SHORT AND LONG RUN MACROECONOMIC EFFECTS OF TRADE POLICY IN THE PRESENCE OF DEBT SERVICING

SYED MANSOOB MURSHED

The Birmingham Business School
University of Birmingham
University House, Edgbaston, Birmingham B15 2TT, UK

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Institute of Social Studies (ISS)
PO Box 29776, 2502 LT, The Hague, The Netherlands.
Murshed@iss.nl
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ABSTRACT

The purpose of this paper is to analyze the macroeconomic effects of trade policy, when the instrument is a voluntary export restraint (VER), on both the home (imposing) country and the foreign (targeted) country. The innovation in the paper is the analysis of trade policy when debt servicing is present in the current account of the balance of payments. This captures the contemporary experience of deficit nations like the USA vis-à-vis surplus countries like China. Trade policy (VER) in the short-run affects the current account and exchange rate, leading to the accumulation of debt *stocks,* which have to be repaid in the long-run in the form of debt servicing *flows*. This leads to a major difference between the short and long-run effects of trade policy in the form of VERs, which can be expansionary and contractionary respectively for the trade policy initiating nation.

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I.   INTRODUCTION

It would be a truism to state that the current global economic contraction is deemed to be the most significant global economic crisis since the great depression of the 1930s. The present predicament originated in a financial crisis that had repercussions for the real economy, and was rapidly transmitted from the United States to the rest of the world. The national income compressions that followed were, however, asymmetric, with many dynamic Asian economies only experiencing a decline in their (positive) growth rates, while other countries (developed and developing) nations witnessed a diminution of their national income. All of this occurred against the backdrop of what has come to be known as 'global imbalances'. This refers to the differences between deficit nations like the United States (which also simultaneously runs a huge government budget deficit), the UK and many other European nations, and the surplus countries exemplified by China (which has become the world's largest exporter of goods and the second largest economy in absolute terms), Japan, Germany and many other Asian economies. Furthermore, the vast trade surpluses of countries like China are not, in the main, absorbed domestically, but instead held in the form of safe short-term dollar denominated assets such as US treasury bills. It has been argued that this behaviour is predicated on a precautionary principle leading China into hoarding a war chest of financial reserves (in dollars) to be deployed in the event of a speculative attack on its currency. Haunted by the spirit of financial crises past in the East Asian region, China is also reluctant to fully liberalize capital account transactions in its balance of payments.

The recent global recession has also seen a dramatic contraction in world trade, unparalleled since the inter-war period associated with the great depression. Although trade is predicted to recover, this sort of negative shock in an otherwise globalizing economy for the last half a century, can engender a phenomenon known as trade uncertainty; see van Bergeijk (2009) and references therein. Uncertainty about the smooth functioning of the channels of future international trade can have an independent, and additional, adverse effect on the real economy. Added to that is the loss of confidence that characterises deep depressions, as opposed to more temporary recessions. Akerlof and Shiller (2009) refer to this as the confidence multiplier, something that is unusually buoyant in the boom years prior to the recession, and equally stubbornly gloomy in refusing to revive during the course of a depression. When the confidence is low, the expansionary impact of the usual fiscal and monetary stimuli is much more muted, as in the case of Japan since the early 1990s. Akerlof and Shiller (2009) also point out that when economic confidence is at its nadir, individualized stories about corruption and other nefarious activities contributing the downturn abound in the popular mind. Apart from the usual suspects (bankers and financiers), blame may also be laid at the feet of nations such as China for 'exporting too much', and a revival of confidence might necessitate the politically attractive option of some bilateral trade policy restricting goods from China into the USA (or Europe for that matter); see Grossman and Helpman (1994) on how lobby groups induce specific forms of protectionism via political campaign contributions. There are frequent accusations levied against China for gaining 'unfair' competitive advantage by artificially engineering real exchange rate devaluation. The Chinese are also charged with being a nation of excessive savers, compared to the negative saving propensities of American households, where arguably a different brand of consumer capitalism abounds (Akerlof and Shiller, 2009). Trade policy targeted specifically towards China could also serve to reduce trade uncertainty as described and analyzed in van Bergeijk (2009). The multilateral framework governing international trade could then be

complemented and supplemented by bilateral negotiations; this too can become a part of economic diplomacy (van Bergeijk, 2009).

Recently there has been a revival of 'Keynesian' demand management policies that aim to increase output and employment via boosting aggregate demand. Keynes (1936) himself came around to the view that protectionism could also provide a macroeconomic boost during a deep recession. Exports are a component of aggregate demand and imports represent a leakage from domestic demand, hence policies that switch expenditure from foreign to domestic sources would raise domestic aggregate demand via. One instrument that achieves this goal could be bilateral trade policies that restrict imports from a major source. It is not inconceivable that a powerful nation such as the United States (arguably the post-war engine of global economic growth) might convince a major foreign supplier to its market like China to restrict its sales within the USA out of fear of greater future disruption, were the American economy to falter even further. A potential future threat of greater trade disruption may induce China to reduce its current sales in the USA in order to preserve orderly economic relations in the foreseeable future, thereby granting a Keynesian boost to the US economy.

Trade policy could also become a substitute for the traditional instruments of stabilisation (fiscal/monetary) policy, given the constraints placed on the other policy instruments because of growing central bank independence, and the burgeoning debt following the 2008 financial crisis in 'deficit' nations like the USA or the UK, for example. It could also be a means of redistributing income towards factors of production in certain industries. It has been argued that trade policy has small direct output effects when compared with fiscal/monetary policy. But such an assertion neglects the real exchange consequences of trade policy in its various forms. Real exchange rate changes result from the balance of payments effects of trade policy. These have consequences not only for international competitiveness, but also for debt servicing flows. Changes in debt servicing flows have, in turn, income and output repercussions. In order to explore these debt servicing implications for the macroeconomy, it is necessary to distinguish between the short and long-run, as pioneered by Rodriguez (1979) who analyzed fiscal and monetary policy in the presence of debt servicing within a single small open economy setting.

The purpose of this paper is to analyze the effect of trade policy in the form of a voluntary export restraint (VER) on the macroeconomies of *both* the home (imposing) country and the foreign (targeted) country. The analytical treatment of a VER differs from that applicable to a traditional tariff or quota, as it is the exporter and not the importer who obtains the revenues from the trade restriction. Trade policy in the form of a VER is inherently bilateral in nature and it is the favoured form of trade policy engaged in by countries or blocs such as the United States (or even the European Union) when the target of the trade policy is a particular country, China say. This is the example in mind in this paper. A VER is also relatively more WTO compatible.

The literature on the macroeconomic analyses of VERs is relatively scant. Examples of the latter include Murshed (1992) who compares VERs with tariffs in the North-South context, and Murshed and Sen (1999) who analyze the capital account effects of VERs. The innovation in this paper is the analysis of trade policy in the form of VERs when debt servicing enters the *current account* of the balance of payments. Current account deficits lead to the accumulation of the *stock* of debt which has to be repaid in the future in the form of debt servicing *flows*. This leads to a difference between the short and long-run effects of trade policy in the form of VERs. In the

short-run the effects of VER type trade policy impact on the current account. These current account changes eventually cause alterations in debt stocks, requiring debt servicing. In the long-run equilibrium, by definition, no changes in stocks are possible, and appropriate adjustments to bring this about must take place in the economy. Thus, in the long-run, the debt servicing implications of the VER will have fully worked their way through the economies in question. This can lead to the reversal of the short-run effects of the VER in the long-run. The rest of the paper is organised as follows: section II contains a sketch of the two country macroeconomic model; Sections III and IV contain the short and long-run effects respectively of trade policy; finally section V briefly concludes.

II.   THE MODEL

We will employ a two country variant of the Rodriguez (1979) model. We ignore the monetary side of the economy as we wish to focus on the (debt servicing inclusive) current account effects of the VER. Although our model does not explicitly incorporate imperfect competition in product markets, the presence of excess capacity in goods markets brings about the same flavour in our results as imperfect (monopolistic) competition.

The equilibrium relation for the home (VER imposing) country's goods market is given by:

$$Y = E(Y + rD; e(1+v)) + X(Y^* - \frac{rD}{e} + vX^*; e) - eX^*(Y + rD; e(1+v))(1+v) \quad (1)$$

where Y stands for income; E for expenditure; X for exports; X^* for imports; e for the exchange rate, a rise in e is a depreciation (appreciation) of the home (foreign) currency; the stock of debt, D, is in one unit of home currency (say dollars) and can be either positive or negative; rD represents debt servicing, r is the relevant interest rate; v is the *ad-valorem* tariff equivalent of the VER quota, following Brecher and Bhagwati (1987). Expenditure depends on debt servicing augmented disposable income, $E_1 > 0$. $E_2 > 0$, this is the Laursen-Metzler (1950) effect, see Murshed (1997, chapter2, pp. 25-27) for a detailed derivation. Our argument for its inclusion is that it played an important role in Mundell's (1961) seminal work on the macroeconomic effects of tariffs. $E_2 = X^*(1-\varepsilon)$, $\varepsilon < 1$ is the elasticity of real expenditure with respect to real income. The intuition behind it is that an exchange rate depreciation lowers real income (defined in terms of home and imported goods prices), but real expenditure declines less than proportionately, hence nominal expenditure increases. $X_1 > 0$, $X_2 > 0$, $X_1^* > 0$, $X_2^* < 0$. Note that we have normalised domestic and foreign prices at $P=P^*=1$. The *initial* VER rate, v=0, but dv≠0.

An asterisk (*) denotes foreign country variables. Goods market equilibrium in the foreign economy is given by:

$$Y^* = E^*(Y^* - \frac{rD}{e} + vX^*; \frac{1}{e}) + X^*(Y + rD; e(1+v)) - \frac{X}{e}(Y^* - \frac{rD}{e} + vX^*; e) \quad (2)$$

In (2) the exchange rate is employed in the opposite direction of the home country. The signs of the various partial derivatives in (2) are symmetrical to those in (1). It should be borne in mind that the VER rent accrues to the exporting country, unlike a tariff or quota when rents are retained by the importer. Thus, the foreign economy potentially benefits from a positive income effect, just as the home economy should gain from a price or substitution effect shifting

expenditure towards its own goods.

The current account of the balance of payments is defined for the home economy, exactly the converse applies to the foreign economy. We include debt servicing flows (rD) in addition to the difference between exports and imports (trade account) in the current account, following Rodriguez (1979). D stands for the stock of debt denominated in home currency units, rD denotes debt servicing flows where r is the interest rate on debt. The current account, therefore, has *two* components, trade balance and debt servicing flows:

$$D = X(.) - eX^*(.)(1 + v) + rD$$

The above relation states that current account surpluses will contribute to the home country's becoming a creditor (or a reduction in its indebted status) as D is accumulated, similarly current account deficits will contribute to its becoming a debtor (or a diminution of its creditor ranking). In the short-run the inherited debt stocks are non-zero, $D \neq 0$. Current account imbalances arising from the impact of the VER will, however, lead to changes in the stock of debt which have to be eliminated in the long-run equilibrium. We postulate that the home (foreign) country deficits (surpluses) causes the exchange rate to depreciate (appreciate), i.e. e rises:

$$e = eX^*(.)(1 + v) - X(.) - rD \qquad (3)$$

In order to proceed we totally differentiate (1)-(3), and arrange them in matrix form:

$$
\begin{bmatrix} a_{11} & a_{12} & a_{13}^* \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}
\begin{bmatrix} dY \\ dY^* \\ de \end{bmatrix}
=
\begin{bmatrix} b_{11} \\ b_{21} \\ b_{31} \end{bmatrix}
\begin{bmatrix} dR \\ dH \\ dE \end{bmatrix}
\qquad (4)
$$

$$a_{11} = E_1 - 1 - eX_1^*$$

$$a_{12} = X_1$$

$$a_{13} = X_2 - eX_2^* + \frac{X_1 rD}{e^2} - \varepsilon X^*$$

$$a_{21} = X_1^*$$

$$a_{22} = E_1^* - 1 - \frac{X_1}{e}$$

$$a_{23} = X_2^* - \frac{X_2}{e} - \frac{X_1 rD}{e^3} + \frac{E_1^* rD + \varepsilon X}{e^2}$$

$$a_{31} = eX_1^*$$

$$a_{32} = -X_1$$

$$a_{33} = X^* + eX_2^* - X_2 - \frac{rDX_1}{e^2}$$

$$b_{11} = e\varepsilon X^* - X_1 X^* + e^2 X_2^*$$

$$b_{12} = \frac{X_1 X^*}{e} - E_1^* X^* - eX_2^*$$

$$b_{13} = X_1 X^* - e^2 X_2^* - eX^*$$

Next we investigate the stability of the model. The trace is negative if $a_{33} < 0$; the Marshall-Lerner conditions hold, i.e. if an exchange rate depreciation (rise in e) improves the domestic trade balance and vice versa. The determinant of the Jacobian, J =

$$(E_1-1)\frac{rDX_1}{e^2} + (E_1-1)(E_1^*-1)(X^*+eX_2^*-X_2+\frac{X_1 X\varepsilon}{e^2}) - (1-E_1^*)eX_1^*X^*\varepsilon \quad (5)$$

A requirement of stability is that (5) is negative. This is so only if $a_{33} < 0$; if the Marshall-Lerner conditions hold. If D > 0, this is also sufficient; if D < 0, then X > rD, the indebted (home) country's export revenues must exceed debt servicing.

III.   SHORT-RUN MULTIPLIERS

We now analyze the short-run or *impact* multipliers of the system. As far as these multipliers are concerned we postulate, as in Rodriguez (1979), that dD = 0, but D ≠ 0. This means that on impact the historically given debt stocks cannot change, but the inherited stock of debt may be positive or negative. If D > 0 the home country is the creditor nation, but if D < 0 it is the foreign economy which is the creditor country. Turning to the multipliers we find that:

$$\frac{dY}{dv} = [1 - \varepsilon][X^* X^* X_1 - eX_2 X^*(1-E_1^*) - \frac{rDX_1 X^*}{e}] + \frac{\varepsilon X^* X}{e}(\varepsilon - X_1) \quad (6)$$

divided through by J < 0, given from (5) above. dY/dv > 0 only if (i) $X_2 > X_1$ and (ii) $X_1 > \varepsilon$ in absolute value. The VER on *impact* will lead to an improvement in the foreign country's current account as long as it receives more revenues for exporting a smaller quantity (a positive VER rent). This seems plausible, and is in conformity with the stylised facts when the VER is effected by an economy like China, whose export quality appears to be increasing. What it really implies is that the subjects of trade restrictions are *high quality* goods, which are *inelastically* demanded. The improvement in the foreign economy's current account will lead to its currency appreciating, under flexible exchange rates (see equation 8 below). This means that the home country's (the USA's) currency depreciates. This should eventually raise aggregate demand in the home country via improvements in net exports. For this to successfully occur, and raise output, X_2 the price elasticity of its exports in the foreign country must be high. Also the home economy benefits from a positive Laursen-Metzler effect as its currency depreciates. This is greater the smaller is ε, the elasticity of absorption (expenditure) with respect to real income.

$$\frac{dY^*}{dv} = [E_1-1][-E_1^* X^* eX_2^* + E_1^* X_2^* rD - \frac{X_1 X^*}{e^2}(rD + \varepsilon X) + X_2^*\varepsilon X$$

$$+\frac{X^*}{e}(E_1^* rD + \varepsilon X) + X^* X^*(-E_1^* + \frac{X_1}{e}) - X_2 X^*(1 - E_1^*)]$$

$$+ \ X^* X_1^* (\varepsilon \ - \ 1) \ [E_1^* rD \ + \ \varepsilon X \ - \ eE_1^* X^*] \qquad (7)$$

divided through by $J < 0$. dY^*/dv is ambiguous in sign. Even though the foreign economy benefits from the VER rent, currency appreciation potentially crowds out these gains via the deterioration in the trade balance. Also if it is a creditor economy, $rD < 0$, it will suffer from a negative wealth effect. This is because D is denominated in dollars, and its value in local currency declines as the dollar depreciates (each dollar fetches less in remimbi units).

$$\frac{de}{dv} = \frac{(E_1 - 1)[e\,X^*(1+\Omega)(1 - E_1^*)] - (1 - E_1^*)[e^2 X_1^* X^*(1 - \varepsilon)]}{J} > 0 \ (8)$$

This means that the home (foreign) country's exchange rate depreciates (appreciates) as long as $\Omega = eX^*_2/X^*$, the price elasticity of demand of the restricted import is inelastically demanded (less than 1 in absolute value). This is also a condition for a positive VER rent for China after the trade restriction is imposed.

IV. LONG-RUN MULTIPLIERS

The analysis in section III was concerned with impact (short-run) multipliers. In the long-run steady-state equilibrium there must be no change in stocks, which in turn means that the current account *in totality* must balance. The debt servicing implications of the VER fully work through the two economies in the long-run. A trade account surplus must be matched by a negative debt servicing inflows and vice versa. This means that in the steady-state (long-run), $dD = 0$ but $d(rD) \neq 0$. Thus, although changes in debt stocks are zero, debt servicing inflows could be non-zero (see Rodriguez, 1979). The mechanism of change in the current account is debt servicing, $d(rD)$ replaces *de*. Equation (3) is replaced by:

$$X(.) \ - \ eX^*(.) \,(1 \ + \ v) \ + \ rD \ = \ 0 \qquad (9)$$

The various a_{ij} in (4) alter as follows (the b_{ij} are unaltered):

$$a_{13} \ = \ E_1 - \frac{X_1}{e} - eX_1^*$$

$$a_{23} \ = \ -\frac{E_1^*}{e} + X_1^* + \frac{X_1}{e^2}$$

$$a_{33} \ = \ eX_1^* + \frac{X_1}{e} - 1$$

The model is stable and the determinant of the Jacobian now becomes:

$$J = [E_1-1][1-E_1^*] - 2X_1^*X_1 < 0 \quad (5)'$$

Turning to the long-run effects of the VER:

$$\frac{dY}{dv} = \frac{[1-E_1^*][e\varepsilon X^*(1 - eX_1^*) + e\Omega X^*(1- E_1) - eX^*(E_1 - eX_1^*)]}{J} \quad (10)$$

$$\frac{dY^*}{dv} = \frac{[1 - E_1^*][eX_2^*(E_1 - 1) - eX^*X_1^*(1 - \varepsilon)]}{J} \quad (11)$$

dY/dv in the long-run is negative only if $|\varepsilon(1 - eX_1^*| > |\Omega(1 - E_1)|$ in absolute value; $dY^*/dv > 0$ if $|eX_1^*| > |\Omega|$; and $|1 - \varepsilon| > |1 - E_1|$, both in absolute value.

$$\frac{d(rD)}{dv} = \frac{de}{dv} > 0 \quad (12)$$

This is positive and can be verified by examining equation (8) above. It means that the home (foreign) economy experiences positive (negative) debt servicing flows in the long-run equilibrium.

The intuition behind the above results can be best understood by tracing the movements from the impact multipliers in the short-run to the steady-state equilibrium. The effect of the VER for the home country in the short-run causes its exchange rate to depreciate, improving its trade balance. This will improve its credit standing, as either its debt is reduced or its creditor position is enhanced. For the foreign economy exchange rate appreciation worsens the trade balance in the short-run. This leads to an accumulation of debt or its previous creditor status is diminished. In the long-run this increased debtor (or reduced creditor status) eventually requires debt servicing which needs to be financed via improved export performance. This increase in net exports is precisely what causes the foreign country's output to rise in the long-run equilibrium. We have noted that in the long-run equilibrium the current account in total must balance, there can be no changes in debt stocks. For the home economy the long-run effect of the VER leads to a reduction in its trade balance, exactly matched in value by positive debt servicing inflows. The converse results apply to the foreign country.

These results are depicted in figure 1 and 2 for the home and foreign economy respectively, and are obtained from the a_{ij} coefficients above. The YY (Y^*Y^*) schedule depicts goods market equilibrium. A rise in output increases net imports which has to be matched by positive debt servicing making the schedule positive (negative) for the home (foreign) country. A similar line of reasoning is applicable to the external balance schedules, rD. The initial point before the VER is indicated at A, and the post VER long-run outcome is shown at point B.
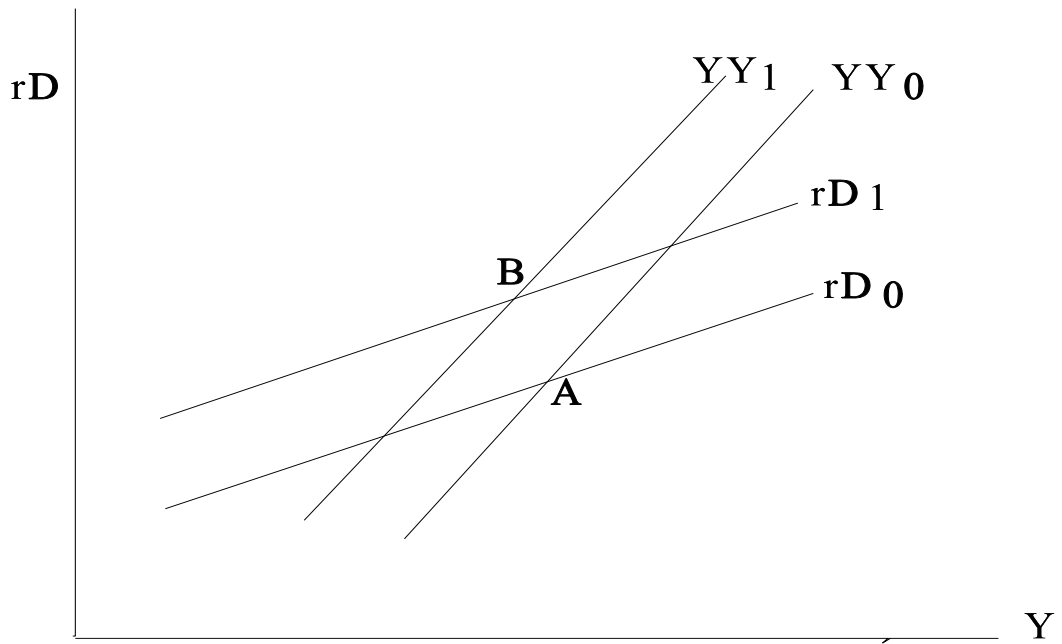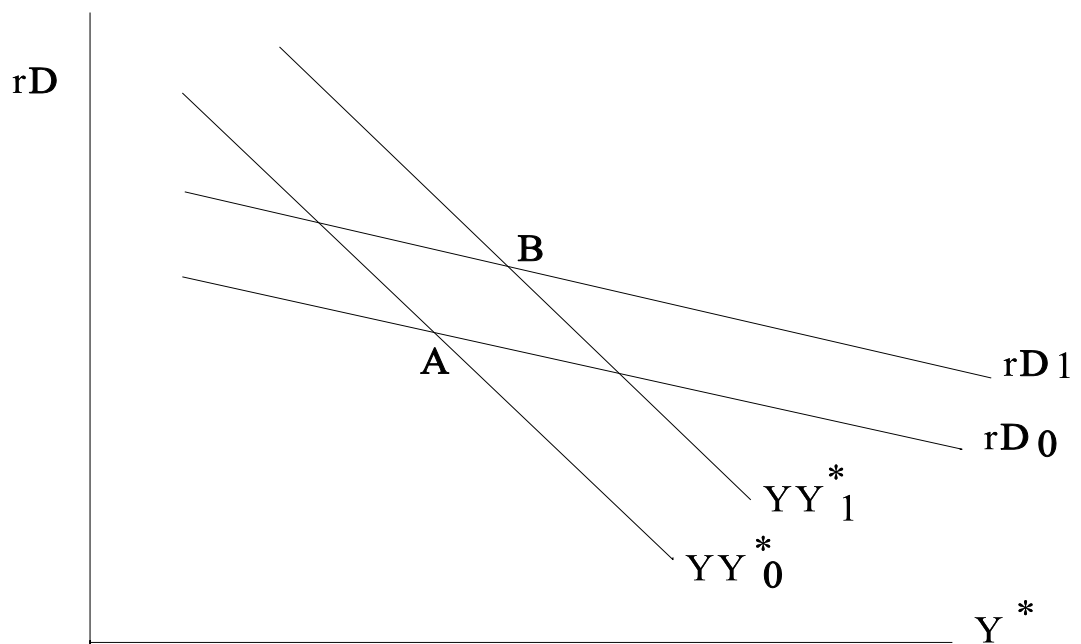
FIGURE 1: VER IN THE LONG RUN (HOME ECONOMY)

FIGURE 2: VER IN THE LONG RUN (FOREIGN ECONOMY)

V. CONCLUSIONS

In summary, therefore, the short (impact) and long-run effects of trade policy in the form of VERs could be diametrically opposite, given the presence of debt servicing. Indeed it can be argued that there is a trade off between the short-run and long-run effects. In the short-run the VER causes exchange rate depreciation in the home economy. This improves its current account and raises output in the home country. In the foreign economy exchange rate appreciation crowds out the benefits of the VER rent. The foreign country's current account surplus worsens as its currency gets stronger, lowering output there. In the long-run, however, the signs of the impact multipliers are reversed. The increase in debt (or the reduction in its creditor status) accumulated by the foreign country following the impact effect of the VER has to be paid off through increased net exports in the future, which is beneficial to output. The converse occurs in the home economy, where the short-run benefits of the improved trade balance are lost in the long-run, and its equilibrium output declines. Both the short and long-run multipliers for the VER, as far as the home or VER initiating country is concerned, are similar to the results in Rodriguez (1979) for monetary policy in a single country.

The moral of the story is that Keynesian minded trade policies aiming to boost domestic output may not work in the long-term when debt has to be re-paid, and that the debtor status of countries like the United States cannot be deemed to last indefinitely. Furthermore, politically expedient trade policies that are at least partially engineered by lobbying groups that target specific exporters and are aimed at rebuilding business confidence have differential short and long-run effects; the latter typically being fully discounted by the almost universally myopic political process.

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