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Stability properties of the currency board: case study of Bosnia and Herzegovina 2004-2010

Abstract

Currency boards have been in place in four European countries since the mid 1990's, yet they are largely neglected in the discussion of the political economy of financial globalization. A currency board arrangement (CBA) is a monetary regime based on fixed exchange rates, open capital markets, and a stipulation that the monetary base can increase only under the cover of foreign exchange. It is widely praised within the "Washington consensus" literature because it is thought to exhibit properties of money supply endogeneity and monetary self-regulation, eliminating the *raison d'être* for monetary policy and the central bank. In fact, because currency board rules prohibit central banks from creating reserves without the cover of foreign currency, it is claimed that domestic and international monetary financial stability is enhanced, i.e., the central bank ceases to be a source of financial instability via lender-of-last resort interventions and discount window lending.

While dozens of theoretical papers have been published that praise the mechanics of the currency board, especially its close relationship to the gold standard, few studies examine the currency board as a participating institution in the global financial system. There has especially been scant attention to the impact of cross-border financial integration on the stability and need for monetary policy in countries operating under currency board regimes. This paper focuses on the institutional history of the currency board's response in Bosnia and Herzegovina to the "growth years" of 2003-2007 and to the financial crisis of 2007-2010. It is fundamentally interested in examining the transmission mechanism that links the acquisition of foreign exchange to changes in the money supply, focusing on the nature of money supply endogeneity and general financial stability over the course of a business cycle. This paper supports the literature of currency boards by arguing that monetary policy/monetary intervention is periodically necessitated to stabilize a financial system, but under the CBA arrangements, it is privatized and decentralized. However, it provides a more chilling interpretation of this often-heralded advantage that "the currency board system relies entirely on market forces to determine the amount of notes and coins that the board supplies" (Hanke and Schuler, 1991, p. 7). Of the several implications, the primary conclusion is that in the case of Bosnia and Herzegovina, the particular process of policy-rent seeking yielded important competitive advantages for the international investment banks that participated in the consortium.

Keywords: currency board, transition economies, monetary policy, central banking, globalization of finance, lender of last resort.

JEL Classification: E50, E60, F40.

Introduction

Currency boards have been in place in four European countries since the mid 1990's, yet they are largely neglected in the discussion of the political economy of financial globalization. A currency board arrangement (CBA) is a monetary regime based on fixed exchange rates, open capital markets, and a stipulation that the monetary base can increase only under the cover of foreign exchange. It is widely praised within the "Washington consensus" literature because it is thought to exhibit properties of money supply endogeneity and monetary self-regulation, eliminating the *raison d'être* for monetary policy and the central bank. In fact, because currency board rules prohibit central banks from creating reserves without the cover of foreign currency, it is claimed that domestic and international monetary financial stability is enhanced, i.e., the central bank ceases to be a source of financial instability via lender-of-last resort interventions and discount window lending.

While dozens of theoretical papers have been published that praise the mechanics of the currency

board, especially its close relationship to the gold standard, few studies examine the currency board as a participating institution in the global financial system. Most theoretical discussions of the currency board assume that the primary source of foreign exchange derives from earnings from foreign trade. The argument is that a negative balance of trade would self correct as domestic prices, interest rates and wages fall, thereby creating the opportunity for an increase in exports as well as inflow of international investment funds seeking higher returns. However, as we see throughout southeast Europe and central Europe – and especially marked in countries operating under currency board administrations – the chief supply of foreign exchange to the currency board is provided *not* by export earnings but through foreign borrowing. Loan demand for real estate, commercial development, and household consumption creates opportunities for domestic banks only if there are sufficient excess reserves to lend. Unwilling to forego profitable opportunities in a financial environment with insufficient domestic saving, banks turn to the international financial markets for loans. The institutional relationship between the parent bank and its subsidiary – much like that in the original

colonial currency board countries – encourages foreign exchange borrowing, as banks believe that some of the risks of lending (adverse selection and moral hazard) can be reduced when subsidiary bank managers work directly with parent bank staff. A kind of correspondent banking system is established. This, however, is not without consequence. There is no legal requirement that the parent bank participate in lending to its subsidiary, and anything that might suggest to parent banks that lent funds could be deployed elsewhere could lead to sudden withdrawal of support, seen as capital outflow to the currency board, with serious destabilizing outcomes. For this reason, the stability that is heralded as the hallmark of the currency board (when export earnings drive money supply adjustment) may become the nightmare when capital flow becomes the dominant variable explaining money supply growth.

A central bank's primary role in participating in the economy is to act as the bell to signal potential overheating and to react before financial markets crash. The important question in this research is how the CBA and the political superstructure represented by the state, domestic firms and workers, and the banking supervision units react to instability. Will it tolerate a major disruption or create its own *ad hoc* lender of last resort in, what Kornai famously termed, some paternalistic way to soften budget constraints.

1. Literature review

1.1. Currency board history. A currency board administration (CBA) is an alternative to the traditional central bank. It is an arrangement whereby the monetary authority/central bank explicitly commits to exchange domestic currency for a specified foreign currency at a fixed exchange rate. Currency boards are thought to contribute to macroeconomic stability by preventing countries from conducting independent monetary policy, including lender of last resort interventions, and by forcing them to finance any fiscal deficit with private domestic or international savings (Hanke and Schuler, 1991, 1994; Lewis, 2002; Schwartz 1993; Williamson, 1995; Ghosh et al., 1998; Kopcke, 1999; Hanke, 2002; Ponsot, 2006; Wolf et al., 2008; Pilinkus et al., 2011; Cross et al., 2012).

Essentially currency boards are considered superior to traditional banking for the following four reasons: (1) it is believed that a “super fixed” exchange rate regime can be an effective anti-inflation tool because it provides transparency and raises the political costs of activist (loose) monetary and fiscal policies; (2) guaranteed convertibility of domestic currency into foreign currency eliminates worry about currency devaluation and anchors inflationary expectations, thereby increasing readiness of foreign

investors to negotiate long-term trade and investment contracts; (3) it supports overall fiscal discipline because the currency board may only acquire foreign exchange and is prohibited from purchasing (and monetizing) government debt; and (4) lender-of-last resort policies along with open market operations disappear: the central bank's hands are tied.

There are approximately 20 currency board regimes in operation today and include both traditional (sometimes called orthodox, classical or colonial) as well as modern-day variants. Among the countries with traditional currency boards are Cayman Islands (1972), Falkland Islands (1899), Lesotho (1980), Faroe Islands (1949) and Bermuda (1915). Modern day CBA's operate in Bosnia and Herzegovina (1997), Estonia (1992), Hong Kong (1983), Lithuania (1994) and Argentina (1991-2002) (Hawkins, 2004; Berensmann, 2004). Traditional currency boards were established by Britain in the 19th century to “free itself from the recurring expense of shipping shillings for troop and other payments by establishing fixed rates of exchange between the shilling and the various coins used in different colonies” (Schwartz, 1992, p. 151). Because the colonial banking systems were comprised primarily of branches of British banks, interbank settlement could be carried out in London (Hawkins, 2004). It also provided a means to monitor any overissue of bank notes on the part of one bank – the so-called problem of adverse clearing – as well as a mechanism to provide emergency reserves to solvent, but temporarily illiquid banks. In short, the small consortium of British banks created a private discount facility to replace the services that a traditional central bank might provide.

As a result, traditional currency boards are distinguished by the fact that they do not hold commercial bank reserves. The balance sheets of the traditional, or colonial, currency boards consist primarily of reserve currency on the asset side and an equal value of domestic currency on the liability side, and so the monetary base is composed solely of domestic currency. It changes as the currency board acquires international reserves through the current or capital account. Because traditional currency boards may not hold domestic assets, they have no capacity to execute discretionary monetary policy. They are unable to sterilize foreign exchange inflows or offset outflows, thereby ruling out open market operations (Hanke, 2002). Traditional currency boards neither accept deposits nor grant loans to the government or banks, and hence do not act as lender of last resort.

Modern day currency boards abide by the rules of the traditional currency board, viz., the fixed exchange rate, full convertibility, and full coverage of the monetary base. But they deviate from the traditional model in several ways. First, because of de-

veloped interbank money markets and the need to settle payments, modern day currency boards hold deposits (reserves) of commercial banks as well as currency on the liability side of their balance sheets. In fact, all modern day currency boards except Hong Kong *require* that commercial banks hold minimum reserves, and this has become one way in which the currency board can exercise some discretion over the money supply (Hanke, 2002; Balino et al., 1997). While the monetary base under the traditional CBA consists solely of currency, the monetary base under modern day CBA's consists of currency and reserves. These reserves amount to a significant proportion of the modern day currency board balance sheets, and in some countries reflect the impact of net private capital flow as a source of foreign exchange (Hawkins, 2004).

Although the CBA in Bosnia and Herzegovina forbids it, some modern day currency boards engage in lender of last resort activities. So long as foreign reserves in excess of that needed to fund the monetary base are used for emergency lending, this is generally considered to be an extension – but not violation – of currency board principles.

Bulgaria and Lithuania, however, permit their central banks to hold government deposits, and this is considered to be a major deviation from traditional currency board rules because it disturbs the automatic link between the changes in the balance of payments and reserve money (Ponsot, 2006; Hanke 2002). Furthermore, it permits the respective ministries of finance to influence the liquidity of the banking system by controlling domestic payments and receipts (Salater, 2004; Dobrev, 1999).

1.2. Money supply endogeneity. The growth and contraction of foreign currency holdings of the currency board is the mechanism that self-regulates the real economy. The metaphor most often cited to explain how the money supply under a CBA automatically adjusts to meet market needs is borrowed from the price/specie flow mechanism of Hume's gold standard: market actors, influenced by changes in income, interest rates, or expectations will determine how much gold (foreign exchange) to hold and how much to deposit in banks. Banks exchange gold (foreign exchange) for domestic currency with the central bank (currency board) and thereby the domestic monetary base is increased. Hence, money supply endogeneity is traced through Δ international reserves $\rightarrow \Delta$ monetary base $\rightarrow \Delta$ broad money (see Williamson, 1995; Kopke, 1999; Desquilbet and Nenovsky, 2004; Lewis, 2002; Schwartz, 1993).

The centerpiece of the theoretical argument for currency boards is money supply endogeneity. The currency board can be seen as a kind of warehouse,

converting foreign exchange into the monetary base. The money supply is determined entirely by market forces – that is, the demands of money users who bring reserve currency to swap for local currency determine the amount of domestic notes the currency board supplies. This is why it is said that monetary base is beyond the central bank's influence, precluding any opportunity for discretionary monetary policy. Richard Kopcke, former vice president of the Federal Reserve Bank of Boston explains:

Currency boards essentially enforce modern versions of the venerable specie-flow standard, which in the past commonly took the form of a gold standard. In theory, a country that varies its supply of base currencies adopts a monetary regime that automatically regulates the level of its prices and the growth of the economic activity. For example, when the prices of the country's factors of production, goods, and services in world markets rise more rapidly than the prices for other countries, its balance of trade deteriorates, causing its holdings of reserve currencies and base money to grow more slowly. Its domestic supplies of money and credit also decelerate which raises its domestic interest rates and reduces the demand for its factors and products, thereby depressing its prices relative to those of other countries. The success of a currency board, therefore, principally depends on the prompt and complete adjustment of its prices, including those in financial contracts (1999, p. 26).

And according to John Williamson:

The third great advantage of a currency board is that it builds in a *payments adjustment mechanism*. This is none other than what has often been identified as the gold-standard adjustment mechanism, otherwise known as the price-specie-flow mechanism, based on perhaps the oldest model in economics, that of David Hume (1752). If a country has a payments deficit, the money supply goes down over time and interest rates rise, tending to attract a capital inflow; the higher interest rates exert deflationary pressure, which will certainly reduce absorption and thus improve the current account of the balance of payments; and, to the extent that internal prices are flexible, the lower pressure of demand will eventually reduce prices and make exports more competitive, thus permitting real output to rise back to full employment without a payments deficit (1995, p. 17).

A model of a currency board regime based on the "consensus" literature and adapted from Lewis (2002) is presented below¹. Let currency board

¹ A modified version of this model was originally published in Gedeon (2009).

notes and bank deposits serve as money supply, M in the CBA. Money, M , is a multiple of the monetary base, B .

$$M = mB, \quad (1)$$

where $m = 1 + c / (c + r + e)$ is the money multiplier. Within the multiplier express, c , r , and e represent the cash holdings, C , required reserves, R , and excess reserves, ER , held as a percentage of demand deposits: $c = C/D$; $r = R/D$; and $e = ER/D$. They are institutional parameters that are assumed to be constant.

The monetary base, B , is composed of currency board notes, N . These are held by the public, N_P or the banks, N_B . By currency board rules, all currency issued by the currency board must be backed for foreign reserves, FR .

$$B = N_P + N_B = FR. \quad (2)$$

As with the gold standard, the currency board's reserve holding are directly related to the acquisition of foreign reserves, FR . From a balance of payments perspective:

$$\Delta FR = \Delta(X - Z) + \Delta W + \Delta K, \quad (3)$$

where X are exports, Z are imports, W are workers' remittances and K is net private capital inflow ($FDI + Commercial\ bank\ lending + Portfolio\ equity + Money\ market\ investments$).

The relationship between credit or the money supply and foreign exchange reserves can be expressed as:

$$\Delta M = m [\Delta(X - Z) + \Delta W + \Delta K]. \quad (4)$$

Equation (4) is significant and merits further examination. First, under traditional models of central banking, in response to price and output changes, monetary authorities adjust the monetary base to achieve a desired level of money supply. Under the CBA, there are no targets: the monetary base and money supply are completely determined by the flow of export earnings, remittances from abroad, and capital inflow. Here the direction of causality is reversed: changes in the base, influenced largely by $(X - Z)$ determine (endogenous) changes in the money supply. Second, there is no associated cost or benefit to financial stability from the source of foreign exchanges: an inflow of capital has the same assumed impact on money supply growth as an increase in export earnings.

The "consensus" CBA literature assumes a stable multiplier under the CBA, and so the *size* of foreign exchange reserves, determined by the currency board country's competitive advantage in exporting and/or attracting foreign investment, endogenously increases or decreases the money supply (Hanke

and Schuler, 1991). Nearly all of the literature assumes that commercial banks' potential to lend is limited by the amount of domestic deposits it receives, and those are related to the level of *GDP*. In *Currency Boards for Eastern Europe* (1991) Hanke and Schuler explain:

Commercial banks are middlemen between lenders (depositors) and borrowers (people who spend bank loans). A bank cannot for long grant more credit to borrowers than depositors wish to grant to it. If a bank grants excessive credit, the borrowers will spend it (for instance by writing checks), and more funds will flow out of the bank than flow into the bank from checks written on other banks. To prevent this sort of mistake from resulting in bankruptcy, a bank needs to hold reserves. The reserves protect it from the consequences of its occasional mistakes. The ultimate reserves in a currency board system are holdings of the foreign reserve currency. The only way to acquire new reserves, obviously, is to obtain currency from the reserve-currency country, which in its simplest form requires running a balance-of-payments surplus changes in the balance of payments change the total domestic money supply in the same direction (pp. 7-8).

1.3. Money supply endogeneity reconsidered. The "error of omission" in this reasoning is that the money creation process has no technical limit under the institutional arrangements that comprise a currency board administration. A CBA permits a completely open door to foreign funds; the flow of borrowed foreign exchange into the country will find its way to the banking system reserves and will eventually be converted into domestic currency reserves. Neither a dearth of deposits by domestic residents nor a shortage of reserves need lead to a slowdown in bank lending – and hence money supply growth – if foreign reserves can be borrowed from international financial markets.

What then explains the endogenous growth of the money base in a CBA? What determines the willingness of foreign banks to lend to CBA subsidiaries? Does the demand for credit create its own supply? Perhaps the nature of money supply endogeneity in a CBA is not primarily explained by the growth in foreign trade earnings but takes on the form: Domestic loan demand $\uparrow \rightarrow$ Foreign Reserves $\uparrow \rightarrow$ Monetary Base $\uparrow \rightarrow$ M2 $\uparrow$. This would explain the counter-intuitive coincidence of persistent large current account deficits (as a percentage of GDP) and prolonged annual money supply growth in a CBA. And it also suggests that the financial system under a CBA may be prone to more fragility and instability than one which is governed by a traditional central bank that can mop up excess liquidity. A highly leveraged economy can produce impressive economic growth

statistics, but it also invites financial fragility and increases vulnerability to contraction of slowdown of capital and financial flows.

To analyze the financial system dynamics under a CBA, we take as a case study the currency board administration in Bosnia and Herzegovina (BH) but will make reference to the performance of the CBAs in Bulgaria, Estonia, and Lithuania. The CBA in Bosnia and Herzegovina is widely heralded as the “most orthodox” of modern-day currency boards. While the CBA’s in Argentina, Bulgaria, Estonia, Lithuania, and Hong Kong make some provisions for lender of last resort interventions, the central bank in BH is prohibited from such intervention. Furthermore, while the Hong Kong, Lithuanian, and Bulgarian currency board rules allow for government deposits with the central bank, this is prohibited in B-H¹.

2. Performance of currency board in Bosnia and Herzegovina 2000-2009

As part of the 1995 Dayton Peace Accords, the Constitution of Bosnia and Herzegovina established the

Central Bank of Bosnia and Herzegovina (CBBH) and the 1997 Central Bank Law established the currency board. The goals were clearly stated: establishment of a strict currency board that would tie the hands of the monetary authorities in return for financial stability in terms of the exchange rate and inflation rate. The convertible mark, KM, was established as the domestic currency. It was originally convertible on demand into deutsche mark and then into euro. The exchange rate is set at 1 euro = 1.95 KM. Foreign banks quickly established branches, and by 2009 the banking system of BH was dominated by an oligopoly of foreign-owned banks that controlled 94.5% of total bank assets. This followed a pattern throughout central and southeastern Europe. Whether it is due to particular institutional histories or because CBA’s can provide for unregulated capital flow from parent bank to subsidiary, we note that the banking systems in the four modern-day European CBA’s exhibit a higher degree of foreign bank ownership than in other transitioning countries: Estonia (98.3%), Lithuania (91.5%), Bulgaria (84%) and Bosnia-Herzegovina (94.5%).

Table 1. Percent of assets held by foreign-owned banks

Country	1997	1999	2001	2003	2005	2007	2009
<i>Baltics</i>							
Estonia	28.8	89.8	97.6	97.5	99.4	98.8	98.3
Latvia	71.2	74.0	65.2	53.0	57.9	63.8	69.3
Lithuania	40.5	37.1	78.2	95.6	91.7	91.7	91.5
<i>CEE</i>							
Czech Republic	23.3	38.4	89.1	86.3	84.4	84.8	84.0
Hungary	61.9	61.5	66.5	83.5	82.6	64.2	81.3
Poland	16.1	49.3	72.2	71.5	74.3	75.5	72.3
Slovakia	19.3	24.1	78.3	96.3	97.3	99.0	91.6
<i>SEE</i>							
Albania	10.1	18.9	40.8	47.1	92.3	94.2	93.6
BiH	4.2	3.8	65.3	79.7	90.0	93.8	94.5
Bulgaria	15.5	42.8	72.7	82.7	74.5	82.3	84.0
Croatia	3.0	40.3	89.3	91.0	91.3	90.4	90.9
Macedonia	11.8	11.5	51.1	47.0	51.3	85.9	93.3
Montenegro					87.5	78.7	87.1
Romania	6.8	43.6	51.4	54.8	59.2	87.3	84.3
Serbia	0.6	0.4	13.2	38.4	66.0	75.5	74.4
Slovenia	5.4	4.9	15.2	18.9	22.6	28.8	29.5

Source: EBRD Banking Survey; IMF Country Reports.

As stated earlier, the predominant argument among currency board advocates is that foreign reserves will rise with balance of trade surpluses and fall with deficits, leading prices and interest rates to change. The fall in prices and wages is the mechanism that is assumed to invite foreign investment. However,

this has not been the case in BH. In the years before the global financial crisis, economic growth was robust, but given negative savings rates, it was financed through the inflow of workers’ remittances, foreign direct investment, and parent bank lending. Table 2 can help highlight this dynamic.

Table 2. Selected indicators, Bosnia and Herzegovina 2004-2009 KM millions (unless otherwise noted)

	2004	2005	2006	2007	2008	2009
Foreign liabilities, FL*	2652	3560	4034	5160	6309	5747

¹ For a full discussion of the differences among the modern day currency boards, see Salater (2004).

Table 2 (cont.). Selected indicators, Bosnia and Herzegovina 2004-2009 KM millions
(unless otherwise noted)

	2004	2005	2006	2007	2008	2009
Domestic deposits (including government)	5578	6876	8838	12139	12024	12188
FL as a % of all bank deposits (%)	32	32.5	31	30	34.5	32
Foreign assets of banking system	1906.1	2096.6	2328.6	3548.4	3098	2970
Net foreign liabilities	746	1462.7	1704.2	1611.1	3211.7	2777
Credit to domestic sector	5882.9	7495.7	9241.5	11823.4	14287.3	13757
GDP	15786	16928	19121	21647	25100	23950
Consumer prices annual growth rate (%)	0.4	3.8	6.1	1.5	7.4	0
Broad money, M2	6831.6	8075.1	10032.2	12211.7	12701.5	12998.3
NFL/Credit to private sector (%)	12.7	19.5	18.4	13.6	23.3	20.2
Growth in credit to private sector (%)	15.8	27.4	23.3	27.9	20.8	-3.7
FL/GDP (%)	16.8	21	21	23.8	25	24.6
Monetary base growth, year on year (%)	24	22	27	23	-8	1
M2 growth, year on year (%)	25.3	18.2	24.2	21.7	4	2.3
Domestic saving/GDP (%)**	-12	-13	-17	-13		
BOP current account	-2579	-2,933	-1,505	-2,261	-3,734	-1,807
BOP capital account	1970	2641	1245	2063	3934	1781
♦ Capital	474	443	457	432	388	347
♦ Financial***	1496	2197	788	1632	3546	1434
Current account balance/GDP (%)	-16.3	-17.1	-7.8	-10.4	-15.1	-7.5

Source: CBBH, Bulletin (2009, 2010).

Notes: * Nearly 93% of all foreign liabilities on the consolidated balance sheet of commercial banks are those deposits and loans of parent bank groups to their Bosnian-based subsidiaries (CBBH). ** Data prepared by CBBH at author's request. *** The financial account includes FDI, portfolio and bank transfers, and the reserve assets.

Salient points from the table include the following:

1. Between 2004 and 2007, growth in credit to the private sector grew at average annual rate of 23.6%. Extending back to 2001, the IMF (2007) estimates a 23% annual growth in credit to the real private sector.
2. The 23% annual growth in credit during this time was financed primarily from capital inflows (IMF 2007, p. 59).
3. The credit-to-GDP ratio reached 54% in 2006 and by 2009 was nearly 60% of GDP.
4. Capital inflow took the form primarily as foreign liabilities held by the banking system. (a) Foreign liabilities as a percentage of all bank deposits averaged approximately 32% of all bank deposits. (b) Nearly 93% of all foreign liabilities on the consolidated balance sheet of commercial banks were those deposits and loans of parent bank groups to their Bosnian-based subsidiaries¹. (c) Foreign liabilities as a percentage of GDP (an indicator of debt burden sustained by domestic firms and consumers) has increased steadily since 2004, averaging approximately 22% of GDP.
5. The impact on the banking system of increased foreign liabilities was an increase in the monetary base, and when lent, an increase in the do-

mestic money supply, M2. (a) Foreign exchange holdings by the currency board increased at an annual rate of 24%, continuing a trend since 2001. These holdings were exchanged for reserve money and currency. Consequently the monetary base increased at an average annual rate of 24%. (b) The domestic money supply, M2, increased at an annual rate of 22% between 2003 and 2007, continuing a trend since 2001.

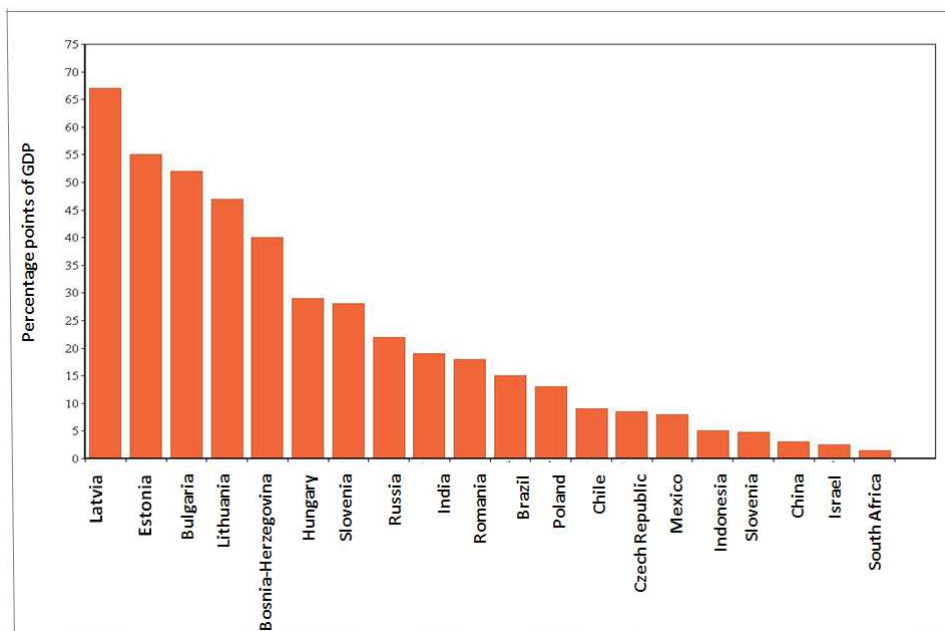
6. The current account balance has been persistently negative. (a) The services and income (transfers) accounts helped to reduce the trade deficit. The majority of current transfers are remittances from abroad and cover the largest portion of the trade deficit. Transfers covered 45% of the trade balance in 2007 and 52% in 2006. With a persistently negative gross saving rate as well as workers' remittances annually exceeding 20% of GDP, this has not been enough to overcome the balance of trade deficits. (b) Financing of the current account deficit has been accomplished through inflow of financial capital, the majority of which is parent bank loans to subsidiaries (IMF, 2008). The current account balance as a percentage of GDP – a proxy for foreign indebtedness – has averaged 12%.

In a *post mortem* of the boom-bust period of 2000-2008 in CEB and SEE countries, the IMF (2013) described the relationship of the foreign-owned bank to its subsidiary as a “centralized” bank funding model

¹ Data prepared by Central Bank of Bosnia and Herzegovina at author's request.

“whereby funding and liquidity management decisions were decentralized and parent banks shifted funds to where they were deemed most needed” (p. 7). In this same report, the IMF reports that total funds to the region grew from US \$200 billion in 2002 to \$1 trillion in 2008, half of which took the form of funding for subsidiary banks. For the region, funding to banks and non-banks totaled 25% of GDP.

Figure 1 provides a comparison of private sector growth in a variety of emerging market economies between 2001 and 2007. This highlights the credit boom in Europe compared with emerging economies elsewhere. It suggests as well that the four European countries under currency boards experienced a considerably higher than average growth in credit/GDP than other countries in their region.



The lending booms fueled by credit drawn on parent banks helped to stimulate the growth of GDP, but it also widened current account deficits, contributed to inflationary pressures, and increased the susceptibility of the transition economies to credit shocks. Whether in the form of foreign loans or foreign direct investment, the inflow of foreign capital creates large external liabilities that require a stronger balance of goods and services to offset the income payments associated with those liabilities. With widening balance of payments deficits, CEB and SEE countries were sitting on time bombs (Ostry et al., 2010; Winkler, 2009; Sorsa et al., 2007; Zettelmeyer, 2009; Hardouvelis and Monokrousos, 2009; Arvai et al., 2009; Aydin, 2008; Kraft and Jankov, 2005; Backe and Walko, 2006).

2.1. Unsterilized discount window lending. The critical insight of this CBA case study is that the parent bank takes on the role (but not necessarily the responsibility) of lending reserves – a role that the traditional central bank would take on under the name of discount window lending. The monetization of the foreign liabilities, once they are exchanged for domestic currency, is the process that Goodfriend and King (1988) term “unsterilized discount window lending”. In short, the very phenomena that the neoliberal school heralds as the crowning achievement of the CBA – that it prohibits money

supply growth by fiat of the central bank – in fact is openly encouraged via a privatized and decentralized route of turning parent banks into informal discount window facilities for their subsidiaries.

Unsterilized discount window lending prompted by domestic loan demand may become self-perpetuating, i.e., the inflow of capital, increase in the monetary base, and subsequent increase in the money supply may become procyclical. During the expansion of credit, asset prices are bid up by those with access to leveraged capital. On the one hand, profit-seeking firms become more optimistic and take on riskier financial structures even though this means that they commit larger portions of their expected revenues to debt service. On the other hand, banks accept smaller down-payments and lower quality collateral, justifying their actions on the increased value of underlying assets. As more external finance, rather than retained earnings, is used, firms become vulnerable to any attempt by financial institutions to pull back on lines of credit or otherwise roll over debt. Under these circumstances, a circularity is introduced such that $\text{loan demand} \uparrow \rightarrow \text{credit} \uparrow \rightarrow \text{money supply} \uparrow \rightarrow \text{loan demand} \uparrow \rightarrow \text{credit} \uparrow$. In terms of the model presented above, we observe capital inflow responding to the demand for loans which serves to increase the money supply and justify continued rounds of loan demand increases and accompanying capital inflow.

The instability occurs when bankers begin to lose some of their high ‘animal spirits’ and start restraining the creation of credit money – or in the case of the global financial crisis – when parent bank liquidity dries up and funds are withdrawn from subsidiary banks. They might start reducing credit lines just when firms need extended loans, creating situations where, as Minsky explains, leveraged loans now become speculative – income is sufficient to cover interest payments, but the principal must be rolled-over. In short, fragility rises and exposes the system to the possibility of crisis.

3. Reinventing the lender of last resort

In the fall of 2008, the boom ended, and the global financial crisis that followed the default of Lehman Brothers put cross-border banking to the test: Western European banks’ need to recapitalize resulted in de-leveraging in transitional economies in which they had established subsidiaries. International banking groups began to withdraw liquidity from the local subsidiaries in early 2008. The transition economies were hit by two shocks: capital inflows declined sharply, which contracted domestic demand, and exports fell. When news about parent bank losses became public, it triggered a brief run on the banks.

Banking systems with high foreign ownership were especially vulnerable to contagion. De Haas and Van Lelyveld (2011) show that multinational bank subsidiaries curtailed credit more aggressively than did domestic banks. This is because domestic banks rely more heavily on local deposits to fund credit growth and hence were in a better position to lend. The assets of the Lithuanian currency board fell 13% between 2007 and 2008, triggering a collapse of its credit market (Central Bank of Lithuania, selected statistics) In the case of Bosnia and Herzegovina, Gedeon (2010) explains that the fourth quarter of 2008 was most dramatic. During the fourth quarter of 2008, foreign exchange reserves of the currency board contracted by 8% – the largest decline recorded in a single quarter. This was due to the 17% drop in bank reserves (KM 705 million) from the withdrawal of deposits from the banks. The decrease of foreign exchange brought about a fourth quarter contraction of the monetary base by 9% and a contraction of the broad money supply, M2, by 4.8%. Compared to the second quarter of 2008 which saw a 5% increase in the broad money supply, the “whiplash” was significant: a quarterly decline in M2 of 9.8% (p. 27).

Fear was widespread that parent bank credit lines would be cut and that withdrawals of deposits would force illiquidity. The absence of agreements on how to share the burden of a defaulting subsidiary between the fiscal authorities in the home and host countries further exacerbated the risk of such a

run. Banks responded by slowing down lending, holding excess reserves, and increasing their lending rates. Because much of the current account deficit had been financed with short-term foreign debt, transition economies throughout CEB and SEE were concerned that a capital inflow slowdown or reversal could push their economies into insolvency (Hardouvelis and Monokrousos 2009; DeHaas et al., 2012, p. 8; Kozaric, 2010).

Initially moral suasion was used to persuade subsidiaries to petition their parent banks to extend emergency lines of credit. Reserve requirements were also lowered in all four currency board countries, but these were primarily seen as signals and had little effect on bank behavior. As Kemel Kozaric, Governor of the Central Bank of Bosnia and Herzegovina, lamented. “The banks’ approach to combating crisis had been very self-centered – solving of own problems with minimal or no understanding of clients’ problems. Although such an approach was to be expected and justified from an economic point of view, it lacked a crucial component-crisis communication. One can also say that the commercial banks approach was based on short-term vision and without any medium term strategy for building of corporate reputation. Certain elements of crisis management in commercial banks themselves further complicated the situation-faceted with shrinking access to international capital markets, BH commercial bankers turned to (more expensive) domestic sources of funding, which resulted in the increase of lending interest rates for the first time after many years. Certain banks, however, took advantage of this fact to change (raise) interest rates on existing loans as well. Although the client contract permitted them to do so, this had negative effects from the standpoint of partner relations and crisis communication. Aid measures, such as debt reprogramming for those whose jobs were imperilled, were only later introduced as an option (Kozaric and Salihovic, p. 11)”. In an honest appraisal of the “rock and a hard place” that the Currency Board found itself, Kozaric and Salihovic continue: “Here we were faced with a paradoxical situation that the Central Bank of Bosnia and Herzegovina, although without a direct responsibility for supervision of commercial banks, found itself in the position to be exposed to greatest pressure and to explain conduct of commercial banks, aware that further deepening of the negative media campaign, which began to affect clients’ perceptions of the banks, would mean for the entire system. The CBBH found itself in this situation exactly due to the previous inert attitude of commercial banks to the public relations function and to their insufficient preparations for communication in crisis situations” (p. 18).

In November 2008 banks warned European Commission, EBRD, and EIB of problems emerging in Bosnia-Herzegovina, Hungary, Latvia, Romania, and Serbia. In response to what the EBRD (2012) admitted was “impromptu coordination”, the Vienna Initiative was created “as a coordination platform for multinational banks, their home and host country supervisors, fiscal authorities, the IMF and development institutions to safeguard a continued commitment of parent banks to their subsidiaries” (p. 8). It was a consortium of 15 private European bank groups, fiscal and monetary authorities from each country in southeast Europe, and the IMF, EBRD, EIB, World Bank, and ECB. The “Joint IFI Action Plan” was launched in February 2009 with the objective “to support banking sector stability and lending to the real economy in crisis-hit Central and Eastern Europe” (www.ebrd.com/pages/news/press/2009/090227.shtml).

With regard to stability of the CBA in Bosnia-Herzegovina, in return for committing to remain in the country for two years and recapitalize subsidiaries as needed, parent bank groups with exposure to Bosnia and Herzegovina won the commitment of massive international balance of payment support from the IMF, EU, IBRD and bilateral donors. They also won agreements from fiscal authorities to wage controls and other austerity measures to trim domestic fiscal budgets (IMF, 2009c).

The IMF approved a total of \$1.57 billion over a period of 3 years for Bosnia and Herzegovina, with the first installment of \$282.37 million made in July 2009. It listed preserving the stability of the financial system as the primary reason for the action (IMF, 2009b, 2009c). According to Milan Cuc, Resident Representative of the IMF to the Bosnian mission, the IMF funds were transferred to off balance accounts of the Central Bank of Bosnia and Herzegovina and distributed to the fiscal authorities in each of the entities. The funds were deposited into the (foreign-owned) commercial banks and monetized¹. In short, the 8 percent loss of gross foreign exchange reserves forced not only the creation of a consortium of private foreign banks to function as “Big Bank Lender of Last Resort” but also a *quid pro quo* that the IMF and other international financial agencies act as “Big Spender of Last Resort.” Altogether 31.8 billion was jointly committed to support large cross-border banks.

Estonia and Lithuania’s banking sectors are largely dominated by Swedish banks; Swedish banks’ equi-

ty and loan claims on their Baltic subsidiaries at the end of 2008 totaled 8 percent of Swedish GDP, while their loans to their subsidiaries amounted to 35-45 percent of bank capital and more than 60% of the loan markets. Therefore, it was to Sweden that the Estonian and Lithuanian currency boards turned for lender-of-last-resort support. In their cases, the intervention in February 2009 took the form of currency swap agreements whereby Sweden agreed to trade Swedish kronor for Estonian kroons up to SEK 10 billion, thereby providing the Estonian currency board with needed foreign exchange reserves (IMF, Sweden, 2009, p. 29).

In 2011 the agreements negotiated under the Vienna Initiative had expired, and Austrian bank regulators introduced new requirements to limit the exposure of Austrian banks in CEE – a move which was viewed as unfair and self-interested by many governments (Hannon, 2012). In January 2012, Vienna Initiative 2.0 was launched. Like the original accord, monetary governance will be shared among the banks, international financial institutions, and affected nations, but the power that each can exert is yet unknown. According to its mission statement, it seeks to (a) avoid disorderly deleveraging on the part of Western European banks; (b) ensure that potential cross-border financial stability issues are resolved; and (c) achieve policy actions, notably in the supervisory area, “that are taken in the best joint interest of home and host countries” (<http://vienna-initiative.com/vienna-initiative-part-2/>).

While Bulgaria was not part of the Vienna Initiative, its CBA, too, was under extraordinary pressure and considered abandoning its CBA. The strong capital inflows coupled with expectations of EU convergence fed the credit boom and contributed to economic overheating: the private-sector external debt ratio rose to 95.9% of GDP by April 2009 (compared to 47% of GDP in 2005 and less than 18% of GDP in 2002); its current account deficit grew; and the lev appreciated (a cumulative 22.4% appreciation of the real effective exchange rate between 2005 and 2008). The overvaluation of the lev paralleled the rise in inflation. Bulgaria now was forced to recognize the reality that a CBA places the main burden of adjusting to overspending and real exchange rate appreciation on the real sector via employment, production, and government spending. Lowering domestic prices would be painful.

Reminiscent of Eichengreen’s (1992) reasons for the malfunction of the gold standard during the interwar period, “Is Bulgaria’s Currency Board Sustainable?” (Hardouvelis and Monokrousos, 2009) outlines the reasons why Bulgarians debated abandoning its CBA in 2009. Given the macroeconomic climate and overvaluation of the lev, they mention 3 options that were debated: (1) maintain the

¹ Interview with Milan Cuc, Resident Representative, IMF, February 2010, Sarajevo.

current foreign exchange rate and CBA and *hope* to adopt the euro quickly, recognizing the pain of entering the European Monetary Union with a significantly overvalued currency; (2) abandon the CBA and devalue the lev and perhaps create a new currency board arrangement under a new BGN/EUR exchange rate; or (3) abandon the currency board altogether and allow the lev to float and establish a traditional central bank with monetary policy tools. Hardouvelis and Monokrousos (2009) describe the dilemma in the following way.

The market alone is not likely to force a devaluation of the lev and a break up of the CBA. Reinforced fiscal prudence by the new government and, possibly, some form of financial support from the IMF and/or other international organizations, would help a great deal towards mitigating FX risks and maintaining confidence on the present regime. In fact, as of May 2009, the foreign exchange reserves in the Bulgarian central bank covered 177% of the monetary base and 81% of the lev-denominated portion of M2. Given Bulgaria's desire to join the euro area, the current overvaluation of the lev presents a major obstacle. Once a member of EMU, it will be difficult to improve competitiveness and reverse the real overvaluation that has cumulated over the last few years. Hence, the authorities face a major dilemma: to devalue the lev or not (p. 25).

Conclusions

While strong macroprudential policies and a robust regulatory system can serve to provide incentive structures to each financial institution that can reduce their contribution to the systemic risk that builds up in booms, they cannot eliminate the possibility of a systemic banking crisis. And for this reason, some contingency plays must be put into place to address the funding for lender of last resort support when it is needed.

The market response of the parent bank during the crisis was to withdraw liquidity from subsidiaries for the purpose of addressing its own balance sheet problems. Because parent banks have no legal responsibility to provide emergency liquidity funds to their subsidiaries, it creates a situation of grave vulnerability for countries operating without traditional central bank monetary policy tools.

References

1. Arvai, Z. Driessen, K. and Otker-Robe, I. (2009). "Regional Financial Interlinkages and Financial Contagion Within Europe", IMF Working Paper 09/6.
2. Aydin, B. (2008). "Banking Structure and Credit Growth in Central and Eastern European Countries", IMF Working Paper, 08/215.
3. Backe, P. and Walko, Z. (2006). "Bank Intermediation in Southeastern Europe: Depth and Structure", *Focus on European Economic Integration*, Vienna: Austrian Central Bank, Foreign Research Division, pp. 48-68.

A lender of last resort steps in because the economic and political costs related to breakdown are considered to be too high. While it is possible that a budget or fund could be established by the central bank, finance ministry, or banking regulatory agencies in a country operating with a currency board, it is also possible that transgovernmental agencies such as the IMF, EBRD, or World Bank can step in and/or external banks can swap lines with domestic banks. In the latter case, it appears that high concentration, where a few money-center banks control a large percentage of domestic banking deposits can be helpful since lenders of last resort must have access to sufficient cash to meet deposit drain and an incentive to purchase domestic bank assets. For these reasons, it is not surprising that the Vienna Initiative was created and has been successful in stabilizing capital flows during economic crisis. However, this decentralized decision process imparts to private authority considerable influence and opportunity for rent-seeking.

Moreover, the "colonial" solution in which the parent bank groups are re-created as private lenders of last resort/central banks is an *ad hoc* solution to a systemic problem that challenges not only the stability of the banking system within a currency board administration but those functioning under other fixed-exchange rate systems as well. That is, open capital markets create vulnerability to credit cycle. The speed of entry generates its own kind of herd behavior which results in hypertrophic credit growth, while the loss of access to international capital markets can create swift and drastic reversal of capital flows that immediately reduce the monetary base, creating a whiplash effect, and increasing external indebtedness without necessarily improving export competitiveness upon which debt service rests.

It is perhaps time to re-think the stability properties of the currency board model. As long as the hallmark of the system is completely open capital markets and prohibition against central bank/currency board manipulation of reserves, a modern day currency board whose banking system is foreign-owned and dependent on foreign liabilities to satisfy domestic credit demand will be subject to destabilizing credit cycles. While implementation of limited capital controls on the inflow of international financial funds might alleviate some of the problems identified, it would *ipso facto* call into question the *raison d'être* of the CBA itself.

4. Balino, T.C. Enoch and A. Ize (1997). "Currency Board Arrangements: Issues and Experiences", IMF Occasional Paper No. 151.
5. Banking Agency of the Federation of Bosnia and Herzegovina (2009). *Information on the Banking System of the Federation of Bosnia and Herzegovina as of December*.
6. Berensmann, K. (2004). "Monetary Policy Under Currency Board Arrangements: A Necessary Flexibility for Transition Countries?" In Kovacevic, D., ed., *Modern-Day European Currency Boards: Practice and Prospects*. Sarajevo: Central Bank of Bosnia and Herzegovina.
7. Brixiova, Z. Vartia, L. and Woergoetter, A. (2009). "Capital Inflows, Household Debt and the Boom-Bust Cycle in Estonia", OECD Working Paper No. 700, ECO/WKP.
8. Bulgarian National Bank (2011). *Annual Report 2010*, Sofia: Bulgarian National Bank.
9. Caprio, G. Dooley, M. Leipziger, D. and Walsh, C. (1999). Working Papers, World Bank: ISSN, pp. 1813-9450.
10. Central Bank of Bosnia and Herzegovina (2007). Quarterly Bulletin No. 4, Sarajevo (2009) Bilten, No. 4, Sarajevo (2012), *Finansijski Izvjestaji za godinu koja je završila 31. Decembra 2012* (Financial Reports for the Year Ending 31 December 2012) Bilten, No. 4. Sarajevo Center for Strategic and International Studies (2010) *Western Balkans Policy Review* CSIS: Washington Cross.
11. Thomas, Haft, J. and Rodgers, D. (2012). "On Currency Boards – An Updated Bibliography of Scholarly Writings", Studies in Applied Economics, Johns Hopkins Institute for Applied Economics, SAE No. 1, June 2012.
12. De Haas, R. Korniyenko, Y. Loukoianova, E., Pivovarsky, A. (2012). "Foreign Banks and the Vienna Initiative: Turning Sinners into Saints", European Bank for Reconstruction and Development, Working Paper No. 143.
13. De Haas, R. and Van Lelyveld, I. (2011). "Multinational banks and the global financial crisis. Weathering the perfect storm?" EBRD Working Paper No. 135, European Bank for Reconstruction and Development, London Demekas.
14. Dimitri and M. Chivakul (2008). "Managing Financial Stability in Bosnia and Herzegovina". In *Monetary Stability in the Function of the Financial Stability*, Sarajevo: Central Bank of Bosnia & Herzegovina.
15. Desquilbet J.-B. and N. Nenovsky (2004). "Credibility and Adjustment: Gold Standards Versus Currency Boards", Discussion Paper, No. 39, Sofia: Bulgarian National Bank.
16. Dobrev, D. (1999). "The Currency Board in Bulgaria: Design, Peculiarities and Management of Foreign Exchange Cover", Discussion Paper No. 9, Bulgarian National Bank.
17. Sofia Dornbusch, R. and F. Giavazzi (1999). "Hard Currency and Sound Credit: A Financial Agenda for Central Europe", European Investment Bank Papers, pp. 24-32.
18. Eichengreen, B. (1992). *Golden Fetters: The Gold Standard and the Great Depression*, New York: Oxford University Press, Eichengreen.
19. Barry and Mussa, Michael (1998). "Capital Account Liberalization and the IMF" Finance and Development, 35 (4), available at <http://www.imf.org/external/pubs/ft/fandd/1998/12/eichen.htm>.
20. Eisenbeis, R.A. (2006). "Home country versus cross-border negative externalities in large banking organization failures and how to avoid them", Federal Reserve Bank of Atlanta Working Papers, No. 18.
21. Eesti, P. (2011). Annual Report of Estonian National Bank European Bank for Reconstruction and Development "Vienna Initiative – Moving to a New Phase", Fact Sheet, www.ebrd.com/downloads/research/factsheets/viennainitiative.pdf.
22. Gedeon, S. (2010). "The Political Economy of Currency Boards: Case of Bosnia and Herzegovina", *South East European Journal of Business and Economics*, 5 (2), pp. 19-32.
23. Gedeon, S. (2009). "Money Supply Endogeneity under a Currency Board Regime: the Case of Bosnia and Herzegovina", *Journal of Post Keynesian Economics*, 32 (1), pp. 97-114.
24. Gedeon, S. and Djonlagic, D. (2009). "Monetary Policy in Bosnia and Herzegovina under the Currency Board Regime", *Eastern European Economics*, 47 (2), pp. 21-36.
25. Ghosh, A.A.M. Gulde and H. Wolf (1998). "Currency Boards: the Ultimate Fix?" *IMF Working Paper*, No. 9818, January 1998.
26. Goodfriend, M. and King, R. (1988). "Financial Deregulation, Monetary Policy, and Central Banking", Federal Reserve Bank of Richmond, *Economic Review* (3), pp. 3-22.
27. Hanke, Steve H. (2008). "Friedman: Float or Fix?", *Cato Journal*, 28 (2), pp. 275-285. "Currency Boards" *Annals*, AAPSS. 579, pp. 87-105.
28. Hanke, Steve H. (2012). "A Gold-Based Currency Board, Please", *Globe Asia*, pp. 22-24.
29. Hanke, Steve H. and Kurt Schuler (1994). *Currency Boards for Developing Countries: A Handbook*. San Francisco: ICS Press. *Currency Boards for Eastern Europe*. Washington, D.C.: Heritage Foundation, 1991.
30. Hanke, S. and M. Sekerke (2003). "How Bulgaria is destroying its "Currency Board", *Central Banking Journal*, 14 (1), August 2003.
31. Hannon, P. (2012). "Policy Makers Seek Remedy for CEE Bank Threat", *Wall Street Journal*, January 17, 2012.
32. Hardouvelis, G. and Monokrousos, P. (2009). "Is Bulgaria's Currency Bank Sustainable?" *Economy and Markets*, 4 (7), pp. 1-28.
33. Harmes, A. (2006). "Neoliberalism and Multilevel Governance", *Review of International Political Economy*, 13 (5), pp. 725-749.
34. Hawkins, J. (2004). "Flexibility and Currency Boards", In Kovacevic, D. (ed.) *Modern-Day European Currency Boards: Practice and Prospects*. Sarajevo: Central Bank of Bosnia and Herzegovina.

35. Helleiner, E. (2010). "A Bretton Woods moment? The 2007-2008 crisis and the future of global finance", *International Affairs*, 86 (3), pp. 619-636.
36. Helleiner, E. (2003). "Economic Liberalism and its Critics: The past as Prologue?" *Review of International Political Economy*, 10 (4), pp. 685-696.
37. Hewitson, G. (1995). "Post-Keynesian Monetary Theory: Some Issue", *Journal of Economic Surveys*, Vol. 9, No. 3.
38. International Monetary Fund (2006). "Bosnia and Herzegovina: Financial System Stability Assessment", Country Report 06/403, IMF, Washington DC.
39. International Monetary Fund (2007a). "Bosnia and Herzegovina: 2007 Article IV Consultation – Staff Report", IMF Country Report, No. 07/268, August 2007a.
40. International Monetary Fund (2007b). "Bosnia and Herzegovina: Selected Issues". IMF Country Report No. 07/269.
41. International Monetary Fund (2009a). "Bosnia and Herzegovina: Request for Standby Arrangement – Staff Report. Country Report No. 09/226.
42. International Monetary Fund (2009b). "Agreement with Banks Limits Crisis in Emerging Europe", International Monetary Fund Survey Magazine.
43. International Monetary Fund (2009c). "European Bank Coordination Meeting on Bosnia and Herzegovina" Press Release No. 09/230 "Credit Flows, Fiscal Policy, and the External Deficit of Bosnia and Herzegovina", IMF Working Paper, WP/06/276, December 2006.
44. International Monetary Fund (2009). "Agreement with Banks Limits Crisis in Emerging Europe", IMF Survey online, October 28, 2009. Available at <http://www.imf.org/external/pubs/ft/survey/so/2009/int102809a.htm>.
45. International Monetary Fund (2010). "Bulgaria: 2010 Article IV Consultation – Staff Report", IMF Country Report No. 10/160.
46. International Monetary Fund (2013). *Financing Future Growth: The Evolving Role of the Banking System in CESEE: Technical Notes*, European Division IMF: Washington D.C.
47. Kopcke, R.W. (1999). "Currency Boards: Once and Future Monetary Regimes?" *New England Economic Review*, May/June.
48. Kozaric, K. (2009). "Influence of the Global Financial Crisis on Bosnia and Herzegovina", Special Research Topics, Central Bank of Bosnia and Herzegovina: Sarajevo.
49. Kozaric, K. and Salihovic, A. (2010). "Crisis Communication in Financial Institutions", Special Research Topics, Central Bank of Bosnia and Herzegovina: Sarajevo.
50. Kraft, E. and Jankov, L. (2005). "Does Speed Kill? Lending booms and their Consequences in Croatia", *Journal of Banking and Finance*, 29, pp. 105-121.
51. Lavoie, M. (2003). "A Primer on Endogenous Credit-Money", in *Modern Theories of Money*, Louis-Philippe Rochon and Sergio Rossi (eds.), Elgar: Cheltenham, pp. 506-543.
52. Lewis, M.K. (1996). "Currency Boards and Currency Arrangements in Transition Economies", In Sevic, Zeljko, (ed.), *Banking Reforms in South East Europe*, Cheltenham.
53. Edward, E. and Lavoie, M. (2002). "Endogenous Money: Accommodationist", In *A Handbook of Alternative Monetary Economics*, Northampton, MA.
54. Mihaljek, D. (2006). "Rapid Growth of Bank Credit in Central and Eastern Europe: the Role of Housing Markets and Foreign-Owned Banks", Conference Paper, Twelfth Dubrovnik Economic Conference, Croatian National Bank.
55. Minea, A. and Rault, C. (2008). "Some New Insights Into Currency Boards: Evidence from Bulgaria", William Davidson Institute Working Paper No. 903.
56. Minsky Ann Arbor, Hyman (1985). "The Financial Instability Hypothesis: A Restatement", In P. Arestis and T. Skouras (eds.), *Post Keynesian Economic Theory. A Challenge to Neo Classical Economics*. Sussex: Wheatsheaf.
57. Minea, A. and Rault (1986). *Stabilizing an Unstable Economy*, New Haven: Yale University Press, 1986.
58. Nenovsky, Nikolay and Y. Rizopoulos (2003). "Extreme Monetary Regime Change Evidence from Currency Board Introduction in Bulgaria", *Journal of Economic Issues*, December.
59. Nyberg, L. (2008). "Monetary and Financial Stability from a Central Bank Perspective", In *Monetary Stability in the Function of the Financial Stability*, Sarajevo: Central Bank of Bosnia & Herzegovina.
60. Ostry, J.D., Ghosh, A.R., Habermeier, K., Chamon, M., Qureshi, M.S., and Reinhart, D.B.S. (2010). "Capital Inflows: The Role of Controls", IMF Staff Position Note, SPN/10/04.
61. Palley, T. (2012). *Financial Crisis to Stagnation*, Cambridge University Press, UK.
62. Pilinkus, A. Svolka, E. and Vaclovas, B. (2011). "The Role of Currency Board Regime during Economic Crisis", *Engineering Economics*, 22 (4), pp. 392-401.
63. Ponsot, J.F. (1986). "European Experiences of Currency Boards: Estonia, Lithuania, Bulgaria and Bosnia and Herzegovina, in Vernengo, Matias, (ed.), *Monetary Integration and Dollarization*.
64. Rousseaus, Stephen. (2006). *Post Keynesian Monetary Economics*, London: Macmillan.
65. Salater, W. (2004). "Looking for Rules plus Discretion: Unorthodox Elements in the Design of Modern Currency Boards", In Dragan Kovacevic (ed.), *Modern Day European Currency Boards: Practice and Prospects*, Central Bank of Bosnia and Herzegovina, Sarajevo.
66. Schwartz, A. (1993). "Currency Boards: Their Past, Present, and Possible Future Role", *Carnegie-Rochester Conference Series on Public Policy*, No. 39.
67. Silajdzic, S. (2005). "The Currency Board Trap: The Case of Bosnia and Herzegovina", *International Journal of Applied Econometrics and Quantitative Studies*, Vol. 2, No. 2.

68. Sorsa, P., Bakker, B. B., Duenwald, C. Maehler, A.M., and Tiffin, A. (2007). "Vulnerabilities in Emerging Southeastern Europe – How Much Cause for Concern?", IMF Working Paper WP/07/236.
69. Stack, G. (2009). "Banks Take the Vienna Initiative in Emerging Europe", Business New Europe, November 27.
70. Underhill, Geoffrey R.D. (2010). "Paved with Good Intentions: Global Financial Integration, the Eurozone, and the Imaginary Road to the Fabled Gold Standard", Center for Economic Policy Research, Discussion Paper, 8165.
71. Underhill, Geoffrey R.D. and Zhang, Xiaoke. (2008). "Setting the Rules: Private Power, Political Underpinnings, and Legitimacy in Global Monetary and Financial Governance", *International Affairs*, 84 (3), pp. 535-554.
72. Wessels, B. (2006). "Currency Board Arrangements (CBA's) as Exchange Rate Option", *World Review of Entrepreneurship, Management and Sustainable Development*, 2 (4), pp. 351-361.
73. Winkler, A. (1995). "Southeastern Europe: Financial Deepening, Foreign Banks and Sudden Stops in Capital Flows", *Focus on European Economic Integration*, Austrian Central Bank, 1, pp. 84-97.
74. Williamson, John (1999). *What Role for Currency Boards?* Washington D.C.: Institute for International Economics.
75. World Bank (2011). "World Bank Group Says \$27 Billion Available to ECA Countries Affected by Eurozone Crisis", International Finance Corporation, January 25, 2011. available at [http://www1.ifc.org/wps/wcm/connect/gion_ext_content/regions/europe+middleeast+and+north+africa/ifc+in+europe+and+central+asia/news/world+bank+group+says+\\$27+billion+available+to+eca+countries+affected+by+eurozone+crisis](http://www1.ifc.org/wps/wcm/connect/gion_ext_content/regions/europe+middleeast+and+north+africa/ifc+in+europe+and+central+asia/news/world+bank+group+says+$27+billion+available+to+eca+countries+affected+by+eurozone+crisis).
76. World Bank (2012). "Full Forum Meeting of the European Bank Coordination "Vienna 2.0" Initiative, News Release, March 14, 2012. Available at http://ec.europa.eu/economy_finance/articles/governance/2012-03-13-ebci_en.htm.
77. Wolf, H.C., Ghosh, A.R., Berger, H., Gulde, A. (2008). *Currency Boards in Retrospect and Prospect*, Cambridge: MIT Press.
78. Zettlemeyer, J. (2009). *Transition Report*, London: European Bank for Reconstruction and Development.