THE NATURAL TRADE BALANCE

by
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SUMMARY

It is argued that many of the world's countries are actually facing a « natural » trade balance, i.e., a given trade balance position which in the long run is unaffected by exchange rate changes. The reason is that since parity adjustments affect the price of tradables and, therefore, price expectations, the domestic price level changes in a way such that, in the end, the original trade balance effect of a devaluation or a revaluation is cancelled. There is a statistical study of three South American countries showing zero correlation between trade balance positions and exchange rate changes.

The Natural Trade Balance.

During the past few decades economists have attempted to evaluate and predict the consequences of a country's exchange rate changes on its domestic economy and international financial relations. Economic thought has developed along three different analytical lines or approaches, these having been labeled the « elasticities », « absorption » and, more recently, the « monetary » approach. The purpose of this paper is to advance the proposition that these approaches can be enhanced by taking into account the past inflationary experience of so many industrial and less developed countries and the ensuing formation of price expectations. Therefore, we aim to compare and contrast the three conventional approaches while

introducing the possibility that, because of particular but quite common circumstances, many of the world's countries may find themselves facing the absence of a trade-off between exchange rate changes and balance of trade adjustments. In other words, we shall argue, while introducing some tentative econometric evidence, that many economies, both relatively rich and poor, are facing a « natural » trade balance ([1]).

I) *Devaluation Analysis.*

Let us begin by briefly reviewing the three conventional approaches. Both the elasticities and the absorption analyses admit the possibility of long-run trade-offs between exchange rate changes and trade balance movements. Elasticity analysis says that as long as certain foreign exchange market stability conditions are satisfied, the greater the sum of the elasticities of demand for a country's exports and of its own import demand, the more efficacious is an exchange rate change. The absorption approach points out that since a surplus can be attained only when total domestic expenditures fall behind total domestic output, what matters is to what degree can an exchange rate change affect the inequality between domestic output and absorption (expenditures).

The emerging monetarist view recognizes the existence of only short-run trade-offs between parity changes and trade balance adjustments ([2]). It is held that the representative country lacks an independent monetary policy because of its external constraint. For example, in economies close to full employment a devaluation causes domestic price increases through a goods' arbitrage process—thus creating an imbalance between the demand for and supply of money. As a consequence, absorption is curtailed via a real balance effect, and this allows for changes in the balance of payments in the direction of a lowered deficit or even a surplus. In the long-run, however, reserves increase as a payments surplus is generated. This is of

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([1]) As will become obvious, I use the word « natural » à la Wicksell, and in a similar manner as do Milton Friedman and Edmund S. Phelps when they speak of a « natural » rate of unemployment, i.e., in describing a somewhat permanent and long-run value.

([2]) See, for instance, the following works: Harry G. JOHNSON, « The Monetary Approach to Balance-of-Payments Theory », *Journal of Financial and Quantitative Analysis*, VII, 2 (March 1972), 1555-72, reprinted in his *Further Essays in Monetary Economics* (Cambridge, Mass.: Harvard, 1973), 229-49; Rudiger DORNBUSCH, « Devaluation, Money, and Nontraded Goods », *American Economic Review*, LXIII, 5 (December 1973), 871-80; and Ronald I. McKINNON, « Monetary Theory and Controlled Flexibility in the Foreign Exchanges », Princeton University, *Essays in International Finance*, 84 (April 1971).

great importance, since a higher level of international reserves means that the domestic supply of money rises and, through the real balance effect, absorption increases and a new money market equilibrium is established. In the end, the country's trade balance gravitates toward its original (deficit) position. This analysis follows quite clearly from the monetarist presumption that monetary policy does not control the money supply. Indeed, it controls only the volume of domestic credit or, what turns out to be the same, the composition of the monetary base, i.e., the relative size of international reserves and domestic financial assets.

We now seek to take explicitly into account the fact that so many developed and less developed countries have featured, during the past decade, an inflationary condition. It is proposed that we do so by including the role of price expectations in the devaluation analysis. What is it that influences the formation of price expectations? In most macroeconomic models developed in the United States — a relatively closed economy — the answer has been given through the presumption that price expectations are some (partial adjustment) function of past price level changes. This may well be incomplete. Indeed, it is quite possible to imagine that in the relatively more open European and less developed economies, exchange rate changes also constitute the base on top of which inflationary expec- tations are built. Casual empiricism and some tentative econometric work seem to indicate that in countries which have sustained inflationary con- ditions and have thus been forced to devalue often, the exchange rate begins to be taken as an inflation predictor and purchasing power indicator ([3]). Labor unions and consumers have learned that as the exchange rate is changed, the domestic price of tradable goods also changes. Therefore, exchange rate variations may be viewed as an even better predictor of im- peding price level movements than projections based on cost-of-living statistics.

Given an economy where price expectations influence market behavior, and assuming that those anticipations are a function of past price level changes, exchange rate movements, or both, it should not be difficult to study the implications. Say that a small (representative) country has a balance of payments deficit and some degree of inflation. Suppose that the government authorities decide to devalue in order to stop the loss of reserves. The domestic price of tradables will rise, and this entices business- men to increase their demand for labor and capital. However, after some

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([3]) See Arturo C. PORZECANSKI, « The Inflationary Impact of Repetitive Devaluation », forthcoming in the *Journal of Development Studies,* 1974.

period of time price expectations will be such that the supply of labor and capital falls at every nominal wage and rental return, since the owners of labor and capital feel « cheated » by the devaluation and/or the ensuing price increases above and beyond what they had already anticipated. Therefore, it is quite possible that the labor and capital markets will start clearing at the same predevaluation level of employment and plant utilization yet at a higher nominal return. Throughout the economy, this means that the aggregate supply and demand curves may well intersect at the same (pre-devaluation) level of output but at a substantially higher price level. In turn, the balance of payments is once again in a trade deficit position. But it is also possible to overshoot. If a devaluation triggers a more important reaction on the labor and capital markets' supply side, i.e., if the supply of labor and of capital curves shift to the left by more than the demand for labor and for capital curves shift to the right, then unemployment will actually be generated and the trade balance may end up worsened. In other words, a devaluation (or revaluation) can not only fail to work but may also affect the trade balance and the labor market in an opposite direction than that predicted by the conventional wisdom.

It is important to note that the speed with which the factors of production react to the devaluation depends mostly on what it is that they base their price expectations on. If those expectations are established solely on the basis of past inflation rates, then they will react slower than if they base their anticipations on exchange rate changes themselves. However, in either case the devaluation is likely to fail. It may be that the country in question finds itself with a slightly better or slightly worse deficit than it started out with—it all depends on the strength of price expectations to affect inflation rates.

The reader should notice that the monetary approach and our own analysis coincide in the pessimism with which they view exchange rate changes. This is what leads me to propose the existence of a « natural » trade balance, i.e., a given trade balance position dictated by a country's supply of and demand for exports and imports and similarly real phenomena, rather than by devaluations and revaluations.

Perhaps it is time for a graphical comparison. Take the case of a country with a chronic trade deficit. Both the elasticities and absorption approaches suggest the existence of a trade-off between devaluation (an increase in R, the price of foreign exchange) and the trade balance, e.g., a downward sloping line such as (1). (See Figure One). According to the elasticity approach, every country faces one such trade-off curve,

which corresponds to its given elasticities of demand and supply; for instance, the smaller the sum of its relevant elasticities, the steeper the trade-off curve. The absorption approach says that the closer to full employment this economy finds itself to be, and the greater the lack of expenditure-reducing policies, the steeper the trade-off curve. The monetary approach and our price expectations model admit the possibility of a short-run trade-off but deny that of a long-run trade-off between exchange rate changes and trade balance movements. In this sense, the latter two analyses would say that this economy may move along trade-off (1) from point (a) to point (b), but that in the long-run the trade balance gains are lost, and a new trade-off line is established (2), the economy thus moving to point (c). If the country decides to devalue once more, then the same process will take it from point (c) to (d),
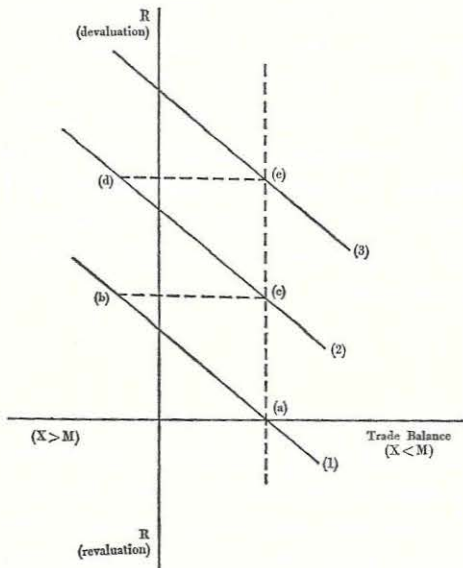
FIGURE ONE - The Natural Trade Balance Line.

and finally to (e) on trade-off line (3). There is, therefore, a long-run natural trade balance — in this case, a natural trade deficit — symbolized by the vertical line going through the point labeled (a). According to the monetarists, the reason for the shifts in the trade-off curve is the change in the real money stock. The introduction of price expectations accelerates these shifts, with the extent and magnitude of price expectations and the strength of their effect on the price level determining the height of the short-run trade-off curve the country finds itself to be on.

It is quite possible to imagine that, over time, countries do not face a vertical and unique natural trade balance line, and this is due to two reasons. First, the natural trade balance line may not be perfectly vertical, or it may constitute more of a band of points distributed around a given trade balance position. Indeed, if a given devaluation triggers high price expectations and large price level increases, it is possible to imagine a positively sloping long-run trade-off line instead of the strictly vertical one. A band of points may also be generated if the strength of price expecta-

tions or the extent of variations in the real money stock change over time as a consequence of the adjustment in the behavioral functions or modifications in the relevant institutions. Second, we would expect the natural trade balance line (or band) to move over time. Indeed, it is a function of many real forces, economic organization, and institutional constraints. We do expect that changes in the supply of and demand for exports and imports, variations in industrial organization and economic efficiency, as well as in the extent of barriers to trade all cause the natural trade balance line (or band) to shift. As one example, if import restrictions were such that prior to the devaluation the price of importables was artificially high, a devaluation concurrent with a relaxation of tariffs and other restrictions may not trigger price expectations because the domestic price of importables remains roughly the same.

II) *Some Empirical Evidence.*

We felt that it would be interesting to study the experience of a few countries that have devalued often while sustaining inflationary conditions of varying magnitudes probably accompanied by different price expectations mechanisms. A priori we thought that one possible econometric test of the monetary approach and expectations model would be to analyze the behavior of a country's trade balance as a function of its devaluation experience. Specifically, the elasticities and absorption analyses demand that a given trade-off between exchange rate changes and balance of trade positions be present; in contrast, the monetarist approach supplemented by an expectations model suggests the non-existence of a systematic long-run trade-off.

To that effect we chose three South American countries, Brazil, Colombia, and Uruguay, which have had an inflationary history accompanied by repeated devaluations. We used both quarterly and yearly data, taking forty observations (1960I-1969IV) and eleven observations (1960-70), respectively. All of the countries (except Uruguay during 1962 and 1970) had at least one yearly exchange rate change — almost all of them devaluations — though the three countries usually showed multiple exchange rate changes during any given year. Exports plus imports constitute almost twenty percent of Brazil's gross national product, and close to thirty percent of Colombia and Uruguay's G.N.P. All three had different inflationary experiences, averaging the following yearly percentage changes in the consumer price index during the 1960-70 period: Brazil, 46%;

Colombia, 12%, and Uruguay, 48%. Their inflationary condition followed different patterns and peaked at different times, e.g., Brazil in 1963/64 with 87%, Colombia in 1962/63 with 32%, and Uruguay in 1967/68 with 125% inflation. The three countries had mostly balance of trade deficits during the period of study, although Brazil oscillated quite a bit, with large deficits (e.g., 1962 and 1968) and huge surpluses (e.g., 1965 and 1966). For the exchange rate we used the country's official exchange rate—in the cases of Brazil and Colombia, their coffee export rate. In the econometric study we used the trade balance $(X - M)$ as the dependent variable, giving surpluses a negative sign so as to match the analysis of Figure One. The independent variable used was percentage changes in the exchange rate, i.e., $(R_t - R_{t-1}) / R_{t-1}$. We employed the Classical linear regression model with least-squares estimation ([4]).

As can be observed in Table One, the results of the yearly and quarterly tests were thoroughly disappointing in terms of establishing the existence of some trade-off line between devaluation and the trade balance. Different lagged measures of exchange rate change were tried, but all equations continued to turn out to be statistically insignificant. For illustration purposes, we report the equations using $\%\Delta R_{t-2}$, since they had the highest (though still insignificant) F statistic. As can be observed, in every estimate, whether yearly or quarterly, the adjusted correlation coefficient $\bar{R}^2$ was equal to .00, indicating no correlation whatsoever between exchange rate changes and trade balance positions. (See Table One).

EXCHANGE RATE CHANGES AND THE TRADE BALANCE:
BRAZIL, COLOMBIA, AND URUGUAY

TABLE ONE

BRAZIL: *Yearly data* ($n = 11$)

$$(M - X) = 67.5 - 171.6\%\Delta R$$
$$(.6) \quad (.79) \qquad F = .60 \ \bar{R}^2 = .00 \quad DW = 1.3$$

Quarterly data ($n = 40$)

$$(M - X) = 2.5 - 69.5\%\Delta R_{t-2}$$
$$(.2) \quad (.68) \qquad F = .46 \ \bar{R}^2 = .00 \quad DW = .75$$

([4]) The data used here are taken from various issues of the International Monetary Fund's *International Financial Statistics*. Quarterly and yearly totals are in terms of U. S. dollars. Exchange rates used are the official, principal-export rate; in the case of Brazil and Colombia, they are the coffee export rates (items 01, a, or d). For the yearly values of the countries' exchange rate we chose the average value and not the last quarter's exchange rate.

COLOMBIA: *Yearly data* ($n = 11$)

$\quad$ $(M - X) = 77.7 - 134.5\%\Delta R$
$\qquad\qquad$ (1.4) $\quad$ (.29) $\qquad\qquad$ $F = .08$ $\overline{R^2} = .00$ $\quad$ $DW = 2.8$

$\quad$ *Quarterly data* ($n = 40$)

$\quad$ $(M - X) = 16.4 - 94.5\%\Delta R_{t-2}$
$\qquad\qquad$ (3.5) $\quad$ (.91) $\qquad\qquad$ $F = .83$ $\overline{R^2} = .00$ $\quad$ $DW = .94$.

URUGUAY: *Yearly data* ($n = 11$)

$\quad$ $(M - X) = 11.0 + 5.5\%\Delta R$
$\qquad\qquad$ (.7) $\quad$ (.30) $\qquad\qquad$ $F = .08$ $\overline{R^2} = .00$ $\quad$ $DW = .98$

$\quad$ *Quarterly data* ($n = 40$)

$\quad$ $(M - X) = 5.0 + 8.1\%\Delta R_{t-2}$
$\qquad\qquad$ (1.6) $\quad$ (1.07) $\qquad\qquad$ $F = 1.1$ $\overline{R^2} = .00$ $\quad$ $DW = 1.7$

Note: figures are rounded; figures in parenthesis correspond to the coefficient's *T*-ratio; *F* and *DW* stand for the *F* and Durbin-Watson statistic, respectively; $\overline{R^2}$ is the adjusted correlation coefficient squared; *n* stands for the number of observations; and *M*, *X*, and *R* stand for imports, exports, and the official exchange rate.
Source: See Footnote 4.

Although this empirical evidence is only meant to be introductory and tentative, one cannot but be surprised by the outcome, which suggests the absence of any linear and inverse relationship between devaluation and the trade balance. Although interpretation of these results is also up to the reader, we cannot feel that some credence must be given to those theoretical approaches and models which emphasize the nonexistence of systematic and permanent trade-offs. Rather, it seems likely that our time-series analysis has caught these countries being faced by a scatter of points representing ever changing and shifting trade-off curves which are explicitly rationalized by the monetary approach and our expectations model.

Conclusions.

Current devaluation approaches fail to take into consideration the inflationary condition which many industrial and less developed economies have experienced during the past decade. The elasticities, absorption, and monetary analyses are lacking in that they fail to recognize the establishment of price expectations as a variable in important behavioral functions. Specifically, they neglect the effect of price expectations upon the decision-making rules of the suppliers of labor and capital. Once this is taken into account, it is quite possible to imagine laborers and the owners of capital and natural resources demanding higher nominal returns

whenever they observe price level increases. Since devaluations generally do cause the price of tradables to rise, we advance the proposition that price expectations are affected by either the exchange rate changes themselves or the ensuing price increases or both. The consequence is for inflationary behavior to be generated such that any short-run reduction in absorption or expansion of output is cancelled by an over-all drop in aggregate supply. In the long-run, countries are faced by such increased price levels that the balance of trade is forced to come back to its original position. Due to the workings of price expectations plus the changes in the money stock as outlined in the monetary approach, we propose the existence of natural trade balances, i.e., particular trade balances which in the long-run are unaffected by exchange rate changes.

The policy implication of our analysis is that countries which have price expectations mechanisms built into their key economic relationships should not rely on exchange rate manipulations to induce trade balance changes. Rather, they ought to only depend on policy measures which affect comparative advantages, consumer demand, inflation, and the extent of trade restrictions.

LA BILANCIA NATURALE DEL COMMERCIO

Negli ultimi decenni gli economisti hanno tentato di valutare e predire le conseguenze delle variazioni del tasso di cambio di un paese sulla sua economia e sulle relazioni finanziarie internazionali. Il pensiero economico s'è sviluppato lungo tre diverse linee o approcci: delle « elasticità », dell'« assorbimento » e, piú recentemente, « monetario ». Scopo di questo saggio è di suggerire che questi approcci possono essere migliorati tenendo conto della passata esperienza inflazionistica di tanti paesi industriali e meno sviluppati e conseguente formazione delle aspettative di prezzo. Tendiamo cioè a confrontare i tre approcci convenzionali introducendo la possibilità che, per circostanze particolari ma del tutto comuni, molti paesi possano trovarsi in assenza di un trade-off tra le variazioni dei tassi di cambio e gli aggiustamenti della bilancia del commercio. In altre parole, sosterremo, introducendo qualche tentativo di evidenza econometrica, che molte economie, sia relativamente ricche che povere, si trovano di fronte a una bilancia « naturale » del commercio.

Cominciamo col presentare brevemente i tre approcci convenzionali. Tanto l'analisi delle elasticità che dell'assorbimento ammettono la possibilità di

trade-offs di lungo andare tra le variazioni dei saggi di cambio e i movimenti della bilancia commerciale. L'analisi dell'elasticità dice che sintanto che certe condizioni di stabilità del mercato dei cambi esteri sono soddisfatte, quanto maggiore è la somma delle elasticità di domanda per le esportazioni di un paese e della sua domanda di importazioni, tanto piú efficace è la variazione del saggio di cambio. L'approccio dell'assorbimento sostiene che potendosi ottenere un sovrappiú soltanto quando le spese totali interne sono inferiori alla produzione interna, ciò che importa è in che misura una variazione del saggio di cambio può influenzare la disuguaglianza tra produzione interna e assorbimento (spese).

La veduta monetarista che si sta affermando riconosce l'esistenza solo di trade-offs di breve andare tra le variazioni delle parità e gli aggiustamenti della bilancia commerciale. Si sostiene che il paese in questione manca di una politica monetaria indipendente a causa del vincolo esterno. Per esempio, in economie vicine al pieno impiego una svalutazione fa aumentare i prezzi interni attraverso un arbitraggio dei beni creando cosí uno sbilancio tra la domanda e l'offerta di moneta. Come conseguenza, l'assorbimento viene ridotto attraverso l'effetto reale di bilancio e questo consente che la bilancia dei pagamenti muti in direzione di un disavanzo ridotto e persino di un avanzo. Nel lungo andare, tuttavia, le riserve aumentano poiché si genera un avanzo dei pagamenti. Questo è di grande importanza, poiché un livello piú elevato di riserve internazionale significa che l'offerta interna di moneta aumenta e, attraverso l'effetto reale di bilancio, aumenta l'assorbimento sino a stabilire un nuovo equilibrio del mercato monetario. Alla fine la bilancia commerciale del paese gravita verso la sua posizione originaria (disavanzo). Questa analisi segue in modo chiaro dalla presunzione monetaristica che la politica monetaria non controlla l'offerta di moneta. Invero, essa controlla soltanto il volume del credito interno, o, ciò che in definitiva è lo stesso, la composizione della base monetaria, cioè la dimensione relativa delle riserve internazionali e delle risorse finanziarie interne.

Cerchiamo ora di tener conto esplicitamente del fatto che tanti paesi, sviluppati e meno sviluppati, hanno avuto una condizione inflazionistica. Proponiamo di far questo includendo il ruolo delle attese di prezzo nell'analisi della svalutazione. Che cosa è che influenza la formazione delle attese di prezzo? Nella maggior parte dei modelli macroeconomici sviluppati negli Stati Uniti — un'economia relativamente chiusa — la risposta è stata data nella presunzione che le attese di prezzo siano qualche funzione (di aggiustamento parziale) delle passate variazioni del livello dei prezzi. Questo può tuttavia non bastare. E' infatti possibile immaginare che nelle economie relativamente piú aperte dell'Europa e dei paesi meno sviluppati le variazioni del saggio di cambio costituiscano anche la base su cui sono costruite le attese inflazionistiche. Un empirismo casuale e l'evidenza econometrica sembrano indicare che in paesi con sostenute condizioni inflazionistiche e quindi spesso costrette a svalutare, il saggio di cambio comincia a essere considerato come anticipatore dell'infla-

zione e indicatore del potere d'acquisto. Sindacati e consumatori hanno imparato che quando varia il saggio di cambio, variano anche i prezzi interni dei beni scambiati. Le variazioni del tasso di cambio possono quindi essere considerate come un anticipatore dei movimenti del livello dei prezzi persino migliore delle proiezioni basate sulle statistiche del costo della vita.

Una seconda sezione del saggio viene dedicata all'evidenza empirica.

Le analisi delle elasticità, dell'assorbimento e monetarie sono dunque lacunose in quanto non tengono conto della formazione di attese di prezzo come variabile in importanti funzioni di comportamento. In particolare trascurano le attese di prezzo sulle regole decisionali dei fornitori di capitale e lavoro. Una volta che questo è messo in conto, è del tutto possibile immaginare lavoratori e detentori di capitale e di risorse naturali domandare saggi nominali di rendimento piú elevati quando constatano aumenti del livello dei prezzi. Poiché in generale le svalutazioni determinano un aumento dei prezzi delle merci, le attese di prezzo sono influenzate o dalle stesse variazioni del saggio di cambio o dagli aumenti di prezzo che ne conseguono o da entrambi. La conseguenza è quella di un comportamento inflazionistico generato in modo che qualsiasi riduzione di breve andare nell'assorbimento o nell'espansione della produzione viene eliminata da una generale caduta dell'offerta aggregata. Nel lungo andare i paesi si trovano di fronte a livelli di prezzo tanto aumentati che la bilancia del commercio è costretta a ritornare nella sua posizione originaria. Stante il funzionamento delle attese di prezzo e delle variazioni dello stock di moneta delineati dall'approccio monetario, proponiamo di considerare l'esistenza di bilance del commercio naturali, che nel lungo andare non sono influenzate dalle variazioni del saggio di cambio.

Le implicazioni di politica di questa analisi è che i paesi che hanno meccanismi di attese di prezzo inserite nelle loro relazioni economiche chiave non dovrebbero contare sulle manipolazioni del saggio di cambio per indurre variazioni nella bilancia commerciale. Essi dovrebbero piuttosto cercare di dipendere soltanto da misure di politica che influenzino i costi comparati, la domanda di consumo, l'inflazione e l'estensione delle restrizioni commerciali.