

Pricing to Market in Chinese Foreign Trade

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Motivation

- In recent years, the Exchange Rate Pass-Through has become a hot issue in international economics and industrial economics and other related fields.
- July 21, 2005, China reformed the RMB exchange rate formation mechanism. A floating exchange rate regime, based on market supply and demand was carried out.
- It's interesting to see whether exchange rate reform promotes the competitiveness of export, considering China is the largest country in the world export.

Literature

- Many studies show that the exchange rate has incomplete pass, which means that exchange rate changes are not fully reflected to the price of exports;
- Export enterprises only pass part of the changes in exchange rates through price changes.
- Krugman (1987). Carew and Florkowski (2003). Shutao Cao, Wei Dong et al. (2015), Joseph P. Byrne et al. (2013), Sushanta Mallick et al. (2012)

Literature

For related research in China:

- There is a big difference in the ability of pricing to market among industries. Chen et al. (2010)
- The pricing to market (PTM) capacity of export enterprises have improved after the exchange rate reform. Ma (2010)
- Bi (2007) concluded that the SITC8 class (miscellaneous manufactured articles)and SITC7 class (machinery and transport equipment) export enterprises had more pricing to market power.

Research Question

- Do Chinese exports show different (asymmetric) PTM characteristics over the period 2000-2010 before and after the exchange rate reform.
- whether pricing to market behaviors show the same pattern if we look at it from the perspective of product?
- How to explain?
- This question has rarely been studied in existing literature

Main results

1. There is no PTM features in the export products with comparative advantage and without comparative advantage.

2. Most Chinese export products do not have a country heterogeneity of export pricing. What's more, when these products do not have the PTM features, their pricing power will be severely weakened in the target market country.

3. As time goes by, the Chinese exports enterprises' price fluctuations caused by the time factor is not obvious.

Empirical Model

According to Knetter (1989) model

consider a fixed-effects model of the form:

$$\ln P_{it} = \theta_t + C_i + \beta_i \ln r_{it} + u_{it} \quad (1)$$

Where θ_t is a time effect, C_i is a country effect, and u_{it} is error term, β_i captures exchange rates effect.

- Two-way fixed effects

Data

- The BACI database (2000 to 2010)
- Advantages:
 - 1.The database provide accurate information on the comparative analysis of a country's import and export.
 - 2.The database accurately processes the FOB-FOB mirror price, and re-evaluated the accuracy of the Import and Export Report in commodities.
 - 3.The database contains more than 5000 Categories and over 200 countries.

key variables

Table 1 The key variables list

No.	Variable names	The corresponding variable description
1	Export prices	The price of commodity i in year t
2	RMB nominal exchange rate	The RMB nominal exchange rate to the target country i in year t
3	time dummy	2000-2010
4	country dummy	The main import and export target countries include: Albania, Algeria, Afghanistan, Argentina, the United Arab Emirates, Aruba, Oman, Azerbaijan, Egypt, Ethiopia, Ireland, Estonia, Angola, Antigua and Barbuda, Austria, Australia, Macau, Barbados, Papua New Guinea, Pakistan, Paraguay, Bahrain, Panama, Brazil, etc. (176)

Effect of exchange rate fluctuations on Chinese exports price

- By using the model1, this article make a overall inspection on the impact of exchange rate fluctuations on Chinese exports of PTM during 2000-2010, the corresponding regression results are as follows:

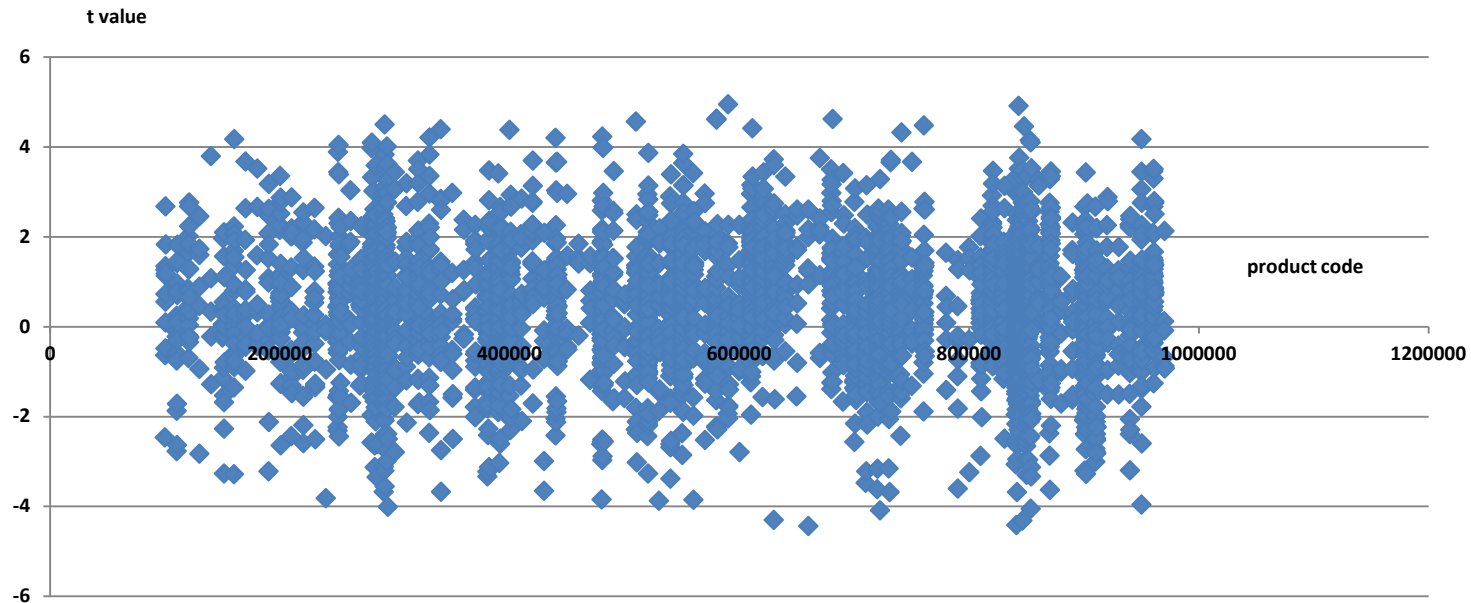


Figure 1 T-value distribution: Fluctuations in exchange rate under HS96 six yards standards influence Chinese export commodity price index.

I .Effect of exchange rate fluctuations on Chinese exports price

Table 2 P value distribution

Exchange rate coefficient significance level	frequency(%)	percentage(%)	Cumulative total (%)
1% significance level	294	6.99	6.99
5% significance level	382	9.08	16.07
10% significance level	296	7.03	23.10
Not significant	3236	76.90	100
total	4208	100	

==Table3==

Effect of exchange rate fluctuations on Chinese exports price

Period test: Table 4 Chinese export prices coefficient of significance level (p value) distribution table

Exchange rate coefficient significance level	Frequency (%)	Percentage (%)	Total (%)
1% significance level	138	3.29	3.29
5% significance level	203	4.83	8.12
10% significance level	169	4.02	12.15
Not significant	3,689	87.85	100.00
Total	4,199	100	

Note: under standard of HS96 six yards during 2005-2010 the impact of exchange rate fluctuations

Table 5 Chinese export prices coefficient of significance level (p value) distribution table

Exchange rate coefficient significance level	Frequency (%)	Percentage (%)	Total (%)
1% significance level	150	3.57	3.57
5% significance level	245	5.83	9.40
10% significance level	245	5.83	15.23
Not significant	3,563	84.77	100.00
Total	4,203	100	

note: under standard of HS96 six yards during 2000-2005 the impact of exchange rate fluctuations

I .Effect of exchange rate fluctuations on Chinese exports price

Conclusion one:

- There is no PTM features in the export products.
- Low value-added
- Strong reproducibility without strong international competitiveness

II .Country heterogeneity in Chinese export product pricing

1.Target market and major export product categories screening

- To make the country heterogeneity comparable
- Follow the market size of China's export trade
- we choose the EU, the US, Japan, ASEAN, Hong Kong, Korea, Canada as the main export market

II .Country heterogeneity in Chinese export product pricing

1.Target market and major export product categories screening

Table 6 Target market country's export product range distribution table

Product code	Product	Export product categories (unit)	product categories exports to the target market(unit)	Percentage (%)	Product code	Product	Export product categories (unit)	product categories exports to the target market(unit)	Percentage (%)
10	Grain.	12	2	0.17	55	Rayon staple.	109	23	0.21
12	Oil seed, fruit, cell grain, seed, fruit, etc.	25	7	0.28	56	Yarn; twine, rope etc..	32	24	0.75
13	Shellac; gum and other vegetable saps and extracts.	7	4	0.57	57	Carpets and other floor coverings.	21	6	0.29
14	Vegetable plaiting materials; vegetable products.	5	2	0.40	58	Special woven fabrics; lace; tapestries.	41	26	0.63
15	Animal / vegetable oils and their products, etc..	24	1	0.04	59	Dipping, coating, cover / composite fabric, etc..	24	11	0.46
16	Meat, fish or shellfish, such as the animal, etc..	23	4	0.17	60	Knitted or woven fabrics.	17	11	0.65
17	Sugar and sugar confectionery.	13	3	0.23	61	The art of clothing and apparel, knitted or crocheted.	106	68	0.64
18	Cocoa and cocoa products.	7	1	0.14	62	The art of clothing and apparel, knitted or crocheted.	114	65	0.57
19	Flour, starch, Cereals, milk, pastry products.	16	7	0.44	63	Other textile products, clothing, etc..	53	37	0.70
20	Vegetables, fruit, nuts or other parts of the plant.	40	9	0.23	64	Shoes, leggings etc.; parts of the foregoing articles.	26	21	0.81
21	Miscellaneous food, etc..	16	6	0.38	65	Jewelry and its parts.	10	6	0.60
22	Drinks, wine and vinegar.	17	3	0.18	66	An umbrella, a cane, a whip, etc.	7	6	0.86

II .Country heterogeneity in Chinese export product pricing

2.Analysis of the heterogeneity of the country of export products

Take the European Union, the United States, Japan, ASEAN, Hong Kong, South Korea, Canada as the seven main export market ,country heterogeneity of China's major export products are shown in Table 7

II .Country heterogeneity in Chinese export product pricing

2.Analysis of the heterogeneity of the country of export products

Table7 Fluctuations in prices of export products affected by country heterogeneity

Percentage Product code	Product	EU					ASEAN				Canada	America	Korea	Japan	Hongkong
		Germany	France	Netherlands	Great Britain	Spain	Philippines	Thailand	Singapore	Malaysia					
13	Shellac; gum and other vegetable saps and extracts.	0.50	0.50	0.75	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.25	0.50
32	Tanning, dyeing extract, pigment, etc..	0.59	0.48	0.48	0.41	0.37	0.48	0.41	0.30	0.41	0.37	0.26	0.15	0.22	0.41
33	Oil and perfume, cosmetics etc..	0.47	0.40	0.47	0.27	0.20	0.73	0.20	0.47	0.40	0.40	0.33	0.40	0.33	0.33
34	Soap, organic surface active agent, detergent, etc.	0.36	0.55	0.36	0.27	0.36	0.18	0.36	0.27	0.45	0.27	0.27	0.36	0.45	0.36
35	Protein; starch; adhesive; enzyme.	0.17	0.17	0.17	0.17	0.17	0.33	0.17	0.17	0.33	0.17	0.17	0.33	0.50	0.33
42	Leather products; Saddlery and harness; travel goods etc..	0.58	0.58	0.63	0.53	0.58	0.47	0.68	0.63	0.63	0.63	0.58	0.63	0.58	0.63
46	Production of straw, reed, etc..	0.00	0.40	0.20	0.20	0.20	0.40	0.20	0.40	0.60	0.20	0.20	0.20	0.20	0.20
49	Print books, newspapers, pictures and other products, etc..	0.27	0.27	0.18	0.45	0.27	0.64	0.27	0.27	0.55	0.64	0.18	0.45	0.64	0.45
56	Yarn; twine, rope etc..	0.33	0.33	0.38	0.38	0.38	0.63	0.38	0.46	0.58	0.33	0.46	0.29	0.33	0.33
58	Special woven fabrics; lace; tapestries.	0.27	0.27	0.31	0.23	0.27	0.35	0.35	0.35	0.27	0.38	0.27	0.35	0.35	0.35
60	Knitted or woven fabrics.	0.27	0.27	0.36	0.27	0.27	0.18	0.18	0.27	0.36	0.27	0.27	0.09	0.09	0.18
61	The art of clothing and apparel, knitted or crocheted.	0.34	0.26	0.26	0.28	0.35	0.43	0.40	0.31	0.37	0.31	0.34	0.40	0.46	0.41
62	The art of clothing and apparel, knitted or crocheted.	0.28	0.23	0.25	0.23	0.28	0.46	0.37	0.29	0.38	0.31	0.28	0.37	0.45	0.40
63	Other textile products, clothing, etc..	0.24	0.24	0.32	0.22	0.16	0.41	0.19	0.16	0.32	0.19	0.24	0.27	0.30	0.30
64	Shoes, leggings etc.; parts of the foregoing articles.	0.52	0.43	0.43	0.43	0.52	0.67	0.43	0.62	0.48	0.62	0.43	0.62	0.52	0.48
65	Jewelry and its parts.	0.17	0.00	0.17	0.17	0.17	0.33	0.33	0.33	0.33	0.67	0.17	0.50	0.67	0.33
66	An umbrella, a cane, a whip, etc.	0.67	0.83	0.50	0.50	0.67	0.67	0.33	0.50	0.50	0.67	0.67	0.50	0.67	0.67
67	Feather down; artificial flowers, etc..	0.60	0.80	1.00	0.80	0.80	0.60	0.80	0.80	0.80	0.60	0.60	0.40	0.80	0.80
68	Stone, gypsum, cement, asbestos, mica, etc..	0.40	0.40	0.52	0.28	0.32	0.52	0.36	0.36	0.40	0.48	0.40	0.36	0.40	0.52
69	Ceramic products.	0.30	0.25	0.30	0.25	0.20	0.50	0.30	0.25	0.30	0.35	0.30	0.40	0.35	0.35
70	Glass and glass products.	0.31	0.31	0.41	0.31	0.26	0.36	0.26	0.31	0.21	0.51	0.31	0.26	0.46	0.26

II .Country heterogeneity in Chinese export product pricing

3. The analysis of export products country heterogeneity by control the export products' PTM

- Take the EU, US, Japan, ASEAN, Hong Kong, South Korea, Canada as the major export market.
- when the PTM features of the export products are controlled, the country-pricing characteristics of Chinese enterprises exporting products are shown as Table 8 and Table 9.
- The proportion of the significant country pricing characteristics are shown in Figure 4, Figure 5.

II .Country heterogeneity in Chinese export product pricing

4. The analysis of export products country heterogeneity by control the export products' PTM

Table8 Fluctuations in prices of export products affected by country heterogeneity (Products with PTM behavior)

Categories	Product	Export product categories (unit)	Export product categories with PTM behavior (unit)	EU					ASEAN				Canada	America	Korea	Japan	Hongkong
				Germany	France	Netherlands	Great Britain	Spain	Philippines	Thailand	Singapore	Malaysia					
13	Shellac; gum and other vegetable saps and extracts.	4	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2
32	Tanning, dyeing extract, pigment, etc..	27	4	3	1	3	3	3	4	3	1	3	1	1	2	3	3
33	Oil and perfume, cosmetics etc.	15	5	4	4	4	2	2	4	1	4	3	4	3	2	3	2
34	Soap, organic surface active agent, detergent, etc.	11	3	1	2	2	1	1	2	3	1	2	0	0	3	3	3
35	Protein; starch; adhesive; enzyme.	6	1	0	0	0	0	0	1	0	0	1	1	1	1	0	1
42	Leather products; Saddlery and harness; travel goods etc..	19	10	6	6	6	5	6	5	8	6	6	8	8	7	6	7
46	Production of straw, reed, etc..	5	1	0	0	1	1	0	1	1	1	1	0	0	1	0	1
49	Print books, newspapers, pictures and other products, etc..	11	3	2	2	1	2	2	2	2	1	1	2	2	2	2	2
56	Yarn; twine, rope etc..	24	7	5	6	6	6	5	6	6	6	6	6	7	5	6	5
58	Special woven fabrics; lace; tapestries.	26	7	5	4	4	4	4	4	7	5	5	5	4	7	7	6
60	Knitted or woven fabrics.	11	2	2	2	2	2	2	2	2	2	2	2	2	1	1	2
61	The art of clothing and apparel, knitted or crocheted.	68	19	11	9	9	9	11	11	9	11	9	9	11	10	16	10
62	The art of clothing and apparel, knitted or crocheted.	65	22	9	9	11	8	9	13	12	10	13	10	8	10	13	11
63	Other textile products.	27	12	5	4	8	5	5	7	5	4	7	5	7	8	8	7

II .Country heterogeneity in Chinese export product pricing

3. The analysis of export products country heterogeneity by control the export products' PTM

Table9 Fluctuations in prices of export products affected by country heterogeneity (Products without PTM behavior)

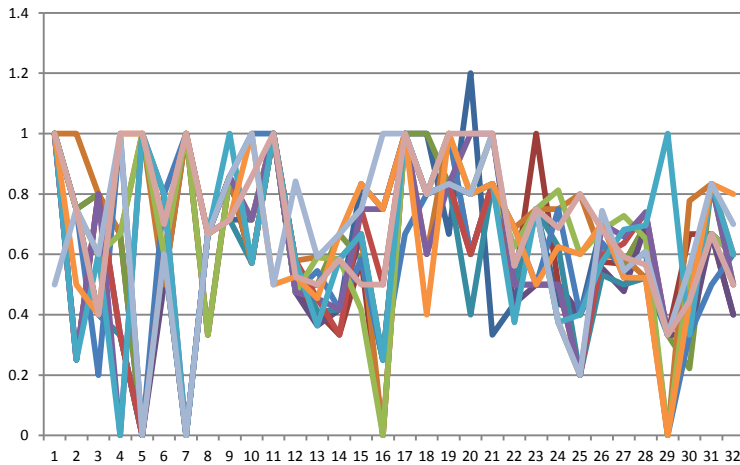


Figure 4 Fluctuations in prices of export products affected by country heterogeneity (Products with PTM behavior)

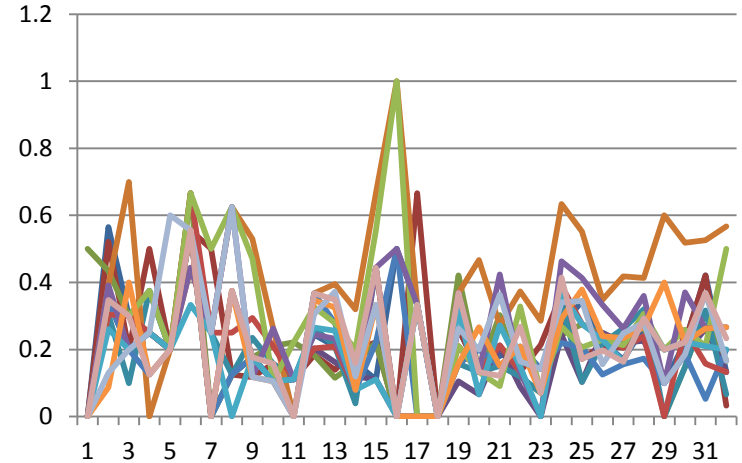


Figure 5 Fluctuations in prices of export products affected by country heterogeneity (Products without PTM behavior)

II .Country heterogeneity in Chinese export product pricing

The Second Conclusion:

- Most Chinese export products do not have a country heterogeneity of export pricing.
- Their pricing power will be severely weakened in the target market country when they do not have PTM features.

III. The temporal heterogeneity of Chinese export products' market pricing

- According to the time trend characteristic of all Chinese export enterprises.
- we screened out the number of product categories with significant time trend characteristic.
- Table 10、 Table 11 、 Figure 6,7,8.

III. The temporal heterogeneity of Chinese export products' market pricing

Table 10 Fluctuations in prices of export products affected by time heterogeneity

Categories	Product name	Product category (unit)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Specialization index
10	Grain.	12.00	3	4	4	5	4	1	2	3	3	4	7	0.29
11	Malt; starch; inulin; gluten.	22.00	10	10	4	3	4	2	1	2	2	5	5	0.19
12	Oil seed, fruit, cell grain, seed, fruit, etc.	25.00	14	6	3	3	4	7	2	4	7	6	11	-0.71
13	Shellac; gum and other vegetable saps and extracts.	7.00	3	2	2	1	1	3	2	1	2	3	4	0.52
14	Vegetable plaiting materials; vegetable products.	5.00	1	1	2	0	0	1	1	1	2	2	4	0.04
15	Animal / vegetable oils and their products, etc..	24.00	7	8	6	7	7	5	6	5	5	8	4	-0.82
16	Meat, fish or shellfish, such as the animal, etc..	23.00	7	6	10	4	6	6	4	4	6	7	3	0.93
17	Sugar and sugar confectionery.	13.00	5	6	7	5	4	3	4	3	3	3	4	0.17
18	Cocoa and cocoa products.	7.00	5	4	1	1	2	1	2	1	3	2	4	0.06
19	Flour, starch, Cereals, milk, pastry products.	16.00	8	7	5	2	2	4	3	4	4	2	7	0.31
20	Vegetables, fruit, nuts or other parts of the plant.	40.00	21	21	9	15	12	13	8	13	13	17	17	0.89
21	Miscellaneous food, etc..	16.00	8	9	6	5	4	6	6	5	5	5	3	0.42
22	Drinks, wine and vinegar.	17.00	5	5	3	4	6	7	7	6	7	7	9	0.06
23	Animal feed.	17.00	6	6	4	7	3	6	5	4	8	10	9	-0.12
24	Tobacco and products.	6.00	3	3	1	3	1	3	3	3	2	3	2	0.15
25	Salt; sulphur; plaster pad; lime and cement.	66.00	32	28	26	15	18	14	15	14	16	23	24	0.15
26	Ore, slag and fly ash.	14.00	9	7	7	4	4	5	4	4	3	5	5	-0.93
27	Mineral fuels, lubricants and their distillation products, etc..	30.00	16	11	13	13	12	10	8	9	11	11	17	-0.68
28	Chemistry; compounds; radioactive elements, etc..	162.00	87	86	61	54	53	49	52	50	70	68	70	0.26
29	Organic chemicals.	265.00	134	110	73	80	69	72	72	79	79	89	83	-0.15
30	Pharmaceutical products.	24.00	13	8	7	7	10	6	7	4	7	6	8	-0.08
31	Fertilizer.	22.00	14	10	5	9	6	6	7	6	14	10	9	-0.03
32	Tanning, dyeing extract, pigment, etc..	42.00	23	23	12	7	9	7	9	10	13	13	15	-0.01
33	Oil and perfume, cosmetics etc..	30.00	17	12	8	4	10	6	9	9	13	10	12	0.41
34	Soap, organic surface active agent, detergent, etc.	22.00	13	11	6	7	6	7	8	9	11	8	9	0.03
35	Protein; starch; adhesive;	12.00	9	6	4	4	6	5	6	5	7	8	7	-0.05

III. The temporal heterogeneity of Chinese export products' market pricing

Table11 Fluctuations in prices of export products by time heterogeneity affects-percentage

Percentage Product code	Product name	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Specialization index
10	Grain.	0.25	0.33	0.33	0.42	0.33	0.08	0.17	0.25	0.25	0.33	0.58	0.29
11	Malt; starch; inulin; gluten.	0.45	0.45	0.18	0.14	0.18	0.09	0.05	0.09	0.09	0.23	0.23	0.19
12	Oil seed, fruit, cell grain, seed, fruit, etc.	0.56	0.24	0.12	0.12	0.16	0.28	0.08	0.16	0.28	0.24	0.44	-0.71
13	Shellac; gum and other vegetable saps and extracts.	0.43	0.29	0.29	0.14	0.14	0.43	0.29	0.14	0.29	0.43	0.57	0.52
14	Vegetable plaiting materials; vegetable products.	0.20	0.20	0.40	0.00	0.00	0.20	0.20	0.20	0.40	0.40	0.80	0.04
15	Animal / vegetable oils and their products, etc..	0.29	0.33	0.25	0.29	0.29	0.21	0.25	0.21	0.21	0.33	0.17	-0.82
16	Meat, fish or shellfish, such as the animal, etc..	0.30	0.26	0.43	0.17	0.26	0.26	0.17	0.17	0.26	0.30	0.13	0.93
17	Sugar and sugar confectionery.	0.38	0.46	0.54	0.38	0.31	0.23	0.31	0.23	0.23	0.23	0.31	0.17
18	Cocoa and cocoa products.	0.71	0.57	0.14	0.14	0.29	0.14	0.29	0.14	0.43	0.29	0.57	0.06
19	Flour, starch, Cereals, milk, pastry products.	0.50	0.44	0.31	0.13	0.13	0.25	0.19	0.25	0.25	0.13	0.44	0.31
20	Vegetables, fruit, nuts or other parts of the plant.	0.53	0.53	0.23	0.38	0.30	0.33	0.20	0.33	0.33	0.43	0.43	0.89
21	Miscellaneous food, etc..	0.50	0.56	0.38	0.31	0.25	0.38	0.38	0.31	0.31	0.31	0.19	0.42
22	Drinks, wine and vinegar.	0.29	0.29	0.18	0.24	0.35	0.41	0.41	0.35	0.41	0.41	0.53	0.06
23	Animal feed.	0.35	0.35	0.24	0.41	0.18	0.35	0.29	0.24	0.47	0.59	0.53	-0.12
24	Tobacco and products.	0.50	0.50	0.17	0.50	0.17	0.50	0.50	0.50	0.33	0.50	0.33	0.15
25	Salt; sulphur; plaster pad; lime and cement.	0.48	0.42	0.39	0.23	0.27	0.21	0.23	0.21	0.24	0.35	0.36	0.15
26	Ore, slag and fly ash.	0.64	0.50	0.50	0.29	0.29	0.36	0.29	0.29	0.21	0.36	0.36	-0.93
27	Mineral fuels, lubricants and their distillation products, etc..	0.53	0.37	0.43	0.43	0.40	0.33	0.27	0.30	0.37	0.37	0.57	-0.68
28	Chemistry; compounds; radioactive elements, etc..	0.54	0.53	0.38	0.33	0.33	0.30	0.32	0.31	0.43	0.42	0.43	0.26
29	Organic chemicals.	0.51	0.42	0.28	0.30	0.26	0.27	0.27	0.30	0.30	0.34	0.31	-0.15
30	Pharmaceutical products.	0.54	0.33	0.29	0.29	0.42	0.25	0.29	0.17	0.29	0.25	0.33	-0.08
31	Fertilizer.	0.64	0.45	0.23	0.41	0.27	0.27	0.32	0.27	0.64	0.45	0.41	-0.03
32	Tanning, dyeing extract, pigment, etc..	0.55	0.55	0.29	0.17	0.21	0.17	0.21	0.24	0.31	0.31	0.36	-0.01
33	Oil and perfume, cosmetics etc..	0.57	0.40	0.27	0.13	0.33	0.20	0.30	0.30	0.43	0.33	0.40	0.41
34	Soap, organic surface active agent, detergent, etc.	0.59	0.50	0.27	0.32	0.27	0.32	0.36	0.41	0.50	0.36	0.41	0.03
35	Protein; starch; adhesive; enzyme.	0.75	0.50	0.33	0.33	0.50	0.42	0.50	0.42	0.58	0.67	0.58	-0.05
36	Explosives; fireworks; matches; alloys, etc.;	0.38	0.38	0.38	0.25	0.13	0.13	0.38	0.25	0.00	0.38	0.13	0.91
37	Photography or film products.	0.35	0.39	0.30	0.09	0.04	0.09	0.13	0.17	0.26	0.39	0.35	-0.02
38	Miscellaneous chemical products.	0.42	0.51	0.30	0.30	0.30	0.37	0.35	0.33	0.30	0.33	0.39	-0.12
39	Plastics and its products.	0.57	0.54	0.29	0.28	0.32	0.31	0.27	0.25	0.29	0.25	0.31	-0.10

III. The temporal heterogeneity of Chinese export products' market pricing

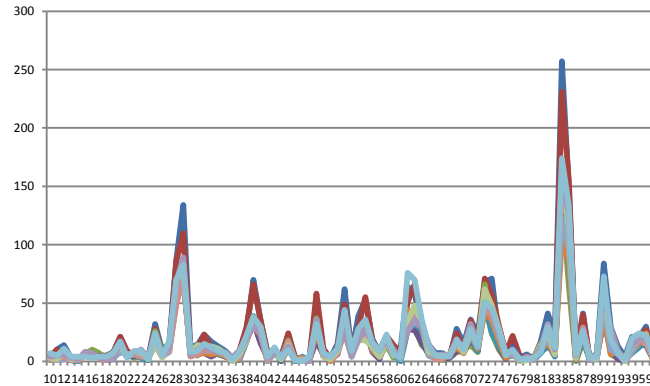


Figure 6 time trend characteristic of significant characteristics product categories

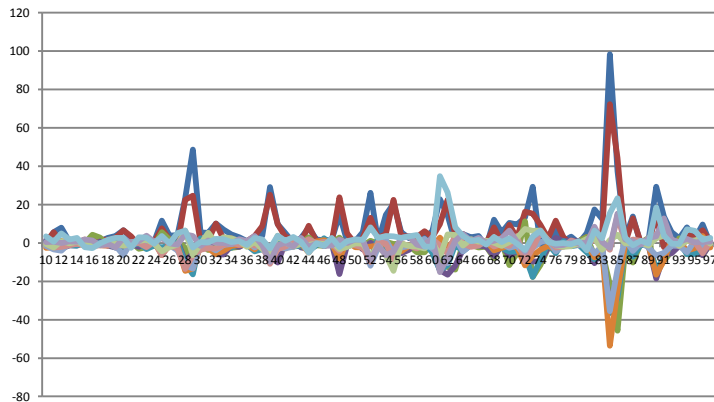


Figure 7 Deviation of product categories with time trend characteristics

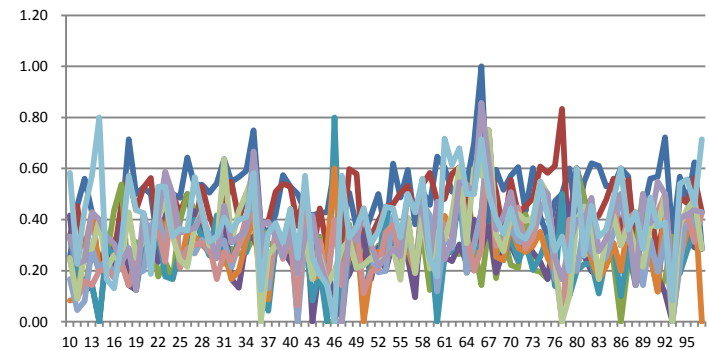


Figure 8 2000--2010 time trends that affect the pricing of Chinese exports relatively significant level of statistical analysis table (10% significance level)

III. The temporal heterogeneity of Chinese export products' market pricing

The third Conclusion:

- The majority of commodity's export price do not fluctuate as the change of time.
- China's production costs of the elements required have been in varying degrees of growth(Negative effects)
- From 2000-2010 all-factor productivity in China's export enterprises greatly improved(Positive effects)
- The positive and negative effects on the export products will cancel each other out, changes in export prices over time is not obvious.

Thanks!