Macro-management of Economic Growth with Underemployed Labour and Technological Inertia

By

Arvind Virmani

Draft: December 1997[1]

Presented in ADB/World Bank Senior Policy Seminar on Managing Global Financial Integration in Asia, Manila, Philippines, 10-12 March 1998.

[1] The model was initiated in 1993-4 at the time of the surge in portfolio inflows ($ 6 billion in 12 months), from negligible amounts earlier. It formed the basis of macro discussions and debates with the international organizations.

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1 ASSUMPTIONS[2]

1.1.1 Surplus Labour

There is unemployed or under-employed labour. This implies that labour supply is not a constraint on Industrial growth, though the wage rate need not remain constant.

1.1.2 Technological Inertia

(a) World Technology Frontier

The domestic technology frontier lies (well) inside the international technology frontier.

(b) Domestic Technology Diffusion

The economy may also be operating within the domestic technology frontier.

1.1.3 Imperfect Capital Market

Capital markets in developing countries are imperfect because of lack of information & knowledge, and consequently they are characterised by high uncertainty & critical dependence on expectations.[3] This problem is magnified for cross-border capital transactions & flows. Mobility into and out of the country is imperfect for a combination of capital market & policy reasons. Economic policy reform can therefore initiate a large inflow (stock/flow adjustment), as can a change in perceptions unconnected with specific policy reforms.

1.1.4 Asymmetric Prices

There is an important sector of the economy in which prices are downward sticky and upward flexible. This sector usually consists of large, organised capital intensive industry. The sector has to be large & significant enough to result in aggregate wage-price asymmetry.

1.1.5 Tax Evasion

Administrative systems & capabilities are not adequate to the task of maintaining honesty in the face of large incentives for evasion & corruption.[4]

[2] The assumptions are based on stylized features of a highly populated low-income country.
[3] Please see Virmani (1982).
[4] This is not a core assumption, and can be dropped if inapplicable. It is, however, applicable to low-income countries like India. It may become less important as income rises.

2 FACTOR MARKET IMPLICATIONS

2.1 Employment and Wages

Labour supply is therefore perfectly elastic at the start of the growth process and remains so till the country reaches middle income levels. Thereafter, real wages will start to rise and the labour supply will gradually become less elastic.

2.2 Technology

Transfer and diffusion of technology is an important potential source of growth as long as the economy is inside the international technology frontier. Direct foreign investment, import of capital goods, and international trade help in diffusion of technology from the world technology pool to the domestic economy. Technology has itself to defuse to the entire domestic economy, so that investment in the form of domestic capital goods can contribute to this diffusion. Both types of diffusion, international and domestic, will be facilitated by the presence of educated and skilled population, good communications & media, and travel & tourism.

2.3 Capital

Low-income countries would generally satisfy the assumption of partial capital mobility because of relatively undeveloped (imperfect) financial markets. Even countries that have capital account convertibility may not have perfect capital mobility. Many middle income countries (up to the mid-middle level) would also satisfy this assumption for the same reasons. The implication of this assumption is that foreign supply of capital is (near) perfectly elastic only till some point beyond which it may rapidly become completely inelastic. This inflection point varies from country to country and can change over time with changes in expectations. Domestic investment is therefore closely related to domestic saving except when there is a sharp (positive or negative) change in the inflection point driven by exogenous changes in either economic fundamentals or perceptions/expectations.

2.4 Dualistic Growth

Sustained high rates of growth are therefore possible as long as the economy has surplus labour, remains within the capital inflow elbow (_|) and has not reached the international technology frontier. Once one of these constraints becomes applicable the nature of the growth process must change and gradually approach the standard developed country format (& model).

3 MACRO IMPLICATIONS

In the absence of a formal mathematical formulation, the nature of the model can best be appreciated by applying it to specific situations.

3.1 Capital Inflow

3.1.1 New Equilibrium

In such an economy a rise in the steady state level of capital inflows, arising for instance from economic reforms, increases the total supply of savings available within the economy. This in turn will lead to a decline in the real interest rate for the economy and an increase in investment. Increased investment, coupled with the reforms (which initiated the change), will increase the growth rate of the economy. A subsidiary implication (contention!) is that for the same capital inflows the increase in growth will be higher, the higher the proportion of Direct Foreign investment component.

Higher investment and growth will lead to a higher current account deficit. In equilibrium, the real exchange rate will appreciate or depreciate depending on whether the current account deficit increases by less or more than the increase in the capital flows. As the real exchange rate is the price of non-tradable services their price (P_{nt}) will rise relative to tradable goods & services, P_{nt} will rise or fall (respectively). The final outcome will depend on the conditions under which non-tradable services are produced and distributed. The base case is assumed to be a system that is as efficient and market based as the supply of tradable goods and services.[5] In this case, the outcome is more likely to be one of neutrality (and possibly depreciation).[6]

If the infrastructure system is an inefficient government dominated one, and then the supply of non-tradable infrastructure services may not be sufficiently responsive and elastic. In such a system real exchange rate appreciation and lower growth response is more likely.[7]

The implication for fiscal deficit is very clear. The fall in the real interest rate and the rise in growth rate means that the sustainable long-term fiscal deficit (and primary deficit) increases as a proportion of GDP. Therefore, the optimal fiscal deficit is **higher** (or fiscal surplus lower) than it would be without the increase in capital flows.

3.1.2 Transition

Even in the short run, there will be an immediate impact on interest payments and consequently the fiscal deficit will fall if primary deficit

[5] This is implied by the fact that no special assumptions have been made above.
[6] This would be highly unusual case/situation in the traditional Mundell-Fleming model.
[7] This would be the base case in the Mundell-Fleming model (with no change in growth rate).

remains unchanged. Thus, in principle, the primary deficit can be raised fairly quickly while maintaining the fiscal deficit. In a government dominated (inefficient) infrastructure system, a higher level of inflows increases the,

i) Potential gains from reform and private entry, and,

ii) Benefits of reducing unproductive government expenditures that are intensive in the use of non-tradable infrastructure services.

Whether the primary deficit should actually be increased in any given situation depends on the longevity of the higher level of capital inflows, the quality of government expenditures, and the institutional reversibility of fiscal policy.

An increase in the fiscal deficit financed through higher borrowings will also help absorbs some of the capital inflows, thus reducing the need for such inflows to be channelled through the financial system. This can be critical if the financial system is undeveloped (shallow, inexperienced) and/or under regulated.

A shift of government financing from central bank lending (to government), to borrowing through issue of government paper would similarly take the pressure off the financial system, thus giving time for it to develop. The benefits from financial liberalisation and prudential regulation also increase, as do the potential costs of delay.

In the short run, the demand for assets will increase immediately, while new investment will require some gestation period. Thus prices of domestic assets are likely to rise sharply to restore stock equilibrium (overshooting). These should then gradually decline to the equilibrium levels as new supply of assets is generated through increased investment. Thus a large increase in capital inflows will be accompanied by a stock market boom and an increase in the price of real estate (i.e. the relative price of such assets will increase). This overshooting can also be moderated by an increased supply of government securities and T-bills.

3.1.3 Money and Inflation

The higher inflows also have implications for monetary policy, inflation and the nominal exchange rate. Firstly, if the nominal exchange rate were **fixed** by policy, the Central Bank would have to purchase foreign exchange during the adjustment period. The increase in foreign exchange reserves of the Central Bank should not be 100% sterilised, as this would completely nullify the benefits of lower interest rates and higher investment and growth.

Partial sterilisation is the (conditionally) optimal policy, though the extent of sterilisation will depend on the availability of financial instruments and stage of development of the financial system. In other words, during the period of adjustment to the new equilibrium, part and only part of the increase in foreign exchange assets should be offset by a decline in net domestic assets of the Central Bank. Partial sterilisation also means that the rate of inflation would rise (given upward flexibility in prices) during the adjustment period. The degree to which this happens, however, depends upon the,

(i) Extent of under-utilised or excess capacity: It is very important to remember the context in which capital inflow has increased. When the inflow is triggered by economic policy reform, these will improve the efficiency with which existing capacity is utilised. On the other hand if the change in inflow is triggered by change in world savings and/or interest rates, this assumption may not be appropriate.

(ii) Speed with which investment responds to greater availability and lower cost of savings for investment.

In the *base case* mentioned above, the reserve accumulation would gradually slow down as the economy adjusts to the new equilibrium. Thus the increase in inflation would be temporary, and would be tempered by the factors mentioned above. In other words inflation would be lower (and in India in 1994-95 significantly lower) than forecast by the conventional full employment, monetarist model. An additional reason is that the domestic demand for money would rise because of lags in investment of foreign funds and the holding of cash in their portfolio.[8]

If the nominal exchange rate were a **freely floating** one, it would appreciate sharply at the time capital inflow increase, and then depreciate gradually over the adjustment period to reach its equilibrium level. It is hypothesised that the real appreciation during the adjustment period will be lower in the case of the fixed than in the floating rate regime.[9] It has been contended that the Indian experience of 1993 and 1994 supports this hypothesis.[10]

[8] Mentioned in the Economic Survey, 1994-95.
[9] The model would have to be formalised to demonstrate this.

[10] The nominal exchange would have appreciated by at least 10% in a free-floating regime, while the Inflation rate increased by only about 2% points. I first made this point at an IMF/World Bank conference on capital flows in Washington (1994).

In the *'problem infrastructure' case* reserve accumulation would continue beyond the adjustment period. This case shares some features with the conventional Mundell-Fleming model. The main differences in policy implications are; (i) that it may still be preferable to hold the nominal exchange rate fixed initially (during the adjustment period) by accumulating reserves. The reserve accumulation can then be gradually reduced, and the nominal exchange rate is thus allowed to appreciate. (ii) The appropriate fiscal policy response is not a reduction in the primary deficit but an increase in government investment in non-tradable infrastructure. This could be augmented by a reduction in government consumption expenditure which is intensive in the use of non-tradable infrastructure services (at least during the adjustment period).

Thus, given a situation of capital inflows, the general policy response outlined above represents a tightening of monetary policy and loosening of fiscal policy.

3.2 Capital Outflow

A sharp slow down in capital inflows or an actual capital outflow of the kind seen in Mexico and more recently in South East Asia requires an obverse policy from the one outlined above, but with one important difference.

3.2.1 New Equilibrium

An outflow of capital represents a reduction in the supply of savings available to the economy. This will result in a rise in the domestic interest rates, a contraction in investment and reduction in the growth rate. In this situation fiscal policy has to be tightened to increase public savings available to the private sector.[11] This increase in public savings will mitigate the fall in total saving available to the economy and consequently the savings available for the better, more profitable companies. This in turn will mitigate the negative effect on investment and growth.

The current account deficit will fall as a result of the reduction in investment and growth. In equilibrium this reduction may be greater or less than the reduction in capital flows. If the fall in capital inflows is motivated by an adverse change in economic policies, then logic demands that the base case be as defined earlier. In the base case as defined earlier the reduction in the Current Account Deficit is likely to be equal to (or more than) the decline in capital flows. In the Public or non-market, non-tradable supply case, the reduction in Current Account Deficit is likely to be less than the reduction in

[11] Or equivalently to reduce net withdrawal of savings from the private sector.

capital flows, and consequently there will be a real depreciation of the exchange rate.

The E. Asian case (arguably) constitutes such a non-market situation with respect to non-tradable goods & services for the following reasons:

(i) Years of formal an informal directions (hidden controls) by finance ministries and Central banks to lend to sectors, industries and areas, and not lend to others, has a created a non-market (control) ethos. This is much more damaging in the long run, then any static gains and losses from directed credit. This **control mentality** affects both the controllers and the controlled, and makes them inefficient or incompetent in dealing with market risks, and changes in the economic environment.[12]

(ii) **Nepotism & Cronyism** has flourished beneath the surface, in countries that are politically closed and far from democratic (Singapore where anti-corruption is almost a national ideology appears so far to be a clear exception).[13] A true test of a politically open and democratic society is the amount of criticism of the government and the leader (President or Prime Minister) by intellectuals and the media.[14] Many countries that have been touted by capitalist ideologues as open and or democratic would fail this test, while truly open and democratic societies appear to be much more corrupt than they really are, because all the warts are exposed every day in the media. Cronyism, nepotism and sweet heart deals have been an additional source of inefficient non-market based lending by the government directed financial system. Again the mentality that it generates, and the undermining of efficient and competitive work methods is more important in the long run than any static or individual loses.

The excessive lending to, and investment in, non-tradable sectors such as real estate is one of the symptoms of this non-market behaviour of the financial system, as is the absence of adequate prudential regulations with respect to such lending. Non-market lending to inefficient tradable sectors is somewhat more difficult to hide from public view, because it has often to be accompanied by higher tariffs or non-tariff barriers.[15] Given that E and S. E. Asian economies have been relatively open to international trade, there is a difference between

[12] Affects the ability to recognize, analyze, monitor and manage risk.
[13] Some ideologues of capitalism however classed these countries (in political, media and press freedom) above or almost at par with, the few truly democratic developing countries,
[14] Another test is the variance in the electoral fortunes of the ruling party or leader and the opposition.
[15] For instance the notorious car project in one of the Asian crisis countries.

the efficiency and market orientation of the tradable and non-tradable sectors, so that the latter can be termed as non-market in a relative sense.[16]

3.2.2 Transition

A sharp capital outflow will immediately raise interest rates, and the fiscal deficit. It will also lead to, a reserve decline in a fixed nominal exchange rate system, and a nominal depreciation in a free-floating one. In this situation a sharp reduction in the primary deficit is the only quick and effective policy tool available to meet the crises. In the non-market non-tradable case, the nominal exchange rate must be allowed to depreciate to the new equilibrium, by not selling reserves till this is achieved. Given the downward stickiness in prices, this is essential for bringing about a real depreciation and getting the full benefits of expenditure switching.[17]

In the short term there will be a sharp fall in the relative price of domestic assets, and a reduction in their collateral value. Rational banks will respond by lowering short term lending limits for owners of these assets, and may also reduce total loan limits on new loans below their equilibrium levels. This will put pressure on the liquidity of firms, and consequently on their operational efficiency and profitability. This can trigger an increase in non-performing assets, loan defaults and consequently an increased risk of banking system failures. If such a de-stabilising cycle is triggered the approach to the new equilibrium could be extremely painful and the nature of the equilibrium could itself be negatively affected.

Real interest rate may similarly rise above their equilibrium levels causing permanent damage to the economy.

3.2.2.1 Expectations and Rational bubbles

Logically, nominal depreciation is not required in the base case. If we bring market expectations into the picture,[18] however, there is the possibility that short-term reserve losses will trigger negative expectations, which take the economy away from equilibrium (in the short term). In this situation some short term nominal depreciation may speed the adjustment to the new equilibrium even in the case in which the new equilibrium does not require real depreciation.

[16] The governments of Hong Kong and Singapore reportedly controlled the supply of land and thus implicitly had a kind of monopoly over the real estate sector.
[17] These aspects of the analysis were first done in 1991-92 in the 1991 crises, and the appropriate fiscal and monetary policies to address them.
[18] which would be very difficult to do in a formal model

3.2.3 Money and Inflation

To counter the increased risk of systemic financial failure arising from asset-liability mismatches, it is necessary to increase liquidity in the system. In the fixed exchange rate (reserve draw down case), this can be done by partially offsetting the decrease in foreign exchange assets of the Central Bank by an increase in domestic assets of the Bank. To this extent, monetary policy has to be loosened. In the downward flexible exchange rate case, domestic assets would have to be increased. The extent to which net domestic assets should be increased will depend on the structure of the economy. The initial response has to be a large offset followed by gradual move to a partial offset.

It may become necessary for the government and the Central bank to make judgements about how much liquidity to provide and to whom. At the same time future Moral hazard needs to be avoided. Once a crisis has started there will be no escape from making judgements about the viability and future market profitability of individual financial institutions. If, however, action is initiated well before the crises erupts, an exclusion strategy, which provides general liquidity but excludes a select group, may be possible.

Thus the optimal response to a large capital outflow is a tighter fiscal policy, and a looser monetary policy during the period of adjustment to a new equilibrium.

3.2.4 Crises Equilibrium: Breakdown of Tatonment

A very sharp nominal depreciation can, however, also set a destabilising expectations process in motion.[19] A nominal depreciation will immediately reduce the perceived return on capital to foreign investors. This in turn will trigger forward sale of currency and spot sale of currency financed by sale of assets (or by local short-term borrowing). This will further reduce the expected returns to foreign investors, possibly triggering further devaluation (a panic cycle).

3.2.4.1 Expectations and Rational bubbles

The introduction of expectations into the picture complicates the analysis. In the very short run (weeks), the interest rate may have to be allowed to rise sharply by holding monetary growth unchanged, so as to discourage the build-up of destabilising expectations. Thereafter, monetary policy would have to be loosened to provide liquidity to (efficient) financial intermediaries. As the new equilibrium is approached monetary policy would return to a more neutral stance.

[19] In the so-called 'non-market' case discussed above.

To summarise, capital outflows require a, (i) tightening of fiscal policy and a loosening of monetary policy (a symmetric response), and (ii) a relatively free adjustment of the nominal exchange rate (an asymmetric response).

3.3 Demand Cycle

Given the assumption of aggregate price asymmetry, a Keynesian demand recession is possible within this model. The question to be addressed here is whether the model of this paper offers any policy prescriptions that are different from those of the standard 'Keynesian' ones. The most important difference is that the source of the demand reduction (investment or consumption, government or private) is important for determining the policy response in this model. This arises from the fact that the cycle is embedded in an economic growth/development framework, and the macro aspects cannot be addressed in isolation from the growth aspects.

3.3.1 India 1997-8

This can be illustrated by taking a specific case, the appearance of Demand side recession in a low-income economy (India), earlier characterised by supply side cycles driven by weather.[20] The causes of this reduction in the rate of growth starting towards the end of 1996-97 were a number of demand factors and a few supply factors:

(i) The passing of a hump in investment in the consumer durable goods sector arising from liberalisation (adjustment from controlled to free regime), and the related build-up of excess capacity (to exploit economies of scale).

(ii) A rise in interest rates arising from a tight monetary policy designed to choke off inflation (too) rapidly,

(iii) A decline in the rate of growth of world trade and consequently in demand for exports,

(iv) A sharp decline in agricultural growth in the previous agricultural season, much of whose impact on aggregate demand was felt in FY 1996-7.

(v) Slower growth of (organised) power production.[21]

[20] A paper written in February 1997 argued that the Indian Economy was facing its first full-fledged, 'Keynesian Growth Recession'. Earlier cycles were supply side ones driven by agricultural growth and the monsoons. An updated (for new IIP series) version of which was printed in Business Standard in June. A few sections (one related to demand vs. supply cycles, another spelled out the linkage between reforms and imports) were dropped from the BS version due to space limitations.

[21] That is, excluding power generated on premises for own use.

The appropriate policy response arising from application of the model of this paper, is as follows;[22]

(i) Temporary Fiscal Expansion: A sharp reduction in income tax rates, accompanied by continuing reforms (1997-98 budget). In this model the long-term effect would be higher growth and revenue neutrality, while the short-term (one-year) effect would be a fiscal stimulus.

(ii) Looser Monetary Policy: Return monetary growth to normal levels, up from reduced levels of the previous year. This was expected to ease liquidity.

(iii) Financial Market Competition: Reduce controls that keep interest rates from responding to demand-supply conditions in the market for credit and debt.[23] This along with monetary changes would lead to lower interest rates.

(iv) Real Exchange Rate: Assist the nominal exchange rate to depreciate, by faster elimination of import controls and current account restrictions.[24]

(v) Infrastructure Expenditure: Encourage faster disbursement of government investment expenditure in bottleneck sectors like power. Speed up regulatory and legal reform so as to accelerate entry of private producers.

(vi) New Leading Sectors: Reform Laws,[25] Rules and Procedures (municipal) relating to (a neglected sector like) housing to unleash new sources of investment and growth.[26]

4 GENERAL LESSONS

4.1 Managing Transition

The severity of the East Asian crises in terms of volume, extent and period and the apparent overshooting has alerted us to the need for greater fine tuning of policy in meeting crisis. Traditional economic theory deals with small exogenous changes and their effect on economic equilibrium. A small change in the external environment will therefore move the economy from the old equilibrium to the new one. Fiscal and monetary policy can therefore be modified to restore the old equilibrium or to move to another more desirable one. The transition from the old equilibrium to the new

[22] As mentioned in the above article.
[23] Done to a limited extent in the April credit policy.
[24] The situation changed after the Thai crises in July, and this recommendation lost its macroeconomic importance when FII inflows turned negative in November 1997.
[25] Urban Land Ceiling Act (ULCA), Rent Control Act etc.
[26] "India: Crises, Reform and Growth," Arvind Virmani, Economic and Political Weekly, August 9, 1997.

equilibrium is assumed to be smooth and to not affect the final equilibrium. If the shock is large, the transition is unlikely to be very smooth. The path the economy follows may therefore affect the nature of the final equilibrium itself. In such a situation managing the transition may be as, if not more, important as managing the final outcome or equilibrium. Further the policies which are appropriate for managing the transition may be different from, or perhaps even contradictory to, those needed for modifying the equilibrium in a desirable direction.

4.2 Three Phases of Crisis

In a crisis, even the managing of the transition may require greater fine tuning than conventional wisdom allows for. This is particularly true of serious crises. It is useful to think of two sub-phases within the transition period. The very short term or immediate crises period, when confidence in the economy and its managers is of critical importance, and the short term or normal transition phase.

(a) The first sub-phase could stretch from days in minor crises to weeks (1-4) in serious crises to months (2-3) in a very serious one such as the E Asian one.

(b) The final phase is the one in which the new equilibrium appears within reach.

The appropriate monetary-fiscal policy mix can vary with the phase of the crises. The appropriate policy mix in one phase may even contradict that in another phase. It is therefore important to design and make known the final (medium term) policy framework as well as the transitional (short term) approach, while taking appropriate steps to deal with the immediate crises. This is necessary to ensure credibility and to minimise overshooting during the initial phase.

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