

Fiscal Imbalance, Risk Premium and Financial Crisis - An Analysis of the Argentinean Crisis

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Abstract This paper shows how fiscal imbalance and excessive external borrowing may lead to a financial crisis. The trigger of the crisis is substantial increase in risk premium as a result of persistent budget deficits. This results in hyper depreciation of exchange rate, which causes an adverse balance sheet effect on investment in the presence of external commercial borrowings. This leads to a contraction of output and the country enters into recession. Furthermore, policy prescriptions are provided to curtail the crisis. The situation in Argentina is analysed in the light of this model.

Keywords Fiscal Imbalance, Risk Premium, Balance Sheet Effect, Recession

JEL Classification: F410, F340

1. Introduction

A financial crisis is a phenomenon associated with substantial changes in volumes of credit and asset prices. It is associated with severe disruption of financial mediation and supply of external financing. It is to be noted that Economic development does not result in the elimination of financial crises. The recent financial crises of 2007-2009 in the United States and Europe pointed out those market economies, which however much they prosper and evolve, are still susceptible to collapse or near collapse from financial crisis.

The Greek crisis is essentially a boom-bust cycle. When Greece joined the Eurozone in 2001, confidence in the Greek economy grew which was followed by an economic boom. However, everything changed post the 2008 financial crisis. Underemployment rate reached 28 percent in 2013, worse than what the United States suffered during the Great Depression.

An open economy theoretical model has been constructed to explain the boom burst cycle experienced in most episodes of financial crisis including the Greek crisis. The model is essentially an extension of Krugman's model (2002) with

endogenous risk premium.¹

The verbal upshot of this paper is that budget deficit is one of the most important macroeconomic fundamentals which the international credit rating agencies take serious cognizance of. A deterioration of budget deficit may lead to a demotion of credit rating and hence a rise in risk premium. This in turn causes an increase in exchange rate. Depreciation of exchange rate has two opposing effects - On one hand net export increases, on the other hand investment falls due to adverse balance sheet effect. The greater the value of fall in exchange rate, the greater is the severity of balance sheet effect in the presence of external commercial borrowing. Therefore, depreciation of exchange rate tends to produce a contractionary effect on output in a crisis situation.

The organisation of the paper is as follows: In Section 2, a select literature review is undertaken. In section 3, an open economy effective demand model with endogenous risk premium is constructed and a comparative Static exercise is performed to show the boom-bust cycle as a consequence of budget deficit. Thereafter, contractionary monetary policy is shown as an effective tool of stabilization. In Section 4, the situation in Greece is analysed in the light of this model, supported by empirical exercises to study the effect of fiscal imbalance on different macroeconomic indicators such as unemployment and inflation in Greece. Section 5 concludes the paper.

2. Literature Review

In 1979, Paul Krugman created a model in order to explain "first generation" currency crises as Balance of payments crises. The idea is that these crises result out of a speculative attack on the currency of the domestic economy (typically for a pegged exchange rate). Krugman assumes different effects on the macroeconomic scenarios in case of fixed rates vs. floating exchange rates. Under a floating exchange rate, the government does not trade domestic currency for foreign since it does not attempt to maintain an exchange rate parity.

¹ The aspect of endogenous risk premium induced in this model draws on Sikdar (2014). Certain aspects of stock market and Tobin's Q are examined in Sikdar's paper, in this paper we have ignored the stock market and focused on expectations regarding exchange rate.

An attempt to sell the domestic currency is accompanied by a certain level of rise in the price level, leading to inflation. Such a rise makes the domestic currency less attractive for any value of foreign currency and the portfolio holding of domestic currency falls- thus leading to a hyper-depreciation of the currency.

A second generation crisis refers to hyper depreciation of currency due to a speculative attack that shakes that shakes investors' confidence and ultimately could lead to negative effects on economic indicators.

The third generation of currency crises explores the impact of rapid deterioration in balance sheets on asset prices and their subsequent fluctuation. Modeled on the Asian Crises of the 1990s, it aimed to focus of the largely vulnerable financial sectors and the balance sheet mismatches that existed amongst the sectors of these economies.

The role of large internal banking debts denominated in foreign currencies in triggering a wide spread banking cum currency crisis. They also explore the self-fulfilling nature of such crises- large over-borrowing of domestic banks due to government subsidies and the volatility in exchange rates that ultimately trigger crises. Furthermore, fiscal concerns multiply the extent of the panic created by such crises and form a downward spiral. In such a crisis, Capital mobility manifests itself in the form of capital flight in a deleveraging crisis which leads to the depreciation mentioned above. Thus, there is a case for the use of capital controls in order to prevent a capital flight intensifying the effects of a third generation crisis.

We extend the model of third generation crisis and introduce risk premium in it. Our model seeks to explain the trigger of a crisis situation due to a rise in risk premium. We explore its macroeconomic implications. Finally, we give policy prescriptions for the effective management of such a crisis.

3. The Model

We consider an open economy with flexible exchange rate in the effective demand framework which is an extension of Krugman (2002).

Here, the asset market is considered first followed by the commodity market.

We assume that there are three assets, namely money, government bonds, and foreign bonds. We further assume that government and foreign bonds are perfect substitutes, such that rates of return on these two non-monetary financial assets are equal.

The money market equilibrium is:

$$\frac{M_o}{Q(eP^*,P)} = L(Y, r) \tag{1a}$$

Where: Q is the consumer price index, which depends on both domestic price and price of foreign goods.

The uncovered interest rate parity condition is given by $r = r^* + \frac{e^e - e}{e} + \rho(BD)$, where

ρ is the risk premium,
 BD is the budget deficit,
 $\frac{e^e - e}{e}$ is the expected capital gain,
 $\rho^e > 0$.

The World Bank defines risk premium on lending as the interest rate charged on loans minus the "risk free" interest rate at which short-term government securities are issued or traded in the market. It is, therefore, the additional amount required over and above the expected return for an investor to invest, i.e. "the minimum compensation for bearing risk." Macro-economic policies, political instability, financial regulations, prolonged budget deficits are issues that increase risk for investors investing in foreign markets. When a country is in financial turmoil, the risk associated with investing rises exponentially. The foreign investor needs a greater amount to bear the same amount of interest. Hence, the risk premium is taken to be a positive function of budget deficit in this model.

Accordingly, the money market equilibrium can be rewritten as:

$$\frac{M_o}{Q(eP^*,P)} = L(Y, r^* + \frac{e^e - e}{e} + \rho(BD)) \tag{1b}$$

As e rises, Q rises, and hence, money supply falls. In order to eliminate the excess demand in the money market, Y falls to reduce transactions demand for money.

Hence, we obtain the money market curve (AA curve) as a negatively sloped relation between e and Y, as shown in figure 1.

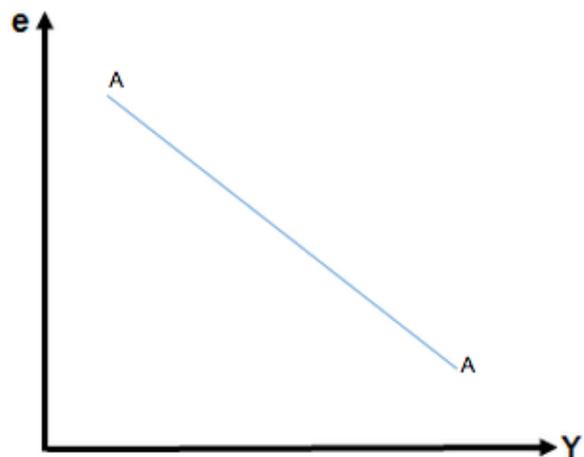


Figure 1. Money Market Curve

Also, as e rises, r rises to reduce speculative demand for money and hence restore money market equilibrium. Further, as Y rises, transactions demand for money rises and to maintain equilibrium r must rise.

Therefore,

$$r = f(e, Y) \text{ where } f'(e) > 0 \text{ and } f'(Y) > 0 \tag{1c}$$

Next, the commodity market is considered.

The different components of aggregate demand are consumption(C), investment (I), government expenditure (G) and net exports (NX). Here, the effect of exchange rate on

aggregate demand is to be examined in the context of balance sheet effect on investment since investment is financed by loan denominated in foreign currency. Hence, depreciation of exchange rate leads to increase in debt service charges, and produces an adverse balance sheet effect on investment. On the other hand, as the real exchange rate rises, domestic goods become more competitive in world markets, leading to an increase in exports made by the domestic country. In addition, a rise in real exchange rate reduces domestic demand for foreign goods, causing a fall in imports. As a result, net exports rise as real exchange rate rises. Hence, a depreciation of exchange rate has two opposing effects on the output.

The commodity market equilibrium is represented by the following equation:

$$Y = C(Y - T) + I\left(r, \frac{eP^*}{P}\right) + G + NX\left(\frac{eP^*}{P}, Y\right), \quad (2a)$$

Where, $I_r < 0, I_e < 0, NX_y < 0$ and $NX_e > 0$

Equation (2a) can be re written as:

$$Y = C(Y - T) + I\left(f(e, y), \frac{eP^*}{P}\right) + G + NX\left(\frac{eP^*}{P}, Y\right) \quad (2b)$$

Also, the interest rate parity condition maybe written as:

$$f(e, Y) = r^* + \frac{e^e - e}{e} + \rho(BD)$$

$$f(e, Y) - \rho(BD) = r^* + \frac{e^e - e}{e}$$

As e rises, NX tends to rise. However, I falls. As a result, the effect of an increase in e on Y is ambiguous. As such, the following cases may arise:

Case 1:

Rise in NX is greater than the fall in I . As a result, Y rises. In this case, the commodity market curve (henceforth referred to as the CC curve) is positively sloped, as shown in figure 2(a)

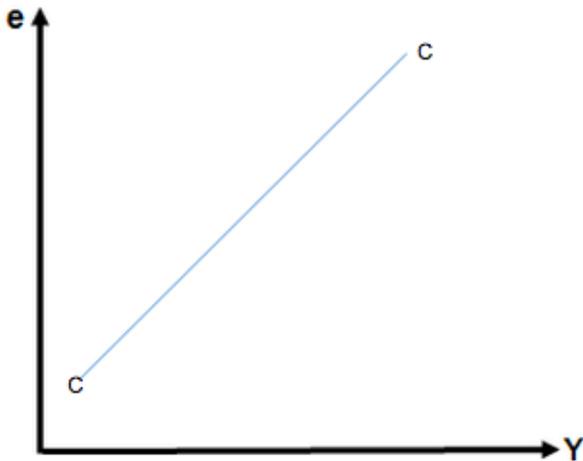


Figure 2(a). Commodity Market Curve: Net Export effect dominating

Case 2:

Fall in I offsets increase in NX and hence Y falls so that the CC curve is negatively sloped in the e - Y framework. This is shown in figure 2(b).

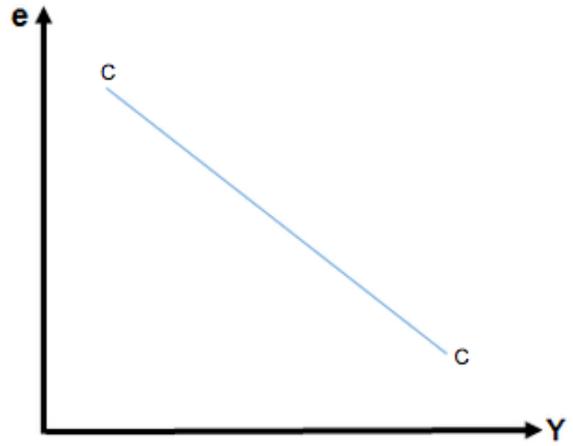


Figure 2(b). Commodity Market Curve: Investment effect dominating

3.1. State of Equilibrium

Thus, the model is represented by the two equilibrium situations as shown in figure 3a and 3b.

Case 1: CC curve is positively sloped

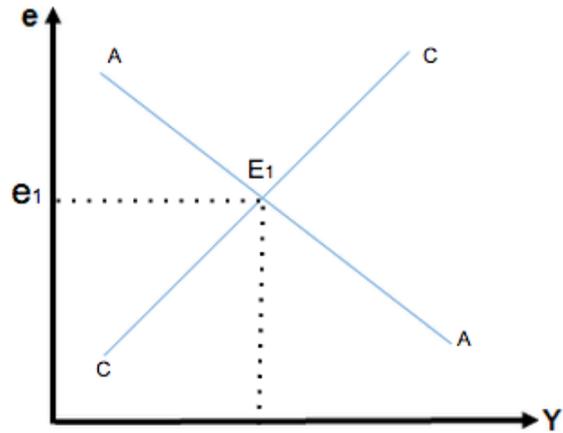


Figure 3(a). Equilibrium Condition: Net Export effect dominating

Case 2: CC curve is negatively sloped

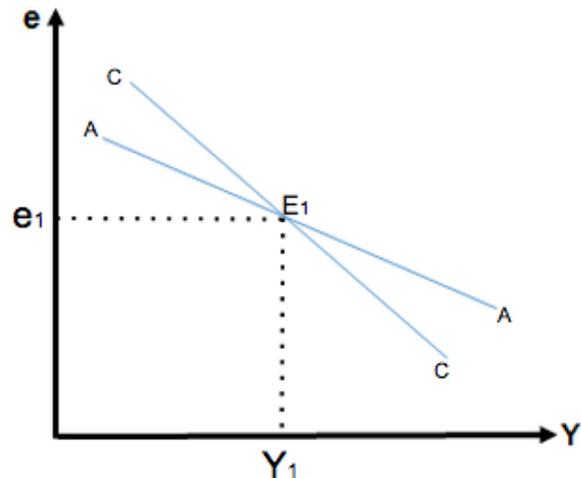


Figure 3(b). Equilibrium Condition: Investment effect dominating

We note that when both the CC and AA curves are

negatively sloped, the CC curve is steeper than the AA curve. This is to ensure Walrasian stability of the constructed framework.

3.2. Comparative Statics

3.2.1. Expansionary Fiscal Policy

Case I: “Boom” period, where the CC curve is positively sloped. The effect of a fiscal expansion is illustrated below:

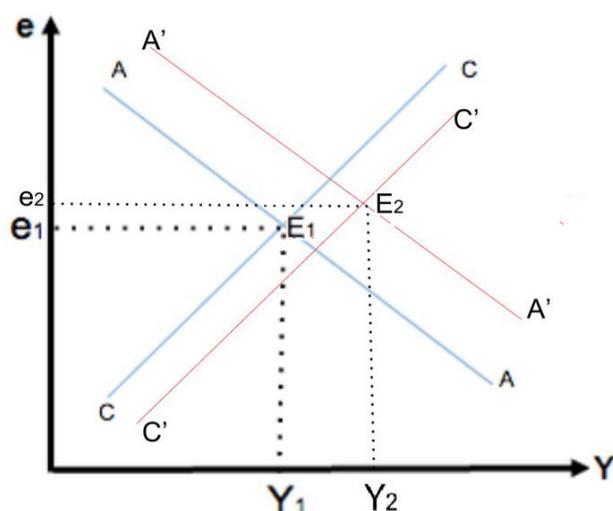


Figure 3(c). Expansionary Fiscal policy: Boom period

An increase in government expenditure raises output and shifts the CC curve to the right. Also, an increase in government expenditure raises budget deficit and hence risk premium rises. To maintain the uncovered interest rate parity condition, e depreciates, thereby shifting the AA curve upward. As a result, output expands even more and hence a fiscal policy is highly effective during the boom period.

Case II: The crisis situation or the “Burst” period, where the CC curve is negatively sloped. Here, a fiscal expansion leads to output contraction although initially output rises. This has been illustrated as follows:

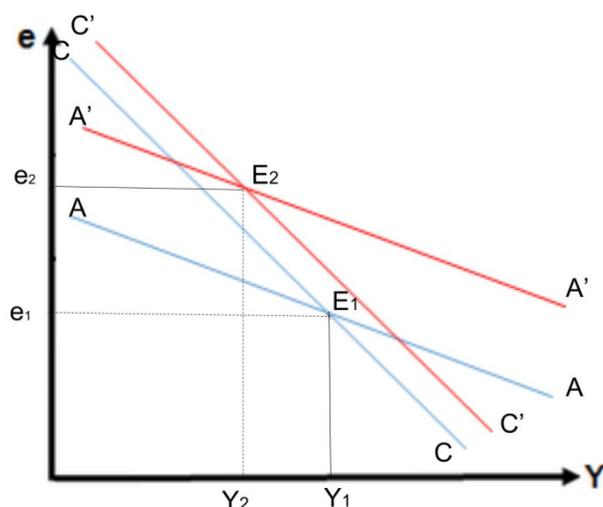


Figure 3(d). Expansionary Fiscal policy: Bust period

An increase in government expenditure initially increases output (Y). This is shown by the rightward movement of the CC curve to $C'C'$. However, it also widens the budget deficit, raising the risk premium. An increased risk premium causes a depreciation of the exchange rate and reduces investment, which dominates the rise in net exports. Hence, the net effect is a contraction in output. This occurs when the decrease in domestic investment is greater than the increase in government expenditure. Therefore, expansionary fiscal policy leads to adverse results during the bust period.

3.2.2. Monetary Policy

In a crisis situation, contractionary monetary policy is an effective tool of stabilization. A fall in money supply causes interest rate to rise. It follows from the uncovered interest rate parity condition that exchange rate appreciates. This results in a rise in investment and fall in net exports. Since in a crisis situation, the effect on investment dominates the effect on net export, output expands. This has been illustrated as follows:

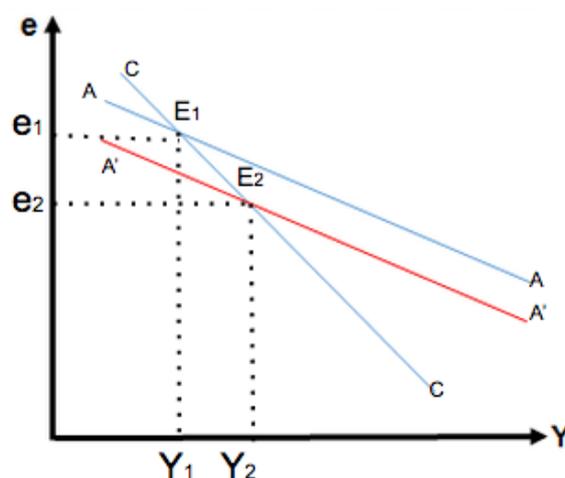


Figure 3(e). Contractionary Monetary policy

4. Application of the Model

Using this framework we undertake a case study focusing on the financial turbulence in Argentina.

Argentina followed a fixed exchange regime. This was done with the view point of curbing inflation and leading to capital inflow in the economy. Though, capital inflow had a positive impact on the economy in terms of living standards, there was an adverse impact on the current account. An overvalued exchange rate of 1 peso to one dollar made the exports less competitive in the world economy and simultaneously the imports were cheaper. The GDP contracted due to a fall in domestic demand, leading to unemployment levels over 15%. To overcome the debt crisis, Argentina had to undertake the austerity measures proposed by the IMF, including shifting to a flexible exchange rate

regime. During this period (1998-2002), the government debt substantially increased due to falling tax collections, rise in government expenditure and interest on previously undertaken debts. This led to a general loss in confidence of the global community in Argentinean finances. The tendency of risk premium to rise as a result in loss of investor confidence in the economy exacerbated the crisis condition by causing a further fall in Y and rise in e . This led to a situation wherein it became difficult for Argentina to borrow funds in the world markets, veering the economy towards bankruptcy. This, like most other financial crises was a result of the boom burst cycle as analysed previously. Given the crisis situation, rising budget deficits and hence risk premium aggravated the crisis even further leading to contraction of output and hyper depreciation of currency from 1 peso = 1 USD to 4 Peso = 1 USD.

5. Conclusions

We analyse financial crisis in terms of boom-bust cycles, highlighting the crisis situation in Argentina. Effective demand principle shows how fiscal imbalances in conjunction with external commercial borrowing leads to recession which is marked by a severe contraction in output and hyper depreciation of currency. However, when the economy is in crisis a contractionary monetary policy leads to an appreciation of exchange rate and hence raises investment and output.

Appendix

Mathematical derivation of the slopes of the CC and AA curves are show below.

Commodity Market

The relevant equation in the commodity market is given as follows (referred to as equation (1)):

$$Y = C(Y - T) + I\left(f(e, Y), \frac{eP^*}{P}\right) + G + NX\left(\frac{eP^*}{P}, Y\right)$$

Money Market

From the money market, we get the following equation (equation (2)):

$$\frac{M}{Q(eP^*, P)} = L(f(e, Y), Y)$$

For details on the notations, variables, and relationships, refer to Section III, The Model.

Slope of CC Curve

Totally differentiating equation (1), we get

$$\begin{aligned} dY &= C'dY + I_1[f_e de + f_Y dY] + I_2 \frac{P^*}{P} de + NX_1 \frac{P^*}{P} de \\ &\quad + NX_2 dY \\ dY[1 - C' - I_1 f_Y - NX_2] &= \\ &= de \left[I_1 f_e + I_2 \frac{P^*}{P} + NX_1 \frac{P^*}{P} \right] \quad (3) \\ \frac{de}{dY} &= \frac{1 - C' - I_1 f_Y - NX_2}{I_1 + \frac{P^*}{P} [I_2 + NX_1]} \end{aligned}$$

Now, $I_1 < 0$ and $NX_1 > 0$.

From the above equation, it is clear that

$$\frac{de}{dY} > 0 \text{ if } |NX_1| > |I_1|:$$

$$\frac{de}{dY} < 0 \text{ if } |NX_1| < |I_1|$$

$$\frac{de}{dY} = 0 \text{ if } |NX_1| = |I_1|$$

Thus the CC curve may be positively sloped, negatively sloped, or vertical.

Slope of AA Curve

Totally differentiating equation (2), we get

$$\begin{aligned} L_y dY &= -\frac{M}{Q^2} (P^* Q_e de + Q_p + dP) \\ &= L_1 [f_e de + f_Y dY] + L_2 dY \\ \Rightarrow \frac{de}{dY} &= -\frac{Q^2 [L_Y + L_f f_Y]}{M P^* Q_e + Q^2 L_f f_e} \quad (4) \end{aligned}$$

Hence, it is clear that the AA curve is negatively sloped.

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