Made in America (by Immigrants)
How Protectionism Spurs Immigration

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Abstract:

International trade theory predicts that in the presence of protectionism, labor will flow in to compensate for restricted trade. Estimations show that for an average American industry from 1974-1997, tariffs raised the foreign-born percentage of their workforce 1.6 percentage points, a large effect since the mean percentage of immigrant laborers was 9.9. Further, regressions for each quartile of capital per worker ratios show larger immigration effects in more labor intensive industries. The evidence presented here does not aim to explain all of the reasons for immigration, but it does show a strong correlation between protected industries and immigration, clearly accounting for some of the movements. It further shows that though labor flows can substitute for free trade, immigration imposes an additional deadweight loss on the world economy. It also notes that by attracting immigration, tariffs may actually counteract their intended purposes in terms of wage and unemployment effects.

Made in America (by Immigrants)
How Protectionism Spurs Illegal Immigration

Introduction

While mercantilists were enthralled by tariffs as an instant stimulant to the economy, their adverse effects on the economy have now been known for centuries. Still, many protectionist policies continue to be politically popular as they promise jobs and higher wages. The "Buy American" campaign has sought aid to passed-by industries on these grounds in direct response to the ever-present threat of globalization. However, globalization involves flows of more than just Chinese textiles and off-shored jobs—labor, capital, and output goods are all exchanged. As such, tariffs may preserve jobs that the economy has transitioned away from, but while Americans move to fresher sectors, new workers must fill the vacated positions, and it is likely that an inflow of international labor satisfies these demands. In short, trade barriers may only have the effect of saving jobs from going to foreign countries, but then bringing foreign workers into the country to fill them.

Data from U.S. industrial censuses show that labor does in fact flow in to compensate for restricted trade. Protectionism creates marginal jobs that would otherwise not exist domestically. To offset this imbalance, immigrants come to the United States to fill the jobs, evidenced by the disproportionate amount of foreign-born workers in highly protected industries. The evidence presented here does not aim to explain all of the reasons for immigration, but it does show a strong correlation between protected industries and immigration, clearly accounting for some of the movements. It further shows that though labor flows can substitute for free trade, immigration imposes an additional deadweight loss on the world economy that is generally not discussed in

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trade theory, and, by drawing new labor in, many protectionist policies' intended effects on labor markets may be effectively washed out.

Theory

Mundell (1957) showed that in the absence of freely traded goods, international factor prices can still converge (as predicted by Samuelson's factor price equalization theorem) through the movement of production inputs. As applied to the labor market, this predicts immigration in response to protectionism. While Mundell's model requires the extreme assumptions of no trade and perfect factor mobility, similar results can be derived from other trade models. In general, as most models since Heckscher and Ohlin's work involve production inputs (labor, capital) and output goods, it is not a surprising result that restricting trade will affect factor flows.

A simple model can be constructed in which this effect of tariffs drawing in immigration is illustrated.[1] Attention will be restricted to two countries, the first with industries i and total labor L. Surplus labor supplied by the second country if needed $(L^* - L)$ (i.e. labor supply is perfectly inelastic in the first country and perfectly elastic in the second with respect to the quantity of labor demanded in the first[2]). Assume that industries in the first country are sufficiently small that their actions do not affect the wages for unskilled workers (wages are determined exogenously by the national labor market):[3]

$$w = w^* \tag{1.1}$$

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[1] This model is built on previous work by Lambson (1991)

[2] Though these assumptions are an extreme case, all that is required to show immigration in this model is an immigrant labor supply that is more elastic than domestic labor supply. This certainly seems plausible for the U.S. and is supported by empirical work.

[3] This assumption can be relaxed to assume simply that the industry is small relative to the world labor market.

Assuming a competitive market, workers will be paid the marginal revenue product of labor (constant across industries):

$$P_i f'_i (L_i)=w, \quad i=1,\dots,n \tag{1.2}$$

Assuming full employment, the sum of labor in all industries will equal the total labor supply in the economy.

$$L = \Sigma L_i \tag{1.3}$$

The intent of the model is to show the effect of raising the price of a good in one industry through a tariff. Differentiating 1.1-1.3 with respect to a price change in industry k yields:

$$\partial w/\partial P_k = 0, \tag{1.4}$$

$$\partial L_k/\partial P_k = - f'_k (L_k)/ P_k f''_k (L_k), \tag{1.5}$$

$$\partial L_i/\partial P_k = 0 \quad i \neq k, \text{ and} \tag{1.6}$$

$$\partial L^*/\partial P_k = \Sigma \, \partial L_i /\partial P_k \tag{1.7}$$

Substituting 1.5 and 1.6 into 1.7 yields the total change in labor with respect to a change in P_k:

$$\partial L^*/\partial P_k = \partial L_k/\partial P_k + \partial \Sigma_{(i \neq k)} L_i/\partial P_k \tag{1.8}$$

$$= - f'_k (L_k)/ P_k f''_k (L_k) \tag{1.9}$$

Assuming $P_i > 0, \; f'_i (Li) > 0,$ and $\; f''_i (L_i) < 0$ for all i,

$$\partial L^*/\partial P_k > 0 \tag{1.10}$$

With a price increase due to a tariff, $L^* > L$ and workers must immigrate to the first country to fill the increased labor demand due to the tariff.

Examples

Two cities illustrate this point well—Dalton, Georgia and Lawrence, Massachusetts. Dalton, nestled about 90 miles north of Atlanta in the foothills of the Appalachians, brands itself the "Carpet Capital of the World," and perhaps rightfully so: the Dalton area accounts for 85% of American carpet production, and the U.S. supplies 45% of world carpet output (Patton, 2006). Despite these large exports, carpet is still supported by hefty tariffs as a textile mill product.

Despite their booming business, Dalton mill owners have complained of labor shortages since the '50s, when the most common recruits were displaced farmers from Appalachia, and expansion in the ensuing decades spread the workforce thinner still. By the '80s, Dalton's dearth of workers "threatened the continued existence" of the mills in the carpet capital. Various options were explored including moving production to Mexico (Patton, 2003).

Instead, Mexico met them in the hills of North Georgia. Hispanic immigrants first appeared in Dalton in the late '80s, but with the housing boom of the '90s and subsequent skyrocket in carpet demand, the migration was in full force—newcomers tipped off by phone calls from relatives boasting "good indoor jobs" and "Work in Dalton" billboards scattered across the country poured into the town along with several families recruited directly from Mexico (Russakoff, 2006). Soon, Latino-owned businesses sprung up throughout the town, soccer leagues were overflowing, and there were even Hispanic candidates running for public offices (Hernández and Zúñiga, 2002). Mill owners went further to sponsor the construction of a huge new Catholic church as well as a revamping of the county school system to better accommodate the influx of ESL students. The arriving immigrants were hailed by mill owners as the

"saviors" of the industry, keeping the factories at home in Dalton (Patton, 2003). Today 40% of Dalton's population is Hispanic, making up nearly half of the mill workers (Russakoff, 2006).

Lawrence, Massachusetts began as a thriving center of American manufacturing. The nation's first planned industrial city dominated textiles in the nineteenth and early twentieth centuries, and today the New Balance shoe factory stands alongside the aging mills, the largest of the company's five American factories. New Balance proudly manufactures their athletic shoes in America, an almost unheard of feat nowadays—while Nike and others make headlines with their sweatshops in Asia, New Balance fills orders from Maine and Massachusetts (though they do assemble a few components in China). Athletic shoes are, however, sheltered with heavy government protection.

The mills are not the only tradition in Lawrence, though. Since its creation Lawrence has swallowed up huge waves of migrant workers from a revolving door of sending countries, earning itself the appropriate nickname of "Immigrant City." The latest people to arrive in Lawrence are Hispanics, mainly from the Caribbean, along with a minority of Vietnamese and Cambodians. Downtown, Spanish is the rule and English the exception. Stores, churches, and people in the streets give this relic from the industrial revolution the illusion of being near Santo Domingo, not 20 miles north of Boston. Lawrence is now 60% Hispanic, and over 30% of its residents were born in foreign countries. Many of these migrants came north from New York because friends or relatives relayed news of available jobs, but now some even come straight from their homelands.

Immigrant City largely fills the labor pool at the New Balance factory and its distribution center further west in town. New Balance enhances their hiring of

immigrants by enlisting the services of temp agencies, huge employers of new arrivals and unskilled workers between jobs. Temporary workers are used for a trial period, after which they are generally hired full-time or sent back to the agency. The result is New Balance's mainly Caribbean workers who patriotically produce American athletic shoes.

The Correlation between Protectionism and Immigration

Data from U.S. industrial censuses show a clear relationship between the level of protection an industry receives and the percentage of their workers that are foreign born. This supports the assertion that marginal jobs are available in protected industries that would otherwise not exist and that these jobs are filled by an inflow of immigrant labor. Certainly in the diverse American economy we should not expect that all employees in these marginal sectors be immigrants, but high levels of immigrant workers that cannot otherwise be explained would indicate the types of flows predicted in theory.

The dependent variable in these estimations is the percentage of workers in an industry's workforce that are foreign born, obtained from census data. (These were later multiplied by 100 for notational efficiency in the tables.) Additional figures for the 450 industries listed by the 1972 SIC (Standard Industrial Classification) come from the NBER-CES Manufacturing Industry Database (Bartelsman, Becker, & Gray, 2000) and cover several categories including employees, hours worked, total wages paid, capital stock, imports, exports, etc. Tariff rates were calculated by dividing duties collected on imports in an industry by the total value of the goods and then multiplying by 100 (Magee, 1998). State level GDP by industry was obtained from the BEA. The data

encompasses 1974-1997 with statistics for each year. Table 1 gives a summary of the variables.

Using this information, the relationship between immigrants in the workforce and tariff rates was estimated while controlling for average hourly wage rates (since immigrants work disproportionately in low-wage jobs), capital per production worker (since immigrants are often found in labor-intensive trades), time (since immigration increased through this period), and geographic controls (since immigration is generally very affected by location). Also included in subsequent models are interaction terms to show the changing effect of tariffs by year and decade.

Regressions for every year from 1974 to 1997 as well as the pooled sample show a significant positive relationship between immigrant employment and tariff rates. Other controls were also significant and in accordance with theory, strengthening the model. The results for the pooled sample using OLS are reported in Table 3 with industry-clustered standard errors.

This model was also estimated using feasible GLS for panel data, and the results were nearly identical those in Table 2. These findings are also robust to the inclusion of geographic variables, proxies for immigrants' skill sets (measured both by the imports in that industry as well as Mexican output in that industry, since Mexico supplied at least 60% of the immigrants for this period), and industry size.[4]

These findings are both statistically and practically significant: the calculated tariff rates have a mean of 5.8, so, on average, protectionism increased immigrants in the workforce by 1.2 to 1.6 percentage points (13 to 19%). As an example of highly

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[4] The estimations would be greatly benefited by a fixed-effects regression, however, due to the relatively unchanging nature of tariffs during this period, any effect of tariffs is swallowed up in the industry-specific fixed effects. Pooled regressions, on the other hand, exploit the differences in tariffs across industries rather than across time and are therefore more useful for this analysis.

protected industries, most textile markets had tariff rates of at least 20—in an average year this would increase the number of immigrants working in their industry by about four percentage points. Dalton's tufted carpets enjoyed protection rates close to ten through these years, and shoes with rubber (like New Balance's) had the highest cushion rates at 40, bumping up their draw of immigrants by 2 and 8 percentage points respectively.

It should also be noted that given the coefficient for the interaction between tariffs and time, this relationship is not decreasing but rather increasing with time. Models similar to that used in table 2 for the years 1990-1997 actually yield an estimate between .4 and .5 for tariffs' influence on immigration.

Changing the dependent variable to only include new immigrants (those who have been in the U.S. less than five years) may approach the true effect of tariffs more accurately as it will exclude movements of immigrants who have already been in the U.S. for several years. Table 3 shows that tariffs positively impact this proxy for immigration as well. While slope coefficients are clearly smaller, the range of the dependent variable is also much smaller, and it leads to similar percentage changes in immigration at the mean (11 to 19%).

Additional regressions used as a dependent variable the percent of an industry's workforce composed of non-immigrants that had moved to a new state or county in the last five years. This was intended to estimate the effect of tariff-protected jobs on internal migration within the U.S. These models showed a very significant negative effect of tariffs on new move-ins working in an industry, indicating that the bulk of non-immigrant workers in high tariff industries have held the jobs for long periods of time and have not been drawn in by surplus employment.

Further evidence of this effect of tariffs on immigration is shown in Table 4. For this period, U.S. tariffs were much higher in industries that employed small amounts of capital per worker (relatively labor-intensive industries) than in industries using more capital. Trade theory would predict that under these circumstances, much of the described immigration effect should occur in labor-intensive industries since the change in labor demand with increased demand for an industry's outputs would be much higher than in more capital-intensive sectors, and the data seems to support this. Relatively labor-intensive industries exhibit a strong immigration effect while more capital intensive industries show a smaller (though still statistically significant) effect.

An Additional Burden to the World Economy

An important policy implication of these findings is that of increased costs due to protectionism. It is widely understood that tariffs impose a deadweight burden on an economy as the tax revenues and producer surplus generated are not large enough to offset the welfare loss. When trading partners are also considered, the costs of protection stack even higher. Still, absent from these sums are the costs born by the migrants of the world who leave home and family to seek jobs in a foreign land.

For illegal immigrants, migration costs are great and often not recouped by anyone. The 'coyotes' that shuttle newcomers across the border benefit some, but the expenses in terms of lost labor, breaking up families, leaving familiar culture and language, possible death en route, and countless other sacrifices are born by the migrants and paid to no one. Eschbach et al. (1999) document at least 1600 fatalities of would-be immigrants at or near the United States' southern border from 1993-1997. (The risks of migration became so severe in the late '90s that the Mexican government

was prompted to publish a pamphlet with instructions for making the journey safely.)

Studies also show that immigrants may also suffer from poor mental health: Vega,

Kolody & Valle (1987) find this relationship and are able to further attribute it to factors

such as perceived distance and loss of personal ties from their homeland. These are just

two published examples of such costs, but it is clear that the costs are real and somewhat

large.

Consequences in the Labor Market

Gaston and Trefler (1994) as well as many others (Butcher & Card, 1991;

Friedberg & Hunt, 1995, e.g.) report the interesting finding that in many cases,

protectionism has no significant effect on wages. This is completely at odds with theory

and the political motivations behind the trade barriers. However, this may follow from

the findings in this paper—while protectionism can inflate labor demand, the labor

inflows that this induces may counteract the intended labor market outcomes. If the

expansion of demand through protectionism and the depression of wages due to

increased labor supply were of the right amounts, an equilibrium could be reached with

no change in wage levels and little change in domestic employment, though total

employment would increase by the number of immigrants drawn in.[5] From this, it is

apparent that the political motivation for restrictive trade policies could be wholly

unfounded. All else equal such policies may achieve their aims, but in a multiple

equilibrium context they will more likely have little or no effect, clearly weakening any

empirical support for wage-supporting or employment-increasing trade barriers.

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[5] No attempt is made here to estimate the magnitude of these conflicting effects, but such an outcome is
clearly possible.

Conclusion

As theory predicts, we cannot successfully alter the flow of output goods and expect no consequence in input markets. Tariffs have a direct and somewhat large influence on migration to the United States—a 10% increase in tariffs likely leads to two additional immigrant workers per 100 in an industry, and this relationship appears to be increasing, not decreasing, over time. As such a relationship is found both in theory and in empirical tests, the incongruence of responding to globalization by protecting American jobs and blocking immigration should be soundly established.

While tariffs have certainly declined in prominence in the U.S., many industries remain heavily protected, and some industries have actually garnered increased import duties in recent years in response to rampant job flight. However, from this analysis it is not clear that tariffs can any longer achieve their political ends. All else equal, tariffs may only have the effect of protecting fleeting jobs in the U.S., but then inducing subsequent immigration to fill the positions, and there seems to be no reason why either party should prefer an arrangement. When this argument is coupled with the additional costs imposed on the world through needless migration, the exchange is most probably a net loss in welfare.

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Figure 1:
Relationship between Tariffs and the Ratio of Immigrants in an Industry's Workforce (by Industry Groups, Averages from 1974-1997)
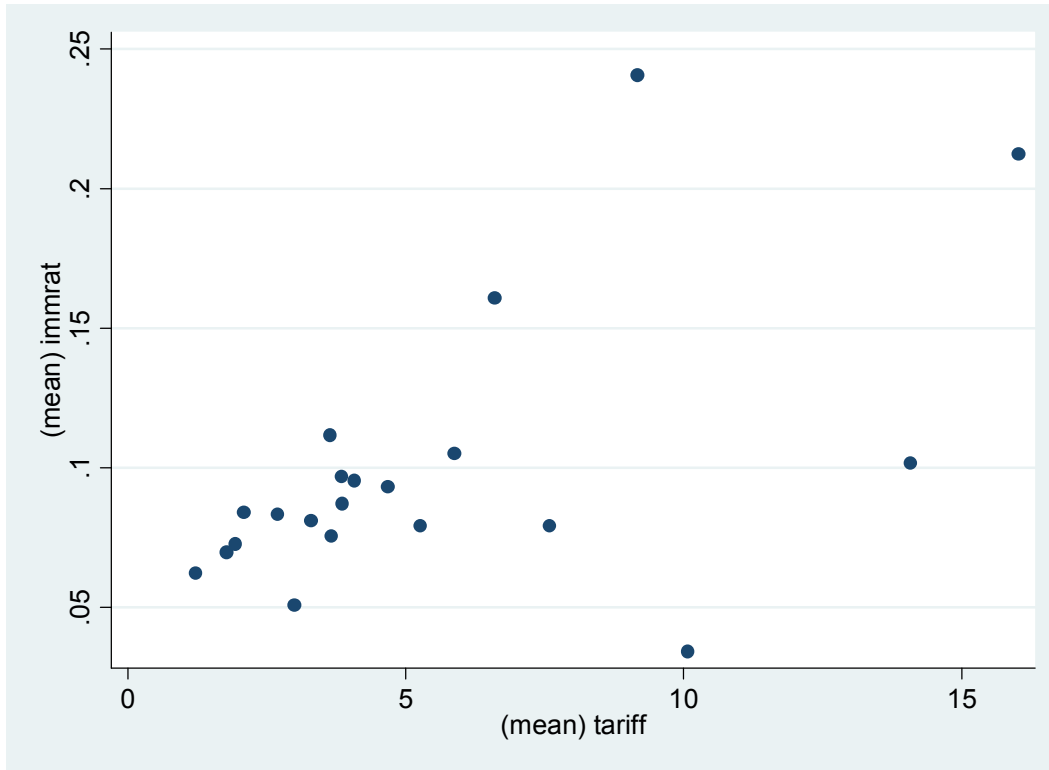
Note: Both points that are plotted in the lower right-hand side of the graph (the tobacco and textile industries) are very highly concentrated in the South (>75%), a region that was estimated to have a strong negative effect on the dependent variable and had almost no immigration for centuries until recently.

Figure 2:
Relationship between Tariffs and the Ratio of New Immigrants
(Less than 5 Years in the U.S.) in an Industry's Workforce
(by Industry Groups, Averages from 1974-1997)
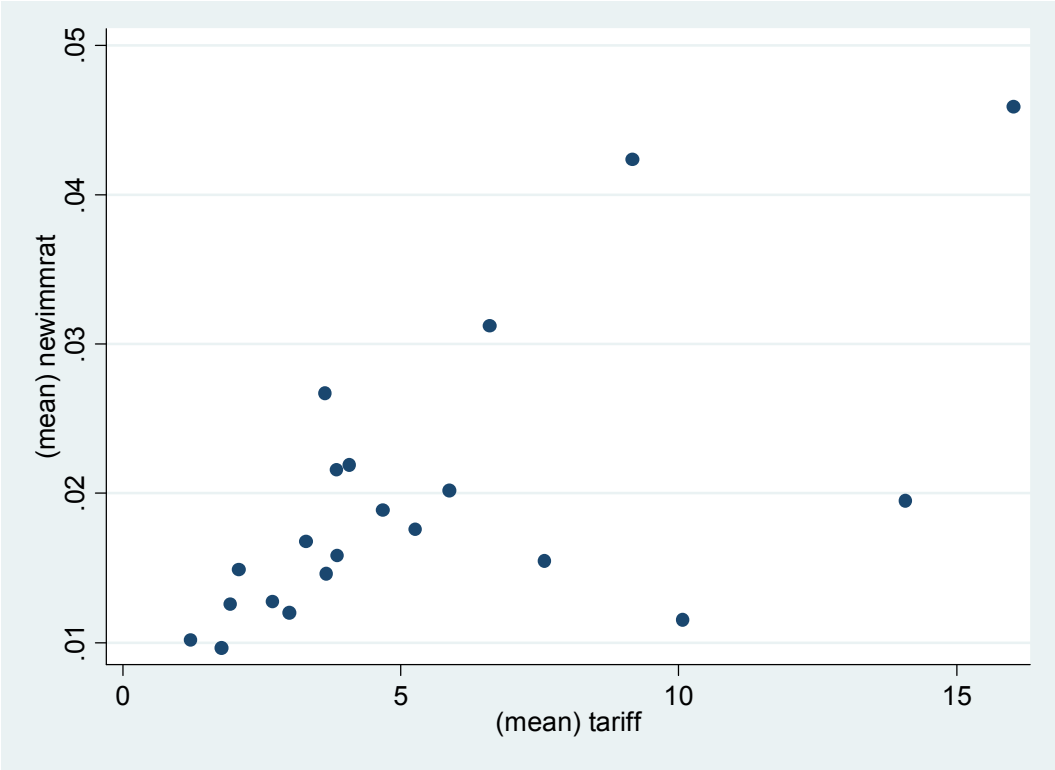
Table 1:
Summary of Variables

Variable	Mean	St. Dev.
Immigrants per 100 in an Industry's Workforce	9.94	6.35
New Immigrants per 100 in an Industry's Workforce	2.08	1.22
Tariff Rate	5.80	6.14
Wages	$8.74	3.69
Capital per Worker (1972 US $1000)	$106.66	141.11
% Eastern Production (High % of Immigrants)	.191	.083
% Southern Production (Low % of Immigrants)	.213	.164

* n = 8988, years range from 1974-1997

Table 2
Correlates of Immigrants per 100 in an Industry's Workforce

	(1)	(2)	(3)
Tariffs	.278 (.046)**	.201 (.041)**	.220 (.041)**
Wages	-.617 (.008)**	-.593 (.008)**	-.592 (.008)**
Capital per Worker	-.0012 (.001)	-.0012 (.001)	-.0012 (.001)
South	-2.84 (1.27)*	-2.79 (1.27)*	-2.81 (1.27)*
East	17.71 (3.10)**	17.86 (3.10)**	17.79 (3.10)**
Time	.637 (.037)**	.580 (.042)**	.633 (.034)**
Decade			-.497 (.225)*
Tariff * Time		.0093 (.0042)*	
Tariff * Decade			.086 (.031)**
Constant	4.52 (.82)**	4.82 (.82)**	4.52 (.82)**
Observations	8988	8988	8988
R²	.363	.366	.363

** Significant at 1% level, * Significant at 5% level;
Industry-clustered standard errors in parenthesis

Table 3
Correlates of New Immigrants (Less than 5 Years in the U.S.)
per 100 in an Industry's Workforce

	(1)	(2)	(3)
Tariffs	.056 (.010)**	.038 (.008)**	.041 (.008)**
Wages	-.167 (.018)**	-.161 (.018)**	-.161 (.018)**
Capital per Worker	-.00002 (.00003)	-.00002 (.00003)	-.00002 (.00003)
South	-.579 (.26)*	-.567 (.26)*	-.573 (.26)*
East	3.50 (.62)**	3.54 (.62)**	3.52 (.62)**
Time	.112 (.007)**	.098 (.008)**	.104 (.007)**
Decade			-.059 (.039)
Tariff * Time		.0023 (.0008)**	
Tariff * Decade			.021 (.005)**
Constant	1.50 (.19)**	1.57 (.19)**	1.56 (.19)**
Observations	8988	8988	8988
R²	.419	.423	.424

** Significant at 1% level, * Significant at 5% level;   Robust standard errors in parenthesis

Table 4
Effect of Tariffs on Immigrants per 100 in an Industry's Workforce by Amount of Capital per Worker (Quartiles)

	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile
Tariffs	.197 (.027)***	.134 (.019)***	.044 (.023)**	.039 (.021)*
R^2	.543	.383	.211	.179

*** Significant at 1% level, ** Significant at 5% level , * Significant at 10% level;