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The Poverty Macroeconomic Policy Nexus

Some Short-run Analytics

George Mavrotas[1]
and S. Mansoob Murshed[2]

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Abstract

The present paper utilises a short-run theoretical macroeconomic model of a small open economy to look at the impact of macroeconomic policies and financial deepening upon poverty through sectoral changes. This is because an expansion in certain sectors may cause greater poverty reduction. The model involves a non-traded and a traded sector on the formal side of the economy. The former is more capital intensive and the latter more unskilled labour intensive. Increased employment in the traded sector is more pro-poor compared to a similar rise in the non-traded sector as the former draws workers out of poverty in the informal sector. The model in our paper analyses short-run effects of devaluation, a rise in the money supply induced by financial deepening, and taxation to discourage non-traded goods consumption. Financial deepening can induce greater output and reduce poverty. Other results are mixed and taxonomic. We also attempt to differentiate between the stylised experiences of East Asia and Latin America. East Asian economies have relied more heavily on labour-intensive manufactured exports, whereas Latin America has had a relatively greater share of capital intensive and natural resource based exports. In recent decades countries in these two regions have had differing experiences in poverty reduction, with poverty arguably declining more in East Asia.

Keywords: open economy macroeconomics, poverty, macroeconomic policy, East Asia, Latin America

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[1] UNU-WIDER, Helsinki, Finland; [2] The Birmingham Business School, University of Birmingham, Edgbaston, Birmingham, UK.

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1   Background and motivation

The literature on macroeconomic policy and poverty is certainly not characterised by its paucity. Indeed, since the advent of the PRSP (poverty reduction strategy paper) process, the poverty assessment of policy changes is *de riguer*. Furthermore, there exists voluminous literature on the links between financial sector development (broadly defined to go beyond financial deepening) and economic growth for industrial and developing countries (Arestis and Demetriades 1997, Levine 1997, Demirguc-Kunt and Levine 2001, Green and Kirkpatrick 2002, Wachtel 2004 and Goodhart 2004, among others provide comprehensive assessments of the above literature). Although the empirical literature on the finance-growth nexus remains inconclusive overall regarding the impact of financial sector development on growth, a causal link between the two variables is well-established (see Green et al. 2005 and Mavrotas and Son 2005 for a recent discussion). More recently, a small, though growing, part of the above literature has focused on the impact of financial sector development on poverty-reducing growth, which is of crucial importance *inter alia* for the attainment of the Millennium Development Goals (MDGs) (Green et al. 2005, Mavrotas 2005); of relevance to this is the role of financial development in countries emerging from conflict (Addison et al. 2002). The links between financial sector development and macroeconomic policy and poverty reduction in an analytical macroeconomic context, however, are relatively less well explored. The macro-studies that do exist are mainly of the computable general equilibrium (CGE) or social accounting matrix (SAM) genre requiring counter-factual simulation to arrive at policy recommendations. These models require elaborate assumptions about closure and a plethora of numerical guesses about parameter values. Consequently, the channels via which policy affects income are not always sharply in focus. On the other hand, most studies that connect finance to poverty are concerned with issues of agency associated with credit rationing, and how micro-finance can help avoid problems of moral hazard, adverse selection and missing markets. Unfortunately, it is not normally possible to explicitly incorporate theories of agency into multi-sector macro-models.

In analysing the link between poverty and macroeconomic change the functional distribution of income may be of importance. It is well known that growth reduces poverty. Kakwani (2000) and Kakwani and Pernia (2000) have, however, gone further in defining pro-poor growth, bearing in mind that growth will always reduce poverty as long as the distribution of income does not worsen. Truly pro-poor growth requires a more egalitarian income distribution. The question that subsequently arises is whether we should be focussing on the personal rather than the sectoral distribution of income. The poor are often concentrated in certain occupations or sectors of the economy, and expansion in these areas helps alleviate poverty more via increased employment/wages than when economic progress takes place elsewhere. The current hotly debated discourse on what is truly pro-poor growth can be usefully related to a multi-sectoral model of the macroeconomy. The advantage of an analytical short-run macroeconomic model is that sharp policy implications can be drawn. These models can also form the basis of econometric work based on actual available data in order to test theoretical propositions and establish the relative frequency of taxonomic results.

The present paper utilises a short-run *theoretical* macroeconomic model of a small open economy to look at the impact of macroeconomic policies and financial deepening upon poverty via sectoral changes, similar to Murshed (2001). As stated above, this is

because an expansion in some sectors may cause greater poverty reductio than in others. The model that follows involves a non-traded good and a traded sector in the formal side of the economy.[1] The former is more capital intensive and the latter more (unskilled) labour intensive. Growth and increased employment in the non-traded sector will be less pro-poor than a comparable increase in the traded sector, as the latter draws workers out of poverty in the informal sector. We know that financial deepening can induce growth, but how pro-poor is it? The model in our paper *explicitly* analyses short-run effects of devaluation, a rise in the money supply induced by financial deepening and taxation (strictly not a macroeconomic policy) to discourage non-traded goods consumption.

Furthermore, the model follows the sectoral delineation between traded and non-traded goods outlined in Sachs (1999) which attempts to differentiate between the economic development experience of East Asia and Latin America. The salient features of Sachs' dichotomy are: (a) East Asian economies rely more heavily on labour-intensive manufactured exports,[2] whereas Latin America has had a relatively greater share of capital intensive and natural resource based exports; and, (b) the non-traded sector exhibits a greater price in Latin America. In recent decades, countries in these two regions have had differing experiences in poverty reduction, with the personal distribution of income worsening in both areas. Poverty has arguably declined in East Asia, whereas the Latin American experience is much more mixed. Asian countries, excluding those in the Middle East, have been the world's fastest growing economies and the most successful 'globalisers' since the early 1980s, see Murshed (2002). Is East and South Asia's reliance on labour intensive manufactured exports part of the explanation? True, East and South Asia, especially China and India, but also countries like Indonesia and Vietnam are more labour abundant than any other region of the world. So it is not surprising that they specialise in unskilled labour intensive manufactured exports, such as ready made garments. Furthermore, East Asian economies have traditionally pursued more open or export-oriented policies. In Latin America, the abandonment of import substitution industrialisation strategies following the 1980s debt crises may have resulted in greater economic dislocation and poverty than in East and South Asia except in say, Chile. Moreover, alternative export expansion strategies in Latin America have been less successful, and at present the higher-wage Latin American countries are less competitive in labour-intensive manufacturing.

Within a single unified framework, typologies are developed in our paper, distinguishing between what could be the stylised East Asian and Latin American experience ex-post. Therein lies the major innovation of our model; providing, as it were, a single toolkit with which to analyse short-run macroeconomic policy impact on poverty and related issues.

It is worthwhile emphasising, at the very outset, what the model does not incorporate. The model is not a long-run growth model involving the accumulation of physical,

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1 The traded-non-traded dichotomy may be somewhat artificial. What matters most are relative factor intensities and the nature of the main exportable commodity.

2 There are exceptions in both regions; for example, Malaysia and Indonesia are major exporters of primary commodities.

human, institutional and social capital. The short-run comparative statics contained in the paper have implications, however, for long-run growth and development. Nor is it concerned with macroeconomic effects related to international debt and debt-financed domestic fiscal policy.

The rest of the paper is organised as follows. Section 2 contains a sketch of the model; section 3 describes model equilibrium, and section 4 presents comparative statics results arising from variations in the model's parameters. Finally, section 5 includes a summary as well as some policy implications.

2 Sketch of the model

The economy is comprised of two formal sectors on the real side, one of which is internationally traded, the other being a non-traded commodity. M indexes the traded sector, which is both consumed domestically and exported. It is basically a labour-intensive manufactured good. In addition, there are consumption imports, C_F which compete with M in domestic consumption. M is produced utilising labour only, following Sachs (1999), in order to capture the part played by labour intensive manufactured goods produced for export and domestic consumption. The price of M, P_T, is normalised at unity and is in any case given in a small open economy. The supply of M is described by:

$$M = \theta L_M \tag{1}$$

L_M represents labour employed in the M sector and θ stands for the marginal value product of labour in that sector. Note that this sector can draw upon unlimited supplies of labour[3] from an informal sector at a fixed wage rate, so that an increase in output leads to an expansion in formal sector traded goods employment at a fixed wage.

The non-traded goods sector is represented by N, the production of which requires capital, labour and an imported intermediate input (T). Therefore, it requires some foreign technological input and is the capital-intensive sector by definition. In a sense, the output of the N sector is more 'sophisticated' than in the other sectors, but perhaps that is precisely why it is non-traded. Note that the manufacturing could lie within both the M and N sectors, and the 'real-life' counterpart of the non-traded sector is not restricted to public and private services only. In summary, the output of the N sector could include government services, utilities, private services, as well as the hangover from the days of import substitution industrialisation: shielded or state-sector manufacturing. For the sake of analytical convenience, in the N sector fixed proportions characterise the use of the intermediate input from abroad. See Findlay and Rodriguez (1977) for a discussion of production functions where an imported input enters in a 'Leontief' fashion. Supply[4] in the N sector, in general reduced form, can be depicted as:

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[3] This is similar to the Keynesian assumption of excess capacity, which is assumed for all formal sectors in the model.

[4] The *production* function for N may be characterised as f (K, L_N, min T), where K denotes capital. At this stage, however, we are concerned with supply behaviour which is a function of the relative price and the exchange rate.

$$P_N N = P_N N(P_N, E) \qquad\qquad (2)$$

P_N represents the price of the non-tradable good. The supply of N increases with P_N but declines as the nominal exchange rate depreciates (E increases) as this makes the intermediate input more expensive. As far as the domestic value added of the N sector is concerned, this is obtained by subtracting the value of the intermediate input:

$$(P_N - \lambda)N(P_N, E) = P^D_N N \qquad\qquad (3)$$

where $\lambda = ET$, as $P_T = 1$, P^D_N measures domestic value added in the N sector.

Turning to consumption or the demand side, in the manufactured traded goods sector, this is composed of domestic demand (C_M) and foreign or export demand (X_M):

$$C_M(P_N, Y, E) + X_M(E) = M \qquad\qquad (4)$$

Domestic demand for the output of the M sector depends positively on the price of the non-traded good, P_N as well as income, Y. It is also positively related to the exchange rate, a rise in E represents devaluation, an increase in the cost of obtaining imported substitutes. Export demand is positively related to the nominal exchange rate. Equation (4) represents equilibrium in the M sector. Equation (4) can be interpreted as demand on the left-hand side equalling supply on the right-hand side.

In the non-traded goods sector, equilibrium between demand and supply is represented by:

$$C_N(P_N, Y) + I_N(r) = (P_N - \lambda)N(P_N, E) \qquad\qquad (5)$$

Domestic consumption of non-tradables is negatively related to its own price and positively linked to income. I_N stands for investment, that is the savings leading to capital formation in that sector, negatively related to the interest rate (r).

Equations (4) and (5) can be viewed as the balance or equilibrium relations for the traded and non-traded goods sector respectively in the sense of supply equals demand. We need to specify the concept of national income, Y or GDP. This consists of domestic value-added in both productive sectors less imports. Thus:

$$Y = (P_N - \lambda)N(P_N, E) + M - EC_F(E, Y) \qquad\qquad (6)$$

Note that there are two imports; λ, the imported input, and C_F, consumption imports. They have been subtracted from the value of domestic product, as they do not augment domestic value-added. Consumption imports are positively related to their relative price described by the exchange rate, as well as income.

It is useful at this stage to define an overall price index (P), representing the aggregate cost of consumption of all three goods: imported consumption goods (priced by E), non-traded goods and domestic non-resource based traded goods prices. This price index is a cost of living or consumer price index. It represents the cost of purchasing a basket of goods comprising imported consumer goods, non-tradables and traded goods. The

prices of these three goods are represented by E, P_N and P_T respectively.[5] The consumer price index is of use in measuring the real consumption wage and arriving at an appropriate definition of real money balances. The consumer price index takes the form:

$$P = E^\beta P_N^\alpha P_T^{(1-\alpha-\beta)}$$

This collapses to:

$$P = E^\beta P_N^\alpha \qquad\qquad\qquad (7)$$

as $P_T = 1$.

We now turn to specifying a monetary sector for this economy that takes the following form:

$$H(Y, r) = H/P \qquad\qquad\qquad (8)$$

Equation (8) is exactly the same as the LM function for the economy. It represents equilibrium on the monetary side of the economy. Money demand, on the left-hand side of (8), is negatively related to interest rates and positively linked to Y. When it is deflated by the consumer price index P, we obtain the value of real balances. Note also that changes in the exchange rate will impact on real balances, for example, nominal exchange rate depreciation or devaluation (rise in E) lowers real money supply.

Next, we come to the balance of trade:

$$X_M(E) - EC_F(E, Y) - ETN(.) = F \qquad\qquad\qquad (9)$$

The left-hand side represents the trade balance or exports minus imports. Exports arise from the traded sector, and the two imports are consumption and intermediate inputs respectively. F stands for the trade balance, which is positive if there is a trade surplus, negative if there is a deficit. We postulate a fixed exchange rate regime. This corresponds to the stylised facts for the vast majority of developing countries. Under a system of fixed exchange rates, the balance of payments is a residual in the short-run; improvements in the trade balance cause an increase in the stock of foreign exchange reserves, F and vice versa. Flexible exchange rates can, however, be easily incorporated, but will add an extra endogenous variable, E, into the system. E will rise (depreciate) with balance of payments deficits and vice-versa.

Finally, we can move on to consider employment, made up of work in the two formal sectors, M and N. We can safely assume that almost all developing countries have surplus labour to some extent, in the sense described by Lewis (1954). Countries in East and South Asia, because of their greater populations, may be deemed to be endowed with greater surplus labour compared to the other less populous regions of the world. An increase in demand in the traded sector will lead to a rise in labour input requirement, and we postulate that this need is fulfilled by drawing on surplus labour at the going wage rate. This also implies the existence of a residual informal sector, which

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5   The exponents in P (β, α and 1- $\alpha - \beta$) represent the weights or shares of the three goods in the representative consumers consumption basket. They sum to unity.

provides subsistence to workers not engaged in either the formal traded or non-traded sector. It is likely that a wage premium exists in the traded goods sector, over and above the subsistence rate in the informal sector. Increased labour demand in the non-traded sector may lead to increased wages for workers in that sector, should there be a skill premium in existence. We may, therefore, postulate that increased employment in the traded sector is more pro-poor compared to a similar rise in the non-traded sector, as the former draws workers out of poverty in the informal sector. Total formal sector labour employment (L) is composed of the sum of labour employed in the two sectors:

$$L = M + L_N \tag{10}$$

Note that the M sector only employs labour, whereas in the N sector it is one of several factors used for production. We can also safely conclude that the former (traded) sector is more labour-intensive and therefore more pro-poor.

Totally differentiating (10) we find that:

$$dL = \theta dL_M + (P_N - \lambda) f_2 dL_N \cdots \text{where } dM = dL_M \tag{11}$$

The first term on the right-hand side above is obtained using (1). The last term in (11) is obtained from profit maximising behaviour around the production function for N, f (K, L_N, min T), where K denotes capital, and L_N is employment. Employment rises with equilibrium output in each sector, but the rise in employment is greater in the traded sector as labour is the only factor of production there. Moreover, increased non-traded output may also lead to a rise in real wages in that sector. If workers in that sector are relatively non-poor, then economic expansion biased in the non-traded direction will not be so poverty reducing. Furthermore, since it is the traded sector which draws on the poor in the residual informal when it expands, it is via this channel that growth (or income expansion in the short-run) lowers the poverty headcount.

3   Equilibrium

We assume that excess capacity exists in the short run. Both the productive sectors are like fix-price sectors, in the sense of Taylor (1983). This postulate can be later relaxed by the imposition of capacity constraints or full employment. The assumption of excess capacity in the short run is compatible with a state where factors of production are paid their marginal product. Nor does it preclude increases in money wages when either one or more productive sectors expand.

It is postulated that in the non-traded goods sector, N, excess demand causes its relative price P_N to be bid up. The rise in P_N will restore equilibrium in that sector. In the non-resource based traded goods sector, M, excess demand causes output to rise, but one could make its relative price increase as well. In the monetary sector excess demand for money leads to a rise in interest rates which restores equilibrium.

The short-run equilibrium of the model can be described by writing equations (5), (4) and (8) in excess demand format, after substituting (6) into them. The idea is that excess demand in these three independent equilibrium relations leads to an increase in P_N, M and r respectively, corresponding to the non-traded goods sector, the traded (but not

natural resource based) sector and the money market. Totally differentiating (5), (4) and (8) and writing them in matrix format gives us:

$$\begin{bmatrix} C_{N1} + C_{N2}\rho - N - P_N N_1 & C_{N2}(1 - C_{F2}) & I_{N1} \\ C_{M1} + C_{M2}\rho & -1 & 0 \\ H_1\rho + \delta & H_1(1 - C_{F2}) & H_2 \end{bmatrix} \begin{bmatrix} dP_N \\ dM \\ dr \end{bmatrix}$$
$$= \begin{bmatrix} -C_{N2} & 0 & -C_{N2}\Omega + (P_N - \lambda)N_2 - TN \\ -C_{M2} & 0 & -C_{M2}\Omega - X_{M1} - C_{M3} \\ -H_1 & 1/(P_N^{\alpha} E^{\beta}) & -H_1\Omega + \beta H/(E^{1+\beta}P_N^{\alpha}) \end{bmatrix} \begin{bmatrix} dR \\ dH \\ dE \end{bmatrix} \quad \ldots (12)$$

Note that $\rho = (N + P_N N_1)(1 - C_{F2}) > 0.$ \hfill (13)

Also $\Omega = (P_N - \lambda)N_2 - TN - C_F - C_{F1} - C_{F2} \gtrless 0$ \hfill (14)

The parameter Ω can be interpreted as the 'income' effect of an alteration in the exchange rate; in the sense, it captures the effect of an alteration in E on Y in equation (6). Its sign is ambiguous (it could be either positive or negative). As will become apparent below, the sign and magnitude of Ω will turn out to be crucial for the analysis of devaluation. $\Omega < 0$ if $C_{F1} < 1$, which means that the demand for consumption imports is inelastic with respect to the exchange rate. $\Omega > 0$ only if $C_{F1} > 1$, and $C_{F1} < N_2$. In this case the demand for consumption imports is elastic, and the impact of a change in E has to be greater on consumption imports than on imports of intermediate inputs.

Furthermore, $\delta = \alpha H/(E^{\beta} P_N^{1+\alpha}) > 0$ \hfill (15)

The signs of the various partial derivatives above are:

$$\{C_{N1}, I_{N1}, H_2, C_{F1}, N_2\} < 0; \{C_{N2}, C_{F2}, C_{M1}, C_{M2}, C_{M3}, N_1, H_1, X_{M1}\} > 0.$$

The determinant (J) of the Jacobian matrix is:

$$J = -H_2(C_{N1} + C_{N2}\rho - N - P_N N_1) + I_{N1}(H_1\rho + \delta) + \{(1 - C_{F2})(C_{M1} + C_{M2}\rho)\}\{H_1 I_{N1} - H_2 C_{N2}\}$$
\hfill (16)

The determinant is negative in sign as $(1 - C_{F2})(C_{M1} + C_{M2}) < 1$. This means that the model is stable, which is helpful in the conduct of meaningful comparative statics analysis that follows and is in accordance with Samuelson's correspondence principle.

4 Variations in parameters

This section is concerned with comparative static analysis around the equilibrium described in the previous section.

4.1 A rise in H

A rise in H can emerge for a variety of reasons such as policy induced increases in money supply. It can also be the consequence of financial deepening, leading to a rise in the high powered monetary stock. Financial sector development could also be defined more broadly to include several aspects of the deregulatory and the institution-building process in the financial system, including issues related to the efficiency of financial intermediaries (Bandiera et al. 2000; Beck et al. 2000a, 2000b; Mavrotas and Son 2005). These could also have an impact on H; however, for simplicity, we focus here on the financial deepening aspect of financial sector development.

$$\frac{dP_N}{dH} = \frac{I_{N1}}{P_N{}^\alpha E^\beta J} > 0 \dots (17)$$

where J < 0.

$$\frac{dM}{dH} = \frac{I_{N1}(C_{M1} + C_{M2}\rho)}{P_N{}^\alpha E^\beta J} > 0 \dots (18)$$

$$\frac{dr}{dH} = \frac{-\{C_{N1} + C_{N2}\rho - N - P_N N_1\} - C_{N2}\{(1 - C_{F2})(C_{M1} + C_{M2}\rho)\}}{P_N{}^\alpha E^\beta J} < 0 \dots (19)$$

Thus, an increase in H causes an expansion in both the N and M sectors. It is interesting, however, to note that the expansionary impact is greater in the non-traded goods sector, by comparing equation (17) with (18). The reason is that the rise in H impacts on interest rates, and the lower interest rates affect capital accumulation positively in the N sector. We do not have capital as a factor of production in the traded sector. From (10) and (11) we cannot unambiguously pin-point in which sector the greater expansionary employment takes place. However, the greater are the price and income effects inducing demand for traded goods, the greater is the expansion in the M sector, and the subsequent rise in employment in the more pro-poor traded sector. This is more likely in East Asia rather than Latin America where there is, traditionally, a greater demand for basic domestic goods. Finally, the effect on the trade balance is clearly negative, as can be seen by differentiating the trade balance equation (9) with respect to E:

$$\frac{dF}{dH} = -EC_{F2}\frac{dY}{dH} - ETN_1\frac{dP_N}{dH} \dots (20)$$

The results above, with respect to a rise in H on the N and M sectors, can be depicted in terms of a diagram, in M and P_N space. In Figure 1 the NN and MM schedules represent equilibrium (supply equals demand) in the non-traded and traded goods markets
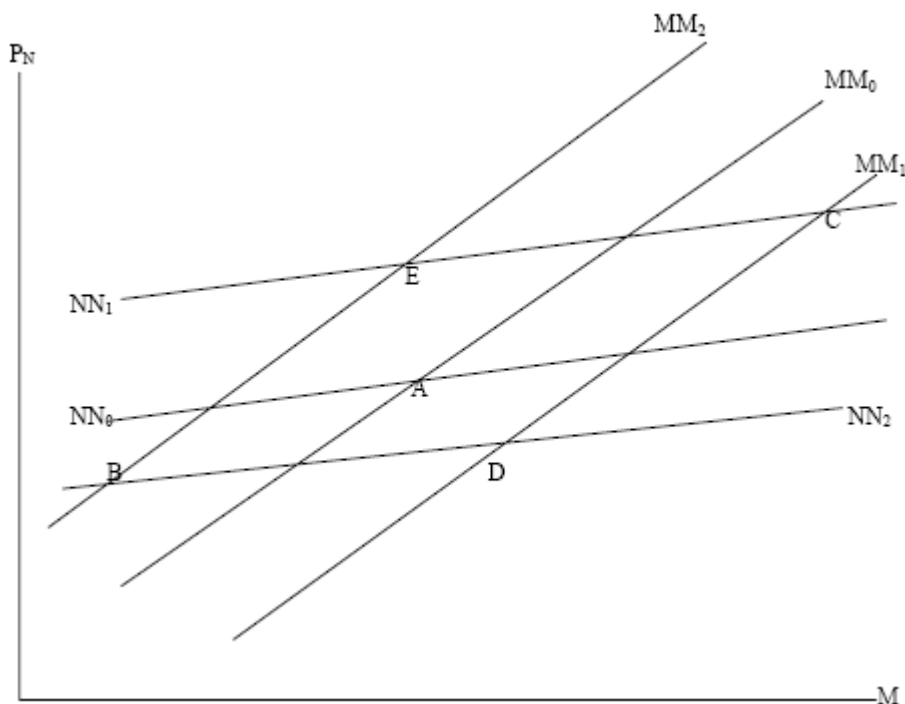
Figure 1

respectively.[6] They are both positively sloped as an increase in either M or P_N raises income; and thus, the demand for the other good goes up. The initial equilibrium in both markets occurs at the intersection point A. An upward movement in NN represents an expansionary effect on output in the N sector, NN_0 moves to NN_1. It reflects the fact that more N is demanded for each level of M. In the M sector, a rightward movement signals expansion from MM_0 to MM_1. This indicates that a greater quantity of M is demanded for each level of N produced. As both sectors expand, we arrive at point C in the new equilibrium following the rise in H.

4.2 A devaluation (rise in E)

Policy based exchange rate depreciation can be motivated by a variety of reasons, including balance of payments crises, the desire to improve international competitiveness and attempts to cope with debt servicing. It could also be part of a programme of structural adjustment or efforts to counteract the deleterious effects of natural resource booms or Dutch Disease.

Devaluation, which is an increase in E, will from (8) lower the value of real money balances, hence, putting upward pressure on the interest rate r. Note that devaluation, at

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6   The NN and MM schedules are obtained by totally differentiating (5) and (4) for dP_N and dM, setting dr and other differentials equal to zero. We then discover that the ratios of the differentials, $dP_N/dM > 0$, in both (5) and (4). Thus, both MM and NN schedules, derived from (5) and (4) respectively are positively sloped. But the slope of MM is greater as the ratio is greater in (4). This makes MM steeper than NN in Figure 1.

least upon impact, lowers the real wage as the price of imported consumption goods increases. It will also make the intermediate import more expensive in terms of domestic currency.

When we examine the impact of devaluation on the non-traded sector:

$$\frac{dP_N}{dE} = \frac{-H_2\{-C_{N2}\Omega + (P_N - \lambda)N_2 - TN\} + H_2C_{N2}(1-C_{F2})H_2\{C_{M2}\Omega + X_{M1} + C_{M3}\}}{J}$$

$$\frac{-I_{N1}H_1\{C_{M2}\Omega + X_{M1} + C_{M3}\}\{(1-C_{F2})\} - H_1\Omega I_{N1} + (I_{N1}\beta H)/(E^{1+\beta}P_N{}^\alpha)}{J} \ldots(21)$$

As noted above, the analysis of the effect of devaluation will depend quite crucially on Ω, which can be construed as the effect, on national income, of devaluation (impact of changes in E on Y). There are two opposing effects of devaluation upon imports: one negative impact on the supply-side as imported inputs cost more domestically; the other is the positive impact devaluation has by reducing consumption imports, which become more expensive in terms of the home currency. If we examine (14), we find that $\Omega < 0$ when the negative impact of devaluation on the non-traded sector (via imported intermediate input costs) dominates its positive effect via consumption imports. This is what Krugman and Taylor (1978) refer to as 'contractionary' devaluation, although their analysis would also include the effect on exports, which we consider below in (27). It is also the classic Latin American 'structuralist' outcome. Let us refer to this as case 1. The converse, when $\Omega > 0$, more like in East Asia, we will call case 2. This is because in the stylised East Asian scenario the non-traded sector is less significant, and consumption imports are likely to be highly price-elastic.

Case 1 ($\Omega < 0$), Latin America: In this instance:

$$\frac{dP_N}{dE} > 0, if$$

$$|(P_N - \lambda)N_2 - TN| > |C_{N2}\Omega|$$

$$|C_{M2}\Omega| > |C_{M3} + X_{M1}|$$

$$|I_{N1}H_1| > |C_{N2}H_2| \ldots(22)$$

The reversal of the above is necessary for $dP_N/dE < 0$.

Case 2 ($\Omega > 0$), East Asia:

$$\frac{dP_N}{dE} > 0, if$$

$$|C_{N2}H_2| > |I_{N1}H_1| \ldots(23)$$

The reversal of this condition is necessary for $dP_N/dE < 0$.

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With regard to the effect of devaluation on the non-resource based tradable good, M, we obtain:

$$\frac{dM}{dE} = \frac{-H_2\{C_{N1} + C_{N2}\rho - N - P_N N_1\}\{C_{M3} + X_{M1}\} - H_2\{C_{N1} - N - P_N N_1\}C_{M2}\Omega}{J}$$

$$\frac{-H_2\{(P_N - \lambda)N_2 - TN\}\{C_{M1} + C_{M2}\rho\} + C_{N2}\Omega H_2 C_{M1}}{J} +$$

$$\frac{I_{N1}\{-H_1\Omega C_{M1} + (\beta H)/(E^{1+\beta}P_N{}^\alpha)\}\{C_{M1} + C_{M2}\rho\} + I_{N1}\{H_1\rho + \delta\}\{X_{M1} + C_{M3}\} + I_{N1}\delta C_{M2}\Omega}{J} \quad (24)$$

$\Omega < 0$ is necessary for $dM/dE < 0$. This was case 1 above, the 'Latin American' experience. If the converse is true, and $\Omega > 0$, the East Asian model holds, then $dM/dE > 0$ if:

$$|C_{N2}H_2| > |I_{N1}H_1| \ldots (25)$$

In the East Asian case both sectors are likely to expand, as indicated by a shift from the point A to C in Figure 1. The increase in the traded goods sector will, however, be the greater of the two. The effect is strongly and unambiguously pro-poor as increased employment in the traded sector reduces the numbers of the poor in the informal sector. In the Latin American case there could be a negative impact in one or both sectors of the economy. If the contractionary effect is only in the non-traded commodities, point D will be the new equilibrium in Figure 1. This will turn out to be pro-poor. If both sectors decline, the new equilibrium is at point B.

One would expect devaluation to push up interest rates, as it lowers the value of real money balances. The expression for this effect in equation (26) turns out to be quite involved.

$$\frac{dr}{dE} = \frac{\{H_1\Omega - (\beta H)/(E^{1+\beta}P_N{}^\alpha) + H_1(1 - C_{F2})(C_{M2}\Omega + X_{M1} + C_{M3})\}\{C_{N1} + C_{N2}\rho - N - P_N N_1\}}{J}$$

$$-\frac{\{C_{N2}(1 - C_{F2})\{(C_{M1} + C_{M2})(\beta H)/(E^{1+\beta}P_N{}^\alpha) + (H_1\rho + \delta)(X_{M1} + C_{M3}) + \delta C_{M2}\Omega\}}{J}$$

$$+\frac{\{(P_N - \lambda)N_2 - C_{N2}\Omega - TN\}\{C_{M2}\rho(H_1(1 - C_{F2}) + (H_1\rho + \delta))\}}{J}$$

$$+\frac{\{(P_N - \lambda)N_2 - TN\}\{C_{M1}H_1(1 - C_{F2})\}}{J}$$

$$(26)$$

If $\Omega > 0$, then $dr/dE > 0$, if $|H_1\Omega| > |(\beta H/E^{(1+\beta)}P_N{}^\alpha|$, implying a high income elasticity of money demand. Even if $\Omega < 0$, $dr/dE > 0$, as long as the condition above is reversed, as well as: (a) $|N_2| > |C_{N2}\Omega|$, and (b) $|X_{M2} + C_{M3}| > |C_{M2}\Omega|$ in absolute value. Note that these are sufficient conditions.

Finally, we come to the all-important impact of devaluation on the balance of trade. From (9):

$$\frac{dF}{dE} = X_{M1} - C_F(1+\eta) - TN - ETN_2 - EC_{F2}\frac{dY}{dE} - TN_1\frac{dP_N}{dE}\ldots(27)$$

Where $\eta = EC_{F1}/C_F < 0$. This is the elasticity of consumption import demand with respect to the nominal exchange rate. Note that $N_1 > 0$ and $N_2 < 0$. The first term on the right-hand side of (27) is positive. With regards to the second term, if imports are inelastically demanded then the balance of trade worsens; however if they are elastically demanded, the trade balance improves. The third and fourth terms on the right-hand side of (27) refer to the additional payment which is needed to finance intermediate inputs for N production; the smaller the N sector, the lesser the adverse supply-side effect of devaluation on the balance of trade. Finally, the last two terms on the right-hand side of (27) will be negative unless Y and the N sector decline following devaluation. In summary, devaluation is likely to be positive in its effects on the economy, the smaller the non-traded goods sector and the more elastic the demand for consumption imports. This may conform more to the stylised nature of 'East Asia' as envisaged by Sachs (1999).

4.3 A tax on non-traded goods

In addition to devaluation, more directly interventionist policies could be pursued to foster the output of the tradable labour-intensive sector. One form of such policies could be an *ad-valorem* tax, τ, on the price of the non-traded good, P_N. Note that even when the tax is levied on the supplier, it ends up being borne by the consumer. The tax is similar to VAT. The object is to discourage consumption of the N sector's output after, say, a resource boom and sustain domestic demand for the traded good, M. The proceeds of the tax on the consumption of non-traded goods are redistributed back to the population in a lump-sum fashion.[7] In other words, it does not alter the distribution of income, and national income Y is unchanged. In the technical sense $dY/d\tau = 0$ in equation (6), because the public receives the tax revenue back as an income supplement. This policy is akin to industrial policy favouring production of labour-intensive tradables vis-à-vis more capital-intensive non-traded commodities. If successful, the policy will expand M sector production at the expense of N sector output in the context of a constant national income, Y. Ultimately, the aim is to avoid some of the pitfalls of the 'Dutch Disease' type effect which shifts the production base towards non-tradable goods from tradable goods that are also for export. The policy instrument chosen, however, amounts to a consumption tax, which is essentially an 'expenditure-switching' policy with a view to making consumers spend more on M relative to N. Most importantly, if successful, the effect of such a policy will be very strongly pro-poor, as it draws the poor out of poverty by providing increased employment in the formal traded goods sector.

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[7] Alternatively, the tax revenues may be utilised to subsidise the production of M. But such a policy, within this particular model, would merely augment supply without necessarily raising domestic consumer demand. Also, the algebraic effects of doing this are very similar to the case when the revenue is given back to consumers.

In order to proceed we need to modify the equilibrium relations of the model to take account of the tax. These were (5), (4) and (8), respectively. Once the tax, τ, on the price of the non-traded good, P_N is incorporated we have:

$$C_N(P_N(1 + \tau); Y) + I_N(r) = (P_N - \lambda)N(P_N, E) \qquad (5')$$

Note that τP_N 'nets' out from the right-hand side of (5').

$$C_M(P_N(1 + \tau); Y; E) + X_M(E) = M \qquad (4')$$

And

$$H(Y, r) = H/[E^\beta \{P_N(1 + \tau)\}^\alpha] \qquad (8')$$

To simplify the computation of the results, we utilise the standard technique where the *initial* value of $\tau = 0$, but of course $d\tau \neq 0$. Totally differentiating (5'), (4') and (8') we discover that the Jacobian of the matrix is in (12) is unchanged, but the right-hand side relevant for $d\tau$ becomes:

$$\begin{bmatrix} - C_{N1}P_N \\ - C_{M1}P_N \\ - \delta P_N \end{bmatrix} d\tau \cdots (10')$$

This is what will be utilised for the comparative static exercises.

Turning first to the effect of the tax on the non-traded sector, we discover that:

$$\frac{dP_N}{d\tau} = \frac{P_N H_2\{C_{N1} + C_{N2}(1 - C_{F2})C_{M1}\} - I_{N1}\{H_1(1 - C_{F2})(C_{M1}P_N) + \delta P_N\}}{J} \ldots (28)$$

Note that $|J| < 0$. The expression above will be negative if $|C_{N1}| > |C_{N2}(1 - C_{F2})C_{M1}|$. The reversal of this condition is necessary, but not sufficient, to induce a fall in the equilibrium output of N. The condition states that the price elasticity of demand for N with respect to a change in price (C_{N1}), outweighs the marginal propensity to consume non-tradable goods (C_{N2}). The former effect causes a decline in consumer demand for the N sector's output as it is now more expensive; the latter is the propensity to consume non-tradables, which if high enough (as in the Latin American stereotype) could even negate the object of the tax, as consumers have a strong preference for the non-traded good. See Clarida and Findlay (1992) for an analytical model where such proclivities are outlined. In the more virtuous East Asian case, the output of the N sector declines following the imposition of the tax.

When we come to the effect on the output of traded-goods, we find that:

$$\frac{dM}{d\tau} = \frac{\{N + P_N N_1\}P_N H_2 C_{M1} + I_{N1}P_N \rho\{H_1 C_{M1} - \delta C_{M2}\}}{J} \ldots (29)$$

This will be positive as long as, $C_{M1}H_1 > \delta C_{M2}$. Again, this implies the price effect outweighs the marginal propensity to consume. The price effect makes consumers choose more M; in order for the tax to work this parameter must be high. If the M sector expands and the N sector contracts, then in (11) the first term on the right-hand side is

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positive, while the second term is negative. This means that employment rises in the traded sector, and falls in the non-traded sector. The former effect is likely to be greater, as the traded sector is more labour intensive. Overall employment will therefore increase, and the net effect is more pro-poor.

When we come to depict these results diagrammatically in figure 1, point D illustrates the 'successful' post-tax intervention, with a decline in the N sector accompanied by an expansion in the M sector. Starting from an initial position at A where NN_0 and MM_0 intersect, the tax will shift the MM schedule to the right, to MM_1 say indicating expansion. The NN schedule moves downward to NN_2 depicting contraction.

The effect of the tax on interest rates is analytically complicated. This is despite the fact that from (8') the value of real balances declines, as the tax becomes operational, putting upward pressure on the interest rate, as there is excess demand for money. But a decline in the N sector and investment in that sector moderates interest rate increases. The algebraic effect is:

$$\frac{dr}{d\tau} = \frac{(C_{N2}\rho - N - P_N N_1)\delta P_N - (N + P_N N_1)(1 - C_{F2})H_1 C_{M1}P_N}{J}$$

$$+ \frac{P_N C_{N2}(1 - C_{F2})\delta\rho C_{M2} - C_{N1}P_N\{H_1(1 - C_{F2})C_{M2}\rho + H_1\rho\}}{J}\dots(30)$$

This is ambiguous in sign, the first line in (30) is positive and the second negative, but the entire effect is likely to be positive.

Finally, we have the effect on the trade balance, from (9):

$$\frac{dF}{d\tau} = -ETN\frac{dP_N}{d\tau} > 0\dots(31)$$

Hence the trade balance improves after the imposition of a tax on the N sector, as long as non-tradable production declines and with it the need to import intermediate inputs.

5   Summary and policy implications

Table 1 contains a summary of the impact of the policies considered above.

The effect of financial deepening amounting to a rise in the money supply is to expand the economy. This policy is pro-poor, but the effect may be weak if the non-traded sector expands more than the traded sector, which draws more people out of poverty. Financial deepening may need to be accompanied by policies of exchange rate depreciation to induce more tradable sector output. This, arguably, is the widespread East Asian type experience, especially in China. Turning to devaluation, there is the possibility of contractionary devaluation, particularly for the non-traded sector. This likelihood is strongly associated with Latin American characteristics. When devaluation is expansionary, it is so because the non-traded sector is less important to domestic consumers, and surges in import consumption are accompanied by export expansion.

Table 1 Summary of analytical results

Type	Financial deepening	Devaluation	Industrial policy favouring tradables
Latin America	Both sectors expand, N by more. Weakly pro-poor	N contracts. M may also fall. May be pro-poor (if M does not decline) or may not be pro-poor	May work. If so, then pro-poor
East Asia	Both sectors expand, N by more. More pro-poor than in the Latin American case	Both M and N expand. Strongly pro-poor	Works unambiguously and is strongly pro-poor

These are more likely in the East Asian case, where countries are more likely to have trade balance surpluses and more orderly servicing of international debt. The converse applies in most recent Latin American cases. Devaluation is pro-poor as long as the traded goods sector expands. This is likely to be case for all economies, except those specialising in natural-resource based goods that are price and income inelastic.

A policy to tax non-traded goods consumption will be akin to industrial policy favouring the production of traded goods. Such a policy would be initiated because of the view that labour-intensive manufactured and exportable traded goods are superior to non-traded goods production, the latter including manufacturing 'dinosaurs' from the past. It is also very pro-poor as it pulls out of poverty by expanding traded sector production which absorbs numbers of the poor. This policy is most likely to succeed when non-traded goods are quite price-elastic in demand, and the propensity to consume them out of income is small. Arguably, these are features of the more successful East Asian economies with their diffused production structure. Size would also be an important consideration. Without a critical mass of consumers geared to the domestic consumption of labour-intensive traded manufactures, industrial policies of this type would be rendered meaningless.

A number of caveats are in order before concluding. First, the assumption about increased employment in the traded sector promoting pro-poor growth because it draws the poor out of poverty in the informal sector may be challenged from the standpoint that one size does not fit all. This is certainly true, and the near-poor and poor may also be employed in the non-traded sector. Our dichotomy would match the stylised facts, however, for countries that do export labour intensive products, and have some remnants of state owned enterprises and nationalised public utilities with the really poor engaged in informal sector activities. Countries, such as India, have not only reduced poverty since they opened up, but there is evidence that informal sector wages are also rising. Those nations that have moved up the product cycle and export more skill intensive commodities have, to a great extent, reduced poverty via more impressive growth rates. Furthermore, any discussion about poverty is also fraught with measurement problems as national poverty lines vary so much that cross-country international comparisons using these yardsticks are impossible. We are left with the dollar a day or two dollars a day international measures.

Second, objections regarding the Latin American and East (or South) Asian stylisation may be raised. Clearly there are exceptions to the stereo-types in both regions. Chile and Costa Rica are examples of economic success stories in Latin America; the Philippines are a case of relative failure in East Asia. These exceptions may, however, prove the rule! The main point rests with the fact that the East Asian model is one of a more outwardly oriented economic structure accompanied by a more egalitarian distribution of income. The richer countries in East Asia have moved up the ladder from being unskilled labour intensive manufactured goods exporters, and specialise now in skill and R&D intensive commodities. They have, indeed, become OECD nations in terms of average income and socio-economic indicators, even if they are not members. Latin American nations, which were richer to begin with, say in 1960, have relied more on import substitution industrialisation policies and natural resource based exports. Compelled to open up by the debt crises of the 1980s, they have had less success in exporting manufactured goods compared to East Asia despite the benefits of free trade agreements such as NAFTA for Mexico. They have also been subject to severe macroeconomic crises more frequently, and have been slower to recover. The Latin American region has witnessed slower growth rates, more poverty and greater inequality creation than East and South Asia. There is also a continued reliance on mineral and plantation based natural resource exports.

The most significant factor underlying the Latin American-East Asian dichotomy lies in their differing underlying political economies. The political economy of a plantation-type Latin American economy is outlined in Sokoloff and Engerman (2000). These economies are characterised by greater inequality, a lower middle-class share of income and less investment in productive, growth enhancing public goods. Latin American countries have been caught in a 'staple trap'; the reliance on traditional natural based exports with their associated terms-of-trade volatility. The solution proffered to this endemic problem seems not to have worked well for the region for which it was first proposed (Prebisch 1950). Often the state, and elites, can be more destructively extractive of rents in some regions of the world compared to dictatorships in other areas. See also Auty and Gelb (2001) on benevolent and developmental versus non-benevolent and non-development typologies amongst nation sates with different relative endowments of natural resources vis-à-vis labour. There is a history of social conflict in both regions, but in the Latin American case a more substantial sheltered non-traded sector rather than competitive industrialisation was seen as the economic panacea.

Third, the policy implications contained in this paper advocate the expansion of labour intensive manufactured exports as a means of achieving growth and poverty reduction. In international trade the fallacy of composition argument always applies, meaning that not every country can expand its exports simultaneously. The greater exposure of China and India to world trade, given their huge populations and endowments of labour, means that less populous countries will be less able to compete with them in labour intensive manufactured exports (Mayer 2003). This can be either because of higher relative wages as in Latin America, or because of a size or an economies-of-scale argument that makes China and India more competitive in areas such as ready made garments compared to equally low-waged economies such as Bangladesh and Vietnam. The policy implication for higher waged developing countries is that they must either move up the product cycle themselves or wait for relative wages to rise in India and China.

Finally, it has to be borne in mind that every kind of success, including economic success is, more often than not, a result of serendipity rather than a product of deliberate design.

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