



Interest Rates, Terms of Trade and
Currency Crises:

Are We On the Verge of a New Crisis in the Periphery?

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July 2015

WORKINGPAPER SERIES

Number 388

**POLITICAL ECONOMY
RESEARCH INSTITUTE**

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Abstract

In this paper we develop a simple model of currency crises, which emphasizes the role of currency mismatches and the balance of payments constraint. In our model, crises are driven by external shocks, particularly foreign interest rate and terms of trade shocks, which drive payments imbalances. In a reversal of conventional causality, we show how a currency crisis can then produce a domestic fiscal crisis. We then discuss the historical relevance of the model, tracing the major waves of currency and fiscal crises. The paper concludes with an assessment of the current situation of the peripheral countries in light of our model and argues that concerns of a renewed wave of currency crises may be overstated.

Keywords: currency crisis, terms of trade, public debt, periphery

JEL Classification: E62, F31, F34, F41

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Introduction

Conventional models of currency crises suggest that at the heart of the process there is invariably a fiscal crisis. Alternative models suggest that expectations play a role, that self-fulfilling crises are possible and that balance sheet problems and banking crises might also be relevant to understand currency crises. Both the so-called second and third generation models still insist that fiscal crises might be one of the elements triggering a currency crisis. The model developed in this paper, on the other hand, emphasizes hikes to foreign rates of interest and terms of trade shocks, highlighting the role of the balance of payments constraint in currency crises.

In the same vein of the first generation models, the alternative model emphasizes the role of fundamentals in leading to crises. Yet, in contrast to the Krugman model, it suggests that the fiscal crises are not central for currency crises. Fiscal crises might be the result of currency crises, but not their cause, within this framework. The model is by design simplistic and reduces the complexities of real world currency crises, as much as the first generation models did. The fundamental role of the simplification is to highlight the differences in causality, and the deep roots of currency crises. In this view, it is not the excessive spending of the bloated Leviathan, but the currency mismatch between spending requirements, which often involve imports of essential intermediary and capital goods for peripheral countries and are in foreign currency, and receipts, which are in domestic currency, that lead to a crisis. It is what used to be called the balance of payments constraint, and now has been more colorfully referred to as the ‘original sin’ that is at the heart of the problem.²

The remainder of the paper is divided in four sections. The following section develops a model that might be referred to as post-Keynesian, since demand determines output, prices are determined by technical conditions of production and distribution, and following those conditions the balance of payments is the main constraint on economic growth.³ The subsequent section provides a short overview of the history of currency crises, intended to provide support to the notion that the balance of payments and not fiscal matters are often at the center of this crises. The next section briefly discusses, in light of the model developed in the paper, the possibilities for currency crises in peripheral countries after the global crisis of 2008. It is argued that even though conditions have become more problematic in the last three years, the prospects of

² See Eichengreen, Hausmann and Panizza (2005).

³ Not all of the post-Keynesian characteristics are explicitly treated in this version of the model, but the main assumptions about the role of the balance of payments in currency crises certainly follow Keynesian ideas as well as the old Latin American Structuralist tradition. And alternative denomination that would also fit the theoretical underpinnings of this model is classical-Keynesian, as discussed in Bortis (1997).

currency crises in the periphery have been exaggerated. A short conclusion brings the argument together.

A post-Keynesian Model of Currency Crises

First generation models, based on the ideas of Krugman (1979), suggest that the causes of currency crises are related to the fundamentals of the economy. The fundamentals are associated to the tendency of the economy to reach its potential 'natural' level, PPP and the Quantity Theory of Money. Under these circumstances fiscal deficits financed by printing money are inflationary, and under a fixed exchange rate regime, excessive money printing would cause inflation, expectations of depreciation, deterioration of the current account, and loss of reserves.

In the second generation models (e.g. Obstfeld, 1996) a currency crisis might occur even if the central bank pursues the correct monetary policy, consistent with its commitment to a fixed rate. The reason for a crisis is that there are multiple combinations of exchange rate and money supply that would be consistent with a fixed exchange rate regime and speculators might take advantage of multiple equilibria. So speculators might attack a currency not because the central bank follows an inconsistent policy, but because they think that the costs of keeping the parity (hiking interest rates to reduce loss of reserves, with consequent reduction in the level of activity) would force the central bank to abandon the fixed peg.

Third generation models emphasize the role of the financial sector, since currency crises are often associated to banking crises (Twin Crises). The banks have explicit currency mismatches on their balance sheets because they borrow in foreign currency and lend in local currency. Devaluation would increase the cost of repaying under these circumstances. Speculation results not from inconsistent policies or multiple equilibria, but from the risk associated to balance sheet mismatches (firms might not be able to repay, since revenue is in domestic currency).⁴

While conventional currency crises models of all generations suggest that at the heart of currency crisis there is a fiscal crisis, post-Keynesians emphasize hikes to foreign rates of interest and terms of trade shocks, highlighting the role of the balance of payments constraint in currency crises. Note that the economy in this view is not at full employment, and, hence the effect of fiscal expansions is not on prices, but on the level of activity. Higher level of income leads to increasing imports and a deteriorating current account (CA).

It's the deteriorating CA and not the fiscal deficits per se that matter and the CA position might worsen even if the fiscal accounts are balanced. Further, after a currency crisis the central bank hikes the rate of interest, increasing the costs of debt-servicing, and, hence, government spending, leading to a weakening of the fiscal accounts. In this case, it is the external currency crisis that causes the domestic fiscal crisis (Vernengo, 2006).

The dynamics of the foreign debt-to-export ratio (d) is given by definition as:

⁴ Even though Kaminsky and Reinhart (1999, p. 490) include fiscal deficits among the real causes of currency crises in their theoretical model, they admit that empirically the: "fiscal variable fared the worst, accurately calling only slightly over a quarter of the currency crises." Even that correlation might conceal causality issues.

$$(1.) \quad \frac{\dot{d}}{d} = \frac{\dot{D}}{D} - \hat{x}$$

Where \hat{x} is the rate of export growth and \dot{D} is given by:

$$(2.) \quad \dot{D} = (p_M m Y - e p_X X) + i^* D$$

In other words, foreign currency denominated debt increases when the nominal value of imports is higher than that of exports, and with the service of foreign debt, where m is the import coefficient, p is price and the m and x subscripts refer to imports and exports, and i^* is the foreign interest rate.

Substituting (2.) into (1.) we obtain:

$$(3.) \quad \dot{d} = (p_M \mu - e p_X) + (i^* - \hat{x}) d$$

Where μ is the import-to-export ratio. The dynamics of the exchange rate is described below:

$$(4.) \quad \dot{e} = \delta(\bar{e} - e)$$

Where \dot{e} is the change in the nominal exchange rate measured as the domestic price of foreign currency (i.e. an increase implies depreciation), \bar{e} is the target exchange rate that the monetary authority tries to maintain in a fixed exchange rate regime, presumably one that would be compatible with a sustainable equilibrium of the CA, including the ability to service international debt commitments.⁵ If the exchange rate is lower (more appreciated) than what would be seen as consistent with a sustainable CA, then there is a tendency for the nominal exchange rate to depreciate. In other words, the nominal exchange rate depreciates if, for a given nominal exchange rate there is an unsustainable CA deficit.

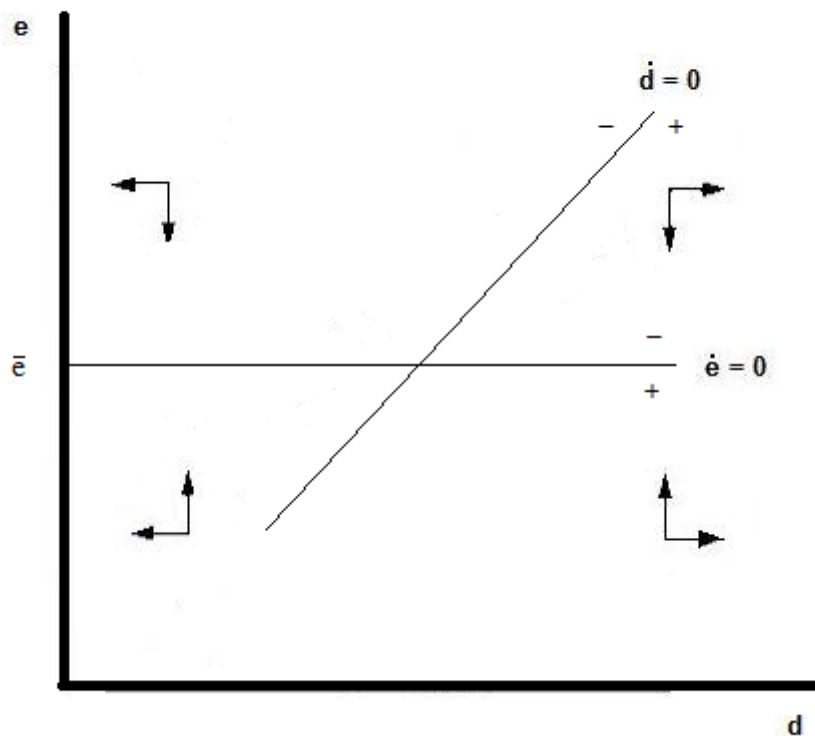
Equations (3.) and (4.) provide a dynamic system which allows us to determine the relation between exchange rate and foreign-debt-to-export ratio. Solving the system and making a few reasonable assumptions about the signs of coefficients we get the dynamics shown in Figure 1.⁶ The \dot{d} phase path might be positively or negatively

⁵ Currency crises can occur in regimes in which the central bank intervenes in the foreign exchange market, but allows only for limited fluctuation, be that a band, a crawling peg, or simply some sort of fear float. Under these circumstances the exchange rate dynamic might be different, and would be affected by interest rate differentials, and possibly by the debt-to-export ratio too. For simplicity we assume that the central bank sets the exchange rate in conformity with a target rate that is compatible with CA equilibrium.

⁶ We assume δ , σ , and γ to be positive. The Jacobian of the system of differential equations is given by:

sloped, depending on whether export growth is higher or lower than the international interest rate. If the interest rate is higher than export growth, then the d-dot line is positively sloped, since depreciation does not increase exports enough to reduce the debt-to-export ratio.⁷ The horizontal sloped e-dot line indicates the fixed exchange rate regime with a rate fixed at \bar{e} .

Figure 1



A financial shock characterized by the increase in the foreign interest rate affects the dynamics of the system.⁸ An increase in the rate of interest affects the ability to service foreign debt, forcing a counter-clockwise rotation of the d-dot line. This implies that the original exchange rate is not sustainable. The final outcome is shown in Figure 2, where the dotted line represents the original d-dot path and the initial equilibrium. The increase in the international interest rate generates an increasing burden of debt, which eventually leads to, at some level of the debt-to-export ratio, the depletion of external reserves, and forces the floating of the currency, which would jump to the new

$$\begin{bmatrix} (i^* - \hat{x}) & -p_x \\ 0 & -\delta \end{bmatrix}$$

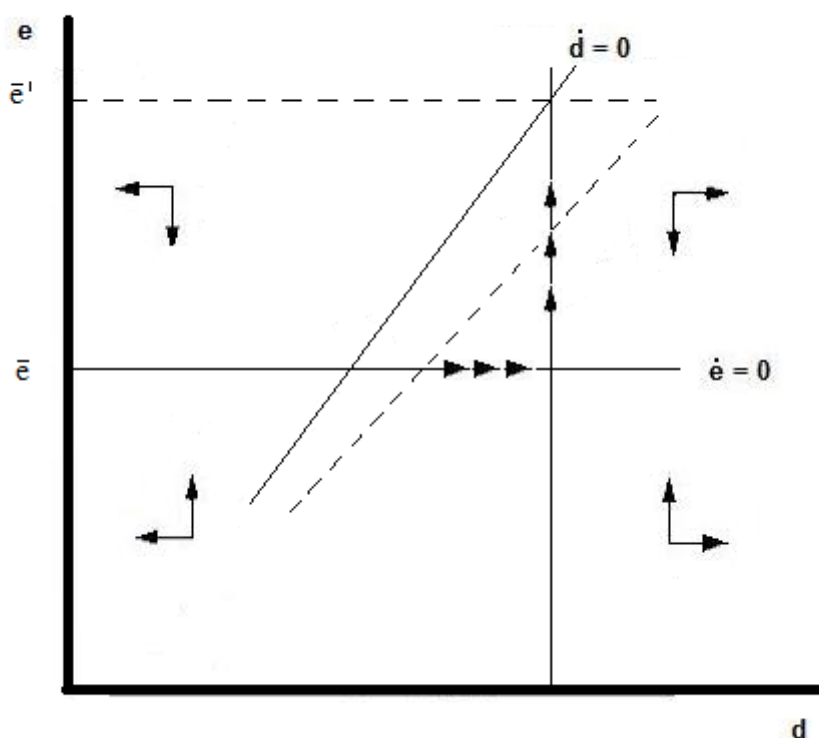
If $\hat{x} < i^*$ the determinant of the Jacobian is negative, and the system is unstable.

⁷ Note that if export growth is higher than the rate of interest the system is stable, something that would be relevant for our discussion of possibilities of currency crises in the periphery in the aftermath of the global crisis of 2008.

⁸ Alternatively a shock might be caused by a greater perception of risk associated to domestic bonds, but for simplicity we discuss only an interest rate shock.

\bar{e} prime level. In other words, the burden of debt increases until *default* puts an end to the process, and at that point depreciation follows. The result is the increase in both the debt-to-export ratio and the nominal exchange rate.

Figure 2



The increase in the international interest rate causes a currency crisis irrespective of the fiscal position of the economy. A fiscal imbalance might lead to an increase in imports, and in the current account deficit, but in this model it would only affect the foreign-debt-to-export ratio and the dynamics of the exchange rate if it affected the import-to-export ratio (μ). In this sense, the problem would not be that excessive fiscal spending leads, in an economy at full employment, to excessive monetary financing, and, eventually to depreciation, but that fiscal policy puts excessive pressure on the current account. The balance of payments disequilibrium, and not full capacity utilization of labor and capital, is the limit to fiscal expansion.

A similar situation would occur if a negative terms-of-trade (TOT) shock took place, but in this case the whole \dot{d} curve would move upwards. In this situation the \dot{d} curve would shift upwards, and the fixed exchange rate would be unsustainable, since it would lead to incapacity to service debt again. A twin shock – meaning higher international interest rates and lower terms of trade – would be the worst possible scenario, and the perfect storm regarding currency crises.

Note that once a shock has affected the equilibrium, if agents have rational expectations, meaning that they form expectations consistently with the model and using all available information, then they would have an advantage to try to speculate

against the currency before reserves are exhausted, and devaluation would occur immediately after the shock, very much like in the self-fulfilling crises models. Yet, the main characteristic of the model presented here is that it emphasizes the role of fundamentals, like the first generation models. In contrast with those models, the fundamentals are essentially connected to the external accounts, and the main drivers of currency crises are the twin shocks of higher interest rates, and lower terms of trade.

It is also important to note that once the currency devalues, and the system moves to a new equilibrium with a depreciated nominal exchange rate and higher foreign-debt-to-export ratio, it is not necessarily the case that the new equilibrium exchange rate, which might be considered compatible with a sustainable CA, was the main instrument of the re-equilibration process in the external accounts. The more likely mechanism for the adjustment of the CA is a collapse of imports associated to a domestic recession, in particular since we assume that export growth is smaller than the foreign rate of interest, and that exports might not be very responsive to the exchange rate. This is the well-known contractionary effect of depreciation, in which the income effect associated to lower wages, resulting from depreciation and the contraction of purchasing power in foreign currency, is larger than the substitution effect.⁹

This is particularly important, since it suggests a completely different macroeconomic environment than the one that would be compatible with the first generation currency crises models. In that model, the system must be at full employment, and that is the reason why monetary financed fiscal expansion leads to pressures for the depreciation of the currency, depletion of reserves and the ultimate crisis. In our model, not only can the pressure for depreciation take place considerably before the system is at full employment (the CA deficit could be unsustainable and the dynamics of the foreign-debt-to-export ratio could be explosive well before the system is at maximum capacity of labor and capital), but the adjustment itself and the crisis would likely be contractionary.

In addition, as noted above, in this scenario the fiscal crisis might be a result of the currency crisis, and not vice versa. If the crisis leads to a recession, then fiscal revenues collapse, and spending, particularly unemployment insurance expenditures, welfare spending, and transfers increase exacerbating the fiscal problems. Further, the central bank might hike the domestic interest rate, to preclude capital flight and further devaluation and that would have an additional effect on interest payments on domestic debt, also worsening the fiscal stance. In this sense, this paper puts the logic of currency crises upside down with respect to first generation models.

Finally, whereas inflation was central to conventional currency crises models, here it plays no direct role. Again the logic is in reverse to conventional models. In the monetarist story usually adopted in currency crises models, money printing causes inflation, which, in turn, leads to external imbalances, reserve depletion and depreciation. Causality goes from money to prices and from the latter to the exchange rate. In the current model, on the other hand, causality is reversed. A depreciation, which results from the incapacity to service foreign debt and to current account imbalances, leads to inflation. If the central bank accommodates inflation by increasing

⁹ The original idea was developed by Hirschman (1949) and Díaz-Alejandro (1963) and formalized by Krugman and Taylor (1978). This is not formalized in this paper, but the results would be compatible with a model of currency crisis in which variations of prices are not central for depreciation.

money supply, as it often is the case, at least to some extent, the sequence would go from the exchange rate to prices and from those to money.¹⁰

A brief history of external constraints, currency crises and defaults

The perspective adopted here suggests that ultimately currency crises may be the result of payments imbalances which in turn are intimately related to economic growth. In this sense, the model above belongs to a larger class of models which view the balance of payments as the primary constraint on economic growth. That is, peripheral countries may have difficulty reconciling equilibrium in the balance of payments with domestic policy objectives like full employment or price stability. If the rate of economic growth and equilibrium in the balance of payments become misaligned, adjustment will primarily come from income rather than relative prices. In the context of this model, this adjustment may involve a fiscal crisis, which is generated by the ensuing currency crisis. In the examples provided above, a terms of trade shock or a foreign interest rate shock initiates the crisis which realigns economic growth with the balance of payments.

That the requirement for long term payments balance acts on the rate of growth is well established by the large literature following Thirlwall's law. The contributions in McCombie and Thirlwall (2004) provide a recent summary. The core notion is that the long run growth of many countries is consistent with the growth rate that would ensure balance on current account, given import and export propensities. What these models do not specify is the nature of the adjustment to the long run balance of payments consistent growth rate. The model here suggests that terms of trade shocks, and foreign interest rate shocks often (but not always) initiate the crisis, which then results in an exchange rate crisis, decline in output, and a transition to unsustainable debt ratios. In what follows, we will describe the evidence that terms of trade shocks, and foreign interest rate shocks are often the source of exchange rate crises, which in turn are associated with debt crises and declines in output.

This view is compatible with the notion of long-term debt cycles. Marichal (1989) argues that debt crises in peripheral countries are usually associated to financial cycles in central countries. Cycles of growth and expansion of international trade lead to surges in lending to developing countries, as the funds in central countries grow faster than their needs, leading to a frenzy of speculation. Ultimately investors became overextended and retrenchment occurs leading to a reversal of capital flows and eventually to default. Suter (1992) finds evidence of decreasing profitability in the center and higher indebtedness in the periphery. Finally, Ginzburg and Simonazzi (2004) suggest that contractionary monetary policy, i.e. higher interest rates in the center, would lead to falling terms of trade and financial crises in the periphery. This view of long term debt underplays the role of public finance in the crises in peripheral countries.

Easterly et al. (1993, p. 470-71) argue that the observed volatility of growth rates (which contrasts with the stability of country level policy institutions) is explained by shock variables. In particular, they find that the terms of trade, war, and a dummy for high debt to GDP in low and middle income countries in 1980 are all significant. These variables lend support to the notion that country growth rates are closely related to events that dominate the external accounts. Importantly, Easterly et al. (1993) conclude

¹⁰ Money is endogenous in this case, something that most mainstream models have now accepted. For a formalization of inflation along these lines see Camara-Neto and Vernengo (2004).

that, “shocks, especially terms of trade shocks, statistically explain as much of the variance in growth rates over 10-year periods as do country policies.” This finding has subsequently been confirmed by Mendoza (1995) and Kose (2002).

Historically, the pattern described in this model has been repeated several times in a variety of international monetary contexts. While it’s clear that debt and currency crises are often popularly associated with corruption or speculative state expenditures, some core structural issues permeate each major wave of fiscal and currency crisis that lend support to the approach of this paper. In particular, there is a common pattern in which the country at the center of international finance increases its interest rate to “bring gold from the moon” (in the famous words of Bagehot) and resolve a balance of payments problem often associated with deterioration in the terms of trade. While increasing the interest rate can often resolve balance of payments difficulties for the core country, other countries are not so lucky. Many issued foreign loans denominated in the core countries currency, which were predicated on export earnings from a favorable terms of trade. Once the central country has raised its interest rate, new loans are no longer forthcoming, domestic interest rates rise, and often the terms of trade collapse creating a perfect storm for a dual currency and fiscal crisis.

The first major wave of country defaults, which occurred during the period of Latin American independence meet some of our criteria. The conclusion of the Napoleonic Wars resulted in London’s displacement of Amsterdam as the center of international trade and finance and a lending boom to the newly independent Latin American countries (starting with Colombia). This coincided with a boom in Britain which in turn led to rising imports and a drain on the Bank of England’s reserves. In response, the Bank of England raised its discount rate (the main monetary policy tool during the 19th century) in 1825 (Kaminsky, 2009). The rate increase prompted recessions throughout Europe and a collapse in world trade which was also associated with a decline in the terms of trade for Latin American economies (Kaminsky, 2012). The rising interest rates, collapsing terms of trade (which in turn led to collapsing tariff revenues), and depreciation (with bonds denominated in pounds or containing specie clauses) all conspired to produce a wave of depression and defaults (Dawson, 1990).

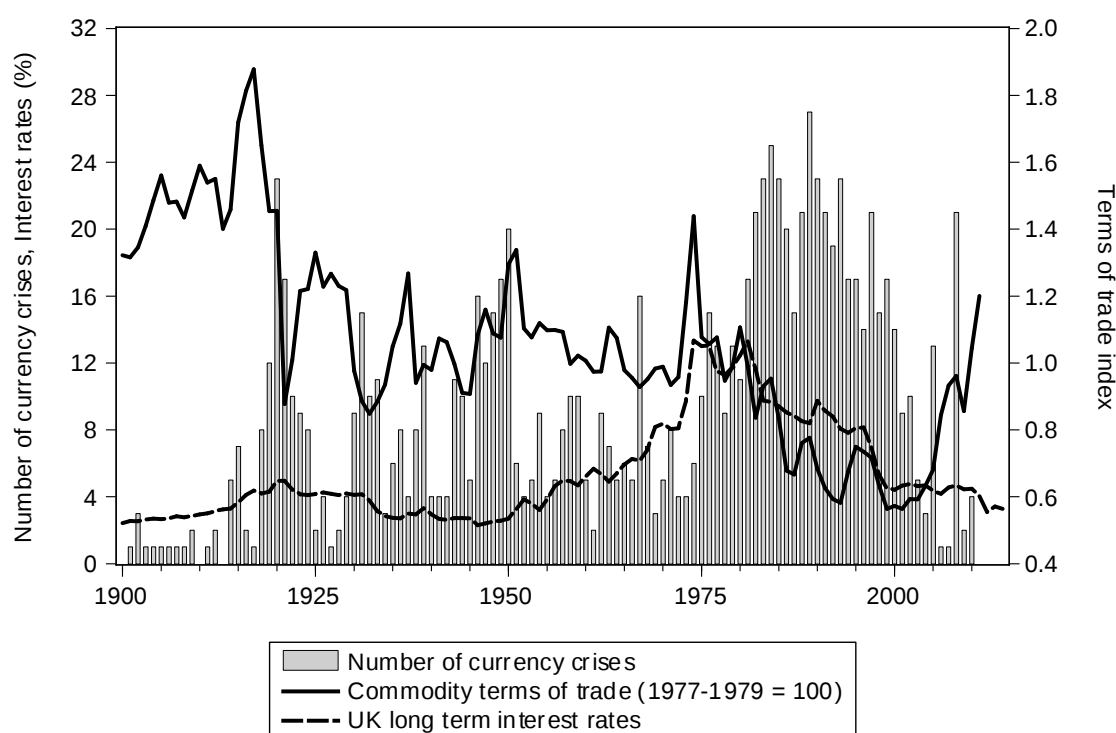
Interestingly a similar pattern of rising foreign interest rates and collapsing terms of trade produced similar depreciations and defaults for the US states during the 1840s. While the federal government was able to issue debt in domestic currency, the individual states were not, and thus were subject to the kind of exchange rate risk that produces an explosive saddle path. During the 1830s US export prices (cotton in particular) began to rise putting pressure on British specie holdings (cotton was a main import for the British textile industry). In response the British raised the bank rate which then pulled capital back from the US, caused the dollar to depreciate, and caused cotton prices to collapse as demand fell and carrying costs rose (Cline, 2012).

The next major wave of defaults associated with currency crises came in the late 19th century, featuring British investments in Latin America once again. By the 1860s lending to Latin America had resumed, but once again resulted in a wave of defaults towards the end of the century. Notably this period of crisis once again coincided with a sharp increase in the British bank rate, large fluctuating gold premiums, terms of trade collapse, and eventual sovereign defaults. Ultimately, as Ford (1962) argues, the crises were resolved primarily through the level of income and not relative prices. The process leading to default was again a deadly combination of increasing servicing costs, declining output, a fall in export proceeds and exchange rate depreciation. It is worth noting that this process did not apply to Great Britain which was able to exert a great

deal of influence over international capital movements via changes in the bank rate. For these reasons, De Cecco (1985) has argued that the classical gold standard may have produced some stability for the center, but also resulted in instability for the periphery.

Another wave of defaults and currency crises was associated with the collapse of the classic gold standard and then the Great Depression. Figure 3 shows the coincidence once again of collapsing commodity terms of trade and rising interest rates. The commodity terms of trade are measured by the Grilli and Yang (1988) commodity price index deflated by an index of manufactured goods' unit values. Though imperfect, this series can be interpreted as a long run measure of developing country terms of trade. As the gold standard collapsed in the aftermath of WWI, British long run rates doubled while commodity prices collapsed. This produced two related waves of currency crises and sovereign debt problems. Notably, as pointed out by Camara and Vernengo (2004) the German hyperinflation experience can be seen in this context as related to balance of payments problems stemming from real causes (war reparations of the Versailles treaty). The resulting large depreciation was associated with a major contraction in German output and rising external obligations.

Figure 3



Source: Authors calculations on the basis of Reinhart and Rogoff (2010), Pfaffenzeller, Newbold and Rayner (2007), and Officer (2015)

As can be seen in Figure 3, the massive wave of defaults in the 1980s and 1990s clearly involved the largest number of countries. While the conventional currency crisis models described earlier saw the 1980s crisis as being the result of excessive fiscal policy, the empirical record seems closer to the model presented here. As pointed out by Eatwell and Taylor (2000) many of the countries involved actually ran very modest deficits or even surpluses prior to the crisis. Instead, a severe increase in US interest

rates, famously pursued by Paul Volcker to stem inflation, increased debt service costs of Latin American countries whose debt was often indexed to the LIBOR. In addition, since much of the debt was in dollars, the resulting appreciation of the dollar caused the external debt to balloon. Finally, the crisis was associated with large terms of trade shock in which commodity prices collapsed. Prior to this, several non-oil exporters were already developing balance of payments difficulties due to the oil shocks of the 1970s. The external payments imbalances were then only resolved through large contractions in output. This process also notoriously coincided with the collapse of the Bretton Woods regime. In Latin America it also marked a turning point for many countries who subsequently abandoned the import substitution strategy and moved toward the so-called Washington Consensus.

The countries involved in the wave of currency crises and defaults limped along through a “lost decade.” Currency crises returned again in the late 1990s among the East Asian economies. This time traditional currency crises models clearly could not apply as the countries in question largely had budget surpluses to begin with. The newly industrializing economies of East Asia were not negatively impacted by the falling commodity prices, and in fact benefited from a large wave of foreign investment causing some currencies (the Yen in particular) to appreciate. These flows led to productive investment in some countries and unproductive investment in others. While explanations of the ensuing crises often focused on excessive state intervention, Henderson (1999) argues the state was rather weak in Thailand and Indonesia. Additionally, Alexander, Dhumale and Eatwell (2006) discuss the weakness of banking and financial regulatory institutions in the East Asian crisis, while Chang (1998) argues convincingly that South Korea’s state capacity was weakened by the crisis itself. The crisis instead may have more to do with the increased capital market liberalization. Stiglitz (2000, p. 1075) has argued this point, noting that, as the crisis spread, “even countries with good economic policies and relatively sound financial institutions (at least as conventionally defined) were adversely affected.”

The common theme, emphasized by our model and the preceding institutional history, suggests that there is a pattern of external shocks which generate balance of payments and currency problems which then in turn cause fiscal crisis. This contrasts with explanations that emphasize country specific policies. As Diaz-Alejandro (1984) emphasized, “blaming victims” is fairly common in the wake of a crisis, but “when sins are heterogeneous” this line of argument becomes harder to maintain.

The dominant role of external shocks in capital flows has been confirmed by others. Calvo et al. (1993) suggest that the capital flows to Latin America in the early 1990s could only be explained with reference to an external shock originating in the United States, which was common to the region, a view also argued by Fernandez-Arias and Montiel (1996). Ying and Kim (2001, p. 954) find that for both Korea and Mexico, “the U.S. business cycle and shocks to foreign interest rates account for more than 50% of capital inflows to both countries.”

Terms of trade shocks also affect developing countries more often than developed. Baxter and Kouparitsas (2000) have found that the terms of trade fluctuations are much larger for developing countries (by roughly two times) than for developed countries which is clearly related to the composition of exports in those countries. The export basket of developing countries has historically been dominated by primary commodities which themselves are known to be quite volatile. Importantly, these goods are prices are often beyond the control of any one commodity exporter (Broda and Tille, 2003).

In addition, it is notable how common the coincidence of terms of trade and interest rate shocks are historically. There seems to be an institutional pattern which lies behind our formal model, in which central countries (first Great Britain and then the United States) respond to rising prices and deteriorating terms of trade with large interest rate shocks. These are then potentially transmitted to commodity prices as demand for these goods by industrialized economies slows, or through carrying costs as argued by Frankel (2006). Thus while commodity prices may be beyond the control of one commodity exporter, they are directly and indirectly influenced by conditions in central countries. The central country thus manages its terms of trade, while the periphery is subject to a perfect storm of external shocks, which lead to currency crises and unstable debt dynamics.

Post-crisis development in light of the alternative model

In the aftermath of the 2008 global crisis the prices of commodities fell significantly recovered somewhat, and seemed to be in a decreasing trend once again. Ocampo and Erten (2013) suggest that we are at the end of a super-cycle of commodity prices. Further, interest rates in advanced economies had remained at very low levels, mostly close to the zero-lower bound, in advanced economies, including the United States. The fear that a not to distant normalization of interest rates in advanced economies and the negative terms of trade tendency in peripheral economies might lead to a wave of currency crises in the developing world.

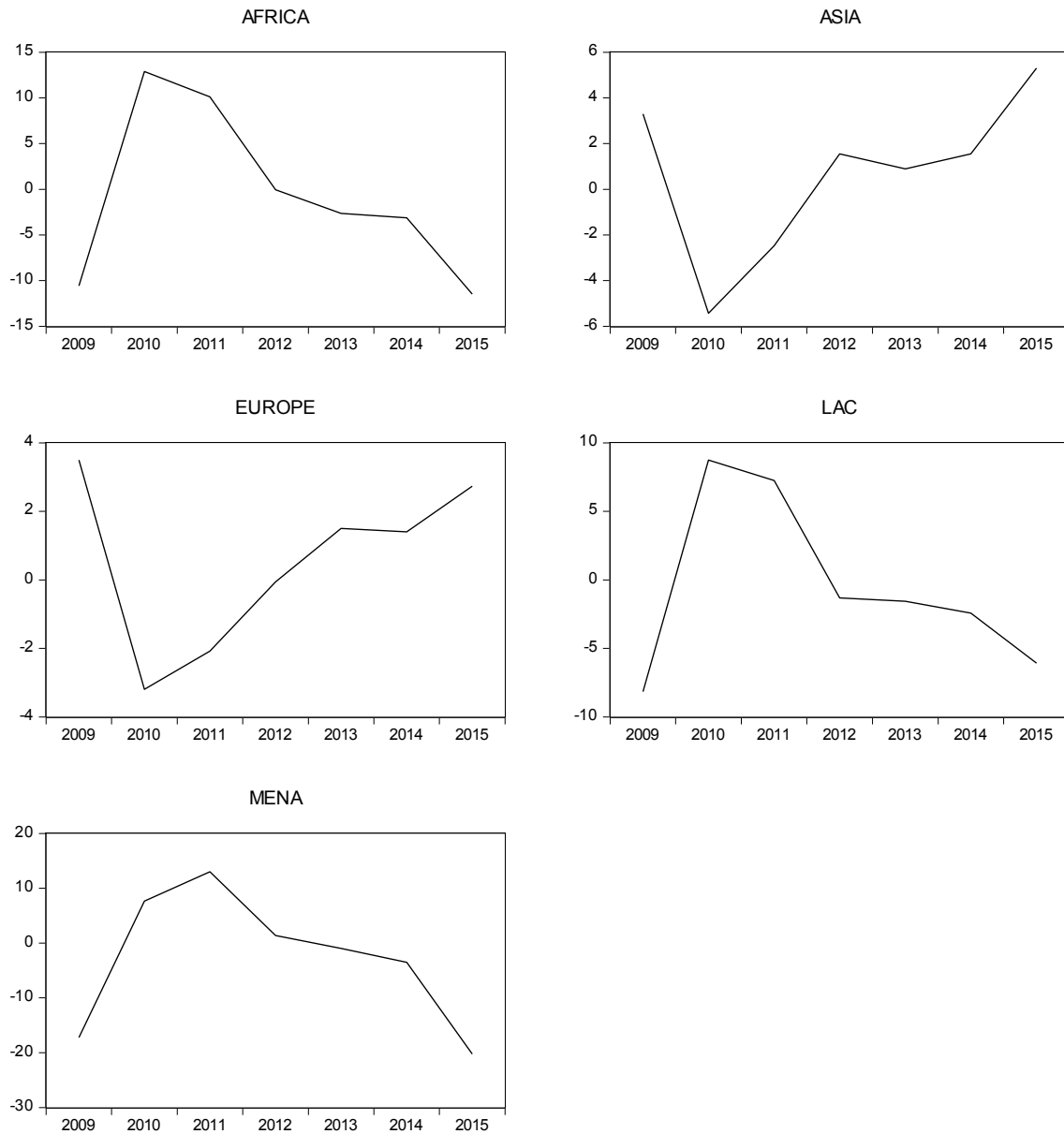
However, the anxieties about the plausibility of that scenario might be exaggerated. For one, the fall in terms of trade has not been yet alarming, or at least not uniformly in all regions, as shown in Figure 4. While the terms of trade of oils exporters in the Middle East and North Africa (MENA) and commodity exports in the Latin America and the Caribbean (LAC), and Sub-Saharan Africa regions have fallen, in Developing Asia and Europe the terms of trade have improved. For all developing countries terms of trade have fallen less than 5% in cumulative terms over the last three years.¹¹ Further when the current account situation is examined, not surprisingly a similar picture emerges with deteriorating external positions in Sub-Saharan Africa, LAC and MENA, and improving external conditions in developing Asia and Europe (Figure 5). Regionally the worst CA deficit is in Sub-Saharan Africa at about 4.5% of GDP.

These would indicate, according to the model discussed in this paper that the possibilities of currency crises in developing countries have increased significantly in the last three years. However, a few counterbalancing forces should be taken into consideration. Following the model, the other crucial variable would be the debt-to-export ratios, and these are relatively low in most regions, the exceptions being developing Europe and LAC, with ratios of 167.2% and 131% respectively in 2013, which is the last data available (WEO-IMF, April 2015). However, when we look at the total debt service as percentage of exports only developing Europe has a relative large burden of 62.2%, while LAC is about 34.7%, which seems considerably less problematic. All the other regions have debt service burdens of less than a quarter of their exports. Further, again with the exception of developing Europe, all regions have had stable or decreasing foreign debt as of 2013.

¹¹ The numbers of Sub-Saharan Africa, LAC and MENA are respectively 17.3%, 11.4% and 24.8%.

Finally, international reserves in developing countries are at a historically high level, which also provides for protection against a currency crisis. Up to 2013, the last available data, all regions continued increasing its foreign exchange reserves, even if at a slower pace, with only Sub-Saharan Africa displaying a minor decrease in the very last year.

Figure 4
Terms of Trade (% change)

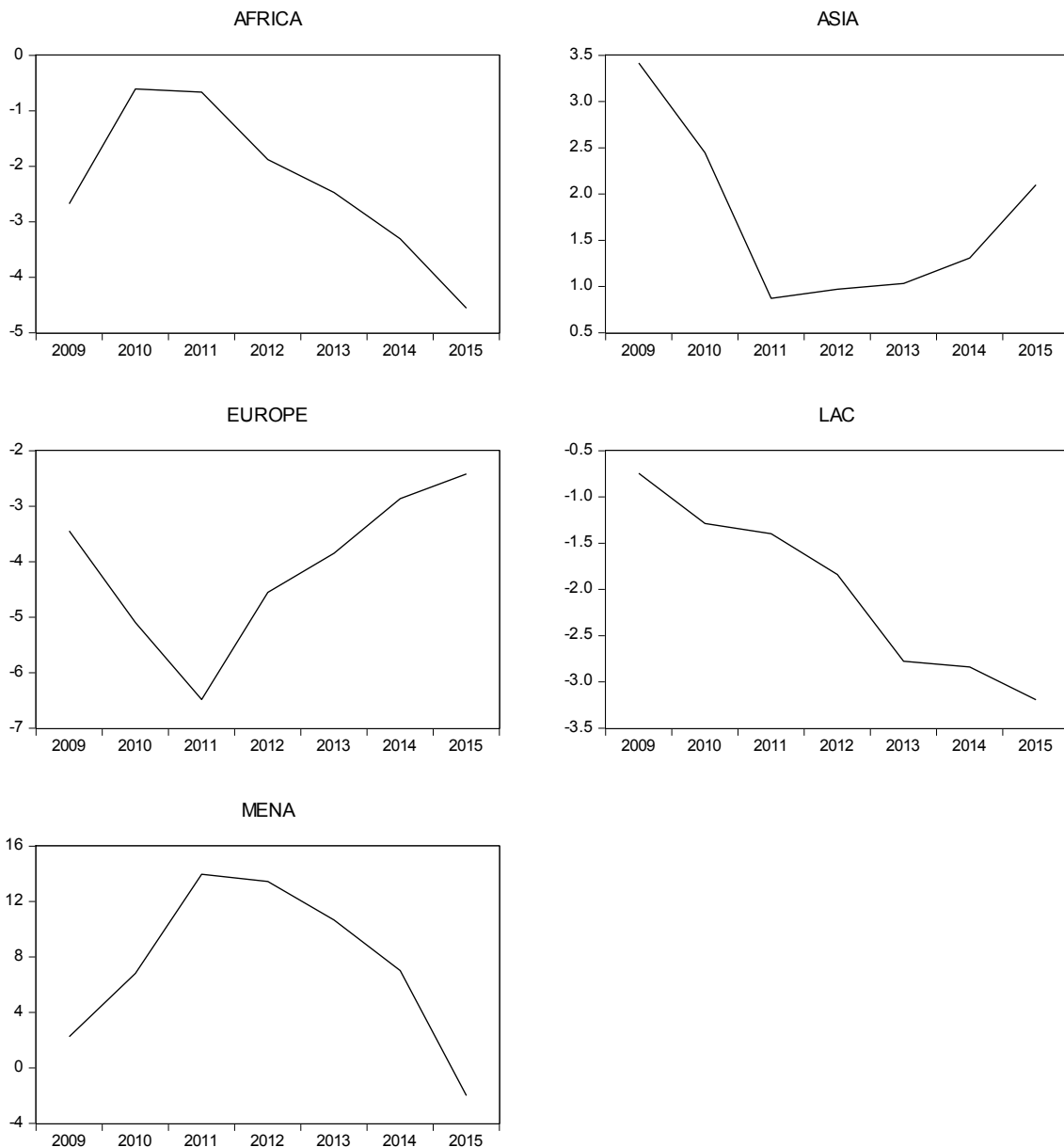


Source: WEO/IMF April 2015

Additionally, while the volume of exports of goods and services, not to be confused with its value, is not growing at the same pace as in the boom period between 2003 and 2008, there is a slow recovery in course, with Asia, not surprisingly, ahead of the rest of developing countries. More importantly for our purposes, however, is the

relation of export growth and the rate of interest. Using the overall rate of growth of the volume of exports of goods and services for developing countries and the 12-Month London Interbank Offered Rate (LIBOR), based on U.S. Dollar, for the interest rate, it is quite clear that the situation would be in the stable situation according to our model (see Figure 6). In particular, the stability follows as a result of the very low levels of the international interest rate since the global crisis.

Figure 5
Current Account (% GDP)



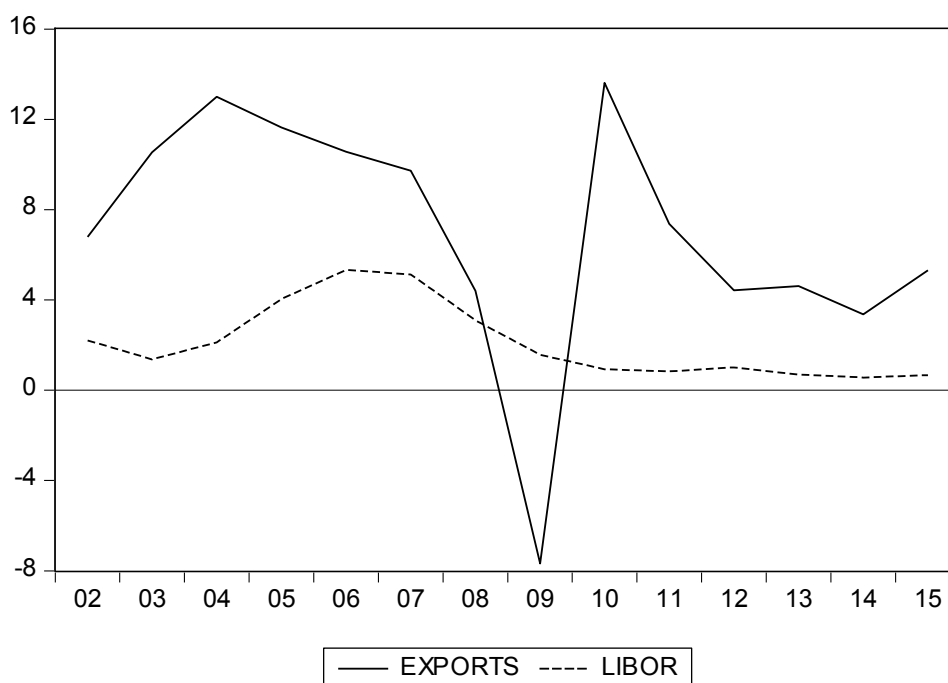
Source: WEO/IMF April 2015

The current conditions in advanced economies, in the United States, in Europe as well as Japan seem to indicate that the tendency for international interest rates to remain at low levels by historical standards. Even in the United States, where arguably there

has been more pressure for the normalization of interest rates, it seems that the Fed, under the conduction of Janet Yellen, remains very cautious and that increases in the basic interest rate will be slow, and remain below historical levels for a prolonged period. With international interest rates close to the zero-lower bound, the chances for currency crises in the periphery are considerably more limited than otherwise they would be.

This is not to say that currency crises in particular countries are not possible in the near future, since that would be an excessively bold conclusion on the basis of regional averages. Specific conditions in some countries might imply that a currency crisis is more likely in one particular county than for the peripheral countries as a whole. Certainly, the case of Greece¹² comes to mind as a possible one, and the possibility of an exit of the euro, which would imply a creation of a more devalued national currency, and that is very much under debate at the time of writing this paper, cannot be completely discarded.¹³

Figure 6



In particular, as much as the 2000s were very different in terms of the effects of higher terms of trade and inflation than the 1970s, with low inflation, the so-called Great Moderation, prevailing in the more recent period, fundamentally as a result of the reduced bargaining power of the working class (Cline and Perry, 2013), the possibility of higher rates in the United States leading to a 1980s style general debt crisis seemed less plausible. Only a large, and somewhat implausible, increase in the rate of interest in the United States would recreate that scenario. At any rate, even if it happened, the fiscal accounts of most emerging and developing markets, to use the IMF's term for

¹² Another one would be the case of Argentina, plagued by Vulture Funds. On why the Argentine case is, however, unlikely to lead to a currency crisis in the near future see Vernengo (2014).

¹³ Note, also, that we are not suggesting that Grexit would necessarily solve Greek or European problems necessarily. Internal devaluation, the fall in prices and wages in Greece has been extensive, but it seems that most of the adjustment of the external accounts, and the rebalancing of the current account deficit, were done by the recession and lower imports as a result of austerity.

peripheral countries, would have no direct bearing on the possibility of currency crises and defaults.

Concluding Remarks

Traditional models of currency crisis, and even second and third generation models all include the possibility of a crisis triggered by domestic fiscal policy. In this paper, we suggest a fundamentals based model in which the causality is exactly reversed. Instead, structural problems in the balance of payments are generated by external shocks, in particular terms of trade and foreign interest rate shocks. It is thus currency mismatches and the structure of imports and exports in peripheral countries that generates crises. We argue that this causality has significant historical relevance and suggest that, although terms of trade have fallen for some regions, low interest rates relative to peripheral export growth imply that a renewed wave of currency crises seems unlikely.

While the more conventional models of currency crisis might lend credence to the global push for austerity measures since the 2008 crisis, our model and analysis suggests the opposite. Austerity measures have in fact not necessarily led to increased stability and declining debt ratios, particularly in peripheral Europe. Rather than focusing on the domestic fiscal accounts, our approach suggests that greater attention should be paid to the structure of the current and capital accounts. Measures to control the nature and size of capital flows and control borrowing costs, as well as domestic policies that generate more favorable import/export propensities may be more successful in avoiding future currency crises.

In particular, as noted above, the crisis among peripheral Eurozone countries, and Greece especially, is relevant to our approach. In our view, the core issue is current account one, which then generates domestic fiscal problems.¹⁴ This view has recently been empirically confirmed by Nikiforos *et al.* (2013) who find that for Greece, the causality runs from the foreign deficit to the public deficit. The focus on austerity is thus dangerously misplaced.

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¹⁴ For a model along these lines that describes the Euro crisis through a Kaldorian lens, see Pérez-Caldentey and Vernengo (2012).

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