasing import exposure of these countries may work through the wage effect. That is, increasing import exposure of these countries may result in higher wages of workers, thus reducing their tendency to engage in criminal behavior.

7 Robustness Checks

I conduct two robustness checks. First, I cluster the standard errors at the c-zone level rather than the state level. Second, I introduce state level fixed effect with standard errors clustered at the c-zone level instead of a region fixed effect with standard errors clustered at the state level as in my initial estimation.

Table 11 provides the first robustness check results for the four countries for which I find statistical significant results in my analysis. The robustness check shows that the point estimates are similar to my initial analysis with all the variables still significant. The second robustness check are provided in table 12. The point estimates for China decreases by about 0.1 percent, but they are still significant at the 5 percent level. For Germany, the point estimates when I control for only the baseline specification increases by about 0.5 percent. Adding additional controls, the point estimates increases slightly and are now significant at the 10 percent level rather than at the 5 percent level as in my original estimation. For Japan, the point estimates increases by 0.5 percent compared to my orginal estimation and are still significant at the 1 percent level. The estimates decreases for Korea. Compared to my original estimation, my point estimates decreases from a negative impact of about 4 percent to a negative impact of about 3 percent. This is significant at the 10 percent level.

8 Conclusion

A wave of recent empirical studies have looked at the ancillary effects of import exposure from China, including crime. To the best of my knowledge this is the first empirical study

that looks at effect of increasing import exposure on crime from the top trading partners of US and compares that with the effect from Chinese exposure. I provide evidence that, in contrast to Chinese import exposure that has a positive effect on property crimes, the increasing import exposure from Germany, Japan and Korea has a negative effect on the change in property crimes. Furthermore, there is no evidence linking the effect of import exposure to changes in violent crimes from any of the countries studied here. I find no significant effect from Canada and Mexico, albeit the mean exposure at the c-zone level is higher from Canadian imports than Chinese imports.

The study also presents a possible channel through which this effect works. I show that the increasing in Chinese exposure leads to increasing unemployment, thus raising the financial pressure on workers. This induces workers to engage in property crimes. In contrast, the negative impact on crime from Germany, Japan and Korea may be because of a potential impact on wages of workers, which needs to be studied further. This paper provides an interesting insight: increasing exposure from developing countries (such as China) has the opposite effect than increasing exposure from developed countries (Germany, Japan and Korea). A possible reason may be because of the types of imports that comes from these countries. Table 1 provides further information on the highest and lowest import industries from all the countries. As it can be noted, the imports of from China are mainly concentrated in labor-intensive production industries. As a result, firms may respond to this increasing import competition by offshoring these production to China, thus either putting a downward pressure on wages of low-skilled workers or by laying off workers. This would raise the financial pressures on workers, which induces people to engage in property crimes for financial gain. On the other hand, most of the imports from developed countries are concentrated in motor vehicle parts and accessories. Further analysis needs to be done in order to look at the potential effect of such imports.

Given these effects of a trade shock may work through the channels of financial pressures, there are various policy implications. Given that financial stress and pressure may be a

potential channel, it would be interesting to look at the effect of unemployment insurance on trade-induced increase in crime rates. Likewise, policies to help increase the human capital accumulation for low-skill, low-wage workers may reduces these effects of import competition.

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Table 1: Ranking imports by country

	High Import Industries	**Low Import Industries**
A:CHN		
1992:	Vitreous China Table,Leather and Sheep-Lined Clothing	Plumbing and Heating, Manifold Business Forms
2000:	Leather and Sheep-lined Clothing, Women's Footwear, Games and Toys	Industrial Gases, Asphalt Felts
2006:	Electronic Computers, Computer Storage Devices	Primary Smelting Copper, Metal Ores
B:MEX		
1992:	Crude Petroleum and Natural Gas, Motor Vehicle and Passenger Car Bodies	Natural Processsed, and Imitation Cheese, Kaolin and Ball Clay
2000:	Motor Vehicle and Passenger Car Bodies, Crude Petroleum and Natural Gas	Tanks and components, Mobile Homes
2006:	Crude Petroleum and Natural Gas, Motor Vehicle and Passenger Car Bodies	Newspaper Printing, Products of coal
C:CAN		
1992:	Crude Petroleum and Natural Gas, Motor Vehicle and Passenger Car Bodies	Lab. Apparatus, Kaolin and Ball Clay
2000:	Motor Vehicle and Passenger Car Bodies, Crude Petroleum and Natural Gas	Phosphate Rock, Lab. Apparatus
2006:	Crude Petroleum and Natural Gas, Motor Vehicle and Passenger Car Bodies	Ordance Accessories, Lace and Warp Knit Fabric Mills
D:GER		
1992:	Motor vehicle and passenger car bodies, motor vehicle parts and accessories	Wood Preserving, Electrical Work
2000:	Motor vehicle and passenger car bodies, motor vehicle parts and accessories	Logging, Drapery Hardware
2006:	Motor vehicle and passenger car bodies, motor vehicle parts and accessories	Uranium ores, Logging
E:JPN		
1992:	Motor vehicle and passenger car bodies, motor vehicle parts and accessories	Wood Preserving, Logging
2000:	Motor vehicle and passenger car bodies, motor vehicle parts and accessories	Mobile Homes, Logging
2006:	Motor vehicle and passenger car bodies, motor vehicle parts and accessories	Logging, Cigarettes
F:KOR		
1992:	Semiconductors and Related Devices, Household A&V Equipment	Lab. Apparatus, Imitation Cheese
2000:	Motor vehicle and passenger car bodies, Radio and TV Broadcasting equipment	Logging, Lab. Apparatus
2006:	Motor vehicle and passenger car bodies, Petroleum Refining	Logging, Cigarettes

Table 2: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	P25	P75
LnChangeProperty	1319	-0.079	0.240	-1.795	1.654	-.189	.037
LnChangeViolent	1319	-0.043	0.404	-1.624	3.496	-.232	.123
CHN Imp Exp	1319	0.57	.857	-0.103	12.937	.104	.709
CAN Imp Exp	1319	1.047	2.074	-2.216	31.136	.263	1.029
GER Imp Exp	1319	0.162	.22	-0.374	3.767	.038	.201
JPN Imp Exp	1319	0.140	.421	-8.356	4.950	.008	.211
KOR Imp Exp	1319	0.083	.218	-1.199	3.008	.001	.106
MEX Imp Exp	1319	0.599	1.137	-1.529	17.112	.140	.638

Note: All import exposure are in $ 1000 per worker in the c-zone as defined in equation 1

Table 3: Top 20% of county exposure: China and Canada

Variable	Obs	Mean	Std. Dev.	Min	Max
Panel A: China					
LnChangeViolent	94	.01	.315	-.97	1.01
LnChangeProperty	94	.026	.169	-.335	.576
CHN Imp Exp	94	2.834	1.541	1.79	12.937
Pct Black	94	10.729	14.177	.131	65.571
Pct College	94	14.506	4.541	9.1	29.5
Pct Below 25	94	33.78	2.859	25.659	45.976
Panel B: Canada					
LnChangeViolent	94	-.024	.354	-.82	1.344
LnChangeProperty	94	-.086	.223	-1.08	.683
CAN Imp Exp	94	5.786	5.16	1.799	31.136
Pct Black	94	7.368	11.517	.112	65.571
Pct College	94	14.954	4.145	7.4	36.367
Pct Below 25	94	34.384	3.584	27.712	45.179

Notes: The table shows the top 20 percent commuting zone with exposure to China and Canada (Panel A and Panel B respectively) for the period 2002-2006. The demographic characteristics are at the initial period level.

Table 4: Bottom 20% of county exposure: China and Canada

Variable	Obs	Mean	Std. Dev.	Min	Max
Panel A: China					
LnChangeViolent	95	.064	.581	-1.624	3.496
LnChangeProperty	95	-.116	.253	-1.725	.519
CHN Imp Exp	95	.244	.121	.006	.432
Pct Black	95	3.93	6.553	0	31.12
Pct College	95	18.703	7.517	7.4	44.1
Pct Below 25	95	34.349	5.613	23.284	54.312
Panel B: Canada					
LnChangeViolent	94	.025	.493	-1.316	3.496
LnChangeProperty	94	-.093	.27	-1.725	.874
CAN Imp Exp	94	.151	.097	-.338	.28
Pct Black	94	7.795	10.753	0	60.746
Pct College	94	19.473	6.948	10.4	42.5
Pct Below 25	94	33.374	4.896	23.284	54.312

Notes: The table shows the bottom 20 percent commuting zone with exposure to China and Canada (Panel A and Panel B respectively) for the period 2002-2006. The demographic characteristics are at the initial period level.

Table 5: OLS Estimates of Import Exposure to Crime

	Δ ln(PropertyCrime)		Δ ln(ViolentCrime)	
	(1)	(2)	(3)	(4)
VARIABLES				
Panel A: China				
CHN Imp Exp	0.0206**	0.0203**	-0.00411	-0.00330
	(0.00780)	(0.00772)	(0.0203)	(0.0211)
Observations	1,319	1,319	1,319	1,319
R-squared	0.121	0.129	0.017	0.031
Baseline Controls	Yes	Yes	Yes	Yes
Demographic Controls		Yes		Yes
Panel B: Canada				
CAN Imp Exp	-0.00189	-0.00342	-0.000352	-0.00338
	(0.00272)	(0.00262)	(0.00472)	(0.00494)
Observations	1,319	1,319	1,319	1,319
R-squared	0.118	0.127	0.017	0.032
Baseline Controls	Yes	Yes	Yes	Yes
Demographic Controls		Yes		Yes
Panel C: Mexico				
MEX Imp Exp	0.00221	0.000888	0.00707	0.00487
	(0.00707)	(0.00692)	(0.0131)	(0.0140)
Observations	1,319	1,319	1,319	1,319
R-squared	0.118	0.126	0.017	0.032
Baseline Controls	Yes	Yes	Yes	Yes
Demographic Controls		Yes		Yes

Notes: ***, **, * denotes statistical significance at 1, 5 and 10 percent respectively. Constants are included in the model but are not reported. Baseline controls include year fixed effects, region fixed effects and start of period manufacturing share. Demographic controls include share of population under 25, share of population that is black, and share of population that has a college degree. All standard errors are clustered at the state level.

Table 6: OLS Estimates of Import Exposure to Crime

VARIABLES	Δ ln(PropertyCrime) (1)		Δ ln(ViolentCrime) (3)	(4)
Panel A: Germany				
GER Imp Exp	-0.0484**	-0.0456**	-0.0634	-0.0608
	(0.0221)	(0.0224)	(0.0879)	(0.0903)
Observations	1,319	1,319	1,319	1,319
R-squared	0.119	0.128	0.018	0.032
Baseline Controls	Yes	Yes	Yes	Yes
Demographic Controls		Yes		Yes
Panel B: Japan				
JPN Imp Exp	-0.0284***	-0.0276***	-0.0156	-0.0134
	(0.00875)	(0.00821)	(0.0303)	(0.0316)
Observations	1,319	1,319	1,319	1,319
R-squared	0.120	0.129	0.017	0.032
Baseline Controls	Yes	Yes	Yes	Yes
Demographic Controls		Yes		Yes
Panel C: Korea				
KOR Imp Exp	-0.0458**	-0.0407**	-0.0505	-0.0426
	(0.0205)	(0.0195)	(0.0578)	(0.0591)
Observations	1,319	1,319	1,319	1,319
R-squared	0.119	0.128	0.018	0.032
Baseline Controls	Yes	Yes	Yes	Yes
Demographic Controls		Yes		Yes

Notes: ***, **, * denotes statistical significance at 1, 5 and 10 percent respectively. Constants are included in the model but are not reported. Baseline controls include year fixed effects, region fixed effects and start of period manufacturing share. Demographic controls include share of population under 25, share of population that is black, and share of population that has a college degree. All standard errors are clustered at the state level.

Table 7: 2SLS Estimate of Chinese exposure on crime

VARIABLES	(1) LnChangeProperty	(2) LnChangeProperty
CHN Imp Exp	0.0336**	0.0337**
	(0.0133)	(0.0132)
Observations	1,319	1,319
R-squared	0.119	0.128
Baseline Controls	Yes	Yes
Demographic Controls		Yes
Partial R-square	0.563	0.561
F-stat	69.5	70.05

Notes: ***, **, * denotes statistical significance at 1, 5 and 10 percent respectively. Constants are included in the model but are not reported. Baseline controls include year fixed effects, region fixed effects and start of period manufacturing share. Demographic controls include share of population under 25, share of population that is black, and share of population that has a college degree. All standard errors are clustered at the state level.

Table 8: OLS Estimates of Unemployment on Property Crime

VARIABLES	(1) LnChangeProperty	(2) LnChangeProperty
URate Change	0.00650	0.00866*
	(0.00464)	(0.00445)
Population Below 25		0.000766
		(0.00231)
Percent College Edu		-0.00768***
		(0.00168)
Percent Black		0.000916
		(0.000752)
Observations	1,319	1,319
R-squared	0.091	0.115
Year FE	Yes	Yes
Region FE	Yes	Yes

Notes: ***, **, * denotes statistical significance at 1, 5 and 10 percent respectively. Constants are included in the model but are not reported. All standard errors are clustered at the state level.

Table 9: OLS Estimates of Exposure on Unemployment

VARIABLES	(1) URate Change	(2) URate Change
Panel A: China		
CHN Imp Exp	0.0839	0.104*
	(0.0581)	(0.0592)
Observations	1,319	1,319
R-squared	0.107	0.121
Demographic Control		Yes
Panel B: Canada		
CAN Imp Exp	-0.0370*	-0.0215
	(0.0203)	(0.0211)
Observations	1,319	1,319
R-squared	0.108	0.120
Demographic Control		Yes
Panel C: Mexico		
MEX Imp Exp	-0.0240	-0.00253
	(0.0387)	(0.0374)
Observations	1,319	1,319
R-squared	0.106	0.119
Demographic Control		Yes

Notes: ***, **, * denotes statistical significance at 1, 5 and 10 percent respectively. Constants are included in the model but are not reported. All models include year fixed effects, region fixed effects. All standard errors are clustered at the state level.

Table 10: OLS Estimates of Exposure on Unemployment

VARIABLES	(1) URate Change	(2) URate Change
Panel A: Germany		
GER Imp Exp	0.160	0.218
	(0.211)	(0.207)
Observations	1,319	1,319
R-squared	0.106	0.120
Demographic Control		Yes
Panel B: Japan		
JPN Imp Exp	0.0726	0.0828
	(0.0723)	(0.0724)
Observations	1,319	1,319
R-squared	0.106	0.120
Demographic Control		Yes
Panel C: Korea		
KOR Imp Exp	0.304	0.317
	(0.233)	(0.228)
Observations	1,319	1,319
R-squared	0.107	0.121
Demographic Control		Yes

Notes: ***, **, * denotes statistical significance at 1, 5 and 10 percent respectively. Constants are included in the model but are not reported. All models include year fixed effects, region fixed effects. All standard errors are clustered at the state level.

Table 11: Robustness Checks for Import Exposure to Crime

VARIABLES	(1) LnChangeProperty	(2) LnChangeProperty
Panel A: China		
CHN Imp Exp	0.0206***	0.0203**
	(0.00768)	(0.00772)
Observations	1,319	1,319
R-squared	0.121	0.129
Baseline Controls	Yes	Yes
Demographic Controls		Yes
Panel B: Germany		
GER Imp Exp	-0.0484*	-0.0456**
	(0.0256)	(0.0224)
Observations	1,319	1,319
R-squared	0.119	0.128
Baseline Controls	Yes	Yes
Demographic Controls		Yes
Panel C: Japan		
JPN Imp Exp	-0.0284***	-0.0276***
	(0.00802)	(0.00821)
Observations	1,319	1,319
R-squared	0.120	0.129
Baseline Controls	Yes	Yes
Demographic Controls		Yes
Panel D: Korea		
KOR Imp Exp	-0.0458**	-0.0407**
	(0.0212)	(0.0195)
Observations	1,319	1,319
R-squared	0.119	0.128
Baseline Controls	Yes	Yes
Demographic Controls		Yes

Notes: ***, **, * denotes statistical significance at 1, 5 and 10 percent respectively. Constants are included in the model but are not reported. Baseline controls include year fixed effects, region fixed effects and start of period manufacturing share. Demographic controls include share of population under 25, share of population that is black, and share of population that has a college degree. All standard errors are clustered at the cz level.

Table 12: Robustness Checks for Import Exposure to Crime

VARIABLES	(1) LnChangeProperty	(2) LnChangeProperty
Panel A: China		
CHN Imp Exp	0.0192***	0.0198***
	(0.00718)	(0.00733)
Observations	1,319	1,319
R-squared	0.164	0.168
Baseline Controls	Yes	Yes
Demographic Controls		Yes
Panel B: Germany		
GER Imp Exp	-0.0513*	-0.0464*
	(0.0283)	(0.0256)
Observations	1,319	1,319
R-squared	0.163	0.166
Baseline Controls	Yes	Yes
Demographic Controls		Yes
Panel C: Japan		
JPN Imp Exp	-0.0336***	-0.0326***
	(0.00809)	(0.00777)
Observations	1,319	1,319
R-squared	0.164	0.168
Baseline Controls	Yes	Yes
Demographic Controls		Yes
Panel D: Korea		
KOR Imp Exp	-0.0333	-0.0285*
	(0.0213)	(0.0161)
Observations	1,319	1,319
R-squared	0.162	0.165
Baseline Controls	Yes	Yes
Demographic Controls		Yes

Notes: ***, **, * denotes statistical significance at 1, 5 and 10 percent respectively. Constants are included in the model but are not reported. Baseline controls include year fixed effects, state fixed effects and start of period manufacturing share. Demographic controls include share of population under 25, share of population that is black, and share of population that has a college degree. All standard errors are clustered at the cz level.

Figure 1: US Import Share of GDP

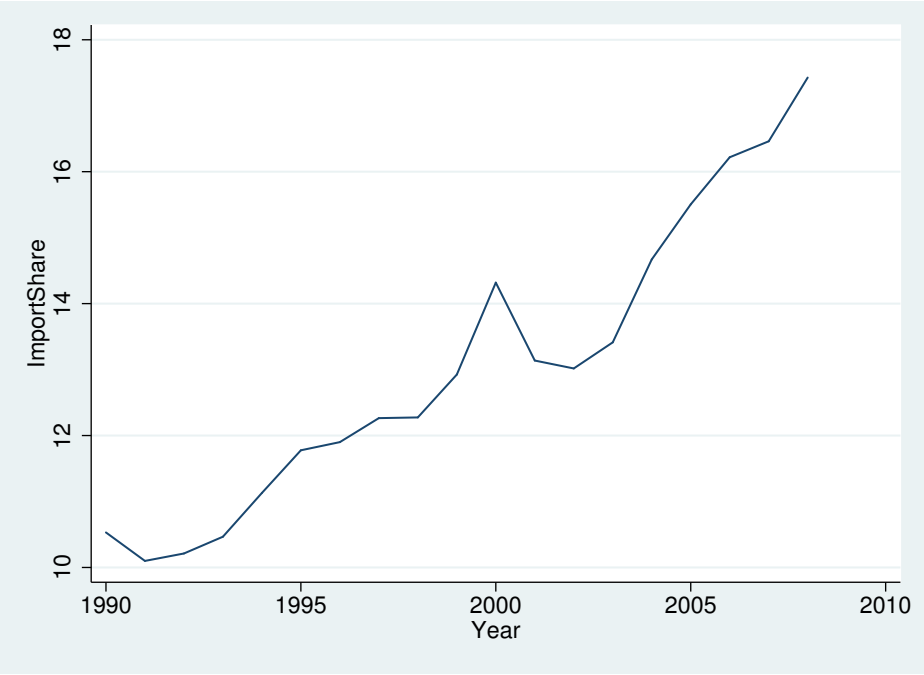

Figure 2: US Imports from its trading partners