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The impact of RMB reform on China's trade competitiveness: an empirical study

Abstract

The motivation for this study was the Chinese government's announcement of the RMB's appreciation on July 21, 2005, and its aim was to ascertain whether that appreciation has affected China's export prices by empirically measuring the degree of the exchange rate pass-through on those prices. Using 73 HS trade categories with cross-industry and time-series data from July 2005 to January 2009, the panel estimation of a fixed-effects model has been applied to measure the degree and stability of any exchange rate pass-through effects. The estimation results show that the export prices of most of the trade categories were affected by the exchange rate changes. The pass-through effect was generally small, at about -0.485, and statistically significant in most of the export prices. The empirical results of this study indicate that, in the long run, China would lose its export advantage and competitiveness if the RMB were to continuously and rapidly appreciate, because its export goods would no longer operate under strong monopolistic competition. At the same time, the expansion of China's export trade is squeezing the markups of the country's exporters. These exporters therefore need to re-think their export pricing strategy and determine whether they want to keep their market share and remain competitive, but sacrifice their markups and profit levels. The implications for China's exchange rate policy suggest that it would be better for the RMB to appreciate slowly and gradually rather than radically. It is also clear that it would be in China's overall economic interest to allow freer flows of capital to reduce the pressure on the continuous appreciation on the currency and pave the way for improvements in export competitiveness and profit margins.

Keywords: pass-through, export pricing, panel estimation, fixed-effects model.
JEL Classification: F14, F31, F41, F42.

Introduction

The issue of the Sino-U.S. trade imbalance continues to capture widespread attention, given that China has contributed the largest share of the United States' trade deficit since 2001. In the past two decades, China's total exports of merchandise to the U.S. have grown by 87 times and rising from an almost zero percent share in 1985 to a 16.1% share in 2008 (the statistical trade figures are shown in Table 1). The issue that has caused China the most criticism is its contribution to the U.S. trade deficit. This issue became particularly explosive in 2001, when the country surpassed Japan to account for the largest share of that deficit. In 2008, China was responsible for 39.3% of the U.S. trade deficit (the rankings of U.S. trading partners by their share of the U.S. trade deficit are shown in Table 2). Both U.S. officials and U.S. trade unions have begun to seriously criticize China's unfair trade practices and its controls on foreign exchange and capital flows. Over the past several years, the U.S. has continued to apply pressure on the Chinese government to open up the country's markets to imports and to release controls and allow the further appreciation of the Renminbi (RMB) to improve the trade imbalance. Market watchers had long expected China to comply, but it was on July 21, 2005 that the Chinese People's Bank suddenly announced a 2% appreciation in the RMB. The Bank also later introduced a series of reforms in the foreign exchange system and in market policy to allow greater flexibility in the currency. Since then, the RMB has been appreciated by almost 20%, and it is now this appreciation and China's monetary decisions that are capturing the world's attention.

Previously, Chinese traders had no need to consider the foreign exchange risk when they traded with the U.S. because, under the fixed exchange rate system, the RMB was fixed and linked to the U.S. dollar. However, since July 21, 2005, these traders have had to reconsider this risk due to the uncertainty caused by the appreciation of the RMB. Exporters, in particular, are directly affected and will have to make their export pricing decisions carefully if they want to maintain their competitiveness and market share. Traders must now adjust their trade prices according to these foreign exchange rate changes.

The purpose of the study reported herein was to analyze empirically the pass-through effect of the RMB's appreciation on China's export prices. More specifically, it aimed to estimate the degree of pass-through on different trade commodities to determine how that appreciation has affected the country's export prices. A low degree of RMB exchange rate pass-through on trade prices has important implications for China's export competitiveness. If trade prices are less responsive to changes in currency values, then a larger appreciation of the RMB will be needed to narrow the Sino-U.S. trade imbalance. Thus, this issue has significant bearing on China's efforts to correct that imbalance. Furthermore, an examination of the degree of the

pass-through effect of the RMB's appreciation also allows a determination of whether China's current exchange rate policy is truly beneficial to its external trade competitiveness.

The remainder of the paper is organized as follows. Section 1 presents the empirical framework and estimation specification. Section 2 describes the data for the empirical exercise and interprets the estimation results. The final section concludes the paper.

1. Empirical framework

The pass-through effect of exchange rate changes on trade prices has captured research attention since the early 1970s when most industrialized countries adopted the flexible exchange rate system. Most studies in this area have examined the degree of pass-through and the stability of trade prices during exchange rate fluctuations. This is because the pass-through effect of the exchange rate on import prices has direct implications for local prices and inflation rates, which has an impact on production costs, output, employment and economic growth. At the same time, the pass-through effect on export prices has a direct impact on a country's external trade competitiveness and market share, which also has implications for its balance of payments, foreign reserves, interest rates, currency values, productivity and economic policy. Mann (1986) was the pioneer of research into the exchange rate pass-through issue, and she has attracted many followers. Recent studies include those of Ghosh and Tajan (2009), Turkcan and Ates (2009), Gaulier et al. (2008), Bhattacharya et al. (2008), Ito and Sato (2008), Parsons and Sato (2008, 2006), Banik and Biswas (2007), Bergin and Feenstra (2007), Marazzi and Sheets (2007), Oladipo (2007), Sekine (2006), Hellerstein et al. (2006), Campa and Goldberg (2005), Ganapolsky and Vilán (2005), Marazzi et al. (2005), Barhoumi (2005), Corsetti and Dedola (2005), Kardasz and Stollery (2005), Ganapolsky and Vilan (2005), Pollard and Coughlin (2004), and Parsley (2003), among others. The prior research focuses on either industrialized and developing countries, and includes country case studies and industrial and disaggregated commodity-level studies, but research into China's exchange rate pass-through remains scarce. This paper therefore attempts to fill this gap in the literature.

In most of the previous pass-through studies, the researchers begin with international pricing behavior to build up their models and then analyze the exchange rate pass-through determinations in different directions[1]. The empirical framework of this paper follows the studies carried out by Campa and Goldberg (2005), Marazzi et al. (2005) and Knetter (1995). Starting from the microeconomic foundation of the pricing strategies of an exporter under monopolistic competition who produces different commodities for foreign markets, the firm's profit (π) is determined by

$$\pi_{it} = \sum_{i=1}^{n} PX_{it} Q_{it}\left[\frac{PX_{it}}{e_{it} \cdot PF_{it}}, \lambda_{it}\right] - C\left[\sum_{i=1}^{n} Q_{it}, PD_{it}, \varepsilon_{it}\right]. \quad (1)$$

In equation (1), PX_{it} is the export price in terms of foreign currency values, Q_{it} is the export quantities of commodity i in a foreign market at time t, and $Q[.]$ is the function of export prices, foreign competitor prices (PF_{it}), exchange rates (e_t) and markups (λ_{it}). $C[.]$ is the total cost of production, which is determined by different input factor costs, and PD_{it} is the domestic prices of these factor costs; ε_{it} is other factors.

Export pricing decisions take account of both the macroeconomic situation of the export market and foreign competitors' prices. The changes in and value of markups are usually dependent on the firm's market strategy[2]; therefore, export prices are simply the markup ($markup_{it}$) over the exporter's marginal cost (mc_{it}) and the changes in the exchange rates (e_{it}). Using lowercase letters to reflect logarithms, the export price equation for each export commodity can be written as

$$px_{it} = markup_{it} + mc_{it} - e_t. \quad (2)$$

If we allow the markups to have both an industry- and commodity-specific fixed effect and a component that is sensitive to exchange rate changes and foreign competitors, then, for simplicity in the logarithms, they can be expressed as a function of the exchange rate (e_t) and foreign competitors' prices (pf_{it}):

$$markups_{it} = \phi_{0i} + \phi_1 e_t + \phi_2 pf_{it}. \quad (3)$$

The exporter's marginal costs can be expressed as the domestic production cost, which is based on the local wages or price levels and others:

$$mc_{it} = c_0 + c_1 pd_{it} + \varepsilon_{it}. \quad (4)$$

Substitute equations (3) and (4) into equation (2), and the export prices can be written in a logarithm panel estimation specification as

$$px_{it} = c_0 + \beta_{0i} + \beta_{1it} e_t + \beta_{2it} pf_{it} + \beta_{3it} pd_{it} + \varepsilon_{it}. \quad (5)$$

Furthermore, to determine whether there are any structural differences in the pass-through effects for

[1] Exchange rate pass-through analysis is also called "pricing to market analysis" in the literature.

[2] Froot and Klemperer (1989) provide a detailed explanation of firm market strategy.

different years, we include yearly dummy variables in the equation as

$$px_{it} = c_0 + \beta_{0i} + \beta_{1it} e_t + \beta_{2it} pf_{it} + \\ + \beta_{3it} pd_{it} + \sum_{k=2006}^{2008} \beta_{ki} Dk + \varepsilon_{it}. \quad (6)$$

In equation (6), e_t is the exchange rate of the home currency (RMB) against one unit of the foreign currency, and pf_i is a foreign competitor's price in terms of the foreign currency. All foreign competitors' prices should include their local costs and competition factors. In this equation, β_{0i} captures the industry-specific effects, and β_{ki}s capture the effects of the time dummies (D_k) for the years from 2006 to 2008; ε_i represents other factors.

Where β_{2i} reflects the marginal production costs of the export goods and is always responsive to changes in markups and foreign competitors' prices. Therefore, the change in the export price is dependent on the change in the markup on marginal costs, foreign competitors' prices and exchange rates. Hence, an export firm would adjust its export prices to maximize its interests in terms of markup profits, market share and minimize foreign exchange risks.

From the panel estimation of fixed-effects model (5), coefficient β_{1i} measures the direct effect of the exchange rate pass-through on the export price as

$$\frac{\partial px_{it}}{\partial e_t} = \beta_{1i}. \quad (7)$$

In general, when β_{1i} = -1, this means that there is complete exchange rate appreciation pass-through onto the export price; when β_{1i} < 0, it means that when the home currency appreciates (exchange rate declines), it causes the export price (in terms of foreign currency) to be adjusted upward. The export price change is negatively related to the exchange rate change. The interesting point here is that when the degree of pass-through is small (i.e., -1 < β_{1i} < 0), it means that when the level of foreign market competition is high, or the export goods have less monopolistic power, all things being equal, the exporter should either keep the export price unchanged, or adjust it less than the proportion of the exchange rate change, or reduce its own markup in order to maintain its market share and its competitive edge in the foreign market, thereby minimizing the degree of pass-through from the home currency appreciation. However, when the level of foreign market competition is not as high, or the export goods have stronger monopolistic power, the exporter can adjust the export price upwards when the home currency appreciates. In this case, the degree of pass-though is even larger than one (i.e., β_{1i} < -1). Because the exporter does not have to worry about a loss in market share, it can maximize its markup and profits because of stronger monopolistic competition in the foreign market; a change in the exchange rate thus leads to a greater negative change in the export price. Thus, the estimated value of β_{1i} indicates the degree of competition of a particular export good in a foreign market. At the same time, it also reflects whether this export good has stronger monopolistic power.

2. Data description and estimation results

The sample data used in this study were obtained from the CEIC database. The monthly cross-section unit value indexes of the export prices (px_i) of 73 selected Harmonized System (HS) trade categories were matched to their equivalent foreign competitor prices. As the U.S. is the largest export market for China's goods, the foreign competitor prices are a proxy and are obtained from the U.S. Bureau of Labor Statistics, which provides the HS import price indexes for different commodities. The consumption indexes (CPIs) for different industries are used as a proxy for the domestic production cost (pd_i) and are obtained from the National Bureau of Statistics of China. The RMB-US$ exchange rates are monthly average values obtained from the China State Administration of Foreign Exchange (SAFE). The sample period is July 2005 to January 2009, for a total of 3139 monthly observations. Given the continuous appreciation of the RMB within the sample period, it is also worth reviewing the degree of the exchange rate pass-through to China's export prices and the impact on China's export competitiveness.

Tables 3 and 4 report the panel estimation results. These are based on the fixed-effects models of equations (5) and (6), which are run, respectively, for all 73 HS trade categories and for 14 different industrial groups based on these categories. From the estimated results of equation (5), it can be seen that most of the trade categories show a statistically significant negative effect of the exchange rate pass-through. The panel-estimated pass-through effect for all categories is about -0.485, which means that a 1% appreciation in the RMB would induce only a 0.485% upward adjustment in the overall export price[1].

The results of the disaggregate industrial-level group estimation show that a relatively larger degree of exchange rate pass-through on the export price is

[1] The degree of export price pass-through in China is smaller than that in Japan (Parson and Sato, 2008), most industrial countries (Campa and Goldberg, 2005) and most developing countries (Barhoumi, 2005).

exhibited in the (1) food and primary products, (2) mineral products, and (10) base metals and articles of base metal and steel categories and a relatively smaller degree in the following categories: (7) textiles and related products, (8) footwear, headgear, umbrellas, gaiters and the parts of such articles, (9) manufactured products, (13) optical, photographic, cinematographic and measuring instruments products, and (11) machinery and mechanical appliances. Obviously, the small degree of pass-through is basically consistent with the large percentage share of China's export goods which are traditionally labor-intensive with lower values added and lower monopolistic competitiveness.

Table 3 raises three interesting issues that need to be explained. First, there is a negative pass-through effect in most of the trade categories considered. In other words, the export prices of these goods experienced an upward adjustment following the RMB appreciation. Second, this effect in all of the trade categories was systematically small, which indicates that these goods face a relatively high degree of competition in foreign markets. Alternatively, it may indicate that China's export goods do not enjoy a strong degree of monopolistic competition. The relatively small pass-through effects indicate that exporters generally choose to cut their own markups to maintain their existing market share and export competitiveness. Third, export prices appear to be mainly driven by foreign competitors' prices rather than by local price levels. This may reflect the growth in China's total exports, during the period of RMB appreciation, may have served to reduce markups and squeeze the profit margins of the country's exporters.

Table 4 presents our analysis of whether there were any yearly structural differences in the pass-through. The panel estimation results of equation (6) show that the coefficients of the three yearly dummy variables (2006-2008) are significant overall. However, the results of the disaggregate estimations show that the pass-through effects were more significant in 2008 than in 2006 or 2007, which indicates that the RMB appreciation had an effect on export pricing strategies in the most recent period. This demonstrates that China's exporters now take exchange risks more seriously than they did at the earlier stages of the currency's appreciation.

In general, our panel estimation of the exchange rate pass-through effect shows that the appreciation of the RMB has had a significant effect on the pricing behavior of Chinese exports. At the same time, however, it is also evident that the level of competition in international markets is very high and that Chinese exports do not enjoy strong monopolistic power in these markets. Therefore, the relatively small pass-through of the RMB appreciation has resulted in exporters adopting a lower pricing strategy and has, consequently, squeezed their markups.

Conclusion

The motivation for this study was the RMB's appreciation since July 21, 2005, and its aim was to ascertain whether that appreciation has affected China's export prices by empirically measuring the degree of the exchange rate pass-through on those prices. Using 73 HS trade categories with cross-industry and time-series data from July 2005 to January 2009, the panel estimation of a fixed-effects model has been applied to measure the degree and stability of any exchange rate pass-through effects. The estimation results show that the export prices of most of the trade categories were affected by the exchange rate changes. The pass-through effect was generally small, at about -0.485, and statistically significant in most of the export prices. Relatively smaller, although still significant, pass-through effects were found in the trade categories of (7) textiles and related products, (8) footwear and related products, and (14) manufactured consumer products. Furthermore, the estimation results of the three yearly dummy variables also provide evidence to show that the pass-through effects were more significant in the more recent period of 2008, which indicates that China's export pricing strategy has recently increased awareness of exchange rate risks among exporters.

In general, the empirical results of this study indicate that, because there has been a relatively small degree of pass-through on export prices in the short run, the RMB requires a larger range of appreciation to improve the trade imbalance between the U.S. and China. In the long run, China would lose its export advantage and competitiveness if the RMB were to continuously and rapidly appreciate, because its export goods would no longer operate under strong monopolistic competition. At the same time, the expansion of China's export trade is squeezing the markups of the country's exporters. These exporters therefore need to re-think their export pricing strategy and determine whether they want to keep their market share and remain competitive, but sacrifice their markups and profit levels. The findings of this study also have implications for China's exchange rate policy. They suggest that it would be better for the RMB to appreciate slowly and gradually rather than radically. It is also clear that it would be in China's overall economic interest to allow freer flows of capital to reduce the pressure on the continuous appreciation on the currency and pave the way for improvements in export competitiveness and profit margins.

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Appendix

Table 1. China-US trade relationship (the US official statistics)
(million US dollars)

	US exports to China	China's share (%) of the US's total exports	US imports from China	China's share (%) of the US's total imports	US-China trade imbalances	China's share (%) of the US's total trade deficits
1985	3856	1.8	3862	1.1	-6	0.0
1986	3106	1.4	4771	1.3	-1665	1.2
1987	3497	1.4	6294	1.5	-2796	1.8
1988	5013	1.6	8511	1.9	-3489	2.9
1989	5755	1.6	11990	2.5	-6234	5.7
1990	4806	1.2	15237	3.1	-10431	10.3
1991	6278	1.5	18969	3.9	-12691	19.4
1992	7419	1.7	25728	4.8	-18309	21.7
1993	8763	1.9	31540	5.4	-22777	19.7
1994	9282	1.8	38787	5.8	-29505	19.6
1995	11754	2.0	45543	6.1	-33790	21.3
1996	11993	1.9	51513	6.5	-39520	23.2
1997	12862	1.9	62558	7.2	-49696	27.5
1998	14241	2.1	71169	7.8	-56927	24.8
1999	13111	1.9	81788	8.0	-68677	20.9
2000	16185	2.1	100018	8.2	-83833	19.2
2001	19182	2.6	102278	9.0	-83096	20.2
2002	22128	3.2	125193	10.8	-103065	22.0
2003	28368	3.9	152436	12.1	-124068	23.3
2004	34744	4.2	196682	13.4	-161938	24.9
2005	41837	4.6	243462	14.6	-201626	33.5
2006	55185	5.3	287774	15.5	-232588	28.4
2007	65236	5.6	321442	16.5	-256206	36.0
2008	71457	5.5	337789	16.1	-266332	39.3

Source: The U.S. Census Bureau.

Table 2. Ten major trade partners of the US trade deficits (percentage shares, %)

Rank	1	2	3	4	5	6	7	8	9	10
2008	China	Canada	Japan	Mexico	Germany	Saudi Arabia	Ireland	Italy	S. Korea	Taiwan
	39.3	11.02	10.73	9.51	6.32	6.25	3.38	3.05	1.96	1.63
2007	China	Japan	Mexico	Canada	Germany	Venezuela	Nigeria	Saudi Arabia	Malaysia	Italy
	36.0	12.7	11.43	9.96	6.88	4.57	4.62	3.88	3.25	3.22
2006	China	Japan	Canada	Mexico	Germany	Malaysia	Nigeria	Venezuela	Italy	Ireland
	28.4	10.8	8.9	7.8	5.8	2.9	3.1	3.4	2.5	2.5
2005	China	Canada	Japan	Germany	Mexico	Venezuela	Nigeria	Malaysia	Saudi Arabia	Ireland
	33.5	12.7	13.7	8.4	8.3	4.6	3.8	3.9	3.4	3.2
2004	China	Japan	Canada	Germany	Mexico	Italy	Venezuela	Malaysia	Ireland	S. Korea
	24.8	11.5	10.2	7	6.9	2.7	3.1	2.6	2.9	3
2003	China	Japan	Canada	Germany	Mexico	Ireland	Venezuela	France	S. Korea	Italy
	23.2	12.3	10.2	7.3	7.6	3.4	2.6	2.2	2.4	2.7
2002	China	Japan	Canada	Germany	Mexico	Italy	Taiwan	Ireland	Malaysia	France
	22	14.9	10.6	7.6	7.9	3	2.9	3.3	2.9	2
2001	China	Japan	Canada	Germany	Mexico	Taiwan	Italy	S. Korea	France	Malaysia
	20.1	16.7	12.9	7	7.2	3.7	3.3	3.1	2.5	3.1
2000	Japan	China	Canada	Germany	S. Korea	Malaysia	Taiwan	Mexico	Italy	Venezuela
	18.6	19.2	12.1	6.7	2.8	3.3	3.7	5.5	3.2	3

Source: The U.S. Census Bureau.

Table 3. The panel estimation results of the fixed-effects model – equation (5)

px_{it}	C	e_t	pd_{it}	pf_{it}	$\hat{\rho}$	$\overline{R}^2$	SEE	DW	N
Total	5.126**	-0.485**	0.077**	0.054**	0.823	0.983	0.035	1.786	3139
(1) Food & primary Pdt	6.933**	-1.087**	0.002	0.014	0.668	0.981	0.048	1.948	731
(2) Mineral Pdt (exclude oil)	9.665**	-1.703**	0.055	-0.270**	0.891	0.988	0.042	1.699	172
(3) Chemical & Allied Industries Pdt	4.616**	-0.581**	0.265	0.017	0.840	0.979	0.026	1.709	344
(4) Plastics & Articles, Rubber & Articles	-2.077	-0.155	1.501**	0.048	0.612	0.880	0.019	1.831	129
(5) Raw Hides & Skins, Leather, Furskins Pdt	4.026**	-0.260**	-0.108	0.360**	0.622	0.881	0.018	2.175	172
(6) Wood & Articles of Wood, Wood Charcoal & paper related Pdt	3.902**	-0.244**	-0.116	0.390**	0.613	0.903	0.033	1.857	172
(7) Textiles & Textile Articles	4.892**	-0.087**	-0.150*	0.129*	0.772	0.974	0.004	2.007	215
(8) Footwear, Headgear, Umbrellas, Gaiters & Parts of such Articles	2.047	-0.040	-0.014	0.587**	0.516	0.733	0.009	2.349	86
(9) Articles of Stone, Plaster, Cement, Ceramic & glassware	4.530**	-0.530**	-0.003	0.268**	0.659	0.889	0.027	2.019	215
(10) Base Metals & Articles of Base Metal	8.091**	-1.250**	-0.015	-0.096	0.893	0.981	0.039	1.446	301
(11) Machinery, Mechanical Appliances etc.	1.304**	-0.121**	0.008	0.759**	0.614	0.980	0.013	2.273	129
(12) Transportation, Vehicles, Aircraft, Vessel etc.	4.726**	-0.246**	0.001	0.094	0.553	0.911	0.009	2.262	172
(13) Optical, Photographic, Cinematographic, Measuring Inst. etc.	2.540**	0.109*	0.390**	0.005	0.775	0.879	0.003	2.124	86

Note: ** and * represent the t-values are statistically significant at 5% and 10%, respectively.

Table 4. The panel estimation results of the fixed-effects model – equation (6)

px_{it}	C	e_t	pd_{it}	pf_{it}	D06	D07	D08	$\hat{\rho}$	$\overline{R}^2$	SEE	DW	N
Total	5.430**	-0.587**	0.047*	0.062**	0.005**	0.004**	-0.007**	0.815	0.983	0.035	1.810	3139
(1) Food & primary Pdt	7.395**	-1.286**	-0.019	0.024	0.007	-0.001	-0.024**	0.655	0.980	0.047	2.008	731
(2) Mineral Pdt (exclude oil)	9.925**	-1.891**	0.082	-0.272**	0.009	-0.006	-0.030**	0.886	0.988	0.042	1.754	172
(3) Chemical & Allied Industries Pdt	4.572**	-0.634**	0.286	0.028**	0.002	0.002	-0.004	0.836	0.978	0.026	1.732	344
(4) Plastics & Articles, Rubber & Articles	-1.663	-0.273	1.334**	0.172	0.005	0.008	-0.021**	0.588	0.888	0.018	2.019	129
(5) Raw Hides, Skins, Leather, Furskins Pdt	3.887**	-0.285**	-0.080	0.374**	-0.003	-0.007*	-0.009**	0.656	0.878	0.018	2.111	172
(6) Wood & Articles of Wood, Wood Charcoal & paper related Pdt	4.027**	-0.317**	-0.159	0.436**	0.008	0.011**	-0.004	0.618	0.902	0.032	1.908	172
(7) Textiles & Textile Articles	4.710**	-0.095**	-0.124	0.141**	0.000	0.000	-0.001	0.766	0.974	0.004	2.021	215
(8) Footwear, Headgear, Umbrellas, Gaiters & Parts of such Articles	2.359	-0.090	-0.010	0.537	0.004	0.001	-0.001	0.537	0.726	0.009	2.405	86
(9) Articles of Stone, Plaster, Cement, Ceramic & glassware	5.064**	-0.705**	0.005	0.222**	0.005	-0.001	0.024**	0.664	0.893	0.027	2.109	215
(10) Base Metals & Articles of Base Metal	9.123**	-1.568**	-0.121	-0.076	0.011	0.011	-0.013	0.877	0.981	0.039	1.441	301
(11) Machinery, Mechanical Appliances etc.	1.149**	-0.129*	0.017	0.790**	-0.008	-0.013**	-0.014**	0.572	0.980	0.012	2.295	129
(12) Transportation, Vehicles, Aircraft, Vessel, etc.	5.139**	-0.318**	0.006	0.032	0.002	-0.001	-0.006**	0.546	0.912	0.009	2.342	172
(13) Optical, Photographic, Cinematographic, Measuring Inst. etc.	2.648**	0.098*	0.384**	-0.007	0.000	-0.003	-0.004**	0.725	0.881	0.003	2.030	172
(14) Manufacturing consumer Pdt.	1.261	-0.061	0.098	0.653**	0.001	0.000	-0.005	0.582	0.959	0.015	2.201	215

Note: ** and * represent the t-values are statistically significant at 5% and 10%, respectively.