

DOES INFLATION TARGETING INCREASE THE DEFLATIONARY BIAS  
IN THE WORLD ECONOMY?

Basil Moore

Stellenbosch University

1. IS-LM BECOMES BR-AD.

Post Keynesian economists have now embraced endogenous money and exogenous interest rates for 30 years. Nevertheless the IS-LM diagram, with its explicit assumption of monetary exogeneity and interest rate endogeneity, remains widely accepted by most mainstream economists and still appears in most money & banking and macroeconomic textbooks.

Post Keynesians recognize that interest rates do not adjust as the textbooks maintain, to equilibrate saving and investment or the supply and demand for “loanable funds.” Bank Rate (BR) is now widely recognized as the main instrument of monetary policy, set exogenously by the CB to achieve its stabilization targets and maintained at that level between interest rate meetings. By an arbitrage process other short-term market rates are held equal to BR plus a specific asset differential, reflecting expected differences in liquidity, maturity, collateral and tax status, and borrowers’ risk among securities. Long term rates are also determined by an arbitrage process, and held equal to the capital markets’ expectations of future values of BR plus a positive maturity premium, which reflects creditors’ preferences to hold assets of shorter maturity than debtors’ preferences to issue securities.

Most financial market participants by now (2005) recognize that the money supply is credit-driven, and not controlled by the textbook base-deposit multiplier relationship. But most academic text books continue to seriously lag practitioners in the teaching of financial phenomena. In IS-LM analysis the LM curve is defined as all positions where the demand for money is equal to the supply of money. It is viewed as upward-sloping because the demand for money rises with income and it is assumed the CB controls the money supply as its policy instrument. Once the money supply is recognized as endogenously credit-driven, and BR is seen as the CB's chief exogenous policy instrument, the LM curve becomes a horizontal line at the BR set by the CB.<sup>1</sup>

The IS curve, defined as all positions where planned saving is equal to planned investment, is similarly false, but for different reasons.  $S=I$  is simply an accounting identity. As the accounting record of investment, saving is identical to investment by definition, at every level of income, interest rate and time period. Saving does not exist as an independent relationship, and should simply be viewed as the accounting record of investment. Whenever some units invest other units necessarily save an equal amount, since total assets equal total liabilities.

In spite of the fact that "to save" is a transitive verb most recorded "saving" is non-volitional, particularly in developed economies,<sup>2</sup> Planned saving is never equal to planned investment except by accident, so the IS curve is literally nonsense. The implied message of mainstream IS-LM analysis: "*Changes in the money supply cause changes in the level of income and interest rates,*" reverses

---

<sup>1</sup> The textbooks are now at last being revised. A new mainstream graduate textbook by Walsh (2003) and a new rigorously rationally optimizing monograph by Woodford (2003) concluded that CB's control the overnight interest rate, not the money supply. Neither author referred to, and presumably was not familiar with the extensive Post Keynesian literature on monetary endogeneity and interest rate exogeneity.

<sup>2</sup> See Moore 2005.

the direction of causality between income and money, and provides a classic example of the “reverse causation” error caused by the confusion of identities with behavioral relationships.

In summary Professor Hick’s IS-LM diagram as a model of modern economies is confusing, nontransparent and even false. As a guide to understanding the interaction between money, interest rates, and money income, IS-LM analysis is a misleading fiction, and should be banished from the text-books. When properly construed by applying capital budgeting to all National Income categories, the IS curve becomes the AD curve in interest rate-output space.

The underlying truth buried in the downward-sloping IS curve is the recognition that AD is inversely related to the level of interest rates. This downward-sloping relationship of the AD curve is contrary to the positive relationship observed empirically between changes in Bank Rate and changes in investment. The behavior of saving, investment, AD and interest rates must now be thoroughly re-examined. Once BR is recognized as the CB’s main policy instrument, whose level is set pro-cyclically over the business cycle, the IS curve metamorphoses into the downward-sloping AD function in interest rate-output space.

In FIGURE 1 the level of Bank Rate set by the CB is measured on the vertical axis and the level of AD is measured on the horizontal axis. The IS curve becomes the AD curve whose slope summarizes the interest-elasticity of aggregate demand. The position and shape of the AD curve shifts pro-cyclically with changes in “animal spirits.” The BR set by the CB in period  $t$  ( $BR_t$ ) is associated with a particular set of “animal spirits,” and generates a particular change in aggregate demand ( $\Delta AD_t$ ). As BR is reduced towards zero AD

increases indefinitely and the AD curve asymptotically approaches the horizontal axis. When firms are quantity-takers output is totally demand-driven and changes in AD ( $\Delta AD$ ) result in identical changes in AS ( $\Delta AS \equiv \Delta GDP$ ).

FIGURE 1 THE BR-AD DIAGRAM

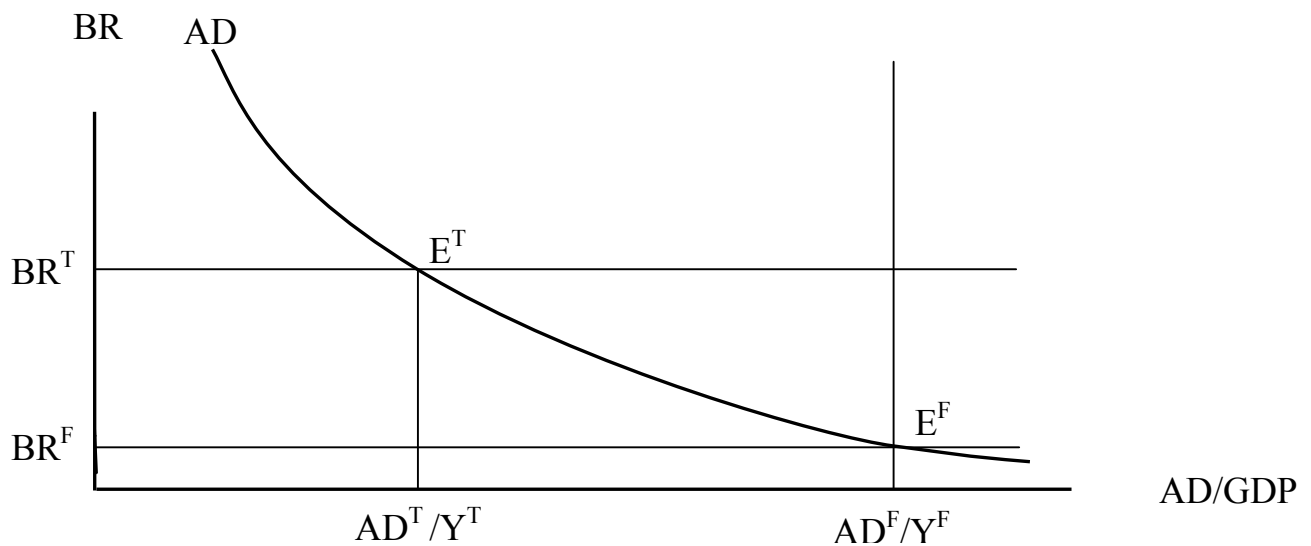


FIGURE 1 reveals the underlying reason why output is demand-constrained in most market economies: **Central banks typically set BR at too high a level (e.g.  $BR^T$ ) which generates output of  $AD^T$ , well above the level  $BR^F$  required for full employment output  $AD^F$ .** Alternatively stated, CB's fail to set Bank Rate at a sufficiently low level ( $BR^F$ ) to induce a level of AD sufficient to equal the full employment output level of output ( $Y^F$ ) in the economy. This simple insight is of critical importance for the analysis of monetary policy.

If economies are in fact demand-constrained as Post Keynesians vociferously maintain, why do CB's have such an innate bias towards tight money? After all most CB's are not managed by fools? There are several reasons, but the most important is because monitoring and influencing price stability is now regarded as CB's critically important responsibility. CB's must attempt to insure that internal and external balance is preserved. In most economies price stability can only be approached by setting higher interest rates, and pursuing more restrictive monetary policies making it impossible for economies to operate without an output gap.

## 2. PROCESS ANALYSIS: THE BR- $\Delta$ AD DIAGRAM

Economies are complex systems which never approach equilibrium configurations. To analyse complex systems comparative-static equilibrium analysis must be replaced with process analysis.<sup>3</sup> The macroeconomic goals of process analysis are to explain and forecast how complex systems change over historical time, how deficit spending is financed and how the manner of finance finance influences the rate of growth of GDP.

In process analysis no attempt is made to uncover a system's future "equilibrium state". All variables must be dated and the current value of all variables is taken as predetermined. The attempt is made to explain and predict the ordinal change in all variables considered, over the shortest period for which data are available. Economies consist of slow-changing and fast-changing variables and different variables differ widely in the chronological period over which change occurs and can be measured.

---

<sup>3</sup> See Moore, 2005.

The current price of all assets equals the markets' collective discount of what the price is expected to be in the subsequent market period. When the current price is equal to the markets' expected price in the next period, the expected change in price will be zero, allowing for discounting and all transactions costs. For many fast-changing variables, experienced speculators can forecast the ordinal short-run change in prices with confidence based on past observations.

For fast-changing variables it is impossible to accurately forecast the ordinal change over even very short chronological periods. Price changes in the short run represent the net cumulative change of thousands of transactions. When the future change in price cannot be known in advance the market has conventionally been termed "efficient." But "efficient" does not mean the market price is "correct" in the sense of the "true" price. "Efficient" markets differ from "inefficient" markets only because prices change more rapidly, and so more rapidly respond to changes in current expectations. The complexity of summing the net effect of a series of stochastic changes enormously increases the uncertainty of the outcome and renders the net cumulative change over very short-run periods unpredictable.

Comparative static equilibrium analysis is not merely useless for complex systems, it is positively misleading.<sup>4</sup> Complex economic variables have no tendency to approach any future "equilibrium" position or growth rate, and changes in current autonomous spending have no "multiplier" effect on future income. When firms are price-setters and quantity-takers the short-run rate of change in prices is predetermined by the past rate of change in costs.

---

<sup>4</sup> By focusing on the final state-change in all variables, equilibrium analysis ignores all events that occur during the transition process but disappear after change ceases. See Stock and Watson, 2003..

In complex economies change is continuous and endogenously generated. Saving is the accounting record of investment so actual saving is identical to actual investment. But planned saving is never equal to planned investment except by accident. Providing inventories remain at their target levels, and there is no quantity-rationing, in every period the change in AS ( $\Delta AS$ ) is determined by the change in AD ( $\Delta AD$ ).

Figure 2 presents the BR-AD diagram of Figure 1 revised for process analysis, and attempts to explain and forecast the change in AD (the BR- $\Delta AD$  diagram). The level of BR is measured on the vertical axis, and the percentage change in AD from its current value to its value in the subsequent period is measured on the horizontal axis. The current level of AD (GDP) is viewed as predetermined by past changes. The analysis attempts to explain and forecast the ordinal change in future AD over the subsequent period.

In Figure 2 the position of zero change in current AD is denoted on the horizontal axis as the origin, and positive or negative changes in AD from its current value are measured to the right or left of the origin ( $\pm \Delta AD_{t+1}$ ). The time unit is the shortest period for which changes in the dependent variable (GDP) are recorded. For variables in the National Income Accounts the chronological time unit is one quarter or one year, depending on data availability. For individual commodities the period over which price and quantity change can be measured is much shorter, quarterly, monthly, weekly, or even daily. For homogeneous assets traded on well

organized markets with low transactions costs, change may be measured in days, hours, minutes, or even an approximation to continual change in real time.<sup>5</sup>

The downward-sloping AD relationship portrays the inverse relationship between the current value of Bank Rate ( $BR_t$ ) and the change in AD in the subsequent period  $(\Delta AD)_{(t+1)}$ . In complex systems all relationships are time-dependent and exhibit only “demi-regularities.”<sup>6</sup> The AD relationship is drawn as **a fractal band that takes up space** not a deterministic single-value relationship. The width of the AD band denotes the variability of the demi-regularity that characterizes particular complex relationships. The  $\Delta AD$  band shifts pro-cyclically upwards during periods of expansion and downwards in periods of recession, which are induced by changes in heterogeneous and non-measurable “animal spirits”.

The aggregate supply relation summarizing the price-setting and quantity-taking behavior of business firms is drawn in Figure 3 as the horizontal band  $(\Delta AS)_{t+1}$ . The “core” inflation rate in the current period is predetermined by the excess of the average rate of increase in money wages over the average rate of growth of labor productivity in the previous period.<sup>7</sup> Increases in money wages in excess of the rate of growth of average labor productivity must either raise unit costs or squeeze business markups. Firms are characteristically able to pass on annual increases in unit costs as annual increases in prices and so are able to maintain a stable markup.

The position of the horizontal band  $(\Delta AS)_{t+1}$  depicts the “core” inflation rate in the subsequent period (t+1). In Figure 3 this is shown as a band between 1 and 2

---

<sup>5</sup> Goodhart and Demas, 1990.

<sup>6</sup> Moore, 2005.

<sup>7</sup> Blinder, 1998.



percent, as pre-determined by the current change in unit costs in period (t). The inflation rate is completely cost-determined and independent of current changes

FIGURE 2 THE BR- $\Delta$ AD DIAGRAM

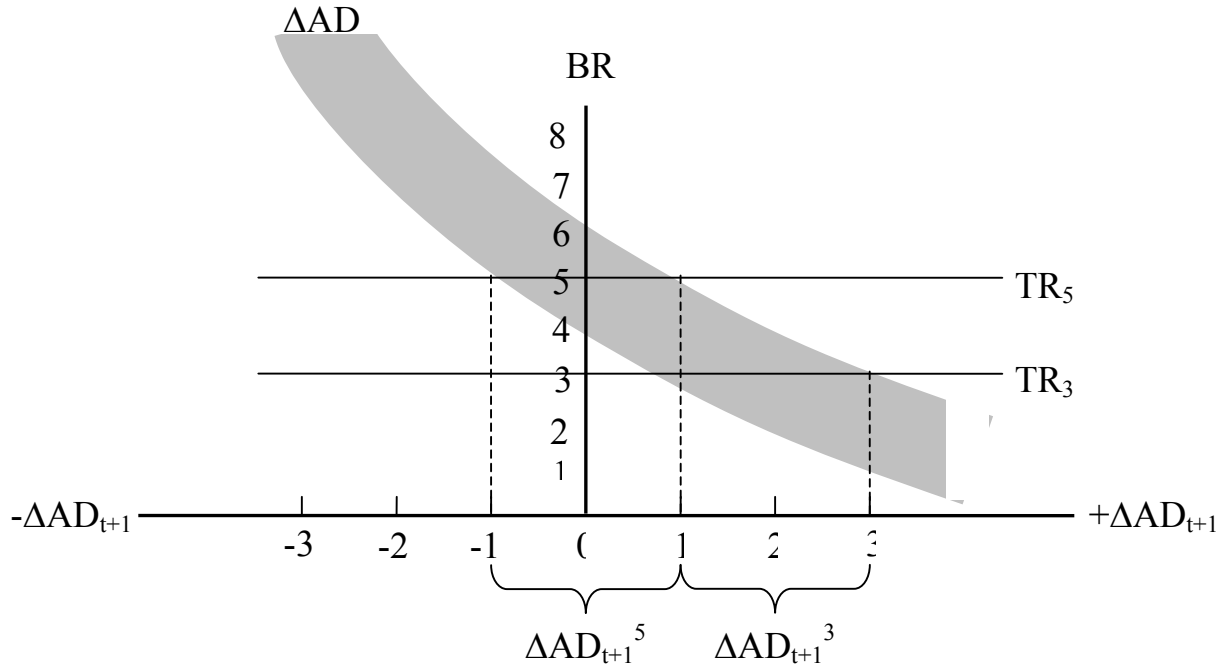
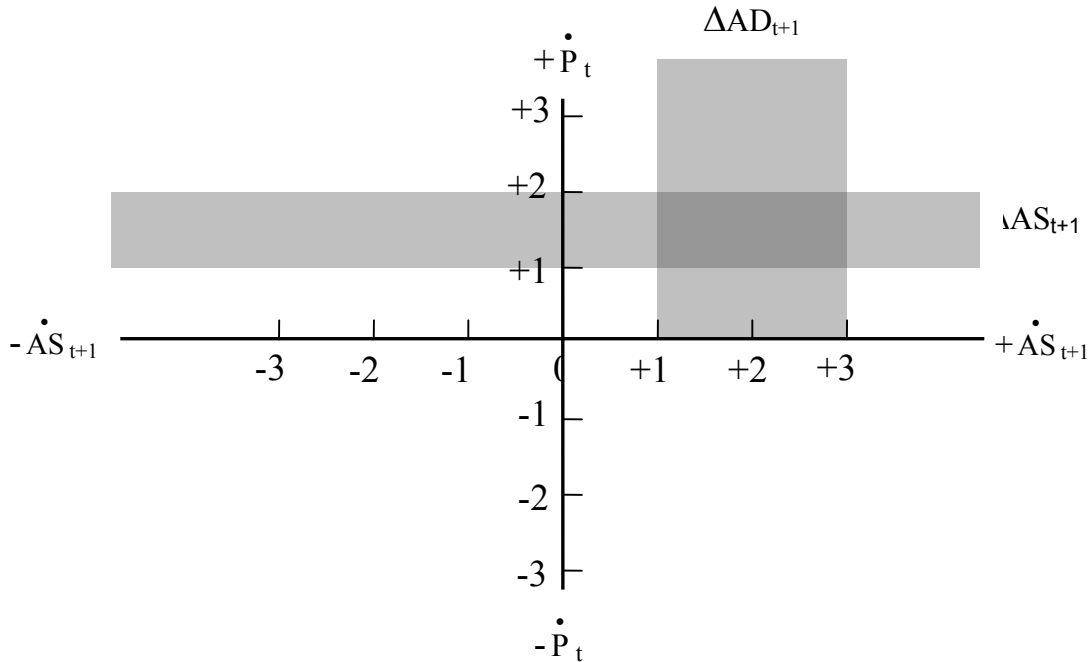


FIGURE 3 THE AD-AS DIAGRAM



in aggregate demand in the present period  $(\Delta AD)_t$ . The position and interest-elasticity of the  $\Delta AD$  band and the BR set by the CB (shown as 3 % in Figure 2) determines the change in AD in period (t+1) (shown as 2 percent with a fan range of 1 to 3 percent in Figure 2) in aggregate demand in the subsequent period  $(\Delta AD_{t+1})$ . The position and interest-elasticity of the  $\Delta AD$  band, and the BR set by the CB (shown as 3 % in Figure 2) determines the change in AD in period (t+1) (shown as 2 percent with a fan range of 1 to 3 percent in Figures 2 and 3).

In Figure 3 the more deeply shaded intersection of the AD and AS bands denotes the average range of changes in inflation (1- 2%) and output (1- 3%) that are expected in period (t) to occur in period (t+1).<sup>8</sup> It does not denote any “equilibrium” band of inflation and output change. Changes in output are

<sup>7</sup> In complex real world economies there is no “equilibrium” level of income, “natural” rate of unemployment, “normal” rate of interest, or “warranted” rate of growth of output that are determined solely by real variables. Money is non-neutral in its effects on both nominal and real output. Moore 2005.

completely demand-determined ( $\Delta AD_{t+1}$ ) by changes in “animal spirits” and by the level of BR set by the CB in the current pricing period. Changes in prices ( $\Delta AS_{t+1}$ ) are solely cost-determined.

“Animal spirits” (agents’ changing expectations of changes in other agents’ future expectations) vary pro-cyclically and shift the AD relationship upwards and downwards. The CB varies BR pro-cyclically in pursuit of its stabilization goals. When the CB expects the  $\Delta AS$  relation to shift up by more than a certain amount, it raises BR. When the CB expects the  $\Delta AD$  to shift down by more than a certain amount, it lowers Bank Rate. Both the timing and ordinal and cardinal change in BR are made at the CB’s discretion.

The CB’s “Policy Reaction Function” describes how the CB has changed Bank Rate in the past in response to the observed deviation of the economy from its stabilization goals.<sup>9</sup> The CB’s “Policy Reaction Function” is now termed the “Taylor Rule” (TR), after an important paper by John Taylor which empirically described the historical rate-setting behavior of the Federal Reserve System.<sup>10</sup> In FIGURE 2 the Taylor Rule TR is drawn as a horizontal line at the Bank Rate set by the CB ( $BR_t$ ). When the CB sets BR at 5 percent ( $TR_5$ ), the expected change in AD ( $\Delta AD$ ) over the subsequent quarter is zero, with a fan range from +1 to -1 percent. When the CB sets BR at 3 percent ( $TR_3$ ), the expected change in AD ( $\Delta AD$ ) over the subsequent quarter is +2 percent (fan range from +1 to +3 percent.) Bank Rate is changed discretionarily in pursuit of its policy targets.<sup>11</sup>

---

<sup>9</sup> Moore, 1988.

<sup>10</sup> Taylor, 1993.

<sup>11</sup> The various theoretical reasons why changes in aggregate demand ( $\Delta AD$ ) are inversely related to changes in Bank Rate are outlined in detail in Moore (2005).

### 3. THE $\Delta$ BR- $\Delta$ AD DIAGRAM

The chief empirical problem for the analysis of complex systems is that outside of the laboratory, the *ceteris* never remain *paribus*. When interest rates are changed it is informative to decompose the change in AD into the change associated with the previous **level** of BR and the change associated with the **change** in BR.

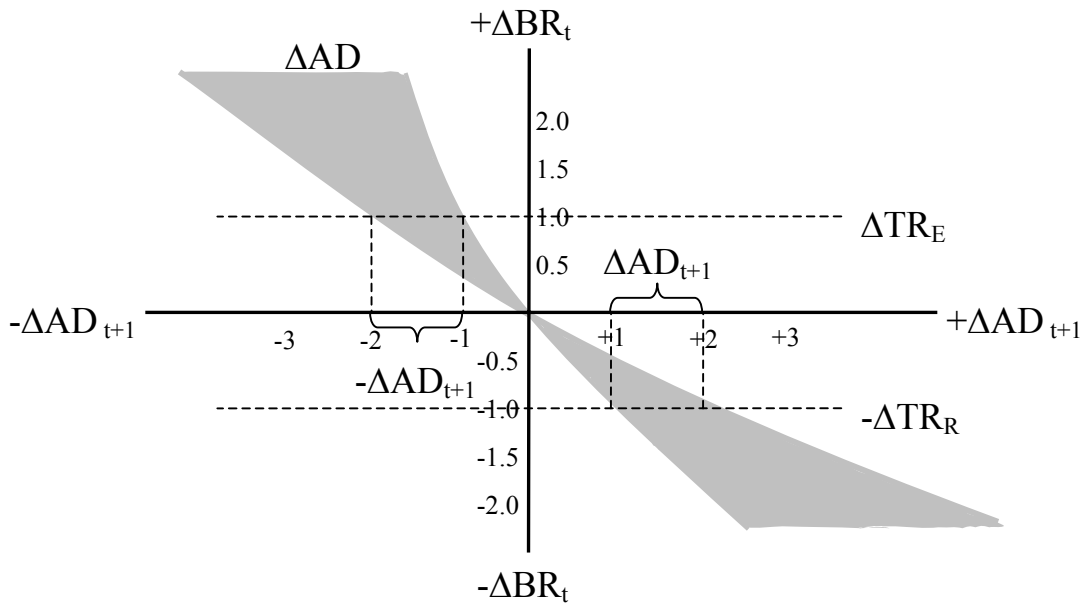
Unfortunately there is frequently insufficient information to distinguish the effects of **changes** in BR on AD from the effects of **levels** of BR on AD. If BR is changed more frequently than once a quarter, the effects of changes in BR on AD cannot be estimated directly since changes in GDP are only measured quarterly.

In Figure 4 the Taylor Rule curve is shown for a one percent increase ( $+\Delta BR_E$ ) and one percent decrease in Bank rate ( $-\Delta BR_R$ ), *ceteris paribus*. A rise in BR *ceteris paribus* induces a reduction in AD, and a fall in BR induces an increase in AD. The implicit assumption which in laboratory experiments is entirely appropriate, is the *ceteris paribus* assumption: in the absence of changes in the causal variable (BR) the dependent variable (GDP) remains unchanged. But this assumption ignores the fact that outside the laboratory changes in “animal spirits” are both continuously changing, and are the prime underlying determinant of changes in both AD and BR.

Using complex economies as our laboratory the expected change in aggregate demand will be zero only under an extremely restrictive set of assumptions: BR must be set at exactly the level where AD remains constant (shown as 5 percent in Figure 2). But in complex systems the most important non-measurable causal

variable, “animal spirits,” changes continually irrespective of whether BR changes or not. In the real world changes in aggregate demand are primarily determined by changes in “animal spirits,” and BR is not changed randomly. AD increases when the economy is in an expansion phase, when CBs raise BR, and falls when the economy is in a contraction phase, when CBs lower BR.

In consequence changes in Investment ( $\Delta I$ ) and AD ( $\Delta AD$ ) vary empirically positively rather than inversely with changes in BR ( $\Delta BR$ ). AD varies pro-cyclically with swings in “animal spirits,” even when Bank Rate is unchanged. Figure 4 is not based on the general case outside the laboratory, but is drawn under the highly restrictive assumption that BR is set at that particular rate (5 percent in Figure 2) which ensures that AD remains unchanged. Such a restrictive assumption must be imposed for AD to remain constant over the cycle, to ensure  $\Delta AD$  is negatively related *ceteris paribus* to the change in BR. Shifts in “animal spirits” cause the  $\Delta AD$  relation to shift pro-cyclically over the cycle. The position, shape of and change in the AD band ( $\Delta AD$ ) are therefore completely time-dependent in their response to changes in BR.

FIGURE 4 THE  $\Delta AD$ - $\Delta BR$  RELATIONSHIP

In Figure 5 the  $\Delta AD$  relation shifts upward during expansions and downward during recessions, and CB's also vary BR pro-cyclically. Even when the interest elasticity of  $\Delta AD$  is very substantial, as shown by the high elasticity of the  $\Delta AD$  curve, this will generally result in a positive relation between changes in  $\Delta AD$  and changes in BR. In fact due to counter-cyclical monetary policy the change in BR ( $\Delta BR_t$ ) can be regarded as the CB's proxy for a change in animal spirits, so an increase in BR in fact signals an expected future increase in inflation, output and aggregate demand.

The effect of a change in interest rate on AD will be substantial whenever the interest-elasticity of AD is high. But to the extent changes in BR are a proxy for CB's estimate of the change in "animal spirits" **changes in AD will be positively empirically correlated with changes in BR.**  $\Delta BR$  and  $\Delta AD$  rise and fall together in expansions and recessions. The broad empirical relationship between changes in AD ( $\Delta AD$ ) and changes in BR ( $\Delta BR$ ) will be positive when BR is

varied pro-cyclically over the business cycle. This explains why the empirical relationship between changes in interest rates and changes in investment spending is predominately positive in both expansions and recessions.

In Figure 5 the BR-  $\Delta AD$  relation is shown in periods of expansion ( $\Delta AD_E$ ) and recession ( $\Delta AD_R$ ). During expansions the change in  $AD_E$  is positive and CBs raise BR. Expected returns on investment projects are then higher due to the expected increase in future  $\Delta AD$  accompanying higher capacity utilization. The demand for investment increases and becomes more responsive to changes in interest rates, as shown by the more interest-elastic  $AD_E$  relationship. During recessions the expected returns on investment projects fall, AD and capacity utilization rates decline, and CBs lower BR. The demand for investment falls and becomes less responsive to changes in interest rates, as shown by the less interest-elastic  $\Delta AD_R$  band.

Figure 6 shows how  $\Delta BR$  and  $\Delta AD$  shift over the cycle.  $\Delta BR$  is varied by the CB pro-cyclically over the cycle. During expansions, when the  $\Delta AD$  relationship is expanding (shifting up), CBs increase BR ( $+\Delta BR$ ). During contractions, when the  $\Delta AD$  relationship is declining (shifting down), CBs reduce BR. The inverse effect of interest rate changes on AD are theoretically assumed substantial as indicated

FIGURE 5 CYCLICAL SHIFTS IN THE  $\Delta AD$  RELATIONSHIP

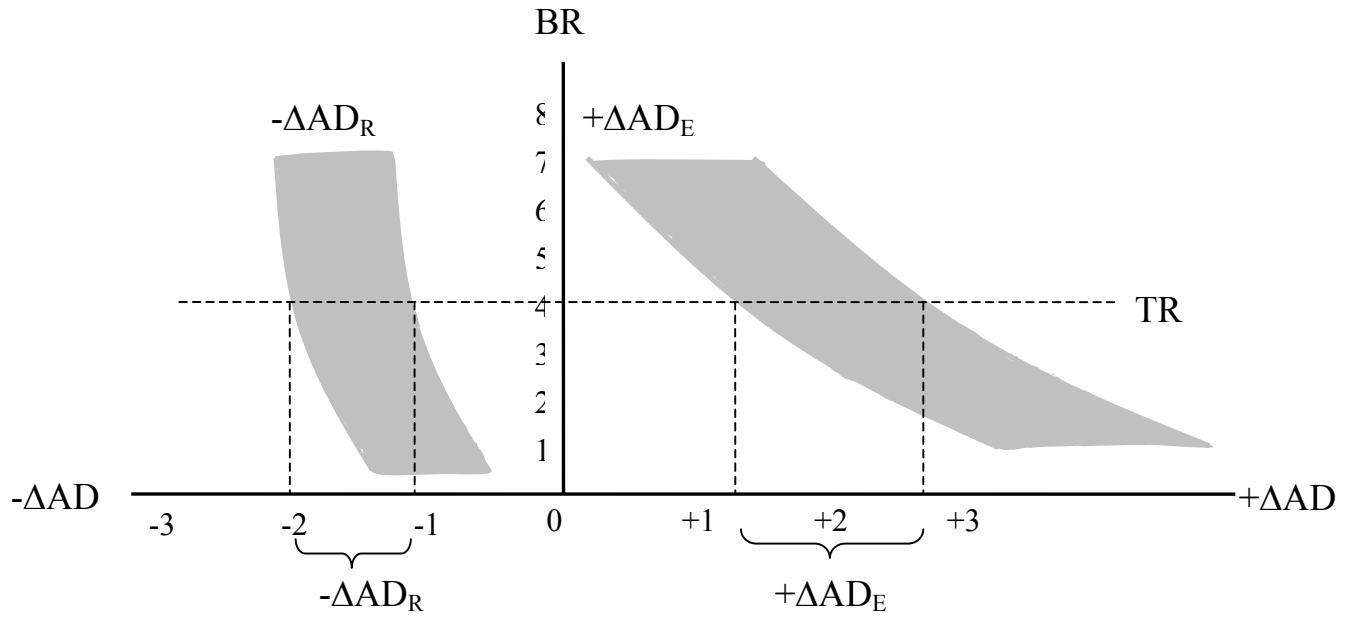
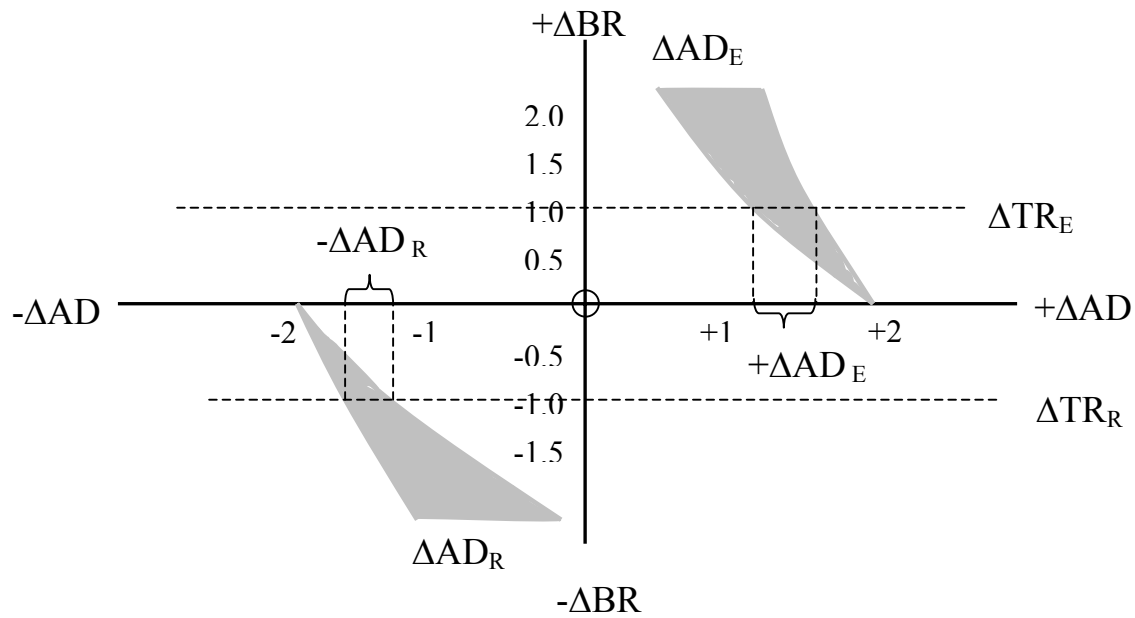


FIGURE 6 CYCLICAL SHIFTS IN THE  $\Delta BR$ - $\Delta AD$  RELATIONSHIP





by the high interest-elasticity of the  $\Delta AD_E$  and the  $\Delta AD_R$  relationships in Figure 6. But the observed empirical association of changes in Bank Rate with changes in AD is merely a reduction in the rate of expansion of  $+\Delta AD_E$  during economic expansions, not an absolute decrease. Similarly during recessions reductions in BR merely reduce the rate of decline of  $-\Delta AD_R$  and do not result in absolute increases in AD. Even when the interest elasticity of investment is high, as shown the effects of  $\Delta BR$  on the change in AD are likely to be outweighed by shifts in the  $\Delta AD$  relationship, due to the accompanying shifts in “animal spirits.”

The above analysis provides an explanation why it has proven so difficult to find significant negative coefficients on interest rates in investment demand equations. The central problem is that the single most important causal variable in an uncertain world, changes in “animal spirits”, are non-measurable and not included in the model’s formal analysis. Since the omitted variable is strongly positively related to  $\Delta BR$ , this imparts a large positive bias to the interest rate coefficient.

#### 4. THE DEFLATIONARY BIAS IN FLEXIBLE EXCHANGE RATE REGIMES

Neoclassical theory assumes away many key implications of a money-using economy, in particular the necessity for CBs to continuously maintain system liquidity due to fundamental uncertainty about future events. This greatly impedes understanding of the core problems facing international finance: illiquidity, increasing debt obligations and “unstable” exchange rates. Keynes developed his vision of how the existing international payments system leads to a global deficiency of aggregate demand in greater length in his post-*General Theory* writings, which are much less widely known. He emphasized that when

governments do not have the political will to stimulate domestic AD, due either to a self-imposed belief in the desirability of a ‘balanced’ budget, or to the fear of missing self-imposed inflation “targets,” each country’s international advantage soon becomes at variance with that of its neighbors.<sup>12</sup>

Nowhere is the difference between Keynes' position and that of mainstream supporters of *laissez-faire* more clearly evident than the question of the desirability of free international capital movements and stable exchange rates. Keynes argued forcibly that government regulation of international capital movements to promote exchange rate stability was necessary and in the public interest. Many international financial flows are the reflection of anti-social activities. In a *laissez-faire* system of international finance there is no way to distinguish short term movement of funds that are used for new real investments, from short-term movement of funds that are used for speculative purposes, and take refuge in one nation after the other in the continuous search for speculative gains, or the avoidance of the tax collector.<sup>13</sup> Exogenous capital movements have detrimental effects on individual countries balance of payments, exchange rates and unemployment. The international flow of "hot" money in the form of precautionary and speculative funds is frequently disruptive and results in the serious impoverishment of nations whose current accounts would otherwise have been balanced:

*"Loose funds ... sweep round the world disorganizing all steady business. Nothing is more certain than that the movement of capital funds must be regulated. ...*

---

<sup>12</sup> Keynes’ analysis makes clear how the huge current account deficits of the US throughout the 1990’s have provided a critically important direct stimulus to AD for the rest of the world. The huge US deficits provided an expansionary bias and prevented the world from falling into deeper and more widespread unemployment. Conversely China’s huge current account surplus has exerted a restrictive effect, by imposing current account deficits on its trading partners in the rest of the world, who must then pursue restrictive policies to protect their exchange rates.

<sup>13</sup> Keynes, CW XXV, 1980, Proposals for an International Currency Union, 1941, 42.

*There is no country which can in the future safely allow the flight of funds for political reasons, or to evade domestic taxation or in anticipation of the owner turning refugee. Equally, there is no country that can safely receive fugitive funds which cannot safely be used for fixed investments and might turn it into a deficiency country against its will and contrary to the real facts.”<sup>14</sup>*

So long as countries trade with the rest of the world, they must avoid expansionary domestic policy that threaten external imbalance in order to protect their exchange rate. Countries that engage in international trade must maintain expected future conversion rates of their currency close to the current values. If the exchange rate is expected to fall CB's must pay a risk premium to attract funds, to compensate foreign portfolio holders for anticipated capital losses.

Since all currencies can represent a store of wealth in asset portfolios, all countries must be concerned both about the current size of their foreign exchange reserves and the future value of their exchange rates. When a country's current foreign exchange outflows consistently exceed its foreign exchange receipts, in existing trade regimes it has very few choices: it must either pay out foreign currencies from its reserves, borrow foreign currencies to cover its negative balance, let the exchange rate depreciate, or devalue its currency.

The world is a closed economy, so total surpluses must equal total deficits. One country's surpluses imply an equal deficit for other countries. To combat cost inflation CB's in all countries with BOP deficits are forced to pursue restrictive policies and maintain interest rates at high levels. But in all countries with surpluses CB's are not forced to pursue offsetting expansionary policies. They are free to permit their surpluses to accumulate forever. All pressure to adjust is

---

<sup>14</sup> Keynes, CW XXV, 1980; Proposals for an International Currency Union, 1941, 87.

placed on the deficit countries, who are forced to pursue more restrictive policies. This asymmetry has been termed the “Keynes Effect” and results in a strong restrictive bias to world AD.<sup>15</sup>

Creditors must bear the exchange rate risk that in the future the debtor country may find itself unable to service its total foreign borrowing, in which case they will be repaid at only some fraction of the face value. As a result LDCs typically face very high borrowing costs, and find it extremely difficult to finance capital imports in excess of their export proceeds. Their cyclical expansions are characteristically deflated by draconian monetary policy designed to depress rapid AD growth, reducing their debt ratios and the growth rate of GDP.<sup>16</sup>

Such response conflicts directly with the goal of maintaining internal balance and aiming at full employment and rapid growth. Countries running large deficits frequently have no choice, and are forced to restrict domestic demand to reduce their demand for imports. Countries persistently running current account **deficits** are widely viewed as “attempting to live beyond their means”. In contrast **surplus** countries are under no similar pressure to increase expenditures on imports or raise foreign investment. They can simply accumulate reserves indefinitely. The net effect of trade imbalances on global AD is highly restrictive, since debtor countries are forced to pursue more restrictive policies while surplus countries are under no similar pressure to pursue offsetting expansionary policies.

---

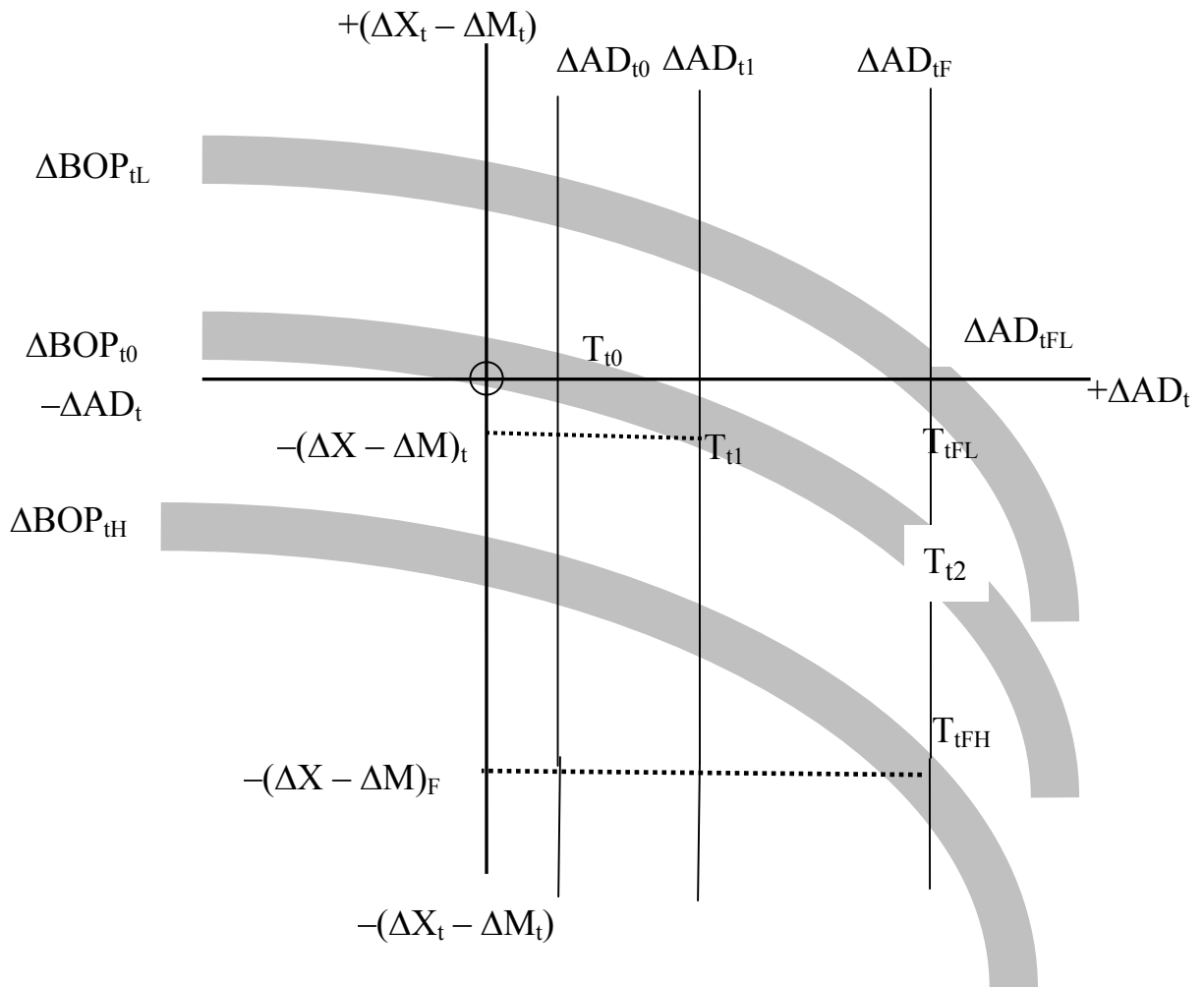
<sup>15</sup> Keynes proposed an International Clearing Union (ICU), which was designed to encourage both deficit and surplus countries to reduce their balance of payment imbalances by appropriate expansionary and restrictive policies. This was to be effectuated by the ICU imposing a tax on the net surplus balance **and** the net deficit balance of both deficit and surplus countries. In spite of his impressive eloquence he was unable to persuade the largest creditor country, in 1946 the US, that it should pay a special new tax on the net surplus amount in its BOP. Keynes, CW XXV, 1980. *Proposals for an International Currency Union*, 1941. See also Keynes 1936.

<sup>16</sup>The importation of capital goods results in an increase in domestic capital formation, and so actually constitutes an increase rather than a decrease in national saving. Moore, 2005.

## 5. THE CONFLICT BETWEEN INTERNAL AND EXTERNAL BALANCE

The conflict between internal and external balance is rendered more transparent by using process analysis. In Figure 7 the current level of AD and the BOP are taken as predetermined. The vertical axis measures the positive or negative change in the BOP surplus or deficit ( $\Delta X_t - \Delta M_t$ ), and the horizontal axis represents the positive or negative change in aggregate demand ( $\pm \Delta AD_t$ ). Imports are positively related to changes in domestic AD while exports are related to changes in foreign AD. The fractal band  $\Delta BOP_{t_0}$  slopes downward to illustrate the extent the BOP deteriorates when AD and imports increase. Given the current exchange rate ( $E_{t_0}$ ) and Bank Rate ( $BR_{t_0}$ ), an increase in domestic AD causes imports to increase and worsens the balance of payments, as shown by the downward slope of the BOP relationship ( $\Delta BOP_{t_0}$ ).

The BOP is in balance where exports are equal to imports and the  $\Delta BOP_{t_0}$  relationship intersects the horizontal axis ( $T_{t_0}$ ). The economy is assumed to be held at a change of  $\Delta AD$  sufficiently below full capacity output so the value of imports is exactly equal to the value of exports and the current account is balanced. The current change in aggregate demand ( $\Delta AD_{t_0}$ ) is insufficient to reach the economy's potential capacity ( $\Delta AD_{tF}$ ). The CB anticipates that although sharply lowering BR might succeed in increasing employment and raising  $\Delta AD_0$  towards  $\Delta AD_F$ , the current account deficit would greatly increase ( $T_{t_2}$ ) and the resulting outflow of foreign exchange would reduce the level of reserves and jeopardize the exchange rate. As a result the CB decides to forego a more expansionary monetary policy, and acquiesce to slightly higher levels of unemployment, greater excess capacity, and a more modest current account deficit ( $T_{t_1}$ ).

FIGURE 7 THE  $\Delta AD$ - $\Delta BOP$  RELATION IN OPEN ECONOMIES

In open economies operating under floating exchange rate regimes where capital mobility is high, an increase or decrease in BR induces short-term capital inflows or outflows, depending on the change in the interest rate differential with the center economies. This causes the exchange rate to appreciate or depreciate, and so to overshoot or undershoot their expected value in the next period. These induced short term capital flows continue over time, in response to continually

changing expectations about real holding-period returns across countries and periods explicitly including anticipated capital gains and losses.

If the interest rate in the center is taken as given, lower interest rates in the periphery reduce the interest rate differential of the country vis-a-vis the rate in the center. These reduced differentials lead to capital outflows, causing the exchange rate to depreciate. By lowering the foreign price of exports and raising the domestic price of imports exchange rate depreciation raises the domestic demand for exports and for import-competing domestic goods, and reduces the foreign demand for imports. The result of a lower exchange rate is to shift the  $BOP_t$  relationship upwards, e.g. to  $\Delta BOP_{tL}$ . This expands AD, increases the net BOP surplus, and makes possible a positive BOP at higher levels of domestic aggregate demand.

The increase in foreign demand for exports and the increased domestic demand for import-competing goods result in an increase in the interest-elasticity of AD, enabling the economy to reach full employment levels of AD ( $\Delta AD_{tF}$ ) that are consistent with internal balance ( $T_{tFL}$ ). Lower exchange rates raise the level of AD consistent with external balance (the intersection of the  $\Delta BOP_{tL}$  relation with the horizontal axis), and the level of income consistent with internal balance (the intersection of  $\Delta BOP_{tL}$  with  $AD_F$ ). As a result lower exchange rates enable internal and external balance simultaneously to be attained ( $T_{tFL}$ ).

In open economies the unintended effect of flexible exchange rate regimes is to enormously increase the power of monetary policy over the economy, particularly over the inflation rate. In closed economies restrictive policies and higher interest rates (BR) raise the cost of borrowing, lower asset prices, and reduce AD. The  $\Delta AD$  relation will shift downward, depending on the interest-elasticity of AD.

But in most closed economies the “core” inflation rate is determined by the extent the average rate of money wage growth exceeds the average rate of growth of labor productivity. In economies where unions have strong bargaining power in many industries, the average rate of money wage increase will be relatively independent of the unemployment rate.<sup>17</sup>

In open economies an increase in BR induces short-term capital inflows which causes the exchange rate to appreciate and overshoot its expected value in the next period, until real rates of return are equalized among different countries. Short-term capital inflows and outflows vary continuously over time. In complex systems change is continual. As a result expected real rates of return on different assets (including capital gains and losses) are never equalized across all countries for all holding periods. Change is continuous. The appreciation of the exchange rate, by raising the foreign price of exports and reducing the domestic price of imports, reduces exports, increases imports and causes the balance of payments to deteriorate. This raises the interest-elasticity of GDP and so increases the reduction in AD that accompanies any given rise in BR in open economies. With a restrictive monetary policy higher interest rates increase the current account deficit at full employment ( $AD_F$ ), and render it impossible for the CB to achieve internal balance.

The effects of changes in BR on  $\Delta AD$  are much greater in open economies, due to short term capital inflows and outflows impacting on the value of the exchange rate. This permits CB's to more easily reach their inflation targets. But the very

---

<sup>17</sup> SA has a dual labor market. Money wages in the formal sector continue to increase at about 7-10 percent in the face of 30-40 percent economy unemployment which is primarily confined to the informal economy.



process of inflation targeting introduces an additional restrictive bias into the world trading economy.

## 6. INFLATION TARGETING

In closed economies a reduction in BR reduces borrowing costs, raises asset prices and expands aggregate demand depending on the interest-elasticity of AD, (e.g. a moderate movement of AD to e.g.  $T_{t1}$  in Figure 7). More expansionary monetary policies reduce BR to lower levels, resulting in a higher level of AD, higher asset prices and greater capital outflows in all economies. But in open economies lower levels of BR also induce capital outflows, which induce depreciation of the exchange rate and raise the domestic price of imports. The reduction in BR causes capital outflows, exchange rate depreciation, increases in the price of imports and temporary increases in the inflation rate, until the exchange rate stabilizes at a lower level depending on the openness of the economy. This causes a rise in the inflation rate due to the higher cost of imported goods that accompany exchange rate depreciation.

A fall in the exchange rate leads to only a temporary increase in the inflation rate, providing all induced secondary cost and price increases are avoided. But even a temporary rise in the inflation rate makes it more difficult for CB's pursuing expansionary monetary policy to achieve their short-term inflation targets. In consequence CB's are frequently reluctant to pursue more expansionary monetary policy, irrespective of the degree of unemployment.

In open economies only the center country, in whose currency all trade takes place, can permit negative current account positions to continue indefinitely. All

other countries must accept the external balance discipline and restrict AD to maintain the current value of the exchange rate. Apart from the center, all countries not enjoying the luxury of current account surpluses must pursue restrictive policies to generate a substantial output gap, to keep domestic AD well below full capacity, in order to prevent their external balance from deteriorating. Restrictive policy may take the form of higher interest rates, higher taxes, restriction of government spending and the imposition of tariffs and quotas on imports. The alternative is to allow the exchange rate to depreciate in floating exchange rate regimes, or permit the rate to fall in fixed exchange rate regimes.

In flexible exchange rate systems creditors often find it difficult to distinguish whether BOP deficits indicate the exchange rate is overvalued, and so is more likely to fall in the future, whether the CB is keeping interest rates high to reduce future inflation, and so the exchange rate may rise further in the future, or whether the deficits are due to investors are borrowing to deficit-finance attractive investment projects and their expectations of high future rates of return may or may not be justified. But the general response to a worsening of a current account deficit is for the central bank (CB) to raise the level of BR to attract additional net short-term funds and to increase the existing exchange rate. Higher exchange rates depress the level of domestic AD, by decreasing both foreign demand for exports and domestic demand for import-competing goods. By reducing the price of imports, exchange rate appreciation directly reduces the inflation rate, and so enables CBs to more easily attain their inflation targets.

But in open economies more restrictive monetary policy, although it temporarily reduces the inflation rate conflicts directly with the output goals of internal balance: higher employment and more rapid output growth. Countries persistently

running large BOP deficits frequently have no choice, and are forced to restrict domestic demand, and reduce their demand for imports to protect their exchange rates. Countries persistently running current account **deficits** are widely viewed as “attempting to live beyond their means”. In contrast **surplus** countries are under no similar pressure to increase expenditures on imports or raise foreign investment to reduce their BOP surplus, and can accumulate additional reserves indefinitely. The net effect of trade imbalances on global AD is highly restrictive. All debtor countries are forced to pursue more restrictive policies, while as Keynes argued surplus countries are under no similar pressure to pursue more expansionary policies.

Developing countries (DCs) are generally more heavily dependent on imported capital goods than mature economies. As the growth rate rises some agents desire to undertake additional capital formation financed by new debt issue in response to higher expected returns on investment projects. For many DC's the marginal propensity to import borrowed capital goods rises above unity when the economy is in the boom phase of the cycle.<sup>18</sup> Creditors must bear the exchange rate risk that the country in the future may find itself unable to service all its foreign borrowing, in which case they will be repaid only some fraction of the face value of their loans. In consequence DCs typically face high borrowing costs and find it difficult to finance capital imports greatly in excess of their export proceeds. Their cyclical expansion must typically be deflated by draconian monetary policies, designed to

---

<sup>18</sup> In SA the MPM has typically exceeded 100 percent during boom periods. B Smit, BER, Stellenbosch University. This suggests one explanation why in a country like South Africa with unemployment rates estimated at between 30 and 40 percent the CB keeps short term interest rates at double digit levels. Such interest rates would be unthinkable in any developed economies, if their unemployment had reached double digit levels.

depress their demand for capital imports and reduce their debt ratios, and in turn further depresses the rate of growth of GDP.<sup>19</sup>

## 7. CONCLUSIONS

For an inflation-targeting Central Banker a higher BR has the very attractive and desirable effects of directly reducing the inflation rate, simply by reducing the domestic cost of imports, depending on the openness of the economy. Higher interest rates lead to greater capital inflows and higher exchange rates, which by reducing import prices lower the inflation rate and enable CB's to more easily reach their inflation target. If a policy of higher levels of BR and higher exchange rates has been followed, as the economy approaches  $AD_F$  the current account balance ( $\Delta BOP_H$ ) will become increasingly negative, as the excess of imports over exports increases ( $T_{ifH}$  in Figure 7).

Such a highly unfavorable trade balance may appear superficially to imply that the economy is in danger of overheating, and must be restrained by even higher interest rates and more restrictive monetary policy in the future.<sup>20</sup> But somewhat paradoxically lower interest rates, by inducing short-term capital outflows, lower the exchange rate, improve the current account balance ( $\Delta BOP_L$ ), and make the simultaneous attainment of external (current account) balance and internal (full employment) balance much more feasible ( $T_{ifL}$  in Figure 7).

Only the center country, in whose currency all trade takes place, can permit negative current account positions to continue indefinitely, providing the country

---

<sup>19</sup> The importation of capital goods actually results in an increase in domestic capital formation and saving. Proper capital accounting would record this as an increase and not a decrease in national saving. See Moore, 2005.

<sup>20</sup> In SA short term rates are currently about 10 percent, and the CB is currently contemplating another rise in BR, in order to keep the inflation rate within its 3 – 6 percent target, in the face of 30-40 percent unemployment.

continues to be regarded by investors as a “safe haven”. All others must accept the external balance discipline, and attempt to maintain the current value of their exchange rate by pursuing various restrictive policies. Apart from the center all countries not enjoying the luxury of current account surpluses must pursue restrictive policies, and keep domestic AD below full capacity to prevent their external balance from deteriorating. This may take the form of higher interest rates, higher taxes, restriction of government spending, imposition of tariffs and quotas on imports, and/or the subsidization and expansion of exports. The alternative is to allow the exchange rate to depreciate in floating exchange rate regimes, or to devalue the exchange rate in fixed exchange rate regimes.

The most common response to a negative BOP is for the central bank (CB) to raise the level of BR, and attract additional net short-term funds to support the existing exchange rate. This serves to depress the level of domestic AD, reduce the demand for imports and increase the demand for exports. In response to the higher expected returns on investment projects, DC’s attempt to undertake additional capital formation to be financed by debt issues. For many DC’s the marginal propensity to import borrowed capital goods rises above unity when the economy is in the boom phase of the business cycle.<sup>21</sup>

Lower interest rates, which may clearly be called for to stimulate investment, employment and AD growth, by reducing the interest rate differential with the center lead to the outflow of short-term capital, and cause the exchange rate to depreciate and overshoot its expected future value until expected real short-term interest rates are equalized. Even though the exchange rate may appear to be

---

<sup>21</sup> In South Africa the Marginal Propensity to Import (MPM) has characteristically exceeded 100 percent during boom periods. Ben Smit, Bureau of Economic Research, Stellenbosch University.

clearly overvalued on PPP terms, as evidenced by a substantial BOP deficit and a declining export sector, reducing AD and worsening unemployment, the Governor may be tempted to stay the course, and even raise BR further, even in the face of huge and growing unemployment, in order to remain within his inflation target.

An increase in BR, by causing the ER to appreciate, directly reduces import prices and enables the Governor to continue his successful management of maintaining inflation within its target band. If he were to lower BR and pursue more expansionary policies the exchange rate and the  $\Delta$ BOP relationship would both fall. The economy would then enjoy higher AD and greater output and employment growth. But anything that causes the inflation rate to rise prevents the Governor from keeping within his inflation targets and so makes him look like a failure because he has not kept inflation within its target band. In many countries inflation-targeting has become the simple test of a Governor's success. The Governor's credibility and popularity is directly linked to his ability to keep the economy within its assigned inflation targets.

The increased importance of short-term capital flows has changed the nature of the game of central banking. By raising BR and increasing the interest rate differential vis-a-vis the center, the CB is now able to stimulate an immediate inflow of short-term capital. In response, the exchange rate increases and overshoots its expected future value until it is expected to fall over the subsequent year by exactly the amount of the interest rate differential and expected real interest rates are equalized among assets and countries. A higher exchange rate has the effect of directly reducing cost inflation, by lowering the domestic price of imports and making it easier for the Governor to hit his inflation target.

Lower BR's, by reducing the exchange rate and causing the  $\Delta BOP_t$  relationships in Figure 7 to rise, makes it easier for CB's to achieve full employment and BOP balance at higher levels of GDP. A more expansionary monetary policy reduces interest rates, increases asset values, raises investment, income and output, expands the level of employment, and surely raises the total utility of the population. But by reducing the level of the exchange rate in open economies it causes the costs of imports temporarily to rise, and causes the inflation rate to increase until the exchange rate has reached its new lower level. The result is that over this transition period the CB will probably not succeed in keeping within its inflation target. If the Governor of the Bank has elevated reaching his inflation targets as the central criterion of the success of his time on watch, the introducing of inflation targeting will make it less likely that the CB will pursue expansionary policies, even when they may clearly be appropriate, because they reduce the likelihood that the CB will attain its inflation target. Instead CB's are more inclined to pursue more restrictive policies which result in lowering the  $\Delta BOP_t$  relationships, and making it more difficult to realize the CB's central goals.

The root problem remains. In most DC's inflation is primarily cost inflation not demand inflation. The "core" inflation rate ( $\dot{p}$ ) is broadly equal to the rate of increase in unit labor costs, the excess of the average rate of wage inflation ( $\dot{w}$ ) over the average rate of labor productivity growth ( $\dot{a}$ ) in the current pricing period ( $\dot{p} = \dot{w} - \dot{a}$ ). This "core" inflation rate can only be permanently reduced if the rate of increase of money wages can be moderated. Unit labor costs are stabilized only when the average rate of growth of money wages is no greater than the average rate of labor productivity growth. In open economies inflation

targeting obscures this central truth and leads to a bias in favor of high interest rates which depresses the level of real income, asset values, employment as well as the growth process.

## REFERENCES

- Blinder, Robert (1998) et.al., *Price Stickiness in the United States*, New York, Russel Sage.
- Keynes, John Maynard (1936) *The General Theory of Employment, Interest and Money*, London, Macmillan.
- Keynes, John Maynard (1980) *Collected Works, XXV Activities 1940-1944: Shaping The Post War World*, London, Macmillan.
- Goodhart, Charles and Demas, Antonis (1990) “Reuters Screen Images of the Foreign Exchange Market: The Deutschmark/Dollar Spot Rate,” *Financial Markets Group Discussion Papers*, 196, August, 1990.
- Moore, Basil (1988) *Verticalists and Horizontalists: The Macroeconomics of Endogenous Money*, London, Cambridge University Press.
- Moore, Basil (2005) *Shaking the Invisible Hand: Complexity, Endogenous Money and Exogenous Interest Rates*, London and New York, Palgrave Macmillan.
- Stock, James and Watson, Mark (2003) “Forecasting Output and Inflation: the Role of Asset Prices,” *Journal of Economic Literature*, September 41(3) 788-829.
- Taylor, John (1993) “Discretion versus Policy Rules in Practice,” *Carnegie Rochester Series on Public Policy*, December, 39, 195-214.
- Walsh, Carl (2003) *Monetary Theory and Policy*, (2<sup>nd</sup> ed) Cambridge Ma. MIT Press.



Woodford, Michael (2003) *Interest and Prices: Foundations of the Theory of Monetary Policy*, Princeton, New Jersey, Princeton University Press.