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Offshoring, Productivity, and Labor Income Risk

Prathi Seneviratne*

November 12, 2015

PRELIMINARY AND INCOMPLETE

Abstract

This paper uses panel data from the US to study the impact of globalization on the mean and variance of individual wages at the industry level. Globalization is measured in several ways; import penetration and export intensity, which capture international exposure in goods markets, and offshoring intensity, which captures exposure in factor markets. Preliminary results show that globalization increases industry-level multifactor productivity, which translates to higher wages, and but the impact on wage volatility depends on the type of exposure to international markets: import penetration raises wage volatility, while offshoring intensity reduces it. This suggests that import competition generates a trade-off between higher wages and higher wage volatility, with ambiguous welfare effects on workers, while offshoring makes workers unambiguously better off by raising wages and reducing unobservable wage risk.

Keywords: International Trade, Offshoring, Wages, Productivity, Labor Markets

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1 Introduction

Until recently, globlalization was synonymous with imports and exports of goods and services. However, since the early 1990s, the costs of offshore outsourcing have fallen sharply as a result of large tariff reductions stemming from international agreements, greater international capital mobility through financial liberalization, and technical innovations such as computers and the internet. For example, tariff reductions through the 1994 North American Free Trade Agreement (NAFTA) increased offshoring activities of US firms in Mexico's *maquiladoras* (Bergin et al, 2009). Business services are now increasingly performed by foreign workers — rather than at home — for use as production inputs by US firms (Amiti and Wei, 2009). As a result, the popular fear of globalization in the US now extends beyond imports into offshoring as well. Both imports and offshoring are vilified in the popular media and by politicians as a source of job losses and greater uncertainty for workers as they are increasingly subjected to the vagaries of international markets. At the same time, economic theory says that economic integration generates efficiency gains that increases productivity. Empirical evidence supports this: Trefler (2004) finds evidence of productivity gains for import-competing industries in Canada following trade liberalization with the US. Amiti and Wei (2009) find that business services offshoring improves productivity in US manufacturing industries. This suggests that globalization generates a potential trade-off between productivity and volatility, so that the neo-classical 'gains from trade' are partially undone by higher risk in the economy. Yet, the literature to date is scant on this subject. This paper estimates the impact of imports, exports, and offshoring on productivity and labor income volatility.

Economic theory says that greater economic integration in goods markets (imports/exports) and factor markets (offshoring) generates economy-wide efficiency gains. The Heckscher-Ohlin theory shows that liberalizing final goods markets reallocates resources to a country's comparative advantage (export) industries, increasing their productivity at the expense of the comparative disadvantage (import) industries. However, the comparative disadvantage industries may respond to import competition by upgrading production technology or eliminating less productive firms, thus driving up industry productivity: Trefler (2001) finds evidence of this outcome for Canadian import-competing industries following the implementation of the Canada-US Free Trade Agreement. Therefore, the impact of import competition on productivity is ambiguous. Melitz (2003) develops a theoretical model of monopolistic competition showing that exposure to trade increases the market share of high-productivity firms who can pay the cost of exporting, thereby raising productivity in exporting industries. Amit and Wei (2009) provide empirical evidence that offshoring of business services inputs from the US increases total factor productivity and labor productivity in US manufacturing industries. Thus, there is some empirical evidence supporting the neo-classical model of the gains from trade.

However, literature has little to say about the impact of globalization on labor income risk. It is a well-documented fact that developed countries have experienced rising wage volatility since the 1970s. For example, Moffitt and Gottschalk (1998) find that transitory shocks to wages were responsible for 50% of the increase in the variance of male earnings in the 1970s and 80s, and was not due to changes in unionization rates and industry shifts (Gottschalk and Moffitt, 1994; Moffitt and Gottschalk, 1998). Krishna and Senses (2014) find evidence of rising idiosyncratic labor income risk in the US between 1993 and 2003, and find that import competition was played a key role. One hypothesis explaining growing income risk is that global economic integration subjects the domestic market to the volatility of less stable foreign markets. Yet, it is also possible that economic integration gives greater opportunities for firms to hedge against risk. For example, the falling costs of offshoring may allow firms to quickly shift production away from less stable to more stable international locations, thus reducing risk in the home market.

This paper first tests the impact of different measures of globalization — import competition, export intensity, and offshoring — on multifactor productivity and labor productivity at the industry level from 2001 to 2007. Import competition and export intensity were defined as the share of imports in total domestic demand and the share of exports in total domestic production, respectively. Import and export data were contructed by Peter Schott who obtained the raw data from the Census Bureau and production data from the Bureau of Labor Statistics (BLS). The offshoring data was constructed from the same import and export data along with input-output tables from the BLS. These same globalization variables are then tested on estimates of labor income risk at the industry level. Labor income risk is estimated from the Survey of Income and Program Participation (SIPP), a data set consisting of multiple panels.

The results show that offshoring has a positive, statistically significant effect on multifactor productivity and labor productivity, regardless of the control variables used. Import competition has a positive, statistically significant effect on labor productivity only, but not when offshoring and export intensity are included as controls. Export intensity also has a positive, statistically significant effect on labor productivity, but not when offshoring and import competition are included as controls. Labor income volatility is separated into two components: the volatility of mean industry wage growth and the volatility of idiosyncratic wage growth. The distinction between the two is important: Industry wage growth is predictable, so workers can in theory hedge against its volatility, while idiosyncratic wage growth is unpredictable, so workers cannot hedge against its volatility. Therefore, the latter has stronger negative implications for welfare. The results show that import competition has a significant positive impact on idiosyncratic labor income volatility, while offshoring has a significant *negative* impact. Import competition has a significant negative impact on industry mean labor income volatility, while export intensity has a significant positive impact. To summarize: Only offshoring has a strong impact on industry-wide productivity, and it is a positive one. Individual labor income volatility increases with import competition but falls with offshoring. Therefore, offshoring appears to generate the classical efficiency gains from trade *and* the additional benefit of lower income risk. These results suggest that workers in offshoring-intensive industries enjoy the greatest benefits from globalization, while those in import-intensive industries suffer the worst losses because the unpredictable component of their incomes become more volatile, and they do not enjoy compensating productivity gains.

The rest of the paper is organized as follows: Section 2 discusses the strategy for estimating the impact of globalization and productivity and presents the results, while Section 3 discusses the estimates of volatility and describes the results.

2 Globalization and Productivity

This section describes the empirical framework for estimating the impact of globalization on productivity. Let the following production function be for industry j in a given time period:

$$Y_j = f(A_j(Imp, Exp, Off), L_j, K_j, M_j, S_j) \quad (1)$$

where Y_j is output, L_j is labor, K_j is capital, M_j is material inputs, S_j is services inputs, and A_j is multifactor productivity (the Solow residual). Multifactorproductivity is a function of the globalization variables — import competition, export intensity, and offshoring.

The globalization variables can affect productivity in several ways. As discussed in the introduction, import competition can eliminate the least productive firms in an industry, thereby increasing average industry productivity. Or, import competition can induce firms to upgrade their production structures and technology so that they can compete with more efficient foreign producers. On the other hand, import competition can lower productivity by reallocating resources away from comparative disadvantage (import) industries. Export intensity can increase productivity by increasing the market share of the most productive firms, thereby raising average industry productivity: this is the Meliz effect. Or, efficient resource reallocation from comparative disadvantage (import) to comparative advantage (export) industries can raise productivity in the latter. Offshoring can increase productivity by allowing firms to simply relocate the least productive stages of production to other countries, thereby increasing firm productivity. Offshoring can also allow firms reorganize their production structures to improve efficiency. The use of new and improved inputs from abroad can also raise productivity (Ethier, 1982). Finally, firms may learn about new production technologies from their offshoringpartners.

The estiamting strategy relies on the assumption that the intensities of importing, exporting and offshoring — relative to domestic production — varies across industries, and that these intensities have a direct impact on multifactor productivity, A_j. Taking the logs of equation 1 yields the estimation equation:

$$\begin{aligned} lnY_{jt} &= \beta_0 + \beta_1 lnImp_{jt} + \beta_2 lnExp_{jt} + \beta_3 lnOff_{jt} + \beta_4 lnL_{jt} + \beta_5 lnK_{jt} \\ &+ \beta_6 lnM_{jt} + \beta_7 S_{jt} + \beta_8 \boldsymbol{I}(ind = \boldsymbol{j}) + \beta_9 \boldsymbol{I}(year = t) + \epsilon_{jt} \qquad (2) \end{aligned}$$

where β_8 and β_9 capture industry and year fixed effects, respectively. The hypothesis is that β_2 and β_3 are positive, while β_1 could take either sign.

The results are given in Table 1 for different specifications of Equation 2. Import penetration and export intensity do not have a statistically significant impact on multifactor productivity in any specification, while offshoring has a strongly positive impact in all specifications. To address the potential endogeneity between the productivity and the explanatory variables, a specification containing explanatory variables lagged by one year is also tested. This is shown in the last column. Again, offshoring has a positive and significant effect on multifactor productivity, while the other globalization variables have no significant effects. None of the lagged globalization variables is significant.

The impact of globalization on labor productivity is also tested. Labor productivity computed by subtracting material inputs and services inputs from sectoral output and then dividing by the number of labor hours in the industry. Subtracting material and services inputs addresses the potential endogeneity between inputs and labor, so inputs need not be included as an explanatory variable now. The results are given in Table

Table 1: Offshoring and Multifactor Productivity, 2001-2007

Dependent variable: Log output

Import Competition	0.6332			0.0607	-1.1752
	(0.7759)			(0.8345)	(0.9735)
Import Competition (lagged)					1.1982
					(0.9080)
Offshoring		**1.384*****		**1.3668*****	**1.7126*****
		(0.4553)		(0.4353)	(0.4866)
Offshoring (lagged)					-0.0341
					(1.0749)
Export Intensity			0.2065	-0.0167	-0.6298
			(0.1580)	(0.1241)	(0.9863)
Export Intensity (lagged)					0.5914
					(1.1796)
Capital services	0.5434	0.6382*	0.5177	0.6392*	0.0383
	(0.3519)	(0.3627)	(0.3380)	(0.3692)	(0.4741)
Capital services (lagged)					0.7346
					(0.5273)
Labor hours	0.3619***	0.2417*	0.3221**	0.2465**	0.8602***
	(0.0790)	(0.1320)	(0.1074)	(0.1146)	(0.1619)
Labor hours (lagged)					-0.5737***
					(0.1658)
Materials	0.1635***	0.1600***	0.1674***	0.1597***	0.1895***
	(0.0222)	(0.0222)	(0.0251)	(0.0221)	(0.0259)
Materials (lagged)					-0.0321
					(0.0284)
Purchased Services	-0.0390	-0.0003	-0.0591	0.0008	0.0177
	(0.0985)	(0.1073)	(0.1236)	(0.0996)	(0.0733)
Purchased Services (lagged)					0.0359
					(0.0687)
Industry fixedeffects?	Yes	Yes	Yes	Yes	Yes
Year fixed effects?	Yes	Yes	Yes	Yes	Yes
R squared	0.99	0.99	0.99	0.99	0.99
Obs	147	147	147	147	

2. In all specifications, the contemporaenous offshoring variable has a strongly significant positive effect on labor productivity in all specifications, while lagged import penetration has a significant positive effect at the 10% level. Surprisingly, the lagged offshoring variable has a significant *negative* impact on labor productivity, although a regression with lagged variables only showed no significance impact for any of the globalization variables (results not shown). Export intensity is not significant in the presence of the other globalization variables. The results point overall to a strongly significant positive impact of offshoring on multifactor and labor productivity.

Table 2: Offshoring and Labor Productivity, 2001-2007

Dependent variable: Log labor producitivty

Import Competition	**0.1586****			0.0782	0.0130
	(0.0649)			(0.0951)	(0.0852)
Import Competition (lagged)					0.1009*
					(0.0548)
Offshoring		0.1858***		0.0861***	0.1253***
		(0.0371)		(0.0303)	(0.0379)
Offshoring (lagged)					-0.1053**
					(0.0475)
Export Intensity			0.0849***	0.0531	0.0744
			(0.0214)	(0.0449)	(0.0490)
Export Intensity (lagged)					-0.0460
					(0.0560)
Capital services	0.0037	-0.0207	-0.0165	0.0024	0.0137
	(0.0232)	(0.0259)	(0.0275)	(0.0211)	(0.0532)
Capital services (lagged)					-0.0084
					(0.0466)
Industry fixedeffects?	Yes	Yes	Yes	Yes	Yes
Time fixedeffects?	Yes	Yes	Yes	Yes	Yes
R squared	0.92	0.92	0.92	0.94	0.95
Obs	147	147	147	147	

3 Globalization and Wage Volatility

This section describes the method for estimating labor income volatility using panel data from the SIPP. Suppose the production function for industry j (Equation 1) takes the following Cobb-Douglasform:

$$Y_j = A_j(Imp, Exp, Off)L_j^{\alpha_1}K_j^{\alpha_2}M_j^{\alpha_2}S_j^{\alpha_4} \quad (3)$$

The share of income to labor is then $\alpha_1 Y_j = r_j L_j$, where r_j is the industry-wide price of human capital. Let L_j consists of the sum of all individual stocks of human capital in industry j. Denote individual i's human capital stock in industry j as $h_j = exp(\gamma_j + \beta_j X_j + u_j)$, where $gamma_j$ is an industry-specific constant, β_j is a vector of coefficients, X_j is a vector of observable labor market characteristics, and u_j is an error term. The individual's wage is then $w_j = r_j h_j = \frac{\alpha_1 A_j L_j^{\alpha_1} K_j^{\alpha_2} M_j^{\alpha_2} S_j^{\alpha_4}}{L_j} exp(\gamma_j + \beta_j X_j + u_j)$. Taking logs of both sides yields a standard Mincer wage equation for time period t:

$$log w_{jt} = \beta_{j0t} + \beta_{jt} X_{jt} + u_{jt} \quad (4)$$

where β_{j0t} captures industry-wide capital, labor, inputs, and multifactor productivity. Estimating equation 3 yields an estimate of the industry-wide mean wage or 'skill price' (β_{j0t}), which is the component of wages not determined by individual characteristics. If globalization channels international shocks into the domestic economy, as discussed in the introduction, these shocks may be captured in the volatility of the changes in the industry mean wage over time. Therefore, the impact of the industry-specific globalization variables will be estimated on the volatility of the changes in industry-specific $\hat{\beta}_{j0t}$.

Estimating equation 3 also yields the *unpredictable* componenent of wages, u_{jt}. This idiosyncratic component of wages may reflectshocks from the industry's exposure to international markets that are not absorbed at the industry level (i.e. by β_{j0t}). Thus, on top of potential changes to the volatility of industry mean wage growth, individuals could also experience changes to idiosyncratic volatility *around* the industry mean wage. In other words, globalization could increase observable volatility and unobservablevolatility. Workerscan hedgeagainsttheformer, butnotagainstthelatter, so the source of volatility matters for worker welfare. Moreover, whether the shocks are temporary or permanent have different implications for individual welfare: temporary shocks can be smoothed while permanent shocks cannot. Therefore, the estimates of idiosyncratic volatility will separate permanent from temporary shocks.

Estimating idiosyncratic volatility requires panel data. The Survey of Income and Program Participation (SIPP) is chosen for this purpose because it follows a large number of individuals over at least 36 consecutive months each, which allows for rich variation in the data within and across months, and allows for industries to be disaggregated to the 3-digit NAICS level. The 2001 and 2004 panels are chosen because the years of coverage, 2001-2007, were a time when offshoring became increasingly important but predates the Great Recession. [1] The analysis is restricted to manufacturing industries at this time because trade data for manufacturing is straightforward to obtain, unlike for services. The methodology for extracting idiosyncratic wage volatility is taken from Carroll and Samwick (1997) and is described below. Equation 2 can be re-written for individual i with the error term divided into its permanent component and temporary components:

$$logw_{ijt} = \beta_{j0t} + \beta_{jt}X_{ijt} + \eta_{ijt} + \epsilon_{ijt} \tag{5}$$

where η_{ijt} is the permanent component to idiosyncratic shocks and ϵ_{ijt} is the transitory component. Both together constitute the unobservable component of the individual's wage. The permanent component is assumed to follow a random walk:

$$\eta_{ijt} = \eta_{ij,t-1} + v_{ijt} \tag{6}$$

The permanent shock is v because changes in this variable persist over time through its effect on η. Both v_{ijt} and ϵ_{ijt} are assumed to have an iid distribution within and across

[1]The 2008 panel is not chosen because the estimates of volatility are expected to be positively influenced by the financial crisis and Great Recession. Moreover, trade intensities tend to fall during recessions. So including data from 2008 onwards may give a potentially misleading relationship between globalization and volatility.

time, with mean zero. The difference from time t to time $t + d$ of the unpredicatable component of wagesis:

$$r_d = (\eta_{ij,t+d} + \epsilon_{ij,t+d}) - (\eta_{it} + \epsilon_{it}) \quad (7)$$

Substituting Equation 4 into Equation 5 yields:

$$r_{ijd} = (v_{ij,t+d} + v_{ij,t+d-1} \ldots v_{ij,t+1}) + (\epsilon_{ij,t+d} - \epsilon_{ijt}) \quad (8)$$

Therefore, the variance of these changes over time yields the equation for estimating idiosyncratic volatility:

$$Var(r_{ijd}) = d\sigma^2_{vj} + 2\sigma^2_{\epsilon j} \quad (9)$$

The sample estimate of $Var(r_{ijd})$ is computed as follows: First, the wage equation is estimated separately for each month in the SIPP panels with industry dummies. Then, the estimated residuals are collected for each individual and the differences in these residuals over different month spans d are computed: this is the variable r_{ijd}. Finally, the squared values of r_{ijd} are the sample estimates of $Var(r_{ijd})$. These estimated values of $Var(r_{ijd})$ are regressed on d and a constant to obtain estimates of the volatility of permanent idiosyncratic shocks (σ_{vj}) and temporary idiosyncratic shocks ($\sigma^2_{\epsilon j}$). The industry dummies from the monthly wage regressions provide estimates of industry mean wages for each month (β_{j0t}). The square of the changes in industry mean wages over time is the sample estimate of the volatility of mean industry wage growth. Finally, these estimated measures of idiosyncratic and industry wage volatility are regressed on the globalization variables.

The results for idiosyncratic volatility are given in Table 3. The dependent variable σ_{vj}, the volatility of permanent shocks. Import penetration has significant positive impact on permanent idiosyncratic volatility, while offshoring has a significant negative impact. Export intensity has no significant impact. (Note that none of the globalization variables are significant when each is the sole explanatory variable.) Table 4 shows the results when only lagged explanatory variables are used. Lagged import competition has a significant positive impact on idiosyncratic volatility, but lagged offshoring has no impact. Lagged export intensity has a significant negative impact on idiosyncratic volatility.

Table 3: Offshoring and Idiosyncratic Wage Volatility, 2001-2007

Dependent variable: Idiosyncratic Wage Volatility

Import competition	0.0228			**0.0457*** **	**0.0442** **	**0.0327*** **	**0.0319*** **
	(0.0165)			(0.0153)	(0.0160)	(0.0136)	(0.0140)
Offshoring		-0.0288		**-0.0628** **	**-0.0641** **	**-0.0772*** **	**-0.0797*** **
		(0.0303)		(0.0240)	(0.0296)	(0.0330)	(0.0344)
Export Intensity			0.0038		0.0022	-0.0058	-0.0052
			(0.0041)		(0.0095)	(0.0037)	(0.0038)
Labor productivity						0.0015***	0.0014***
						(0.0006)	(0.0005)
Multifactor productivity							0.0044
							(0.0066)
Industry fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R squared	0.44	0.44	0.43	0.48	0.48	0.50	0.50
Obs	147	147	147	147	147	147	147

Table 4: Offshoring and Idiosyncratic Wage Volatility: Lagged, 2001-2007

Dependent variable: Idiosyncratic Wage Volatility

Import competition (lagged)	**0.0334** **			**0.0403*** **	**0.0525*** **	**0.0584** **	**0.0561***
	(0.0161)			(0.0129)	(0.0159)	(0.0271)	(0.0274)
Offshoring (lagged)		-0.0162		**-0.0424** **	**-0.0507***	-0.0419	-0.0292
		(0.0300)		(0.0197)	(0.0256)	(0.0319)	(0.0383)
Export Intensity (lagged)			0.0075		**-0.0121** **	**-0.0195*** **	**-0.0204*** **
			(0.0051)		(0.0057)	(0.0057)	(0.0045)
Labor productivity (lagged)						-0.0005	-0.0001
						(0.0013)	(0.0014)
MFP (lagged)							-0.0086
							(0.0098)
Industry fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R squared	0.46	0.43	0.43	0.47	0.47	0.41	0.41
Obs	147	147	147	147	147	147	147

Table 5 reports the results for the volatility of mean industry wage (skill price) growth. Import competition has a significant negative impact, export intensity has a significant positive impact, and offshoring has no impact. Using lagged explanatory variables only yield very similar results (Table 6). Thus, exposure to international markets has a significant impact on the volatility of the industry-wide skill price: more import-intensive industries experience a fall in skill-price volatility while export-intensive industries experience a rise.

Table 5: Offshoring and Industry Wage Volatility, 2001-2007

Dependent variable: Volatility of Mean Industry Wage

Import competition	0.1135			**-0.1407*** **	**-0.360*** **	**-0.4315*** **	**-0.4306*** **
	(0.1699)			(0.0399)	(0.1443)	(0.1383)	(0.1366)
Offshoring		0.5948		**0.6993***	0.5079	0.4263	0.4290
		(0.4534)		(0.4159)	(0.3342)	(0.3032)	(0.3123)
Export Intensity			0.3069***		**0.3231*** **	**0.2730*** **	**0.2724*** **
			(0.0687)		(0.0302)	(0.0593)	(0.0606)
Labor productivity						0.0094*	0.0095
						(0.0056)	(0.0058)
Multifactor productivity							-0.0047
							(0.0270)
Industry fixedeffects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R squared	0.38	0.52	0.63	0.54	0.74	0.76	0.77
Obs	147	147	147	147	147	147	147

Table 6: Offshoring and Industry Wage Volatility: Lagged, 2001-2007

Dependent variable: Volatility of Mean Industry Wage

Import competition (lagged)	0.1374			0.1584	-0.2673	**-0.4726** **	**-0.4774** **
	(0.1749)			(0.1741)	(0.2042)	(0.2103)	(0.2161)
Offshoring (lagged)		-0.0259		-0.1286	0.1612	0.2804	0.3072
		(0.0851)		(0.0913)	(0.3306)	(0.3534)	(0.4069)
Export Intensity (lagged)			**0.3261*** **		**0.4260*** **	**0.4610*** **	**0.4591*** **
			(0.0792)		(0.1324)	(0.0985)	(0.0949)
Labor productivity (lagged)						0.0157**	0.0165**
						(0.0064)	(0.0076)
MFP (lagged)							-0.0182
							(0.0499)
Industry fixedeffects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R squared	0.39	0.37	0.60	0.39	0.64	0.65	0.65
Obs	147	147	147	147	147	147	147

The results overall suggest that exposure to international markets have significant effects on industry productivity and volatility, but the existence of a trade-off between the two is not evidenced in the data. In fact, offshoring increases productivity *and* reduces volatility, suggesting that offshoring benefits the domestic economy beyond the classical efficiency gains from trade: economic risk is also reduced. In constrast, import competition has no relationship to productivity, but has opposing effects on industry and idiosyncratic wage volatility, which has important implications for worker welfare. Import competition reduces industry wage volatility, but workers can hedge against this volatility because mean industry wage growth is predictable. However, import competition increases idiosyncratic wage volatility which workers cannot hedge against. Exporting has the opposite effect of import competition: it increases industry wage volatility but reduces idiosyncratic volatility when operating on a one-year lag. Thus, offshoring unambiguously improves worker welfare, while import competition unambiguously reduces welfare.

However, these results are obtained for the 'average' worker. The impact of globalization may differ widely for workers with different types of skills, as shown in the classical Heckscher-Ohlin model. Moreover, the impact of globalization on productivity tells us nothing about whether these productivity gains trickle down workers in the form of higher wages. So the next steps for this project would be to 1) disaggregate workers not only by industry, but also by education level, occupation, etc, and 2) evaluate the relationship between individual wages and globalization.

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