Pricing in International Markets: A 'Small Country' Benchmark

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Abstract

This study examines exchange rate pass-through in a 'small country' context. The study uses a panel of disaggregated exports from Hong Kong to its major flexible exchange rate destinations since 1992. Most existing evidence on pass-through is taken from G7 countries and finds that export prices (in the importing currency) respond less than fully to exchange rate changes. The notable exception is for exports from the United States. Existing evidence suggests that exporters from the U.S. apparently do not mitigate export prices in response to exchange rates, while other countries' exporters routinely pass-through less than 100% of exchange rate changes. This study provides a benchmark by which to interpret the puzzling behavior of U.S. export prices.

Empirically, Hong Kong's export price behavior overwhelmingly supports the competitive paradigm. In only a few cases is there evidence of less than complete pass-through by Hong Kong's exporters. The panel data set also allows an additional question to be addressed. In particular, there is no evidence of differences in pass-through across export destinations. Thus, by inference, near complete pass-through by U.S. exporters suggests similar competitive behavior.

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1. Introduction

How do exporters respond to exchange rate changes? Simple, competitive models predict that the import price in local currency will vary proportionately with the exchange rate. However, it has been widely observed that the response of export prices to exchange rate changes depends on both the country of origin and the particular industry being considered. What is puzzling about the consensus is that exporters from one country - the United States - apparently price their exports irrespective of exchange rates, while other exporting countries regularly mitigate foreign currency price fluctuations due to exchange rate changes. That is, non-U.S. exporters typically 'price to market', while U.S. exporters fully 'pass-through' exchange rate changes to prices denominated in importer's currency.

This is a puzzle because the two methods of pricing exports suggest different effects on exporters' profit margins, and hence differences in market power. According to the standard competitive model, local currency prices of imports should vary in proportion to the exchange rate (see e.g., Dornbusch 1987, Krugman 1987). Thus, greater pricing to market (PTM) is associated with greater market power, since by definition it requires both market segmentation and the ability to vary markups. Beyond this puzzle, interest in exchange rate pass-through and PTM is intimately associated with the macroeconomic transmission of shocks via exchange rates, inflation, and the current account. Finally, note that a finding of differences in PTM behavior across countries underscores the continued existence of differences in competitive conditions despite increased global economic integration.

The puzzle is ironic since it suggests that U.S. exporters typically have less market power than do non-U.S. exporters, and that U.S. exporters are potentially more damaged by exchange rate volatility than their non-U.S. counterparts.[1] Moreover, there is considerable confusion over this issue as recently reported declines in pass-through (McCarthy 2000) appear to be at odds with increased global integration, and have been interpreted as a *decrease* in the pricing power of firms (Taylor 2000). Perhaps some of the confusion arises due to the apparent failure of the 'small country' assumption when applied to the United States. That is, if the U.S. domestic market accounts for a significant fraction of global consumption, world prices may adjust subsequent to the pass-through by non-U.S. exporters. Hence, the ultimate effect will be apparent pricing to market.

Another difficulty in interpreting these PTM results (especially those studies involving the United States) concerns the impact of invoicing in the importer's currency. As noted by Gosh and Wolf (1994) and by Bleaney (1997), stickiness of nominal prices in local currency can lead to a spurious finding of PTM, at least in the short-run. Moreover, as noted by Goldberg and Knetter (1997), there is a similar short-run bias *against* finding PTM when invoicing is in the exporter's currency. Hence, there is a real sense in which additional data may help resolve this puzzle.

1 Of course, failure to vary markups does not imply that markups are zero. This also suggests U.S. exporting firms may have greater incentive to hedge than non-U.S. exporters.

To date, most empirical evidence regarding export pricing is based on the experience of G7 economies (see Goldberg and Knetter 1997 for an excellent review of several strands of related research). The purpose of this study is to examine the empirical evidence on pricing to market in the context of a small open economy, vis., Hong Kong SAR. The case of Hong Kong is interesting for several reasons. First, it has a history and reputation of fierce domestic competition and open markets. Openness, defined as the ratio of imports plus exports to domestic GDP, is typically in excess of 300%, a number far in excess of the representative G7 countries. As a result, the export market is of primary importance, and the openness limits exporters' ability to subsidize foreign sales with protected domestic markets. Second, with less than one-half of one per cent of world GDP, Hong Kong would by most definitions more closely fit the 'small country' assumption of the standard competitive model. Moreover, the composition of domestic consumption is arguably only loosely related to that in the U.S., which would preclude viewing Hong Kong as part of an 'extended' United States. Finally, this study focuses on a unique data set of disaggregate bilateral exports, commodity by country, for the nine-year period 1992-2000. These represent the most detailed data available on Hong Kong's external trade. The importance of the level of disaggregation will be discussed more fully below.

The effect of Hong Kong's peg to the U.S. dollar (as it relates to export pricing) deserves comment. First, it is obvious that it is not possible to study the effects of exchange rate changes on export prices if there is no variation in the exchange rate. For this reason exports to the United States are excluded. Similarly, exports to the Mainland of China are excluded. In this study, the focus is on Hong Kong's next eight largest trading partners; there is ample bilateral exchange rate variation vis-a-vis this group. Secondly, the invoicing problem may be an issue given that the Hong Kong dollar is pegged to the U.S. dollar. As discussed above, this issue is especially important for short-run analysis. Hence, the analysis in this study is conducted at an annual frequency. Thus, in the context of export pricing to non-U.S., non-Mainland Chinese destinations, the peg should be of secondary importance.

The next section sketches the textbook derivation of export pricing in the simplest possible context. The resulting first order condition is well known and surprisingly general; perfect competition and monopoly are special cases. This section also discusses estimation issues and the advantages that a combined cross-section time-series approach affords. Section 3 discusses the data examined. Section 4 presents the estimation results and a final section concludes.

2. Factors Influencing Pass-Through

Starting with the textbook model of perfect competition, profit maximization implies price equals marginal cost, or, $P_i = C_i$, where, P_i is the price of the i^{th} good. If the good is traded internationally, the price in foreign currency, P_i^*, is simply $P_i^* = C_i/S$, where S is the domestic currency price of foreign exchange. With constant marginal cost, pass-through, i.e., the elasticity of foreign currency price with respect to the exchange rate ($d \ln P^*/d \ln S$), is equal to one (in absolute value). Thus, in the small country, perfect competition benchmark, local currency import prices fully reflect exchange rate changes.

If we relax the perfect competition assumption, the first order condition must include a markup:

$$P_i^* = \lambda C_i/S, \quad (1)$$

The markup (λ) is a function of the elasticity of demand (ε), $\lambda=\varepsilon_i/(\varepsilon_i-1)$. Thus, pass-through can be less than complete if the markup varies. As noted by Goldberg and Knetter (1997) the condition in equation (1) is actually more general than the simple textbook monopoly case. On the one hand, we can consider the elasticities to be associated with a residual demand curve that takes into account the firm's perceptions of competitors' responses to changes in the firm's price. Additionally, the perfect competition case is also a special case of equation (1) when the demand elasticity is infinite.

Thus to estimate pass-through or PTM, empirical measures of marginal cost and factors influencing markups need to be obtained. Traditional estimates of pass-through, e.g., Mann (1986), are derived from linear regressions of equation (1) using aggregate (e.g., import price index) data.[2] Typically these equations include a cost index, e.g., a domestic wholesale price index, and import demand shifters, e.g., a competing price and importer's income. In these studies, pass-through to the U.S. was typically found to be around 60%, changes in markup thus accounted for the residual 40% of the exchange rate change.

Two problems with these estimations include measurement error and simultaneity bias. If marginal costs are not well approximated by cost indices, which is likely, and this measurement error is correlated with the equation disturbance, then OLS estimates will be biased. Moreover, Goldberg and Knetter (1997) suggest the measurement error of existing cost indices may be correlated with exchange rates such that pass-through estimates are biased downward. In their example, foreign outsourcing increases this problem. While this is certainly a problem for estimation, it is not clear why measurement errors would produce relatively more downward bias for pass-through to the U.S. than elsewhere. The second, related problem, afflicting these early estimations is simultaneity bias. At the aggregate level, exchange rates and prices are both endogenous variables. Thus by definition, the exchange rate will be correlated with the disturbance term and, as before, OLS estimates will be biased (see, e.g., Parsley and Popper 1998).

Both of these issues suggest a different estimation procedure is appropriate. Consequently, the empirical approach adopted here follows that developed in Knetter (1993). The econometric problems discussed above are mitigated by the estimation method and by the choice of data. The empirical model is an analysis-of-covariance model, and it is estimated via a fixed-effects regression model. The model is estimated using a panel of disaggregated export unit-value data from Hong Kong to the top eight export destinations simultaneously. Markups and marginal costs are not directly observable, but including a full set of time dummies in the estimation controls for common (across destination) movements in price. As noted by Knetter (1993), the interpretation of the time effects as capturing the behavior of marginal cost is over simplified when more than one firm is in the export sector. He notes that the model still controls for common, underlying changes in industry cost.

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2 Typically, estimations are in percentage change form, i.e. variables included in regression equations are first-differenced, natural log values.

The extent of pricing to market, then, will be measured by changes in destination-specific exchange rates. Other factors such as income and competitors' prices in the destination market may be important for establishing the absolute level of prices in the export market, but (relative) changes in these variables will generally be of much smaller magnitude than the corresponding bilateral exchange rate. Thus, in terms of export prices, the model to be estimated is:

$$\Delta p_{jt} = \theta_t + \beta_j \Delta s_{jt} + \mu_{jt} \tag{2}$$

In equation (2), lower case letters indicate natural logarithms, and Δ represents the first-difference operator. The subscripts now refer to country j at time t. It is thus a generalization of equation (1) in that the condition now considers an exporter selling the same product to multiple markets. The error term μ_{jt} is assumed to be independently and identically distributed with mean zero and variance σ^2_{μ}. The model is estimated separately for each export product examined.

The statistical interpretation of the βs is straightforward. PTM requires a nonzero estimate of β; in particular PTM occurs when $\beta < 0$. A value of zero for β implies that markups do not vary in response to exchange rate changes. Thus pass-through would be complete.

Two additional points merit discussion. First, the model is estimated using annual data. Recent research has indicated short-run exchange rate changes may not be passed through if they are thought to be temporary (e.g., Froot and Klemperer 1989, and Parsley 1995). Related, is the problem of invoicing currency noted previously. If exporters invoice in the importer's currency, estimates of pass-through using high frequency data are spuriously biased downward, simply because of infrequent price adjustment (see e.g., Marston, 1990). Consequently, annual data are employed in this study. Annual data have the further benefit that measurement issues are less severe, since in higher frequency data could more easily be influenced by changes in the composition of exports within a given category. That is, the unit-values are likely to have a higher noise content at higher frequencies. Finally, the data are disaggregated to the greatest extent possible. At a disaggregated level exchange rate changes can arguably be treated as exogenous.

3. Data

The original source data for this study are domestic exports (Hong Kong dollar) value and quantity, disaggregated to the five-digit SITC commodity level, from the *Hong Kong Trade Statistics: Country by Commodity Domestic Exports and Re-exports*, published by the Census and Statistics Department of Hong Kong SAR. For this study, the data were taken from the CD-ROM, *Hong Kong External Trade, Volume 5 (1992-2000)*.

Unit-value data have well known limitations as proxies for price (see e.g., Kravis and Lipsey 1974). In particular, unit-values may change due to changes in the commodity composition of trade. The problem is especially salient at the aggregate level. Hence the focus of this study is on unit-values at the most disaggregated level possible in the data. Other authors have used apparently even greater disaggregations, e.g., Knetter (1989, 1993) uses seven-digit industries, and Takagi and Yoshida (1999) examine nine-digit industries. However, on closer inspection, the unit-values employed in this study appear to be of a comparable level of disaggregation. For example, Knetter examines beer, autos over two liters, books, and snap action switches, while Takagi and Yoshida examine plugs and sockets, microscopes, and brakes and parts. Some examples of the data included in this study are soy sauce, children's picture, drawing or coloring books, and playing cards.

Despite this level of disaggregation, there still remains the possibility for measurement error, and Hong Kong's entrepot trade data provides some unique perspective on the extent of the problem.[3] Specifically, unit-values are computed for Hong Kong exports as well as for Hong Kong re-exports. These unit-values are in many cases strongly related, however, evidence is presented below that there are differences in unit-value movements between these two data sets. Such differences presumably (largely) reflect differences in the composition of the five-digit categories. Hence all of the analysis in this study uses both sources - exports, and re-exports. None of the paper's conclusions are dependent on the particular unit-value series chosen. Additionally, it should be reiterated that this is the best data available. Finally, from a purely statistical standpoint the issue involves the dependent variable - thus any measurement errors are incorporated into the disturbance term. Statistical problems in this case are arguably less severe than those related to mismeasurement of an independent variable.

For this study the top eight export destinations were chosen, ignoring the fixed exchange rate destinations of China and the United States. Twenty-nine five-digit export commodities were chosen from across the full spectrum of export (type) classifications. Separately, these twenty-nine products are studied as purely re-export products as a robustness check on the data. Overall, the aim was to provide variation in terms of the types of products chosen, and to choose important export industries. Thus despite using micro-data, the goal was to be representative - and, not dependent on a particular product or single export destination. Finally, the goal in choosing the largest export destinations was to improve the accuracy of the unit-value data as a measure of price and to minimize the number of missing observations.

Econometrically, a key requirement of the data is for the commodities to be exported to as many of the export destinations as possible. This is the important variation that enables the common change in markups or marginal cost to be more accurately estimated. Unit-values were constructed as the value of exports of the good divided by the quantity exported. We begin by looking at domestic exports and subsequently examine domestic re-exports.

3 That is, this data set permits two unit-value series to be computed for each export product and country. In principle, these series measure the same thing - especially for non-branded goods. To my knowledge, this feature is unique to Hong Kong's external trade data.

Table 1 lists the countries, goods, and the time period included in this study. Note that excluding the Mainland of China and the United States has a dramatic effect on Hong Kong's measured trade. The next largest eight trading partners make up only roughly 25% of Hong Kong's external trade.

The data are available at the monthly frequency. However, at this level of disaggregation there is wide variation in traded volumes. This erratic variation could increase the amount of noise in the unit-value series - particularly in cases where there is heterogeneity within the product category. Thus the analysis in this study is conducted at the annual frequency. As another precaution against the impact of large data outliers, the tables below report analysis here, the top and bottom 1% of the data have been discarded. This filter affects none of the qualitative conclusions reported below.

The nominal exchange rate data were obtained from the CEIC database, and wholesale price indices were obtained from the April 2001, International Financial Statistics CD, except for Taiwan, where data from CEIC was used. Real exchange rates were constructed as equal to the nominal exchange rate deflated by the wholesale price index in the export market.

4. Estimation Results

Prior to reporting regression results examining PTM coefficients we begin with a comparison of the two export unit-value series available in this panel, i.e., the series computed from Hong Kong domestic exports, and those computed from Hong Kong's re-exports. If these two series do indeed measure the same thing, their movements should be positively correlated. A strong test of this hypothesis is whether, after controlling for individual effects (α_j), the two series move together. More formally, the test would be whether $\hat{\gamma} = 1$ in equation (3). Note that, as before, Δp represents the first difference in log price.

$$\Delta p_{jt}^{\text{exports}} = \alpha_j + \gamma \Delta p_{jt}^{\text{re-exports}} + \mu_{it} \tag{3}$$

Table 2 reports the results from the twenty-nine separate regressions. In column 1 the coefficient estimates for γ are given and the *p*-values are in parentheses. Notice that the coefficient estimates range from *negative* 0.252 to 1.088, and the adjusted R-squared statistics are similarly dispersed, but generally appear small. Indeed, in only five equations is more than 50% of the variation in the domestic export unit-value explained by the estimated regression. Among the estimates of γ, the results are slightly more encouraging. Eighteen of the positive coefficients are statistically significant at the 5% level, and none of the negative coefficients is statistically significant. Finally, column 3 reports the F-statistic for the null hypothesis that $\hat{\gamma} = 1$; fully half of the equations reject this hypothesis. As noted above, this result suggests measurement error in these unit-value series. Unfortunately, there is no way to determine which series is more accurately measured. Hence all subsequent analysis will examine domestic exports and re-exports separately.

Table 3 presents PTM estimates for domestic exports for the twenty-eight separate export industry estimations. As before, the estimation period is 1992-2000. First note that the model as outlined by equation (2) allows the PTM coefficient (β) to vary by destination country. However the table reports results imposing the constraint that β was the same across countries. Likelihood ratio tests of this restriction are reported in the final column of Table 3. The restriction is not rejected for any of the equations. This is consistent with the hypothesis that PTM behavior does not depend critically on the destination market. Hence, we focus on the results of the constrained regressions.

Table 3 presents results using the nominal exchange rate as the measure of the exchange rate. Knetter (1993) argues the optimal export price should be neutral with respect to changes in the nominal rate that correspond to inflation in the destination market. Hence he reports estimates using the real exchange rate. One problem of this adjustment is that measurement error is introduced to the extent that the overall inflation rate diverges from the rate of change of the i^{th} commodity. Moreover, Parsley and Popper (1998) argue that central banks that are primarily concerned with the behavior of prices will use monetary policy to try to insulate prices from exchange rate changes. Prices then appear unresponsive to changes in the exchange rate. The observed relationships between prices and the exchange rate will reflect central bank actions instead of the underlying relationship between exchange rates and prices. Thus endogeneity of monetary policy can bias estimates of pass-through downward. For these reasons, in this study, β was estimated using both nominal and real exchange rates for robustness.

For each of the bilateral country pairs, Figure 1 plots changes in logs of both the nominal and real exchange rate series. These two series are strongly related for all eight countries. This suggests that the choice of exchange rate (real or nominal) will probably not matter much for estimates of pass-through. Indeed, none of the conclusions in this paper are affected by the exchange rate (real or nominal) used in the estimations. Thus Table 3 reports estimates using the nominal exchange rate.

The estimates of β are given in the first column of Table 3, and the *p*-values are given in parentheses beneath each estimate. Roughly half of the point estimates imply local currency price smoothing. More importantly, there are only seven statistically significant estimated βs in Table 3, and three of these imply local currency prices exacerbate exchange rate movements. Hence, we find local currency PTM in only four cases. This is in stark contrast to what Knetter (1993) finds for Germany and Japan, where more than half of the products he studied display statistically significant PTM.

Most studies of the Hong Kong economy recognize the historical importance of its role as an entrepot. Hence Table 3 focused on Hong Kong exports only. However, for this study the distinction between purely domestic, and so-called re-exports, is less compelling. Moreover, as noted in Table 2, the export unit-value series computed from domestic exports and those for re-exports are less than perfectly correlated. Thus, in Table 4 the analysis is repeated for Hong Kong's re-exports. For comparability, the same goods are studied as before.

Table 4 conveys much the same story as Table 3. Namely, less than one third of the point estimates of the pass-through coefficients are negative, and all three of the statistically significant coefficients are greater than zero - implying local currency prices amplify exchange rate movements. Thus, again we cannot reject the hypothesis that exporters from Hong Kong pass-through 100% of all exchange rate changes to local currency import prices. This is exactly the 'small country, perfect competition' prediction. Moreover, of the G7 countries for which we have similar estimates, PTM behavior of U.S. exporters most closely mirrors the Hong Kong case.

The low R-squared statistics reported in Tables 3 and 4 suggest that the minimalist specification estimated and reported there may be inadequate. Hence, the equations were re-estimated incorporating a lagged dependent variable in each equation. A second re-estimation included destination-specific fixed effects. The rationale for adding the lagged dependent variable to the basic specification given in equation (2) is to mitigate possible effects of autocorrelation in the residuals. These alternative specifications had no impact on the results.

Thus, we conclude that Hong Kong exporters fully pass-through exchange rate changes to local currency import prices. This conclusion is robust to the exclusion or inclusion of statistically extreme values, to several alternate econometric specifications, and it holds whether one examines nominal or real exchange rates, or whether we consider either domestic exports, or re-exports. Moreover, these conclusions do not appear sensitive to the particular destination market considered (at least among the eight destination markets considered here).

5. Conclusions

Using eight export destinations, this study has examined the pass-through behavior of a panel of five-digit exports from Hong Kong for the years 1992-2000. The simple, competitive model predicts complete pass-through to (foreign) local currency prices, or alternatively no pricing to market. This competitive model is somewhat counter-intuitive, however, in the case of a small country. In the small country (exporter) case, it is at least plausible that the buyer (importer) may exert pressure for the exporter to absorb some of the exchange rate change. Similarly, it is sometimes conjectured that a large exporting country (e.g., the U.S.) may exert market power in the export market, and hence refuse to absorb any of the impact of exchange rate changes.

Most existing evidence, taken from G7 countries, finds varying (but positive) degrees of pricing to market. The notable exception is for exports from the United States. Existing evidence suggests that exporters from the U.S. apparently do not price to market, while other countries routinely pass-through less than 100% of exchange rate changes. By bringing new, non-G7 evidence to this issue, this study provides a benchmark by which to interpret the puzzling behavior of U.S. export prices. A priori, Hong Kong represents the small country, competitive case. In particular, Hong Kong's highly competitive business environment is well documented. Moreover, there would appear little risk of violating the 'small country' assumption in the case of Hong Kong.

Empirically, Hong Kong's export price behavior overwhelmingly supports the competitive paradigm. In only a few cases is there evidence of less than complete pass-through by Hong Kong's exporters. Moreover, consistent with results found by Knetter (1993), there is no compelling evidence of differences in PTM across the destination countries in the sample. Thus, by inference, near complete pass-through by U.S. exporters suggests similar competitive behavior.

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Table 1: Countries and Goods Included

	Countries	Share of Hong Kong's Domestic Exports (2000)
1	Canada	1.8%
2	Germany, Fed. Rep.	5.1%
3	Netherlands	2.2%
4	France	1.5%
5	United Kingdom	5.9%
6	Taiwan	3.4%
7	Japan	2.8%
8	Singapore Rep.	2.6%

Years 1992 - 2000

Goods Included

1	09841	Soy Sauce
2	09849	Other sauces and preparations thereof, mixed condiments & seasonings
3	09891	Pasta, cooked or stuffed; couscous
4	11102	Waters (including mineral and aerated), containing added sugar or other sweetening matter or flavor, and other non-alcoholic beverages, NES
5	58130	Flexible pipes and tubes, having minimum burst pressure of 27.6 MPA
6	64212	Folding cartons, boxes and cases, of non-corrugated paper or paperboard
7	65243	Other woven fabric, containing 85% or more of cotton, denim, weighing > 200 g/sq m
8	69631	Razors, non-electric
9	77119	Other electrical transformers
10	77121	Static converters
11	77255	Other switches for a voltage not > 1000 v
12	77258	Plugs & sockets for a voltage not > 1000 v
13	77811	Primary cells and primary batteries
14	77884	Electric sound or visual signaling apparatus
15	83199	Other handbags
16	84119	Men's or boy's anoraks, ski-jackets, wind cheaters and the like, not knitted or crocheted
17	84140	Men's or boy's trousers, bib and brace overalls & shorts, not knitted or crocheted
18	84151	Men's or boy's shirts, of cotton, not knitted or crocheted
19	84260	Women's or girl's trousers, shorts, breeches and bib and brace overalls & shorts, not knitted or crocheted
20	84482	Women's or girl's briefs and panties, not knitted or crocheted
21	84530	Jerseys, pullovers, cardigans, waistcoats & similar articles knitted or crocheted
22	84692	Other gloves, mittens and mitts, knitted or crocheted
23	84812	Gloves, mittens and mitts, of leather or composition leather, not for sports
24	84843	Hats and other headgear, knitted or crocheted, or made up from lace, felt, or other textile fabric in the piece; hairnets
25	88423	Spectacles, goggles and the like, corrective, protective or other
26	88541	Wrist watches, battery or accumulator powered w/case not made of or clad w/precious metals
27	89212	Children's picture, drawing or coloring books
28	89437	Playing cards
29	89829	Musical boxes, fairground & mechanical street organs & other musical instrument, NES; decoy calls, whistles etc.

Table 2: Comparison of Domestic Exports and Re-export Unit-Value Series

	β	Obs.	F statistic	Adjusted R-squared
Soy sauce	0.413	53	19.93*	0.30
	(0.003)			
Other sauces	0.294	65	78.33*	0.18
	(0.001)			
Pasta	0.217	65	74.72*	0.05
	(0.020)			
Sports drinks	0.058	48	297.32*	-0.09
	(0.295)			
Flexible pipes	-0.056	26	127.92*	-0.38
	(0.559)			
Folding cartons	0.875	65	0.68	0.31
	(0.000)			
Other woven fabric	0.480	44	30.71*	0.37
	(0.000)			
Razors, non electric	-0.252	34	20.84*	-0.18
	(0.366)			
Other electrical transformers	0.111	65	33.82*	-0.07
	(0.470)			
Static converters	0.721	65	2.13	0.14
	(0.000)			
Other switches	0.167	64	17.82*	-0.08
	(0.401)			
Plugs and sockets	0.335	59	1.67	-0.13
	(0.518)			
Primary cells and batteries	-0.215	65	10.44*	-0.07
	(0.570)			
Signaling apparatus	0.760	63	0.48	-0.03
	(0.032)			
Other handbags	1.037	32	0.01	0.47
	(0.039)			
Men's or boy's ski-jackets	0.922	65	0.42	0.89
	(0.000)			
Men's or boy's trousers	0.998	65	0.00	0.87
	(0.000)			
Men's or boy's shirts	0.937	65	1.80	0.79
	(0.000)			
Women's or girl's trousers	0.927	65	1.34	0.18
	(0.000)			
Women's or girl's briefs	0.392	65	41.35*	0.94
	(0.000)			
Jerseys, pullovers	0.958	65	1.63	-0.16
	(0.000)			
Other gloves & mittens	-0.074	55	35.33*	0.02
	(0.683)			
Gloves & mittens	0.763	37	0.65	-0.03
	(0.014)			
Hats	0.555	65	2.57	0.03
	(0.051)			
Spectacles	0.986	65	0.00	0.21
	(0.000)			
Wrist watches	1.088	65	0.82	0.66
	(0.000)			
Coloring books	0.040	64	16.13*	-0.11
	(0.867)			
Playing cards	0.097	56	56.95*	-0.12
	(0.423)			
Musical boxes	0.324	43	6.86*	0.09
	(0.218)			

p-values in parentheses, * denotes significant at the 1% level.

Table 3: Estimated Pass-Through, Hong Kong Domestic Exports

	β	Obs.	LR statistic	Adjusted R-squared
Soy sauce	-0.769	59	5.50	-0.02
	(0.414)			
Other sauces	-0.556	64	2.96	-0.02
	(0.073)			
Pasta	0.487	64	4.49	-0.12
	(0.502)			
Sports drinks	-1.215	53	1.68	-0.02
	(0.034)			
Flexible pipes	0.442	38	12.23	0.11
	(0.668)			
Folding cartons	-0.020	64	1.84	0.30
	(0.983)			
Other woven fabric	-0.729	54	4.17	0.19
	(0.040)			
Razors, non electric	-1.741	34	1.58	-0.21
	(0.623)			
Other electrical transformers	-0.198	63	2.09	-0.15
	(0.848)			
Static converters	2.638	64	6.20	-0.05
	(0.237)			
Other switches	-2.271	62	11.13	0.00
	(0.160)			
Plugs and sockets	0.597	57	0.87	-0.17
	(0.823)			
Primary cells and batteries	0.425	63	6.32	-0.11
	(0.699)			
Signaling apparatus	7.081	61	5.80	-0.00
	(0.019)			
Other handbags	-5.492	30	7.80	0.02
	(0.262)			
Men's or boy's ski-jackets	1.358	64	1.39	-0.16
	(0.352)			
Men's or boy's trousers	0.560	64	1.75	0.04
	(0.026)			
Men's or boy's shirts	0.395	64	7.68	0.29
	(0.042)			
Women's or girl's trousers	0.269	64	4.23	-0.04
	(0.437)			
Women's or girl's briefs	0.331	64	2.16	-0.01
	(0.523)			
Jerseys, pullovers	0.023	64	1.39	0.01
	(0.923)			
Other gloves & mittens	-2.568	53	3.93	-0.09
	(0.050)			
Gloves & mittens	2.240	35	6.32	-0.20
	(0.288)			
Hats	-0.570	64	1.26	-0.07
	(0.668)			
Spectacles	-1.049	64	1.32	-0.15
	(0.421)			
Wrist watches	0.037	64	1.95	-0.18
	(0.955)			
Coloring books	0.028	62	1.34	-0.00
	(0.985)			
Playing cards	-0.480	59	3.07	-0.14
	(0.716)			
Musical boxes	2.541	43	10.38	0.08
	(0.418)			

p-values in parentheses, *, ** denote significant at the 5%, & 10% levels respectively.

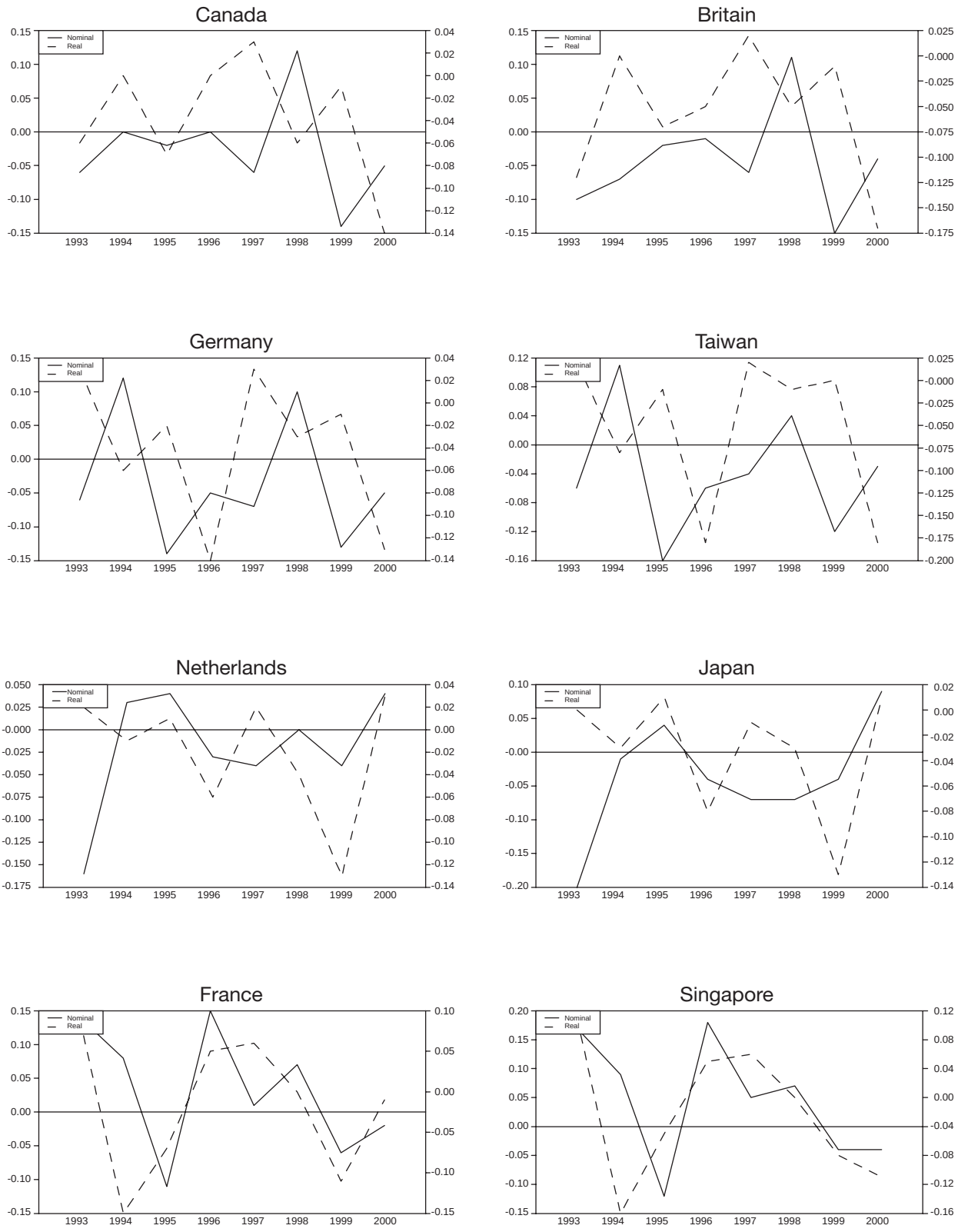
Table 4: Estimated Pass-Through, Hong Kong Re-exports

	β	Obs.	LR statistic	Adjusted R-squared
Soy sauce	-0.329	55	4.30	0.02
	(0.724)			
Other sauces	0.240	64	1.39	-0.17
	(0.815)			
Pasta	-1.651	64	1.35	-0.04
	(0.192)			
Sports drinks	-0.086	58	2.02	0.02
	(0.964)			
Flexible pipes	-1.990	36	4.18	-0.12
	(0.535)			
Folding cartons	-0.169	64	3.25	0.55
	(0.676)			
Other woven fabric	-0.712	46	9.13	0.01
	(0.537)			
Razors, non electric	-0.161	62	5.35	0.00
	(0.925)			
Other electrical transformers	-0.063	64	2.19	-0.02
	(0.940)			
Static converters	1.853	64	3.12	-0.06
	(0.219)			
Other switches	0.293	64	3.71	-0.12
	(0.774)			
Plugs and sockets	0.255	64	1.64	-0.01
	(0.684)			
Primary cells and batteries	0.665	64	0.95	-0.00
	(0.665)			
Signaling apparatus	0.506	64	10.64	0.19
	(0.530)			
Other handbags	0.018	64	0.32	-0.13
	(0.982)			
Men's or boy's ski-jackets	0.369	64	2.44	0.00
	(0.445)			
Men's or boy's trousers	0.065	64	1.30	0.08
	(0.065)			
Men's or boy's shirts	0.828	64	3.33	0.16
	(0.037)			
Women's or girl's trousers	0.380	64	7.10	0.11
	(0.339)			
Women's or girl's briefs	0.583	64	1.10	-0.12
	(0.458)			
Jerseys, pullovers	0.475	64	4.58	0.35
	(0.041)			
Other gloves & mittens	0.035	64	10.18	0.20
	(0.912)			
Gloves & mittens	0.716	64	0.78	0.04
	(0.170)			
Hats	0.124	64	1.36	-0.11
	(0.798)			
Spectacles	0.583	64	9.52	0.02
	(0.312)			
Wrist watches	0.369	64	13.98**	0.19
	(0.359)			
Coloring books	0.362	64	3.47	-0.07
	(0.619)			
Playing cards	-0.511	58	7.68	-0.13
	(0.750)			
Musical boxes	0.755	62	2.42	0.08
	(0.703)			

p-values in parentheses, * denotes significant at the 5% level.

Figure 1: Nominal and Real Exchange Rates

1st difference in logs (HK$/fc)



Real exchange rates (right scale) equal nominal exchange rates (left scale) deflated by wholesale price indexes from the April 2001, International Financial Statistics CD, except for Taiwan, where data from CEIC has been used.