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ABSTRACT
The coincidence of banking and currency crises associated with the financial crisis has drawn renewed attention to the factor linking the two phenomena. This paper analyzed the underlying close links between currency and banking crises following Valesco model. The study argued that the twin-like relationship that exist between currency and banking crises operate through governments’ bailout. The study also argued that the continued government guarantees for the liabilities of the domestic banking system through governments’ budget can consistently deplete bailout reserves and eventually degenerate into a currency failure. This argument is in line with the underlining assumption that, ‘whether or not depositors are insured, the public expects governments to intervene to save most depositors from losses when financial intermediaries run into trouble’. This implies that the warnings that bailout will not be forthcoming appear to be simply not believable. The study concludes that, bail-outs are an inevitable interconnectedness between currency and banking crises of modern economies.

Key Words: Bail-Outs, Banking, Currency and Crises JEL: G00, G21, G28, G33

1 INTRODUCTION
The increased incidence of banking crises in developing countries in recent years has coincided with currency crises in developing countries, which became widespread during the decade of the 1980s, 1990s and 2000. The currency crises have led to resurgence of interest in model of speculative attacks and exchange rate crises (McKinnon & Pill, 1999). Different
models seem to dominate the literature currently. The Conventional models which argue that inconsistencies between fiscal, monetary, and exchange-rate policies and the role of speculative attacks are argued to be the cause of currency crises (Krugman, 1979; Glich & Hutchison, 2001). Another model, by contrast, emphasizes that vulnerability of exchange rate systems even in the presence of consistent macroeconomic policies and sound market fundamentals are the reasons for the crises. The so-called third-generation models of currency crises emphasize the role of balance sheet factors and financial sector weaknesses in triggering speculative attacks. Miller (1996) for instance shows that a speculative attack on currency can lead to bank crisis if deposit money is used to speculate in the foreign exchange market and banks are loaned up.

While all the models above are predicated on the assumption that there exists particular close link between currency and banking crises, an early recognition of this link was in the already-cited paper by Díaz-Alejandro (1985) and Velasco (1987) who drew attention to the close connection between the two types of crises in the Southern Cone. Velasco (1987) argues that in the presence of government guarantees for the liabilities of the domestic banking system, a failure of that system causes deterioration in the government’s budget, which is financed through a depletion of foreign exchange reserves. Kaminsky and Reinhart (1996) argue that, many of the countries that have had currency crises (past and present) have also had full-fledged domestic banking crises around the time when they were experiencing mayhem in their currency/
foreign exchange market, with recent examples including Finland, Mexico, Norway and Sweden.

As formalized in McKinnon and Pill (1999), macroeconomic distortions, such as implicit deposit insurance, can fuel the lending boom that leads to the eventual collapse of the banking system.

As the central bank finances the bail-out of troubled financial institutions, its ability to maintain the prevailing exchange rate commitment erodes. If the central bank finances the bail-out by printing money, we have the Krugman (1979) story; if it finances by issuing large amounts of debt, markets may come to expect future monetization, and the crisis may become self-fulfilling. The central banks’ capacity for defending the currency can be further undermined by its inability to raise interest rates once the currency has come under attack. Those dynamics can, and often have, made countries vulnerable to speculative attacks on their currencies and most of those attacks succeeded (see also Dornbusch, Goldfajn, & Vald, 1996). Since the widespread banking failure is generally considered to have serious negative real effects on the currency this study relates several connected perspectives in literature with the analytical models that attempt to explain the link between banking and currency crises. This study review show banking crisis may be closely linked to currency crisis, the so-called ‘twin crisis’ phenomenon. This model essentially examines how government guarantees of the liabilities of private banks can generate a standard currency crisis. The mechanism is as follows: in the presence of government guarantees for the
liabilities of the domestic banking system, a failure of that system causes deterioration in the government’s budget, which is financed through a depletion of foreign exchange reserves. Given a lower bound on such reserves, their steady depletion must result in a currency crisis. The organization of the paper is as follows: Section 2 describes the relevant literature on the possible links between bank and currency crises. Section 3 discusses the generations of analytical models that attempt to explain the link between banking and currency crisis. Section 4 concludes the paper.

2 LITERATURE REVIEW- LINKAGES BETWEEN CURRENCY AND BANKING CRISES

Based on section one which suggests that, currency and banking crises may not be independent of each other, this section reviews a variety of channels that exist through which the occurrence of each type of crisis may make one of the others more likely. Indeed, the real domestic costs of currency crises in most countries may largely depend on the extent to which they trigger a domestic banking crisis (Agenor & Montiel, 2008). The systematic relationship between banking and currency crises, the occurrence and coinage of “twin” crises (Kaminsky & Reinhart, 1999) may be attributable to a number of past studies. In a pioneering paper, Krugman (1979) argues that under a fixed exchange-rate regime, domestic credit creation in excess of money demand growth may lead to a sudden speculative attack against the currency that forces the abandonment of the fixed exchange rate and the adoption of a flexible-rate regime. Krugman (1979) explains that, speculative
attack will all things being equal occur before the central bank would have run out of foreign reserves in the absence of speculation, and will take place at a definite-defined date. Obstfeld (1998) argues that a weak banking sector may precipitate a currency crisis if rational speculators anticipate that policymakers will choose inflation over exchange rate stability in order to avoid bankruptcies and further strains on the banking sector rather than endure the costs of defending the domestic currency. Velasco (1987) and Calvo (1997) argue that a bank run can cause a currency attack if the increased liquidity associated with a government bailout of the banking system is inconsistent with a stable exchange rate. Miller (1999) explicitly considers currency devaluation as one of the logical policy options for a government confronted by a bank run in a fixed exchange rate regime. Gonzalez-Hermosillo (1996) shows that a bank crisis may lead to a currency crisis in a poorly developed financial system where agents may substitute foreign assets for domestic assets.

Miller (1996), for example, shows that a speculative attack on a currency can lead to a bank crisis if deposit money is used to speculate in the foreign exchange market and banks are 'loaned up.' Chang and Velasco (1999), emphasize the role of international illiquidity as a common 'fundamental, defined as a situation in which a country's consolidated financial system has potential short-term obligations that exceed the amount of foreign currency to which it can have access on short notice. Chang and Velasco (1999) argue that an international liquidity shortfall may be a sufficient, though not necessary,
condition to trigger a crisis. The options left after creditors lose confidence and stop rolling over and demand immediate payment on existing loans—whether to the private sector in Asia or to the government in Mexico and Brazil—are painfully few. The collapse of the currency, of the financial system, or perhaps both is the likely outcome. Rojas-Suarez and Weisbrod (1995) and Obstfeld (1994) argue that a currency crisis may lead to problems in a vulnerable banking sector if policymakers respond to the pressure on the exchange rate by sharply raising interest rates. Another common fundamental factor emphasized in this literature is financial liberalization combined with moral hazard incentives that induce banks to take on particularly risky portfolios, including unhedged foreign currency liabilities. McKinnon and Pill (1996, 1998), for example, emphasize the role of financial liberalization in generating dynamics leading to a twin crisis. Financial liberalization and deposit insurance may fuel a lending boom involving both foreign and domestic credit expansion that eventually leads to a banking and currency crisis.

3 **ANALYTICAL MODEL: THE DIAMOND–DYBVIG FRAMEWORK**

Diamond and Dybvig (1983) developed a model of bank liquidity crises based on bank as a maturity transformer theory. Diamond and Dybvig framework argues that banks play the valuable social role of allowing individuals who place a high premium on liquidity to use their savings to finance illiquid social investments that yield high returns. They argue that banks can achieve this result by offering their individual depositors highly liquid assets and using these resources to
fund investments that, while yielding high returns, require a long period to mature. They are able to do this essentially by pooling the idiosyncratic liquidity shocks that their depositors face into an aggregate liability portfolio from which liquidity shocks are effectively eliminated. Because individual depositors require instant access to their funds while banks' assets take a long time to mature, vulnerability to panic is inherent in the very activity of banking. This is because in the event of unusual demand, some depositors will lose at least some of the value of their claims on the bank. An important feature of the liquid liabilities of banks—that their depositors have access to them on a first come-first served basis (the sequential servicing constraint)—means that depositors who anticipate this loss of value will have an incentive to “run,” that is, to withdraw their assets first, even in the absence of a liquidity motive to withdraw funds. The problem with Diamond and Dybvig is that, this is not the only possible equilibrium. In particular, a bank panic, in which withdrawals exceed the resources available to the bank, resulting in the liquidation of the bank, is also a possible equilibrium. An important question in this regard concerns the conditions under which the bank's resources may be exhausted through withdrawals. In principle, the bank could meet such withdrawals by borrowing abroad or by liquidating domestic investments. General though, the intuition for this is that the run forces the premature liquidation of assets, so that in reality the economy as a whole invests in the storage technology, rather than in the production technology. The implication of this model is that, precisely
because of banks illiquid portfolio structure, a run on banks and abnormally large withdrawals, as was frequently the case in the banking panics of the last century (see Calomiries, & Gorton, 1991) can mark the beginning of banking crisis and eventually culminate into currency crisis.

3.2 THE FLOOD–MARION JOINT DISTRIBUTION APPROACH

Other models of the joint occurrence of banking system and currency collapses include Buch and Heinrich (1999) and Flood and Garber (2004). In the Buch–Heinrich model, a banking collapse brings forward the time of a currency collapse. An adverse shock to bank asset returns lowers the net worth of banks and increases their cost of foreign borrowing. Buch–Heinrich argue that because the government is always monetizing a fiscal deficit and losing international reserves, the decline in foreign borrowing speeds up the inevitable collapse of the fixed exchange rate.

In Flood and Marion (2004), by contrast, bank and currency collapses need not occur together or sequentially. A bank collapse occurs when banks' liabilities exceed their assets, whereas a currency collapse occurs when currency speculators rush to purchase all the government's international reserves committed to the defense of the fixed rate. Speculators act the moment the shadow exchange rate exceeds the fixed rate, as in the standard Krugman–Flood–Garber model. Both bank and currency collapses result from bad shocks to fundamentals, and they are therefore related; but because these shocks affect differently the two conditions for collapse, banking and currency crises do not always occur together.
3.3.1 A BASIC MODEL WITH CLOSE LINKAGES

Following the basic systematic association of banking and currency crises, this study is interested in emphasizing that the linkage between banking crisis and an eventual currency crisis operates through the government’s bailout. According to Levitin, (2011), bail-outs are an inevitable feature of modern economies in which the interconnectedness of firms means that the entire economy bears the risk of an individual firm’s failure. Diaz-Alejandro (1985) explains the twin like banking and currency crises association in terms of extant public or depositors explicitly expect governments to intervene to save most depositors from losses when financial intermediaries run into trouble. Velasco essentially shows how government guarantees of the liabilities of private banks can generate a standard first-generation currency crisis. He explains that, in the presence of government guarantees for the liabilities of the domestic banking system, a failure of that system causes deterioration in the government’s budget, which is financed through a depletion of foreign exchange reserves. Given a lower bound on such reserves, he argues that their steady depletion would all things being equal result in currency crisis (Velasco, 1987).

3.3.2 ENVIRONMENT OF THE MODEL

An early recognition of the systematic relationship between banking and currency crises was developed by Velasco (1987). Velasco begins with small economy without bank. He assumes that the domestic economy is small and produces a single traded good so that the domestic price level is determined by
PPP as $p_t = s$, where $s$ is the nominal exchange rate (price of foreign currency in terms of domestic currency) and the foreign-currency price of the traded good is normalized to unity. Domestic prices and wages are fully flexible, so domestic output is always at its full employment level. Uncovered interest parity ensures that the domestic nominal interest rate $i$ is always equal to the foreign rate $i^*$. The domestic demand for money is given by:

$$m_t = L(i^*)w_t,$$  \hspace{1cm} (1)

Where $w_t$ is private nonbank wealth. The money supply is fully backed by foreign exchange reserves, which pay interest to the government at the rate $i^*$. The government is assumed to simply consume the interest earnings on its foreign exchange reserves, so government consumption $g$ is:

$$g_t = i^* R_t,$$  \hspace{1cm} (2)

The wealth of the private nonbank sector is defined as:

$$w_t = m_t + b_t^* + \frac{y}{i^*},$$  \hspace{1cm} (3)

Where $b_t^*$ denotes domestic private holdings of foreign bonds. Private sector wealth accumulation is accordingly given by:

$$w_t = y + i^*b_t^* - c(w_t) = i^*(w_t - m_t) - c(w_t),$$  \hspace{1cm} (4)

where $c$ is real private consumption, taken to be an increasing function of real private wealth, and the second equality follows from substituting equation (3) into the first part of Equation (4). Substituting (1) into (4), the steady-state level of wealth in the economy is defined implicitly by:

$$0 = i^* \left[ w_t - L(i^*)w_t \right] - c(w_t),$$  \hspace{1cm} (5)
Velasco introduces banks by assuming that the economy's capital stock is held indirectly by the nonbank sector, with banks serving as the financial intermediary, as in Diamond and Dybvig (1983) bank as a maturity transformation framework. Diamond and Dybvig model (1983) argues that banks play the valuable social role of allowing individuals who place a high premium on liquidity to use their savings to finance illiquid social investments that yield high returns. They are able to do this essentially by pooling the idiosyncratic liquidity shocks by transferring, the capital stock of the nonbank private sector to a bank, which in return issues claims on the bank to the nonbank private sector Agenor and Montiel (2008). In this case, however, those claims are in the form of domestic bonds, rather than demand deposits. The present value of the private bonds issued must equal that of the economy's future output, or \( b_0 = \frac{y}{i^*} \), so in the presence of banks the private nonbank sector's wealth becomes:

\[
    w = m + b^* + b_0
\]

(6)

The production of the single traded good is assumed to be subject to economies of scale, allowing the bank to earn monopoly profits equal to \( \pi \) per period, so in the presence of such economies the economy's output becomes:

\[
    y = y + \pi
\]

(7)

The banker is assumed to consume all of these excess profits especially based on the underlying "neo-Alejandrian" construction, namely public guarantees (explicit, implicit, or simply presumed) and expectation of bailouts (Kim, 2013).
Although the implication of equation (7) is that if the shock is small enough, the bank can continue to meet its obligations to its private creditors by simply reducing its own income $\pi$. But if the shock is sufficiently large that it exceeds what the bank can pay out of its own income, the bank can only continue to meet its obligations by borrowing. Assuming for simplicity that the shock is so large that it drives $y^1$ to zero, bank borrowing per period, denoted $F_t$, is given by:

$$F_t = i^* b_0 + \pi + i^* F_t.$$  \hspace{1cm} (8)

Because neither the private sector nor the bank initially changes its consumption behaviour, what happens in this situation is that the larger current account deficit caused by the reduction in $y^1$ is financed by external borrowing on the part of the bank. This is the idea that substantially, the twin crisis paradigm relies on the over-borrowing/over-lending/overinvestment syndrome—that is, the role of lending booms in the buildup of a financial turmoil (Dekle, & Kletzer, 2002).

However, if this external borrowing has an upper bound, say $F_u$, then this situation must eventually come to an end. The critical moment $T$ when the bank's borrowing capacity is exhausted, that is, when $F_T = F_u$, is given by:

$$e^{i^* T} = \frac{i^* F_u + i^* b_0 + \pi}{i^* b_0 + \pi}.$$  \hspace{1cm} (9)

Velasco assumes that bank deposits and the bank's foreign debt are guaranteed by the government. However, the government is assumed not to have sufficient foreign exchange reserves to simultaneously redeem the private bank's deposits and pay off its external debt. He therefore assumes that the government
uses reserves to redeem the bank’s deposits, but simply takes on the bank’s external debts and continues to service them on schedule. The idea is that, in the case of foreign borrowing and ever-greening, it may translates into an unsustainable path of current account deficits and eventually currency crises (Obstfeld, 1994; Calvo, 1997; Kim, 2013). If the government consumed the amount g initially, then its bailout reserve funds must have been given by g/i*, and the initial evolution of its bailouts over time would have been given by:

$$\hat{R}_t = 0 = g - i^* R_0$$  \hspace{1cm} (10)

When it pays off the bank’s depositors, its bailouts reserve fall by b0, so its revenues fall by i* b0. In addition, when it assumes the bank’s debts, its spending rises by i* Fu. Thus, the dynamics of bailouts reserve become:

$$\hat{R}_{t-T} = i^* R_{t-T} - \left( i^* F_u + g \right).$$  \hspace{1cm} (11)

Because $R_t = R_0 - b_0 = g / i^* - b_0$, the bailout reserve of the private bank makes $\hat{R}_{t-T} < 0$ for all $t \geq T$, thus, the key point of the model is that there is an inexorable decrease in the stock of bailout reserves which, assuming a finite lower bound on reserves, must inevitably give rise to a successful speculative attack on the currency. As in the Krugman model, the timing of the attack is predictable, and assuming a zero lower bound on bailout reserves, is given implicitly by:

$$e^{i^* (T^* - T)} = \frac{R_{T^* - T} - \left( F_u - g / i^* \right)}{(R_0 - b_0) - \left( F_u - g / i^* \right)}.$$  \hspace{1cm} (12)
Note that the link between a banking crisis and an eventual currency crisis in this model operates through the government’s budget. Equation 12 is in line with the Velasco argument that in the presence of government guarantees for the liabilities of the domestic banking system, a failure of that system causes deterioration in the government’s budget, which is financed through a depletion of foreign exchange reserves. Because it guarantees the value of the banking system’s liabilities, this shock to the system’s net worth is absorbed by the government, which is thereby caused to run a fiscal deficit that eventually forces it to run out of reserves, triggering the currency crisis (Kim, 2013). As the central bank finances the bail-out of troubled financial institutions, its ability to maintain the prevailing exchange rate commitment erodes (Kuye, Ogundele & Otike-Obaro, 2013). If the central bank finances the bail-out by printing money, we have the Krugman (1979) story; if it finances by issuing large amounts of debt, markets may come to expect future monetization, and the crisis may become self-fulfilling. The central banks’ capacity for defending the currency can be further undermined by its inability to raise interest rates once the currency has come under attack. Consistent with the results of Gorton (2006) and Kaminsky-Reinhart (1999), the model proves that, what triggers the banking crisis is a recession, which impairs the value of the bank’s assets.
4 CONCLUSION

The currency crises have led to resurgence of interest in model of speculative attacks and exchange rate crises. The modified Valesco linkages framework employed in this study helps us to understand that in the event of bankruptcy, the government can intervene and rescue the troubled bank. The model argues that most of the time when government rescues a bank, it injects capital, into the bank to prevent the bank from having to sell its loans at re-sale prices. The study demonstrated that the linkage between currency and banking crises is based on the belief that government would always intervene in terms of bailout. The model assumes that the bailout decision is constant from banks' perspective. The implication of this argument is that the bank has already made belief about the probability of government intervention conditional on bankruptcy. The study concludes that, bail-outs are an inevitable interconnectedness between currency and banking crises of modern economies.

REFERENCE


