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DEMAND AND SUPPLY FACTORS IN THE DETERMINATION OF NIE EXPORTS: A SIMULTANEOUS ERROR-CORRECTION MODEL FOR HONG KONG: A COMMENT*

Premachandra Athukorala and James Riedel

Muscatelli, Srinivasan and Vines (*EJ* 1992) purported to refute Riedel's (*EJ* 1988) finding that Hong Kong is a small, price-taking country in world markets.This comment shows, however, that MSV's results are due entirely to an unjustifiable restriction they imposed on the estimated export demand equation, and not the result of using a superior estimation technique, as they asserted.

Muscatelli, Srinivasan and Vines (1992) (hereafter MSV) attempt to refute Riedel's (1988) finding that Hong Kong satisfies the conditions of a small, price-taking country in world trade. Riedel had shown that while estimation of a conventional, quantity-dependent export demand equation for Hong Kong yields the conventional result of a very low price elasticity and very high income elasticity of export demand, normalising the export demand function by price, instead of quantity, yields results which supported the view that Hong Kong is a small country, unable to influence world prices for the goods it exports. For a small country, Riedel argued, estimates of a quantity-dependent export demand function are likely to yield misleading results, since for a small country export quantity is determined, given export prices, exclusively by supply variables in a recursive, not simultaneous, system of export supply and demand. MSV argue that it does not matter how the export demand equation is normalised, even for a small country, and maintain that the 'normalisation problem' is 'solved' by using 'systems estimation methods rather than a single-equation method such as 2SLS or instrumental variables', and by 'allow[ing] for a more general dynamic specification, constructing a general error correction model (ECM), where excess demand and supply potential affect the evolution of both export prices and volumes in the short run' (p. 1469).

Actually, the application of a systems estimation method to the short-run export supply–demand dynamics is entirely beside the point since what is at issue are the long-run elasticity estimates which MSV obtain in the first stage of a two-stage procedure by applying the Phillips–Hansen cointegration method of estimation. The long-run elasticity estimates for the export supply equation (MSV equation 6) and for the *quantity-dependent* version of the export demand equation (MSV equation 4) are not significantly different from those obtained by Riedel, which is not surprising since the Phillips–Hansen method is in fact an OLS method. The only result that is significantly different in the two studies is the estimate of *price-dependent* export demand equation, in which

* The regression results reported here are drawn from our paper, 'Export growth and the terms of trade: the case of the curious elasticities', in D. Vines and D. Currie, eds., *North–South Linkages and International Macroeconomic Policy*, Cambridge University Press, forthcoming.

MSV (equation 5) obtain a negative and statistically significant coefficient on export quantity while Riedel obtains one that is very close to, and not statistically different from, zero. MSV suggest that this difference is due to the application of different estimation techniques, but in this comment we argue that it is instead entirely due to the kind of restrictions imposed on the estimation equation. We do this by re-estimating the model, using the Phillips–Hansen technique, and by imposing restrictions which formally test the small country assumption, something MSV did not do, which is surprising since that is the heart of the issue.[1]

If the aim were to test the small-country assumption, the restrictions that should have been imposed and tested in the price-dependent export demand equation were zero coefficients on export quantity and world income. MSV do not analyse these restrictions, but instead imposed and tested only the price homogeneity restriction. It is true that the small-country case implies a one-to-one correspondence between the prices received by a country for its exports and the world market price of the same commodity. However, in practice, given the potential mismatch between the price proxies used to measure the two price variables,[2] the arbitrary imposition of this restriction could bias the coefficient estimates of the other regressors, even when such a restriction is statistically accepted at a given probability level (Murray and Ginman, 1976; Warner and Kreinin, 1983).

Table 1 reports the results of Phillips–Hansen estimates of the price-dependent export demand equation (1) with no restrictions imposed, (2) with a zero coefficient restriction on export quantity, and (3) with a zero coefficient restriction on export quantity and world income.[3] Using the Phillips–Hansen procedure to estimate the unrestricted equation, we find that the coefficients on QX and YW are not statistically significantly different from zero (at least at the 10% level), though they do have the expected signs. The zero coefficient restriction on QX is supported by the Wald test (equation 2), and the coefficients of PW and YW show remarkable resilience to the imposition of this restriction. The joint zero restrictions on the coefficients of QX and YW are also data acceptable (equation 3), and interestingly the world price variable (PW) alone explains over 90% of the total variation in the export price variable (PX). The coefficient of PW is less than unity, reflecting perhaps the measurement errors (see footnote 2 above), but the magnitude of the difference from unity is well within two standard errors of the coefficient estimate.[4]

[1] The data set is the same as was used in Riedel (1988) and MSV (1992).

[2] In the data set used here, export price (PX) is measured in terms of a unit value index of Hong Kong domestic exports, while the world price is represented by trade-weighted wholesale price indexes of Hong Kong's trading partners. It is common knowledge that any individual commodity price is likely to be weighted differently in the two indexes. Moreover, there are well-known biases in export unit values as against true prices used in the construction of wholesale price indexes.

[3] The computer package used is Gauss program, FMCRIT, written by Peter C. B. Phillips and Bruce E. Hansen.

[4] We have also applied Johansen's (1988) maximum likelihood procedure, which like the Phillips–Hansen method takes account of short-run dynamics in estimating the cointegrating vector, but has the added advantage of not being sensitive to the method of normalisation, since unlike the Phillips–Hansen technique it is a maximum likelihood procedure. The results based on the Johansen procedure tell the same story: zero

Table 1

Phillips–Hansen Estimates of the Price-Dependent Export Demand Function for Hong Kong

(1) *Unrestricted*

$PX = 0{\cdot}18 \quad -0{\cdot}18QX + 0{\cdot}82PW + 1{\cdot}16YW$

$(3{\cdot}22)^{**} \quad (0{\cdot}98) \quad (5{\cdot}49)^{*} \quad (1{\cdot}58)$

$R^2 = 0{\cdot}91 \quad DF = 3{\cdot}26 \quad PP = 3{\cdot}72$

(2) *With zero restriction on QX*

$PX = 0{\cdot}19 \quad +0{\cdot}72PW + 0{\cdot}81YW$

$(3{\cdot}17)^{**} \quad (4{\cdot}50)^{*} \quad (1{\cdot}19)$

$R^2 = 0{\cdot}92 \quad W(1) = 1{\cdot}77 \quad DF = 3{\cdot}10 \quad PP = 3{\cdot}53$

(3) *With joint zero restriction on QW and YW*

$PX = 0{\cdot}24 \quad +0{\cdot}90PW$

$(4{\cdot}70)^{*} \quad (12{\cdot}87)^{*}$

$R^2 = 0{\cdot}91 \quad W(2) = 3{\cdot}71 \quad DF = 3{\cdot}54 \quad PP = 4{\cdot}08$

Notes:

[a] The sample period is from 1977q1 to 1984q2. t-ratios of regession coefficients are given in brackets with significance levels (one-tailed tests) denoted as: * = 1% and ** = 5%. W = Wald test for coefficient restriction. 5% significance levels for the χ^2 test are W(1) = 3·84 and W(2) = 5·99. DF = Dickey–Fuller test for residual stationarity. PP = Phillips–Perron test for residual stationarity. In all cases, the residual non-stationarity hypothesis is rejected by both DF and PP at the 5% level or better.

[b] Variable definitions and data sources: see Riedel (1988).

To conclude, the inference that Hong Kong is a price-taker in world markets, based on OLS estimation of the inverse export demand function (Riedel, 1988), is equally supported by the more robust Phillips–Hansen estimation method, contrary to what is argued in MSV (1992).[5]

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coefficient restrictions on QX and YW are data acceptable. See Athukorala and Riedel (forthcoming). These results, however, are used only for corroboration, since point estimates generated by this method may be biased.

[5] The analysis of Hong Kong exports in Riedel (1988) was replicated for the case of Korean exports of machinery in Athukorala and Riedel (1991). In Riedel and Athukorala (1993) we demonstrate, as we have in this comment, that the 2SLS results that indicated that Korea is a price-taker in the world machinery market hold up, and in fact emerge even stronger, using the more robust Phillips–Hansen estimation technique as well as the Johansen maximum likelihood procedure.

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