Skill Upgrading and Imports in US Manufacturing

Abstract

Recent theoretical models show that international trade can induce within-industry skill-upgrading by raising R&D intensity and creating skill-biased technologies. This paper tests this assertion by estimating the effect of rising import shares on wage shares for 4-digit SIC US manufacturing industries. Using Arellano-Bond estimation to account for the endogeneity of imports, I find that neither rising import shares nor changes in outsourcing are correlated with rising skill intensity in US manufacturing between 1980 and 1988. Between 1990 and 1996, however, it appears that rising import shares are associated with lower skill-intensity. It does not appear that imports from low-wage countries have a stronger effect on skill intensity relative to non-low-wage imports.

JEL Codes: F14, F16, J21, J30

Keywords: Imports, Manufacturing, Skill-Upgrading, Wage Shares

1. Introduction

Popular media and public belief often state that imports, particularly from less developed countries, are responsible for the decline in U.S. manufacturing employment over the past few decades as well as the decline in relative wages for less educated workers. Between 1980 and 1989 the import share in manufacturing (defined as imports over imports plus domestic production minus exports) rose by over fifty-seven percent. Over the same period, manufacturing employment declined by nearly seven-hundred and fifty thousand. However, the relative experiences of non-production and production workers differed dramatically over this period, with the former actually gaining over one-hundred thousand workers and the latter losing roughly eight-hundred and sixty thousand. The coincidence of these facts suggests that trade may have played a hand in raising the degree of skill intensity in the US manufacturing sector.

Between 1980 and 1989, non-production workers' share of the total wage bill in manufacturing rose from 38.3 percent to 42.6 percent, a roughly 11.2 percent increase. Labor economists have generally concluded that skill biased-technological change is the primary factor behind the skill-upgrading of the 1980s, based primarily on the fact that most of the skill-upgrading occurred within industry. Older trade models predict that trade leads to an increase in the relative demand for skilled workers in skill abundant countries by causing skill-intensive industries to expand and labor-intensive industries to contract. However, newer trade models illustrate how trade can induce within-industry skill upgrading. Increasing competition from foreign competitors may pressure American manufacturers to produce higher quality products or introduce new products at a faster pace, raising the research and development and marketing requirements of the firm. This raises the relative demand for non-production workers. Since non-production workers are on average more educated, the distinction between production and non-production workers serves as a proxy for the distinction between college and non-college educated workers. Imports from less-developed countries may lead to even greater skill-upgrading by leading domestic manufacturers to adopt more skill-intensive technologies which are difficult for firms in LDCs to copy.

This paper tests these assertions by estimating the effect of changes in import shares and parts outsourcing on changes in non-production workers' share of the wage bill in the United States manufacturing sector from 1979-1996. Using 4-digit SIC industry level data and employing the Arellano-Bond estimator to account for potential endogeneity of the regressors, I find a negative correlation between rising import shares and skill-intensity, with a stronger correlation in the 1989-1996 sample. Foreign outsourcing of parts is not correlated with skill-intensity in either period. Furthermore, there was no difference in the effects of rising imports from low-wage compared to non-low-wage countries.

Several papers have used changes in the wage share of skilled or less-skilled labor as a measure of changing skill intensity. Feenstra and Hanson (1996) found a negative correlation between skill-intensity and import shares in the 1970s but a positive correlation in the 1980s. Blonigen and Slaughter (2001) investigate the effect of inward foreign direct investment (FDI) on wage shares in US manufacturing using more aggregated industry-level data. Adams (1999) estimates the relationship between both firm and industry level R&D expenditures on labor cost shares using plant level data. Gopinath and Chen (2003) also analyze the impact of FDI on skilled-labor wage shares using country-level data. Yan (2006) looks at the effects of imported materials and purchases of information and computer technologies on skill-upgrading in Canadian manufacturing. Using plant-level Chilean data, Pavcnik (2003) finds that plants using imported materials tend to be more skill-intensive. Berman, Bound and Griliches (1994) look at skill upgrading in US manufacturing and conclude that trade can only explain a small fraction of the changes that occurred during the 1980s. This paper comes to a different conclusion, perhaps because Berman et al does not directly test for the impact of trade on wage shares. Zhu (2005) finds that product cycle trade, specifically the relocation of production from the United States to its trading partners, contributed to skill-upgrading in middle-income countries' manufacturing industries between 1978 and 1988. However, Zhu finds that traditional trade measures do not contribute to skill upgrading. To my knowledge, this is the first paper to employ the Arellano-Bond estimator (Arellano and Bond 1991) in order to assess the impact of rising import shares on wage shares in US manufacturing and to test for a stronger effect associated with imports from low-wage countries.

2. Theoretical motivation and estimation strategy

Standard trade theory, in the form of the Heckscher-Ohlin model predicts that trade will affect the relative demand for skilled labor in a developed country by causing an expansion of the industries which employ skilled-labor relatively intensively, and a contraction of other industries. Through the Stolper-Samuelson effect, the relative wage of skilled workers rises along with the shift of labor across industries. In fact, the model predicts that when a skilled labor abundant economy undertakes trade liberalization, the rise in the relative wage of skilled workers will cause both industries to employ a lower ratio of skilled to unskilled workers. If the trading partner experiences growth in the exporting industry, the relative price of the import for the home country will fall, causing the skilled to unskilled wage ratio to rise. In either case, the ratio of skilled to unskilled labor employed within each industry in the skilled-labor abundant country will fall. In terms of wage shares, the decrease in relative employment within each industry counteracts the increase in the skilled-unskilled wage ratio. Thus, traditional trade models only explain across-industry skill upgrading in the United States.

However, more recent theoretical developments show that changes in trade patterns can induce within industry changes in the relative demand for skilled workers. Competition from foreign producers may have an additional impact on labor demand, independent of any output effects. Labor demand also depends on the production technology in place. Some firms and industries may use more labor or skill-intensive production processes. While some industries will exhibit a greater tendency for skill-intensity than others (for a given skilled to unskilled wage ratio) this result is not purely exogenous. Firms can choose their technologies, product characteristics and production techniques. Dinopoulos and Segerstrom (1999) and Sener (2001) develop models of North-North trade (between two developed countries) where trade liberalization leads firms to increase their research and development activities raising the rate of technological change. This leads to skill-upgrading within industries since R&D is skill-intensive relative to production. It is interesting to point out that these models predict a correlation between trade and skill-upgrading that is independent of import prices, which are often used in the empirical literature estimating the labor market impacts of trade.

A couple of theoretical models also show how trade with less-developed countries can induce skill biased technological change (SBTC). Thoenig and Verdier (2003) develop a model where both North-North and North-South trade lead to skill-biased innovation. Globalization raises the prospect of imitation or leapfrogging, leading firms to make skill-biased innovations, which are more difficult for firms in the less-developed country to copy or build upon. However, North-North trade only has an initial impact on technology as countries integrate. North-South trade, on the other hand, will continue to raise the share of skill-biased technologies as a greater number of less-developed countries enter the world economy. As competition from low-wage imports increases, technological change should continue to shift demand away from less-skilled workers. Acemoglu's (1998) model of directed SBTC also shows that trade can affect the direction of technological change, raising wage inequality when less-developed countries do not enforce intellectual property rights. In both models a lack of intellectual property rights enforcement is a critical factor linking trade with less-developed countries to rising wage inequality.

Competition from low-wage countries may also force domestic firms to produce higher quality products, which require greater mechanization or computerization, and employ more skilled labor-intensive production techniques. This mechanism fits with a model of vertical differentiation, where goods are differentiated according to quality. In this case, higher income countries have a comparative advantage in producing higher quality goods. Flam and Helpman (1987) develop a model of vertical intra-industry trade (VIIT) and show that technological progress in the less-developed country causes the more-developed country to abandon production of its lowest quality goods and produce higher quality ones. Durkin and Krygier (1998, 2000) have found empirical evidence consistent with VIIT. For these reasons, we can reasonably expect imports from low-wage countries to have a stronger impact on labor demand than general import levels.

In light of these theoretical models, I estimate the effect of rising imports on within industry skill-upgrading, where skill intensity is measured by the wage share. Specifically, the non-production wage share, S, is constructed for each 4-digit SIC industry and year by dividing non-production workers' wages by the total wage bill. Thus, a higher wage share reflects greater skill-intensity. The empirical equation is derived from a quasi-fixed, translog production function, where production and non-production labor are the variable factors and capital is the quasi-fixed factor. The translog production function is less restrictive than either a Cobb-Douglas or a CES function, and has been used in several studies to derive wage share and cost share equations (Adams (1999), Berman et. al. (1994), Blonigen and Slaughter (2001), Pavcnik (2003) and Yan (2006). I regress the skilled-worker wage share on the log relative wage of skilled workers, log capital intensity, and log value-added. Given the predictions of the theoretical models cited above, I also include the import share foreign parts share as explanatory variables.[1] Thus, the basic equation is:

$$(1) \qquad S_{it} = \beta_m MSH_{it} + \beta_P PSH_{it} + \beta_w \log\left(\frac{w_s}{w_u}\right)_{it} + \beta_k \log\left(\frac{K}{Y}\right)_{it} + \beta_y \log(Y)_{it} + \tau D_t + \varepsilon_{it},$$

Where MSH is the import share (total imports divided by total output plus imports minus exports), PSH is the ratio of parts imports to total materials costs, w_s/w_u is the relative annual production wage, K/Y is capital intensity (capital stock divided by value-added), Y is value-added, D_t is a vector of time dummies and ε_{it} is the error term. The import share is defined as imports divided by imports plus the value of shipments produced domestically. The relative wage is constructed by dividing the annual non-production wage by the annual production wage, while capital intensity is measured as the value of the capital stock divided by total value-added. The parts share variable is included as a proxy for international outsourcing of stages of the production process. To the extent that manufacturing firms in the U.S. are outsourcing the relatively labor intensive parts of the production process, this variable should be positively correlated with skill-intensity. In addition to these variables, I include the log of R&D personnel per thousand employees as a measure of R&D intensity. This variable is not included in all

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[1]This is the same basic empirical specification (excluding the trade variables) employed in several studies, including Blonigen and Slaughter (2001) and Pavcnik (2003).

specifications because it is only available at the two-digit industry level and is missing for some industries in some years, significantly reducing the sample size.[2] The model is estimated both with and without the R&D variable.

The imports variables may be correlated with unobserved variables, particularly technology variables which also affect the non-production wage share. For example, an increase in computerization in the industry may be production labor replacing, or non-production labor complementary, while making U.S. manufacturers more competitive. As a result, estimates obtained by estimating equation (1) may be biased. Consider the following unobserved variable, α_{it}, which represents skill-biased technology or investments that affect input demand and may also be correlated with import shares. The technology variable evolves according to the following equation, $\alpha_{it} = \alpha_{it-1} + \xi_{it}$. Thus the current period's technology is the sum of the previous period's technology (α_{it-1}) and a technology shock (ξ_{it}). Differencing the data transforms equation (1) into

$$(1') \quad \Delta S_{it} = \beta_m \Delta MSH_{it} + \beta_P \Delta PSH_{it} + \beta_w \Delta \log\left(\frac{w_s}{w_u}\right)_{it} + \beta_k \Delta \log\left(\frac{K}{Y}\right)_{it} + \beta_y \Delta \log(Y)_{it} + \xi_{jt} + \tau D_t + \varepsilon_{it}$$

The change in the import share is correlated with the innovation in the unobserved technology variable, ξ_{it}, but the previous period's import share is not. Thus, we can use the lagged import share as an instrument for the change in the import share. The same can be done for the specification where imports are separated into low-wage and non-low-wage import shares. The Arellano-Bond estimator accounts for both the potential endogeneity of the regressors and potential lag dependence of the dependent variable.

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[2] The R&D variable is first available beginning in 1979.

In addition to this basic specification, separate variables for low-wage and non-low-wage import shares are included. Bernard et al (2006) provide the low-wage imports measure, called the value share. The value share measures the share of imports coming from low-wage countries. A country is defined as low-wage if its per capita GDP in the year 2000 was less than 5 percent of US per capita GDP. Thus, the value-share is:

(2) $$vsh_{it} = imports_{it,lowwage} / imports_{it} .$$

Using this variable, I construct the low-wage import share (LWIS) and non-low wage import share (HWIS) as follows,

(3) $$LWIS_{it} = \frac{vsh_{it} \times imports_{it}}{imports_{it} + output_{it} - \exp orts_{it}}$$ and,

(4) $$HWIS_{it} = \frac{(1 - vsh_{it}) \times imports_{it}}{imports_{it} + output_{it} - \exp orts_{it}}$$

The theoretical models above predict a positive β_m, which indicates that higher import shares lead to within industry skill-upgrading. The coefficient on the relative wage could be either positive or negative depending on whether the elasticity of substitution between production and non-production labor is greater or less than one. A positive β_k indicates capital-skill complementarity. According to some theoretical models, we should expect a stronger, positive correlation between skill-intensity and low-wage imports relative to non-low-wage imports.

The regressions are performed over two sub-periods, 1979-1988 and 1989-1996. This cutoff is dictated by the data. After differencing the data, we use observations on the change in variables for 1980-1988 and 1990-1996. The import data was subject to a significant change in 1989 which lead to lower calculated import values. While a consistent imports series is available for the full sample, the parts imports data is affected by the change in the imports measure. The cutoff year also roughly coincides with the change in the trend of skill-upgrading, which reached a peak in 1991 and leveled off thereafter.

3. Data

The estimation combines data from three sources. Industry level information on employment, wages, value-added, output, capital stocks and productivity come from the Bartelsman and Gray (BG) dataset, which is available on the NBER website. The data cover 459 manufacturing industries at the 4-digit 1987 SIC classification. All variables presented in dollar values are stated in real terms through the use of deflators. Wages are adjusted using the CPI, with 1996 serving as the base year. The value-added and capital stock variables are deflated according to industry-level deflators contained in the BG dataset, with 1987 as the base year.

The imports data and the low-wage imports measure come from Peter Schott's web site, and all three data series were developed using the U.S. import and export data developed by Robert Feenstra.[3] The data covers 386 4-digit SIC industries from 1972-1996. These industries comprise over 92 percent of the value of shipments in the full dataset. The R&D data comes from the National Science Foundation and are available on their website.[4] The data measure the number of R&D scientists and engineers per 1,000 employees, at the 2-digit SIC level. Estimates are obtained for two sub-periods: 1979-1988 and 1989-1996. Data prior to 1979 are excluded because the R&D personnel data are available beginning that year, and the dataset is split in 1989 due to a change in the way the parts imports variable was measured beginning that year.

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[3] These data series can be found at http://www.som.yale.edu/faculty/pks4/sub_international.htm.

[4] The data are available at www.nsf.gov.

Figure 1 shows the trend in the aggregate non-production wage share over the sample period. The data points for this graph were constructed by aggregating total and non-production wages across all 386 industries annually and constructing the aggregate wage share. The graph shows a steady increase in skill-intensity until 1991, with a slight overall decline through 1996. Between 1980 and 1989, non-production workers' share of the total wage bill in manufacturing rose from 38.3 percent to 42.6 percent, a roughly 11.2 percent increase. At the end of the sample period (1996) the wage share for non-production workers was only marginally higher at 42.9 percent. Figure 2 shows the aggregate annual import share for the entire sample. Between 1980 and 1988, the import share rose steadily from 8.2 to 12.7 percent. The import share continued to rise steadily after 1989, in contrast with the change in the direction of skill-intensity over this period.

Table 1 provides summary statistics for each of the key variables over the two sample periods. The mean and standard deviation are provided for each variable in levels. Columns one and two provide the relevant statistics for the 1980-1988 and 1990-1996 sub-samples, respectively. Focusing on the 1980-1988 period, the average non-production wage share was 37.1 percent while the average import share was 12.5 percent. The data also show that the vast majority of imports came from non-low-wage countries; the low-wage import share was only 0.82 percent while the high-wage import share was 11.7 percent. Columns 3-4 show that low-wage imports made up a greater fraction of overall imports in that latter sample period. The relative wage of non-production workers was higher during the second period as was average industry output. Capital intensity, on the other hand, was lower in the 1990s relative to the 1980s.

Table 2 shows the average change for the non-production wage share as well as the import variables for the two periods. Both panels show substantial differences during the two periods. There was a noticeable increase in skill intensity during the 1980s, but not during the 1990s. Similarly, the import share rose more dramatically in the earlier period. We can also see that the majority of the rise in import shares during the earlier period was due to an increase in imports from non low-wage countries, whereas imports from low-wage countries rose by as much as non-low wage imports during the 1990s.

4. Results

I estimate equation (1') for both periods. For each period, there are three sets of results. The first is for the full sample, the second includes the R&D variable while the third set includes the R&D variable and excludes observations where the import share changed by more than ten percentage points. The results, presented in table 3, show a negative, but no statistically significant correlation between skill-intensity and import shares (column 1) between 1980 and 1988. This result is consistent with previous findings that trade plays only a minor role in raising the relative demand for skilled workers and increasing wage inequality. The import share for intermediate inputs (parts share) is positively correlated with skill intensity, but the result is neither statistically nor economically significant. As expected, the relative wage, industry size and capital intensity are all positively correlated with skill-intensity. The lagged non-production wage share is also strongly correlated with the current wage share. The test for residual autocorrelation fails to reject the null hypothesis of no autocorrelation, supporting the use of the Arellano-Bond estimator.

The results in column 2 include the R&D intensity variable. Including this variable causes a loss of 810 observations and 20 industries (some industries are missing this variable for the entire sample period). The results are consistent with those in column 1. As expected, R&D intensity and skill-intensity are positively correlated. A doubling of R&D workers per thousand employees leads to a 2.2 percentage point increase in the non-production wage share. Given that R&D personnel account for only three percent of all employees over this sample period, this effect goes beyond the direct contribution of R&D workers wages to the non-production wage share. As a robustness check, the model in column 3 excludes observations where the import share rose or fell by more than ten percentage points. Such large fluctuations are likely to reflect either significant measurement error or some significant event(s) which may have serious impact on the import share as well as skill-intensity and are not observable to the econometrician. This exclusion causes a further loss of 25 observations. The results are highly similar to those in column 2.

The results for 1990-1996 (columns 4-6) show conflicting results. In columns 4 and 5 (the latter model includes the R&D variable) do not show a statistically significant correlation between imports and skill-intensity. However, the results which exclude large changes in the import share show a negative and statistically significant correlation between rising import shares and skill-upgrading, a finding which is in contrast to the theoretical predictions. This result is consistent with Feenstra and Hanson's (1996) findings for the 1970s but at odds with their findings for the 1980s, where they show a positive correlation between imports and skill-intensity. The sign on the outsourcing variable continues to be positive but statistically insignificant. Capital intensity no longer has a statistically significant impact, while industry size now shows a negative, but statistically insignificant correlation with the non-production wage share. R&D intensity continues to exhibit a positive correlation with skill-intensity; however the link is weaker than in the 1980-1988 sample. Each model passes the test for no serial autocorrelation of the error terms, again supporting the use of the Arellano-Bond estimator.

Overall, the evidence is mixed. There is some indication that imports may have had a negative impact on skill-intensity in the 1990s. Outsourcing does not appear to have had any effect on rising skill-intensity in either the 1980s or the early 1990s. The results are qualitatively similar to those excluding the relative wage (the specification used by Feenstra and Hanson 1996). Estimating the model on first differenced data also yields similar results.

Low-wage versus non-low wage imports

Given the popular press's emphasis on the effect of rising imports from less developed countries on manufacturing jobs, this paper now asks whether low-wage imports have a different impact on skill-upgrading relative to non-low-wage imports. The results, presented table 4, indicate that there is no significant difference between low-wage and non-low-wage imports. Wald tests consistently fail to reject the hypothesis that the coefficients on the two imports variables are equal. Generally, the results reflect those in table 3. There is some indication that imports were negatively correlated with the non-production wage share in the 1990-1996 sample (column 6) while the model consistently fails to establish a significant link between imports and skill intensity in the 1980s. Again, the model passes the test for serial autocorrelation of the residuals in all specifications.

5. Conclusion

This paper estimates the effect of rising imports on within-industry skill-upgrading in US manufacturing between 1980 and 1996 using 4-digit SIC industry level data. Employing the Arellano-Bond estimator, the results do not find a significant correlation between rising imports and skill-upgrading within industries in the 1980s. There is some indication of a negative correlation between imports and skill-intensity in the 1990s; however this result is only obtained when omitting observations with extreme changes in import shares. I do not find evidence that imports coming from low-wage countries had a stronger impact on skill-intensity.

Some of these findings are in line with much of the existing literature, which concludes that the majority of skill-upgrading was a result of technological change, while international trade only contributes a small fraction to overall changes in skill-intensity and wage inequality. There are several interesting lines of further study. First, a couple of the theoretical models outlined above (Dinopoulos and Segerstrom 1999 and Sener 2001) predicted that increasing foreign competition may lead to rising R&D intensity. Unfortunately, the R&D data used in this study are detailed enough to pursue the question here. Additionally, the literature has mostly ignored the role of cross-industry linkages. In particular, rising imports in one industry may affect firms in downstream industries. Addressing both of these issues will help to further our understanding of the links between trade and labor markets.

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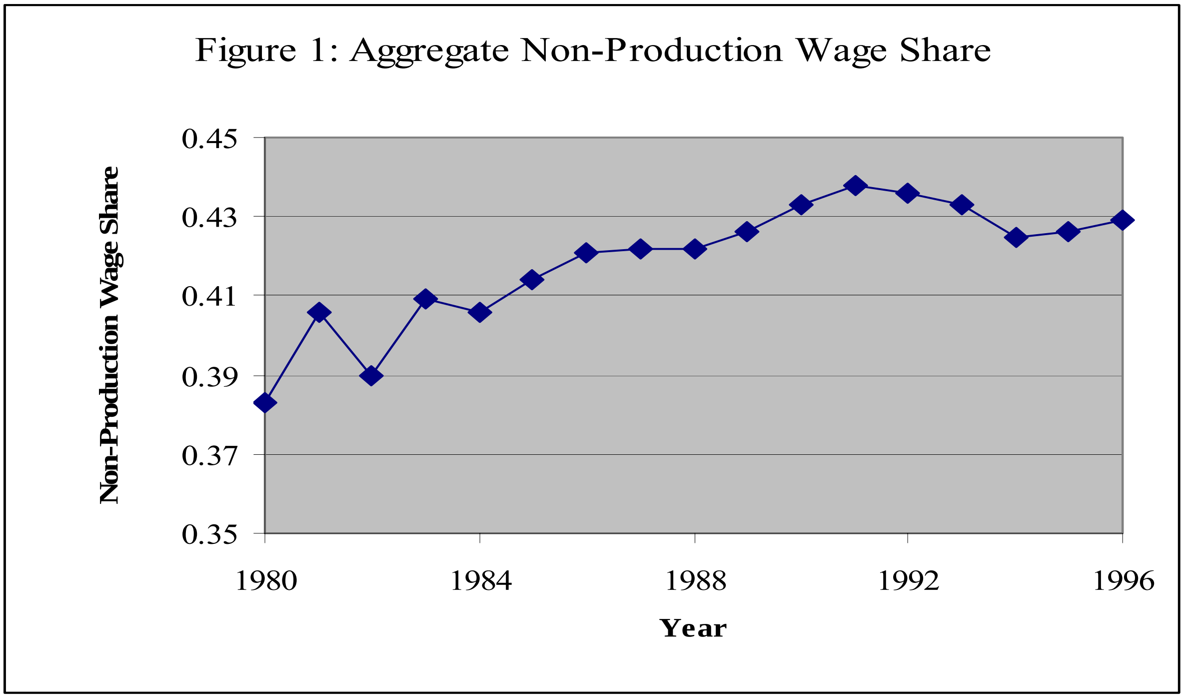

Figure 1 shows the aggregate annual production share of total wages for the sample of 386 4-digit SIC manufacturing industries.

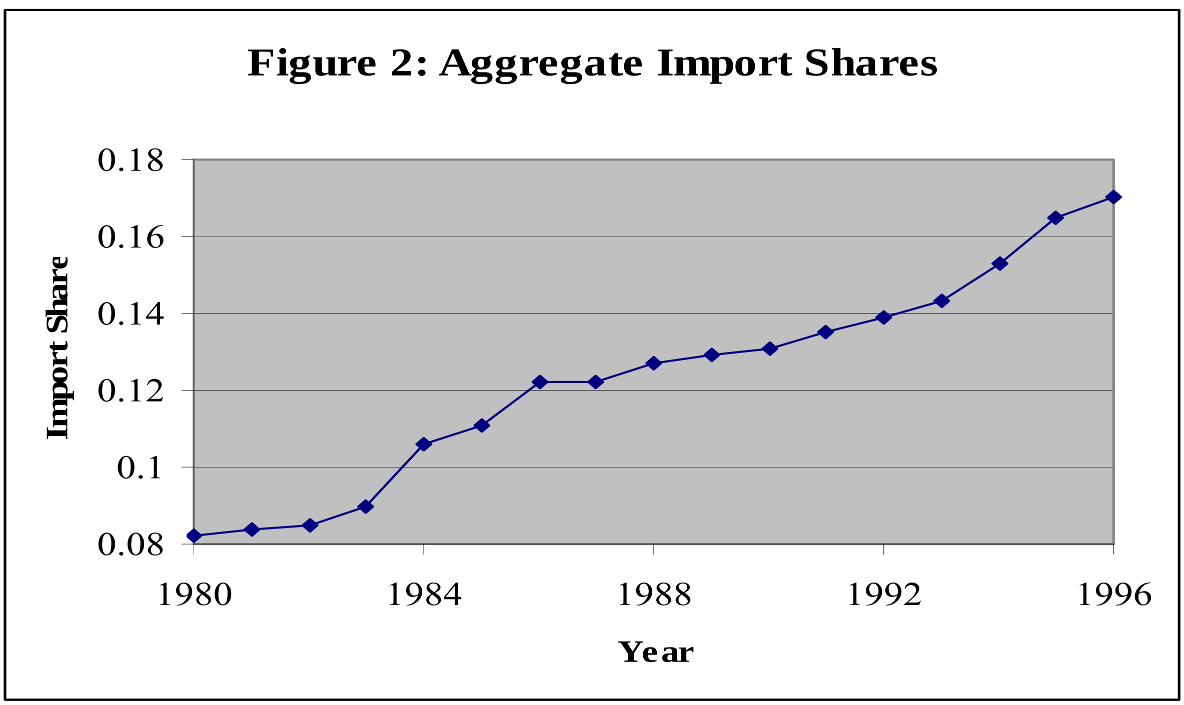

Figure 2 shows the aggregate annual import share for the sample of 386 4-digit SIC manufacturing industries.

Table 1: Summary statistics

variable	1980-1988	1990-1996
Non-production wage share	0.371	0.392
	(0.124)	(0.131)
Import share	0.125	0.192
	(0.142)	(0.203)
Low-wage import share	0.0082	0.033
	(0.025)	(0.088)
High-wage import share	0.117	0.159
	(0.132)	(0159)
Parts share	0.081	0.048
	(0.334)	(0.123)
R&D personnel/1000 employees	28.54	36.81
	(23.9)	(30.69)
Relative wage*	1.613	1.705
	(0.365)	(0.506)
Real value added (millions of $)	2,413	3,298
	(3,662)	(7,889)
Real capital intensity**	1.165	1.016
	(0.977)	(0.683)
Observations***	3,468	2,694

*Log relative wage is the log of the annual non-production wage divided by the annual production wage.
**Log of the capital stock divided by value-added.
***The number of observations for the R&D personnel variable is 2,776 and 2,506 for the 1980-1988 and 1990-1996 samples, respectively.

Table 2: Changes in average import and wage shares

variable	1980-1988	1990-1996
Non-production wage share	0.025	0.003
Import share	0.064	0.052
Low-wage import share	0.012	0.025
High-wage import share	0.052	0.027
Foreign parts share	0.073	0.0058

Statistics represent the mean change (not weighted) for import and wage shares over the time period indicated.

Table 3: Wage share regressions

	1980-1988			1990-1996		
variable	1	2	3	4	5	6
Lagged wage share	0.388**	0.334**	0.285**	0.464**	0.454**	0.399**
	(0.064)	(0.057)	(0.059)	(0.06)	(0.06)	(0.071)
Two-year lagged wage share	-0.043					
	(0.033)					
Import share	-0.033	-0.012	-0.039	-0.0086	-0.0054	-0.081**
	(0.025)	(0.026)	(0.04)	(0.0099)	(0.0094)	(0.026)
Parts imports share	0.0013	0.0029	0.0031	0.004	0.0082	0.0066
	(0.0043)	(0.0037)	(0.0036)	(0.019)	(0.017)	(0.023)
log R&D personnel per		0.022**	0.021**		0.005†	0.0044†
1,000 employees		(0.0049)	(0.0049)		(0.0026)	(0.0026)
Log relative wage	0.091**	0.091**	0.091**	0.085**	0.08**	0.084**
	(0.0081)	(0.01)	(0.094)	(0.0094)	(0.0097)	(0.01)
Log real value added	0.019**	0.0086	0.014	-0.0091	-0.012	-0.0093
	(0.0085)	(0.01)	(0.01)	(0.011)	(0.011)	(0.013)
Log real capital intensity	0.04**	0.027*	0.032**	-0.0061	-0.0051	-0.0016
	(0.0098)	(0.012)	(0.012)	(0.012)	(0.013)	(0.014)
Test for residual autocorrelation	-1.57	-1.13	-1.21	-0.82	-1.07	-0.91
(p-value)	(0.12)	(0.26)	(0.22)	(0.41)	(0.28)	(0.36)
Wald statistic	459.18	411.51	423.78	251.18	252.46	207.87
Observations	3,466	2,656	2,631	2,690	2,415	2334
Industries	386	366	366	386	386	366

Results for Arellano-Bond estimation.
Robust standard errors are in parentheses unless otherwise indicated.
Results in columns 3 and 6 are for the sample excluding observations where the import share changed by more than 10 percentage points.
† denotes significance at 10%.
* denotes significance at 5%.
** denotes significance at 1%.

Table 4: Low-wage vs. non-low-wage imports

	1980-1988			1990-1996		
variable	1	2	3	4	5	6
Low-wage import share	0.0082	-0.0057	0.0063	-0.041	-0.0092	-0.071
	(0.063)	(0.062)	(0.072)	(0.03)	(0.03)	(0.045)
Non-low-wage import share	-0.037	-0.012	-0.041	-0.012	-0.0047	-0.083**
	(0.026)	(0.027)	(0.041)	(0.03)	(0.01)	(0.026)
Parts imports share	0.0017	0.0029	0.0033	-0.012	0.0079	0.0075
	(0.0042)	(0.0037)	(0.0036)	(0.013)	(0.017)	(0.022)
Control for R&D intensity	no	yes	yes	no	yes	yes
Remove observations with large changes in import share	no	no	yes	no	yes	yes
Wald test for LWI=HWI	0.48	0.01	0.49	0.82	0.02	0.08
(p-value)	(0.49)	(0.93)	(0.49)	(0.37)	(0.89)	(0.77)
Test for residual autocorrelation	-1.58	-1.13	-1.2	-0.66	0.02	-0.91
(p-value)	(0.11)	(0.26)	(0.23)	(0.51)	(0.28)	(0.37)
Wald statistic	462.85	416.9	430.04	245.28	251.69	209.41
Observations	3,466	2,656	2,631	3,075	2,414	2,333
Industries	386	386	366	386	386	366

Results for Arellano-Bond estimation.
Robust standard errors are in parentheses unless otherwise indicated.
Results in columns 3 and 6 are for the sample excluding observations where the import share changed by more than 10 percentage points.
† denotes significance at 10%.
* denotes significance at 5%.
** denotes significance at 1%.