Competitiveness – A Comparison of China and Mexico

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Abstract

Latin American countries have lost competitiveness in world markets in comparison to China over the last two decades. The main purpose of this study is to examine the causes of this development. To this end an augmented Ricardian model is estimated using panel data. The explanatory variables considered are productivity, unit labor costs, unit values, trade costs, price levels (in PPP), and real exchange rates in relative terms. Due to data restrictions, China's relative exports (to the US, Argentina, Japan, Korea, UK, Germany, and Spain) will be compared to Mexico's exports for a number of sectors over a period of eleven years. Panel and pooled estimation techniques (SUR-estimation, panel Feasible Generalized Least Squares (panel/pooled FGLS)) will be utilized to better control for country-specific effects (differences between American, Argentinian, Japanese, Korean, German, British, and Spanish markets), cross-section specific (sector-specific) effects, and correlation over time.

JEL Code: C23, F11, F14.

Keywords: Ricardian model of trade, panel data models, panel Feasible Generalized Least Squares, Seemingly Unrelated (SUR) estimation.

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1. Introduction

Latin American countries have lost competitiveness in world markets in comparison to China for the last two decades. The economic opening up of China, which was strategic and well planned, included the attraction of foreign companies and their know-how through special incentives such as tax exemptions, and through the creation of export-processing zones. Latin American countries, in contrast, tried to pursue unilateral and regional trade liberalization (creation of MERCOSUR, CAN, CACM). Their attempts to form Free Trade Agreements (FTAs) with the European Union (EU) and the US have not yet yielded results. Overall, Latin America's strategic planning of exports aimed more towards signing bilateral trade agreements (Mexico-EU, NAFTA, Chile-EU, Chile-US, etc.) with the objective to gain better mutual market access and was less focused on foreign direct investment (FDI).

Due to China's trade strategy, industrial development in the country has been rapid in contrast to development in the farm sector. China's top export sectors are automatic data-processing machines, telecommunication equipment, baby carriages, toys, games, sporting goods, footwear, and textiles. The best performing Chinese products in terms of export shares are television cameras, video recording/ reproduction equipment, furniture, footwear, jerseys, and pullovers (International Trade Center (ITC), based on COMTRADE statistics). China's main export markets are the US, Hong Kong, Japan, Republic of Korea, and Germany (UN COMTRADE statistics database, 2006). In comparison with China, Latin American countries, which are still strong in the agricultural and food-related sectors, lost influence in the manufacturing, machinery, and transport equipment sectors between 1995 and 2000 (TradeCAN, 2002 Edition). Latin American countries export mainly to the US, Germany, the Netherlands, France, Spain, and Portugal, according to UN COMTRADE statistics database, 2006.

The main purpose of this study is to examine the causes of this loss of Latin American trade share and to measure the effects of relative productivity, changes in relative unit labor costs, changes in relative unit values, and changes in the overall price level (in constant US dollar terms) on relative export strength. If we find that the loss of Latin America's competitiveness is more the result of China's exchange rate management, than any failure on the part of Latin America, then Latin America would have less reason for concern. If, however, the loss of competitiveness were more the result of China's increase in productivity, then Latin America should be concerned about its future standing in world markets.

There are few empirical studies attempting to disentangle the concepts of comparative and competitive advantage when examining export success. This distinction, however, is crucial for evaluating the development of market shares in certain sectors and certain markets, as well as examining their determining factors. We build on a study by Golub and Hsieh (2000) who empirically test the Ricardian model, explaining comparative advantage by differences in productivity and labor costs. There is little empirical evidence based on the Ricardian model, except for analyses by MacDougall (1951), Stern (1962), and Balassa (1963). Nonetheless, the simplistic view of productivity differences as source of comparative advantage is confirmed by international comparisons of productivity. The notion of competitive advantage, in contrast, is the key concept of the newer trade theories and of strategic-trade policy and continues to be a much-debated issue in developed and developing countries. After all, it is costs (labor costs, trade costs--transport costs, tariff and non-tariff barriers, insurance costs)) and prices that matter in trade and, together, they are an important factor in determining the success of a product even where product differentiation exists.

We try to extend the study of Golub and Hsieh (2000) by giving sectoral wages (unit labor costs) and prices (unit export values) adequate importance and by including trade costs, price-level indicators, and real exchange rates. We furthermore aim to identify sectors where success is driven more by product quality than by product prices (in terms of export unit values). An optimal model will therefore contain relative productivity, relative unit labor costs, relative export unit values, differences in trade costs, a control for different price levels, and different real exchange rates. Our study will build on a huge set of panel data and use panel and pooled-estimation techniques (SUR-estimation, panel Feasible Generalized Least Squares (panel/pooled FGLS)). In this panel data framework, we are able to control for unobserved heterogeneity of various types (country-specific and sector-specific) and also for time-driven effects.

In our analysis, we will limit ourselves to comparing China with a Latin American country having a very strong manufacturing industry, namely Mexico, in selected single markets (US, Japan, Korea, Germany, UK, Spain, and Argentina).[1]

2. Comparative and Competitive Advantage

We utilize an eclectic model that contains five components: comparative advantage, relative trade costs, relative product prices (as measured by unit export values), relative overall price levels at home and abroad, and relative real exchange rates. As to the first component, comparative advantage, we build on a Ricardian model (the Scandinavian variant of the Australian model (Salter, 1959; Swan, 1960, 1963)), in which labor is the only factor of production and where home (nontraded) goods and traded goods are produced with constant returns, (fixed coefficient production functions of the Leontieff-Walras type). Technology and hence unit labor requirements differ across countries.

1 A comparison between China and Brazil was impaired by data problems (lack of comparable productivity and labor compensation data) with respect to Brazil. Nonetheless, common to China and Mexico is the influence of multinationals and foreign direct investment (FDI).

Following Dornbusch (1977, 1980), comparative advantage in the Ricardian model is determined by unit labor requirements,

$$a = L \ / Q \tag{1}$$

where a is the number of units of labor required to produce a unit of value added (Q), and L is labor employed when producing a product in the home country. The a, the inverse of labor productivity, can be obtained from input-output tables.

The relative unit labor requirement A, our measure of comparative advantage, compares technical efficiency at home and abroad[2] (*) and is defined as

$$A \equiv a^* / a \tag{2}$$

In a two-country, multi-good Ricardian model, comparative advantage can be determined by ranking domestic and foreign labor productivity by sector (i =1,…, n).

$$a_1^* / a_1 > a_2^* / a_2 > ... > a_i^* / a_i > ... > a_n^* / a_n \tag{3}$$

To make fair comparisons of competitiveness between the foreign and home markets, the price of labor has to be viewed in a common currency since countries with low labor productivity are well able to compete if their wages are sufficiently low and/or their exchange rate is depreciated; analogously, countries with high labor productivity might be unable to compete in international markets due to (excessively) high labor costs and/or an appreciated exchange rate.

Relative unit labor costs c_i, therefore, relate to cost/price competitiveness, our alternative first component.

$$c_i = w_i^* a_i^* e / w_i a_i \tag{4}$$

2 In our empirical analysis, China stands for abroad and Mexico stands for home country.

where c_i stands for relative labor unit costs and is a measure of *competitive advantage*. w_i^* and w_i are labor costs (labor compensation) abroad and at home and e is the bilateral nominal exchange rate between abroad and at home.

Sector i has a competitive advantage in the home country if

$$c_i > 1 \quad (5a)$$

$$\text{or } a_i w_i < a_i^* w_i^* e . \quad (5b)$$

Under the assumption that the wage and price setting behavior at home and abroad is similar (similar power of labor unions and similar profit margins, etc.), the ratio of relative unit values (UV) [3] and labor compensation $\left((UV_{it}^* / w_{it}^* e)/(UV_{it} / w_{it})\right)$ could serve as an indicator of product quality, our second component. It could incorporate the aspects of differentiated products having variable quality standards and diverse product characteristics.

Following Deardorff (2004), we extend the concept of comparative/competitive advantage and control for trade costs tc_i, our third component, that arise when serving a certain market m (tcm_i). Taking into account trade costs, the home country will export a good to market m if unit export values (including trade costs) are lower/less than abroad. To control for differences in trade costs,[4] we utilize the variable $TCM_i = (tcm_i^* e) - tcm_i$ as an indicator for a trade cost advantage/disadvantage. In the empirical analysis, we will use TCM_i as a separate variable and do not include it into the term UV_i^* / UV_i.

3 $UV's$ are normally in US dollars. If not, they must be converted to a common currency.

4 Trade costs can comprise tariffs, transport costs, insurance costs, and the like.

As to our fourth component, differing price levels at home (P) and abroad (P*), we will take a look at the Purchasing Power Parity (PPP) theory. According to the PPP theory, prices (in a common currency) for traded goods at home and abroad should be the same in the absence of tariffs, transport costs, and the absence of spatial arbitrage, over the long run. In the short-to-medium time period, however, a relatively lower price (or cost) level is expected to promote trade.

We also accept that the market exchange rate e differs from the PPP exchange rate (e_{PPP}) in the short-to-medium term and that the short-to-medium term real exchange rate (RER) will also differ from RER_{PPP}. Thus the real exchange rate, our fifth component, can reflect the impact of exchange-rate management over the short and medium term.

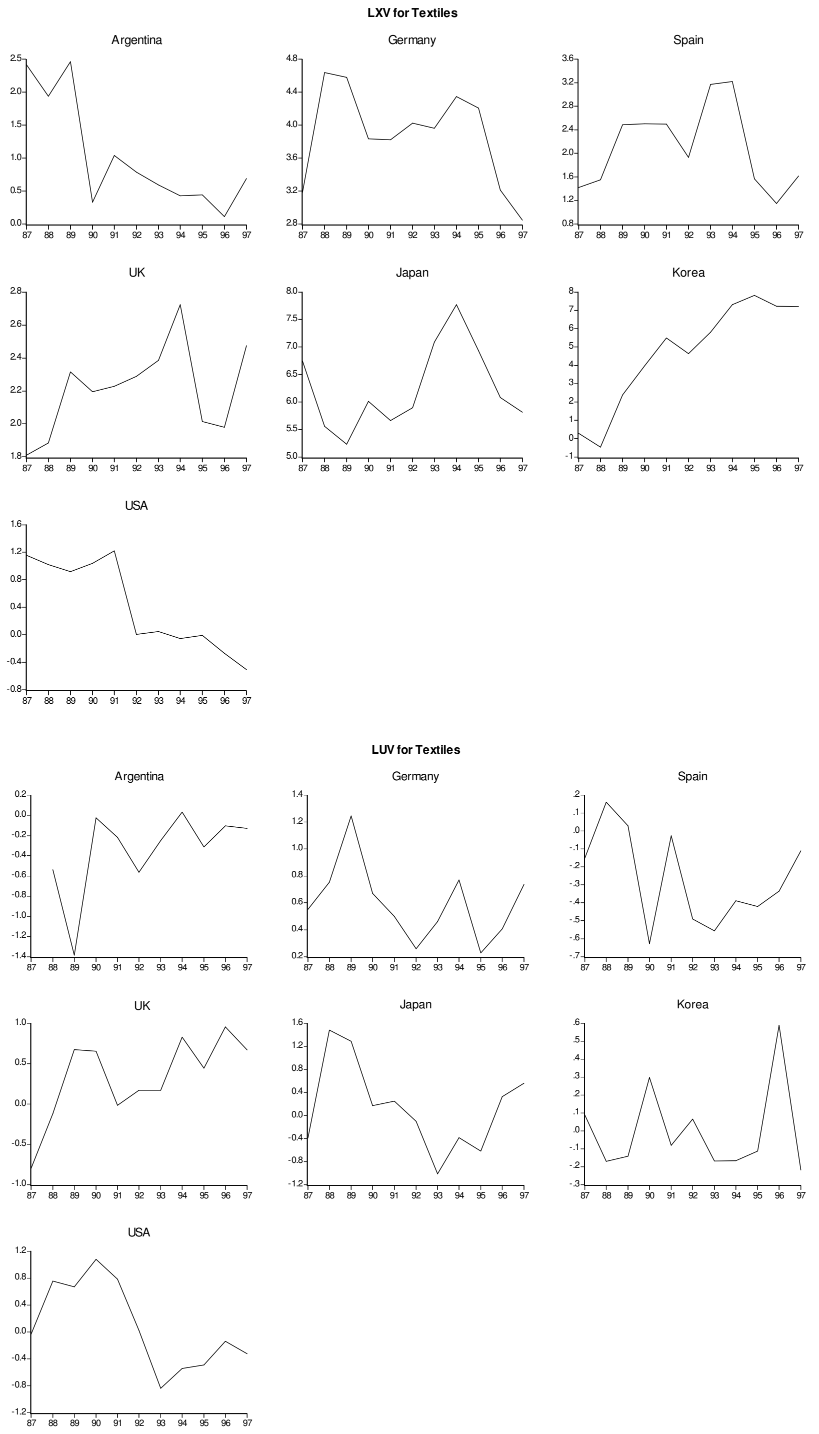
3. Empirical Implementation

3.1 Data and Variables

The main data source employed is World Bank's database (http://www.worldbank.org/trade) for sectoral exports in value and volume (1987-2004), export unit values (1987-2004), and value added per employee (1980-1997).[5] Sectoral data are organized according to the ISIC classification which unites trade and production data. Macro data were taken from the World Development Indicators of 2006. We used household final consumption expenditures per capita (in constant 2000 US dollars) as a proxy for labor costs (1980-2004) and computed bilateral real exchange rates (1980-2004) from WDI, 2006. The relative Chinese to Mexican export values and unit values for the different destination markets are displayed in Figure 1 in the example of the textiles sector.

5 Labor cost per employee (1980-1986) and unit labor costs (1980-1986) had too many missing values to include them in the pooled analysis.

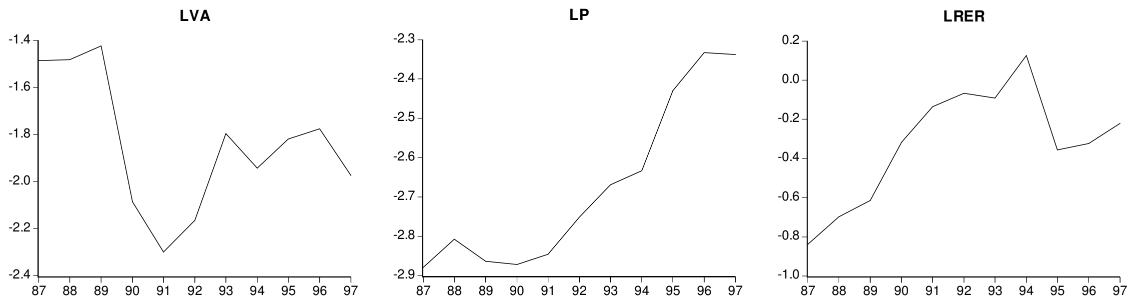
Figure 1 Development of relative export values (LXV) and relative unit values (LUV) for textiles to all destination markets, in logs



Distances were taken from http://www.maritimeChain.com/ and freight costs (based on Hufbauer, 1991, and Busse, 2003) were available from 1980 to 2004. A trade-cost variable is computed by multiplying the freight-cost index with the difference in actual nautical miles (the actual sea route that captains take) between the Chinese port and the Mexican port that is used by ships going to a certain market, e.g., the US.

We have the unfortunate situation of having data for relative productivity (LVA) from 1980 to 1997 and having relative export values (LXV) and relative unit values (LUV) from 1987 to 2004. The relevant sample period thus shrinks to 1987 to 1997. This is not long enough to use some specific estimation techniques examining all sectors (e.g.,system-of-equation techniques (such as SUR) cannot be utilized in some sectors due to a lack of observations).

Figure 2 Development of relative value added (LVA), relative household expenditures (LP) and relative real exchange rates (LRER), in logs



We try to capture the impact of relative labor costs by utilizing relative household expenditures (LP). The argument that the relative real exchange rate (LRER) and LP are both measures of relative real exchanges is true in general terms as both variables measure relative prices or costs. The argument is less true in the sense that relative household expenditures are a price measure for (only) private consumption, whereas the GDP-deflators that enter the LRER measure prices of private and public consumption, of private and public investment, and of exported and imported goods. Note that the correlation between both variables is quite low for the period observed (0.32). Furthermore, checking the impact of correlation between LP and LRER by leaving out either one of the variables did not change the significance, the amounts, or the signs of the coefficients. Both coefficients remained significant in the regression when both variables were in the regression, and the size stayed practically unaltered. The development of these dependent variables is displayed in Figure 2.

3.2 Selection of Destination Markets

We examine relative exports of China and Mexico to a total of seven destination markets. The destination markets were determined by means of the UN COMTRADE database (2007) according to the export value of 2005. Even though 2005 is not in the sample period, it gives us an idea of the markets that will be of relevance in the future. For both China and Mexico, the five most important export markets were selected. This yielded some overlap of countries (The US, the UK, and Germany are important export markets for both China and Mexico.) and some mutually excluding destination markets due to language/cultural ties and geographical distance (e.g., Argentina and Spain are interesting markets for Mexico, and Japan and Korea are the main export markets of China). Accordingly, the US, the UK, Germany, Japan, and Korea have been selected as China's most important export markets, whereas the US, Argentina, Spain, Germany, and the UK have been identified as Mexico's export markets of relevance. Germany and the UK are of utmost importance both for China and Mexico; Spain and Argentina are critically important for Mexico; Japan and Korea are China's predominant export outlets. However, Asian countries are becoming increasingly interesting, particularly for Latin American countries.

3.3 Model Specification

To test for the role of comparative and competitive advantage in our eclectic, mainly Ricardian model, we perform a panel regression analysis of the dynamics of Chinese and Mexican sectoral trade patterns over the period from 1987 until 1997. Export ratios (dependent variable*)* are considered a measure of trade following MacDougall (1951, 1952), Stern (1962), and Balassa (1963).[6] In contrast to the above-mentioned studies, we look at the ratio of exports of Chinese and Mexican exports to certain markets (Argentina, US, Japan, Korea, Germany, and Spain) and not to the world as a whole. The use of trade data (value and quantities) and of unit values is only justified when bilateral exports are considered.

The independent variables considered are: relative labor input (the inverse of labor productivity) in sector *i* at time *t*: $A_{it} = a^*_{it} / a_{it}$ (measure of comparative advantage), relative unit labor costs in sector *i* at time *t*: c_{it} (measure of competitive advantage), relative unit values in sector *i* at time *t*: UV^*_{it} / UV_{it} (possible component of price competitiveness and/or an indicator of quality), and P^* / P (measure of the impact of different cost levels) at home and abroad).

In a *first best data world*, we would set up the following equation for our ISIC sectors i and our seven destination markets j to describe the extended Ricardian model[7]:

$$\ln\left(X^*_{ijt} / X_{ijt} \right) = \alpha + \beta \ln(a^*_{it} / a_{it}) + \gamma \ln\left((UV^*_{ijt} / w^*_{it} e) / (UV_{ijt} / w_{it}) \right) + \delta \ln TCM_{jt} + \varepsilon \ln(P^*_t / P_t) + \phi \ln(RER^*_{jt} / RER_{jt}) + u_{ijt} \quad (6)$$

We consider two versions of equation (6). In the second version, relative productivity ($ln(a^*_i / a)$) is replaced by relative unit labor cost (*ln* c_i). X^*_{it} and X_{it} denote Chinese and Mexican exports to destination country *j* in sector *i* at time *t* and $\ln\left(X^*_{ijt} / X_{ijt} \right)$ stands for China's relative exports. The term "relative" stands for developments in China, as compared

6 These authors used the ratio of US to UK world exports as the dependent variable.

7 Subindices vary depending on whether the variables are sector and destination-market specific (ij), sector-specific (i), or destination-market specific (j).

to Mexico. We build a system of seven equations describing China's and Mexico's competitiveness in the markets of Argentina, Germany, Spain, UK, Japan, Korea, and the US. We expect a relative increase in Chinese technical inefficiency and a relative increase in Chinese unit labor costs to impact negatively on China's competitiveness. Therefore, we expect β to be negative. A bigger relative difference between unit export values and labor compensation could have either a negative sign (when consumers predominantly consider prices) or a positive sign (if consumers emphasize product quality). Furthermore, we think that an increase in China's relative trade costs will reduce China's relative exports and that a relative increase in China's cost and price level (proxied by household expenditures) will negatively impact China's competitiveness. Accordingly, we expect a negative δ and a negative ε. A relative increase in China's real exchange rate (a depreciation of RER^* in relation to RER) is supposed to promote China's relative exports. We therefore expect a positive ϕ.

Unfortunately, data restrictions concerning China, in particular, are severe (labor costs and, consequently, unit labor costs, are available only for the short time span of 1980 through 1986, whereas export volumes and values are only available from 1987 onwards. In a *second best data world,* we are therefore forced to reformulate our extended Ricardian model in the following way:

$$lxv_{ijt} = \alpha_j + \beta \; lva_{it} + \gamma \; luv_{ijt} + \delta \cdot TCM_{jt} + \varepsilon \cdot lp_t + \phi \cdot lrer_{jt} + u_{ijt} \tag{7}$$

where $lxv_{ijt} = \ln\left(X^*_{ijt} / X_{ijt} \right)$ = relative exports to market *j* in millions of US dollars (USD) (in logs); $lva_{it} = \ln(VA^*_{it} / VA_{it})$ = relative labor productivity (in logs) (the inverse of relative input coefficients). We expect a positive sign; $luv_{ijt} = \ln(UV^*_{ijt} / UV_{ijt})$ = relative unit export values in logs.

The expected sign is negative if price competitiveness prevails and positive if product quality is emphasized; TCM_{jt} = difference in transport costs (calculated as the difference between China's and Mexico's difference in distances times a freight cost index; this variable's impact can be positive or negative depending on the destination market[8], $lp_t = \ln(P_t^* / P_t)$ = relative household consumption expenditure per capita (constant 2000 USD) in logs, also an indicator of relative costs. The expected sign is negative; $lrer_{jt} = \ln(RER_{jt}^* / RER_{jt})$ in logs with the base year 2000. For the ratio of China's and Mexico's bilateral real exchange rate with respect to the destination market *j*; the expected sign is positive. The World Bank's database contains twenty-eight ISIC sectors. A few sectors have been withdrawn from the analysis due to severe data problems.

3.4 Estimation Procedure

The estimation procedure can be described as follows: In the first step, a pooled regression is run to get an overview of the relevant variables in each sector. This model-setup is estimated by Feasible Generalized Least Squares (FGLS), thus controlling for autocorrelation and non-stationarity of the series.

In the second step, a system of equations is built around the seven destination markets (Argentina, US, Germany, Spain, UK, Japan, and Korea). We control for correlation of the disturbances between the cross-sections (the above-mentioned seven countries) via Seemingly Unrelated Regression (SUR). By means of this method, correlation between the seven destination markets is considered. The system approach adds supplementary information to the non-system approach which was initially tested. The seven regressions (over the twenty-eight sectors for each destination market) yielded quite poor results.

8 No logs are taken. Unfortunately, sector-specific transport costs are not available. Availability of sector-specific transport costs would enrich the model and probably improve the explanatory power of our model.

In the third step, the system of equations is estimated with cross-section specific (country-specific) coefficients. However, it is only possible to use this method when sufficient data are available (such as in the textile sector).

4. Empirical Results: The Determinants of Competitiveness at the Sectoral Level

We present estimated results starting with a sector of utmost importance, namely textiles, where our data on export values and unit values were relatively more complete. Equation (9) was estimated with cross-section specific intercepts (country-fixed effects) and autocorrelation was controlled for with an AR(1) term. Adjusted R^2 was 0.92 and the Durbin-Watson statistic was 1.96 (see Table 1).

The signs of the coefficients are as expected, except for the variable TCM (transport cost disadvantage). This coefficient was supposed to be negative but it turned out to be zero, indicating that transport costs do not influence the Chinese-Mexican relationship in competitiveness. [9] We observed that the transport cost effect was very well reflected in the cross-section-specific intercepts. The intercepts were negative for the destination markets: the US, Argentina, Germany, Spain, and UK, where China has a transport cost disadvantage, and were positive for the destination markets Japan and Korea, where China has a transport cost advantage. Relative productivity (lva) and our proxy for labor costs (lp) were insignificant but show the correct sign. Relative unit values (luv) had a significant negative impact on relative exports, implying that an increase in Chinese relative unit prices leads to a decrease in Chinese relative exports. A depreciation of the relative real exchange rate (lrer) had a positive impact on relative Chinese exports.

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9 In fact, transport costs were zero or very close to zero for all twenty-eight ISIC sectors. Therefore, transportation costs were removed from the regression equations. The “zero”-impact might be due to the fact that we were forced to use to sector-unspecific transport costs due to unavailability of the data.

Table 1 Determinants of competitiveness (pooled analysis)

Dependent Variable: lxv				
Method: Pooled Least Squares				
Sample (adjusted): 1988-1997				
Included observations: 10 after adjustments				
Cross-sections included: 7				
Total pool (unbalanced) observations: 69				
Convergence achieved after 15 iterations				
VARIABLE	COEFF.	STD. ERROR	T-STATISTIC	PROB.
intercept	1.97	2.63	0.75	0.46
lva	0.54	0.44	1.24	0.22
lp	-0.22	1.07	-0.21	0.84
luv	-0.34	0.18	-1.87	0.07
lrer	1.07	0.65	1.65	0.10
tcm	0.00	0.00	2.49	0.02
AR(1)	0.65	0.10	6.70	0.00
Fixed Effects (Cross)			China/Mex:	
1--C	-6.10	Argentina	TC-disadv.	
2--C	-2.70	Germany	TC-disadv.	
3--C	-2.95	Spain	TC-disadv.	
4--C	-4.28	UK	TC-disadv.	
5--C	9.90	Japan	TC-advant.	
6--C	11.45	Korea	TC-advant.	
7--C	-5.92	USA	TC-disadv.	
	Effects Specification			
Cross-section fixed (dummy variables)				
R-squared	0.94	Mean-dependent var.		3.01
Adjusted R-squared	0.92	S.D. dependent var.		2.33
S.E. of regression	0.66	Akaike info. criterion		2.18
Sum-squared resid	24.60	Schwarz criterion		2.60
Log likelihood	-62.32	F-statistic		65.29
Durbin-Watson stat.	1.96	Prob. (F-statistic)		0.00

In the second step, we built a system of seven equations (one equation for each destination market) and estimated the model by SUR. This procedure is less restrictive and yielded fairly good results. Relative productivity (lva) and relative real exchange rates (lrer) had a positive significant impact and relative costs and relative unit values had a negative impact on Chinese relative exports, as expected. Table 2 shows the SUR results for all seven destination markets together.

Table 2 Determinants of competitiveness in seven markets (dependent variable lxv)

VARIABLE	COEFFICIENT	T-STATISTIC	P-VALUE
lva	0.52*	1.81	0.08
lp	-1.20*	-1.93	0.06
luv	-0.14	-1.34	0.19
lrer	0.78*	1.81	0.07
Total system obs: 69	1 weight matrix	$R^2 = 0.39$	
Sample: 1988-1997	21 total coef. iterations	DW=1.54	

Note: An AR(1) term was added. The coefficient was 0.78 and significant.

In the third step, a SUR was estimated with country-specific coefficients. luv was removed from the variable list, since it was statistically insignificant. Table 3 shows the SUR results for each of the seven countries.

We observe in Table 3 that almost all variables are significant (at conventional confidence levels). Furthermore, the Durbin-Watson statistics are now closer to two and the explanatory power of the regression equations has improved. The main message of Tables 1 to 3 is that the impact of transport costs is captured by the intercept of the pooled regression (see Table 1, Fixed Effects). China's transport cost disadvantage is reflected in the negative intercept of Argentina, Germany, Spain, UK, and the US, and China's transport cost advantage is reflected in the positive intercept of Japan and Korea. Low unit values (proxy for prices) of a textile product enhance textile exports, α being twenty percent (Table 2). In summary, for most countries, productivity, low costs, and a depreciated real exchange rate positively influence competitiveness in the textile sector. Although, a seemingly unrelated regression with country specific coefficients would be our model of choice, we have to admit that the results have to be handled very carefully due to the data limitations discussed before.

Table 3 Determinants of competitiveness at the country-level (dependent variable lxv)

VARIABLE	COEFFICIENT	T-STATISTIC	P-VALUE
Argentina			
lva	0.94**	2.86	0.01
lp	-1.99***	-6.52	0.00
lrer	-1.00***	-3.05	0.00
R^2=0.80	DW=2.38		
Germany			
lva	1.40**	2.87	0.01
lp	-1.86***	-4.36	0.00
lrer	0.90*	1.67	0.10
R^2= 0.70	DW=1.75		
Spain			
lva	1.78***	5.89	0.00
lp	-2.47***	-8.72	0.00
lrer	3.34***	10.75	0.00
R^2=0.84	DW=1.86		
UK			
lva	0.49**	2.38	0.02
lp	-0.30*	-1.87	0.07
lrer	1.13***	5.24	0.00
R^2=0.69	DW=1.93		
Japan			
lva	2.49***	3.80	0.00
lp	0.34	0.52	0.60
lrer	3.95***	5.53	0.00
R^2=0.66	DW=2.31		
Korea			
lva	-1.10	-0.72	0.47
lp	8.01***	6.48	0.00
lrer	5.25***	3.41	0.00
R^2=0.86	DW=1.66		
USA			
lva	-0.79***	-2.98	0.01
lp	-2.10***	-9.52	0.00
lrer	-1.50***	-5.40	0.00
R^2=0.90	DW=2.25		

Model (9) was estimated for the remaining ISIC sectors. The results are presented in the Appendix (Tables A1 and A2). Estimations are primarily based on the SUR technique. SUR is estimated with common coefficients for the system of seven equations. Due to data restrictions some variables had to be dropped from the regressions. The main results were:

In **furniture** trade lower relative costs and a more depreciated real exchange rate influenced Chinese exports positively. With respect to trade in **iron and steel and non-ferrous metals**, lower unit values and a depreciated real exchange rate had a positive impact on China's exports. Product quality (as reflected by higher unit values) was rewarded by an increase in Chinese **fabricated metal** exports as was a depreciated real exchange rate. Unit values did not play a significant role in China's exports of **electric and non-electric machinery**. A depreciated real exchange helped to some extent. Concerning **food** exports, low unit values determine export success. Consumers look for cheap nutrition. This may explain the success of low price supermarkets. In the trade of **wearing apparel**, in contrast, only a depreciated real exchange rate matters. Trade in **industrial chemicals** is positively determined by high productivity, low unit prices and a favorable real exchange rate, whereas trade in **beverages** profits from low costs in the production countries.

5. Conclusions

Even though the results reflect the heterogeneity of the ISIC sectors under examination, they do show that comparative advantage of the Ricardo type is relevant in some sectors (textiles and industrial chemicals). It also becomes evident that low cost countries do have a competitive advantage, at least in some export sectors (textiles, furniture, beverages). Low unit prices are important for export success in non-ferrous metals and food but they are unimportant in the majority of the other sectors under investigation. Almost all sectors do benefit from competitive real exchange rates what makes a prudent exchange rate management so attractive. In this study the impact of transports costs seems to be captured in the cross-section fixed effects (in the country fixed effects). Using a common intercept transport costs are significant and carry the correct sign[10].

10 In preliminary estimations with a common intercept for all seven countries the transport cost coefficient was significant, but the fixed effect model is better able to control for all sorts of country-specific characteristics.

Further research would be desirable on the cost side (labor costs, unit labor costs) of the analysis. We would have especially appreciated to have longer time spans thus making our estimation results more reliable. However, at the present time there are many data limitations that prevent utilization of the more sophisticated model (eq. (8)).

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Appendix

In Tables A1 and A2, we present our estimation results for some ISIC sectors with a sufficient number of observations. Table A1 shows the estimation results that were obtained using SUR and Table A2 contains the estimation results using Iterative Least Squares (ILS) or Weighted Least Squares (WLS). Insignificant variables were left out from the regression analysis. Autocorrelation was always controlled for. The inserted AR(1) was significant, but is not listed in Tables A1 and A2.

Table A1 Estimations based on SUR (dependent variable lxv)

VARIABLES	COEFFICIENTS	T-RATIOS	P-VALUES
Furniture (ISIC 332)			
Lva	-0.06	-1.52	0.13
Lp	-3.02***	-5.48	0.00
Lrer	0.75**	2.07	0.04
Iron and steel (ISIC 371)			
Luv	-0.67***	-4.59	0.00
Lrer	1.54**	1.98	0.05
Non-ferrous metals (ISIC 372)			
Luv	-0.17**	-2.42	0.02
Lrer	1.32***	3.22	0.00
Fabricated metal products (ISIC 381)			
Luv	0.12***(quality?)	4.23	0.00
Lrer	0.91***	3.24	0.00
Non-electric machinery (ISIC 382)			
Luv	0.03 n.s.	1.14	0.26
Lrer	1.04**	2.42	0.02
Electric machinery (ISIC 383)			
Luv	-0.01 n.s.	-0.14	0.88
Lrer	0.86	1.43	0.16
Wearing apparel (ISIC 322)			
Luv	0.11**(quality?)	2.04	0.05
Lrer	1.47***	4.10	0.00
Food (ISIC 311)			
Luv	-0.21***	-4.68	0.00

Table A2 Estimation results based on ILS or WLS (dependent variable lxv)

VARIABLES	COEFFICIENTS	T-RATIOS	P-VALUES
Industrial chemicals (ISIC 351)		**WLS**	
lva	1.51***	3.66	0.00
luv	-0.18**	-2.55	0.02
lrer	2.68***	3.36	0.00
Beverages (ISIC 313)		**ILS**	
lva	0.47	0.56	0.58
lp	-1.30	-1.40	0.17

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