Money Endogeneity and Monetary Policy in a Foreign Bank-Dominated Banking Sector: The Case of Bosnia and Herzegovina and Croatia

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Abstract – The present paper deals with the endogeneity of the money supply in foreign bank-dominated banking sectors. It is highlighted that an increase in the monetary base is associated with an inflow of foreign capital. The countries analysed are Bosnia and Herzegovina and Croatia. Until the end of 2008, both countries experienced a fast credit expansion which was partly financed by an increase in foreign funds which local banks received from their parent banks. The demand of banks for domestic currency led to a strong engagement of central banks in purchasing foreign exchange in order to hold the exchange rate stable. In absence of a functioning interest rate channel, central banks tried to react on high loan dynamics by an increase in the reserve requirement rate or an introduction of special reserve requirements. However, loans continued to increase on a fast pace until the outbreak of the financial and economic crisis at the end of 2008.

Key words – capital flows, endogenous money supply, foreign banks

JEL Codes – E12, E51, E52, E58, F62, G21

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1 Introduction

Mainstream economic analysis argues that the stock of money is determined by changes in the monetary base. Thus, the total stock of money is seen as an exogenous variable which is under the control of the central bank. This assumption is rejected by Post Keynesian economists, who claim that the stock of money is an endogenous variable, which is determined by the demand for credit. The central bank, in its function as the main provider of liquidity, either fully (horizontalists) or partially (structuralists) accommodates the demand for money by providing additional bank reserves.

However, the conducting of an independent monetary policy can be questioned for some developing and transition countries. This is due to the fact that, for example, in many Central, Eastern and Southeastern European countries, central banks are pegging their currencies to the Euro. Changes in the stock of money therefore heavily depend on inflows and outflows of foreign capital. Concerning the endogeneity of money, foreign capital is of special interest, since CESEE-countries generally have a foreign bank-dominated banking sector, where local banks can draw on credit lines from their parent banks.

The present paper attempts to provide an analytical framework for understanding money endogeneity and limitations for monetary policy in a banking sector, which is dominated by foreign banks. Since these banks are part of banking groups which are generally located in Western Europe, they have access to liquidity sources from the Eurozone. As a consequence, local banks could react on an increase in the demand for loans by borrowing additional sources from their mother banks. Therefore, changes in the money supply should be seen as an endogenous process, where the lender of last resort function of the central bank is substituted by the channel mother bank-subsidiary.

The countries considered in the paper are Bosnia and Herzegovina and Croatia. In line with other CESEE-countries, the banking sector in the former Yugoslav republics is characterized by a dominance of foreign-owned banks. Prior to the outbreak of the current economic crisis, these countries were characterized by fast growth rates of loans to the private sector, which were partly financed by cross border lending of local banks from their mother banks. Measures taken by monetary authorities to limit credit growth by, for example, increasing reserve requirements on foreign sources proved to be ineffective, since loans grew on a fast pace until the financial crisis broke out in September 2008.

The paper is structured as follows. Section 2 shows a brief overview of the contrasting discussion between exogenous and endogenous money. It is followed by the presentation of the analytical framework for money endogeneity in foreign bank-dominated banking sectors. Section 4 includes the stylized facts for the two countries considering the process of money endogeneity while section 5 deals with monetary policy. Finally, some concluding points of the paper are presented.
2 Money endogeneity

In orthodox theory, the money supply is considered as an exogenous variable. Accordingly, the central bank controls the money supply via open market operations by purchasing (selling) securities which leads to an increase (decrease) of the monetary base. This in turn increases (decreases) reserves of commercial banks. The higher (lower) level of excess reserves raise (lower) available funds of commercial banks, which they can use for financing loans. Additionally, the money multiplier, which is determined by the reserve requirement ratio, amplifies the initial change in the monetary base. The eventual result is that the total change in money supply is higher than the change in the monetary base. However, the money supply is still under the control of the central bank and adjustments in the interest rate ensure the equality between money supply and money demand.

By contrast, Post Keynesian economists treat the money supply as an endogenous variable and the causality running from loans to deposits. Here, two different strands of thought have developed. On the one side, there is the accommodationist or horizontalist approach (cf. Moore 1988; Lavoie 1992). According to this view, the supply of loans by commercial banks is determined by the demand for loans at a given interest rate. Banks set the interest rate by adding a mark-up to the short-term interest rate. As commercial banks are required to hold reserves for liquidity purposes, they rely on the central bank as a lender of last resort. In the accommodationist view, the central bank fully accommodates the demand for reserves. Thus, the central bank is not able to control the growth of money. On the other side, central banks set the short-term interest rate, which influences the interest rates of loans supplied by banks.

The other strand of thought, the structuralist approach, also considers the money supply as determined by the demand for loans (cf. Chick 1977; Dow 1997). However, structuralists argue that factors like the liquidity preference of economic actors play an important role in the creation or destruction of money. Moreover, central banks have to follow some objectives in their monetary or exchange rate policy, which would influence their readiness to accommodate the demand for money. As a result, the money supply has not an infinite elasticity with respect to the interest rate.

Concerning an open economy setting, even orthodox theory sees the possibility of the money supply to be endogenously determined. This would be the case if the domestic interest rate varies in relation to the world interest rate in a regime of fixed exchange rates. The interest rate changes would lead to capital movements, which would require an offsetting policy by the central bank in order to hold the exchange rate fixed (Palley 2002: 165). Thus, under a fixed exchange rate regime, a country which finds itself in a position of balance of payments surpluses, accumulates foreign reserves. In the orthodox tradition, this would lead to an increase in the monetary base. However, this type of endogeneity is of a supply-led character, which stands in contrast to the demand-led endogeneity in Post Keynesian economics (Lavoie 2001: 218). If the central bank operates under a flexible exchange rate regime, an increase in exports
may lead to a rise in loan demand in export-oriented industries which in turn increases money supply in a Post Keynesian tradition (Palley 2002: 165-166).

3 Money endogeneity in a foreign-owned banking sector

The analysis in this paper builds on existing work of money endogeneity in foreign bank-dominated banking sectors under a currency board regime (Gedeon & Djonlagic 2009; Gedeon 2009, 2010). We consider the more general case of fixed exchange rate regimes and show a variety of possibilities how the financing of loans could be affected by the link between local banks and their foreign mother banks.

An important point in the following analysis is that the assets of the central bank consist mainly of foreign assets, which results from a restrictive monetary policy and a fixed exchange rate regime. Therefore, banks have to attract foreign capital, which could be exchanged with the central bank for required reserves. If the banking sector is predominantly owned by foreign banks, such capital inflows may consist to a great part of either deposits or loans, which local banks receive from their parent banks. Moreover, parent banks could also increase equity capital of their subsidiaries. This could be done either by capital injections or by the decision that profits should be added to capital and not distributed.

As has been mentioned, assets of the central bank consist mainly of foreign assets. The main component of liabilities of the central bank is the monetary base (currency in circulation and bank reserves). The asset side of the balance sheet of commercial banks is divided into domestic loans, bank reserves and foreign assets. The latter are subdivided into deposits and loans. On the liabilities side banks hold equity capital, domestic deposits and foreign liabilities, which consist of deposits and loans.

The starting point of the analysis is an increase in the demand for loans which leads to a rise in the supply of domestic loans. At the same time, domestic deposits are also increased. In order to fulfil reserve requirements, banks have to watch out for foreign assets, which could be exchanged with the central bank for additional reserves. If this inflow of foreign capital is financed by loans from the parent banks (Figure 1), an increase in both foreign liabilities and foreign assets will occur. Banks trade these foreign assets against reserves from the central bank, which reduces their foreign assets and increases their reserves. By acquiring the foreign assets the central bank extends its assets and expands the monetary base through additional reserves granted to the banking sector.

The process is similar if foreign capital inflows consist of deposits from parent banks (Figure 2). These additional deposits are denominated in foreign currency and a part of them is used to back the demand for additional reserves denominated in domestic currency. Therefore, a conversion of foreign currency into domestic currency reserves occurs. The monetary base is expanded through the purchase of foreign exchange by the central bank. Finally, the case
where parent banks increase equity capital of local banks in order to finance the increased loan demand, is somewhat different, since banks are not required to hold reserves against these funds. Thus, in this case no increase in reserves would occur. The same holds for the case where credit growth is financed via retained profits.

The two examples show how money is created by the inflow of foreign capital. We have shown cases where money supply endogenetity is demand-led, i.e. where the process of money creation stems from an increase in loan demand. The process of supply-led endogeneity is somewhat different. Here, banks would first receive loans or deposits from their mother banks. These funds could then be granted as loans where a part of them would be exchanged for reserves with the central bank.

The distinction of foreign capital inflows into loans and deposits was made for illustrative purposes. In practice, a mixture of both effects could occur at the same time. It is also worth to mention, that the gap between domestic loans and deposits may be widening through time. The initial equal increases in loans and deposits show just the moment when a specific amount of loans is granted and the account of borrowers deposited by the same amount. As parts of these loans could be used for financing imports, a fraction of the deposits may be transferred abroad while the level of loans would be left unchanged. The result would be an increase in the loan to deposit ratio.

The illustrated processes of money endogeneity could also endanger the objective of the central bank to limit money growth. In theory, central banks could react either by increasing interest rates or by increasing the reserve requirement rate on the one side and by sterilization...
processes on the other in order to counteract the growth of loans and total money. Furthermore, regulatory changes, for example an increase in the capital adequacy ratio, could limit loan financing via equity capital. In practice, however, these measures may prove to be inefficient.

4 Money endogeneity in Bosnia and Herzegovina and Croatia

During the transition process, the former state-owned banking sector in Bosnia and Herzegovina as well as in Croatia was privatized. Foreign banks, mainly from Western European countries like Austria or Italy, expanded into the region. The result was that until the mid-2000s more than 90% of the assets of the banking sector in both countries was owned by foreign banks (cf. Cetkovic 2011). Foreign-owned banks played a major role in the credit boom, which occurred in the Balkan countries prior to the end of 2008. As can be seen from Figure 3, total loans showed a sharp increase until the financial crisis broke out in September 2008. The highest contribution to loan growth occurred in the private household sector. From 2009 onwards loan dynamics have been slowed significantly, particularly in Bosnia and Herzegovina.

Parts of the granted loans were used for consumption purposes. Moreover, imports were also financed by debt. The result was that the gap between outstanding domestic loans and available domestic deposits increased over time. In the balance sheets of commercial banks, this gap was closed by an increase in foreign liabilities relative to foreign assets. Furthermore, the increase
in foreign liabilities can be attributed partly to loans and deposits from parent banks which is in accordance with the money endogeneity process discussed in section 3. Figure 4 shows the ratio of domestic loans to domestic deposits and the ratio of foreign assets to foreign liabilities. Accordingly, foreign liabilities increased relative to foreign assets when the growth of domestic loans outpaced the growth of domestic deposits.

A closer look at foreign assets and foreign liabilities shows that both increased until the end of 2008, although liabilities rose faster than assets. In Bosnia and Herzegovina, foreign liabilities started to decrease with the outbreak of the recent financial and economic crisis. The turning point for foreign assets occurred about one year later. The decrease in foreign assets was mainly the result of a reduction in short-term accounts held at correspondent banks (CBBH 2012: 50). Another factor for the reduction of foreign assets was the refunding of undisbursed funds from banks in Bosnia and Herzegovina to their mother banks (CBBH 2010: 83). The sharp increase
in foreign assets in the second quarter of 2007 was the result of a high increase in deposits of the government which came from the privatization of the RS Telekom. These funds were transferred by banks to short-term deposits held by them in foreign countries (CBBH 2007: 62). The trend in foreign assets of the Croatian banking sector shows also a turning point at the end of 2008. The temporary decrease which occurred between the start of 2005 and the mid of 2006 is associated with regulatory changes. First, the required coverage rate of foreign currency liabilities was reduced (CNB 2006a: 21). As a result, banks reduced their foreign currency deposits at foreign banks. Another factor was the increase in reserve requirements which led banks to substitute foreign assets for reserves (CNB 2006b: 14). In contrast to Bosnia and Herzegovina, foreign liabilities continued to increase although at a lower pace.

Foreign assets can be subdivided into deposits held in foreign countries, loans to foreigners and foreign securities. Foreign liabilities consist of deposits held by foreigners, loans from foreigners and securities issued by domestic banks. In accordance with Section 3, we focus here on loans and deposits. Figure 5 shows the relative importance of these two components for foreign assets as well as foreign liabilities. For Croatia, loans and deposits are further subdivided into those which stand in relation to the foreign majority owners of Croatian banks. As can be seen, foreign assets of banks in Bosnia and Herzegovina consist mainly of deposits held in foreign countries. By contrast, loans and deposits have a similar share in foreign liabilities. Foreign assets of Croatian banks consist also mainly of deposits. It can also be seen that deposits held at foreign mother banks do not play an important role. The share of loans and deposits is similar for foreign liabilities. The major part of foreign liabilities consist of deposits held by and loans from foreign mother banks. Concerning foreign liabilities of banks in Bosnia and Herzegovina, at the end of 2007 deposits of parent banks accounted for about 78% of deposits while 45% of loans were loans from parent banks (Gedeon 2009: 106).

Foreign liabilities of banks are in general subject to reserve requirements. As have been mentioned, in order to get these additional reserves, banks either sell parts of their foreign assets to the central bank or back these reserves with foreign liabilities. Therefore, the monetary base has a positive relationship with capital inflows. Figure 6 shows the development of foreign assets of the central bank, the monetary base and foreign liabilities of the banking sector. In Bosnia and Herzegovina, the monetary base is heavily correlated with central bank’s foreign assets. It can also be seen that when foreign liabilities of the banking sector started to decline, the increase in the monetary base was halted. In Croatia, the increase in the monetary base was lowered after the outbreak of the crisis, which could be attributed to a slowdown in capital inflows. It can also be seen that the coverage of the monetary base by foreign assets held by the central bank is higher than 100% in both countries. The very high coverage of the monetary base by foreign assets in Croatia until the end of 2003 was partly the result of sterilization instruments. Accordingly, the Croatian central bank used bills to absorb the excess liquidity which it had created by its purchase of foreign exchange.

This section has shown some indicators which should check the assumptions of the previous
Figure 5: Foreign assets & foreign liabilities of the banking sector (12/2007=100, right axis) and their structure (%; left axis)

Section. In Bosnia and Herzegovina, the growth of loans prior to the end of 2008 was associated with an increase in foreign liabilities as well as foreign assets of the banking sector. These foreign sources were exchanged with the central bank for reserves in domestic currency. As a result the monetary base was extended. After 2008, the situation changed significantly. Foreign liabilities decreased steadily as a result of the withdrawal of funds of parent banks from their subsidiaries. Foreign assets have also been reduced, since the reduction in foreign liabilities reduced the need to hold short-term assets in foreign currency for liquidity purposes. The reduction in foreign liabilities of banks did not affect the monetary base since banks did not reduce their reserves although reserve requirements were lowered.

Croatia shows a similar development until the end of 2008. The banking sector financed domestic loans partly by funds received from foreign parent banks. Foreign assets increased too in order to provide foreign currency liquidity for the foreign liabilities. The central bank purchased foreign exchange and increased the monetary base. After 2008, foreign liabilities increased at a lower pace which also reduced the growth of central bank’s foreign assets and the monetary base. In contrast to foreign liabilities of the banking sector, foreign assets started to decline from 2010 onwards as a result of reduced liquidity requirements in foreign currency.

Source: CBBH, CNB.
5 Monetary policy

The central banks in Bosnia and Herzegovina and Croatia follow a restrictive monetary policy, where the main objective is to maintain price stability. The central bank in Bosnia and Herzegovina operates under a currency board. The Croatian central bank officially has a managed float regime but de facto holds its currency stable to the Euro (DM until 1999) since the mid 1990s. The fixed exchange rate regimes imply that the central banks in both countries adjust their monetary policy to the inflows and outflows of foreign capital. As a result, the monetary base is only expanded if an inflow of foreign capital occurs. Central banks thus hold more or less only foreign assets against their liabilities. It should be mentioned here that the Croatian National Bank introduced reverse repo transactions in the mid of 2005 as an instrument of liquidity management. As a result, the central bank provides liquidity to commercial banks which in turn supply T-bills of the Ministry of Finance as collateral. However, these transactions represent only a minor fraction of total assets of the central bank.

Figure 6 shows the foreign exchange transactions of the central banks which they conduct with banks and governmental institutions. It can be seen that prior to the crisis, both central banks were highly engaged in acquiring foreign exchange. In the case of Bosnia and Herzegovina such purchases are a requirement of the currency board in situations when the demand of commercial banks for domestic currency is increasing. The growth rate of the monetary base in Bosnia and Herzegovina went hand in hand with the net purchases of foreign exchange from banks and was on a higher level when growth rates of foreign liabilities of the banking sector were high. By purchasing foreign exchange, the Croatian National Bank tried to take some pressure off the exchange rate, since the latter experienced an appreciation due to the high capital inflows. The figure for Croatia only shows transactions with banks. In the period...
2004-2007, purchases of foreign exchange from banks was the main activity of the central bank while after 2007, purchases from the Ministry of Finance, which are not shown in the figure, have played an increasing role.

Figure 7: Foreign exchange transactions of the central bank (2007/12=100)

A further common characteristic of the two countries is the high degree of Euroization (cf. Scheiber & Stix 2009). A high fraction of loans is indexed to the Euro and the major part of domestic deposits is also denominated in Euro. As a result, the ability of the central bank to influence interest rates by changing the policy rate is hampered. Figure 8 shows the interest rate for long-term household loans in domestic currency compared to its counterpart for indexed loans. Since Bosnia and Herzegovina is operating under a currency board, there is no policy rate at all. The use of the policy rate by the Croatian National Bank seems to have an effect on the domestic long-term interest rate. However, there is a relative high spread between the interest rate for loans in Croatian Kuna and that for indexed loans. This probably contributes to the fact that the share of indexed loans in total loans is on a very high level as can be seen from Figure 8.

Since the policy rate is not an efficient instrument in the two presented countries, central banks turn to reserve requirements in order to control the money supply. Figure 9 shows the index for domestic deposits and banking sector’s foreign liabilities as well as the associated

Source: CBBH, CNB.
reserve requirements and the reserve requirement rate. The Central Bank of Bosnia and Herzegovina increased the reserve requirement ratio steadily until the end of 2008, reacting to an increase in domestic deposits as well as foreign liabilities of the banking sector. After 2008, the reserve requirement rate was reduced and a special rate for deposits with a maturity over one year introduced. The lowering of the reserve requirement did not lead to a significant reduction of reserves, indicating that commercial banks hold a high level of excess reserves at the central bank.

The Croatian National Bank implemented some extraordinary measures with the purpose of limiting the growth of the money supply. The minimum foreign currency liquidity was introduced in 2003 in order to ensure that banks hold an adequate amount of foreign currency assets in relation to their foreign currency liabilities. Another measure is the marginal reserve requirement which was in effect between the mid of 2004 and the end of 2008. This measure had the aim of reducing credit funding from foreign sources since it was calculated on the growth of foreign debt of commercial banks. These reserves were held at a special account at the Croatian National Bank and were not part of the monetary base. As can be seen from Figure 9, foreign liabilities of banks declined during 2007 and 2008 when the marginal reserve requirement was on a very high level. However, with the outbreak of the recent crisis in September 2008, the Croatian National Bank abandoned this special instrument, leading to a total reduction in associated reserves. Total reserves, which were increasing until the end of 2008, more or less stagnated from 2009 onwards.

As we have seen, particularly the Croatian National Bank implemented a set of measures in order to reduce credit growth. Commercial banks went on to circumvent these measures by looking for funding sources other than foreign deposits and foreign loans. As a result, mother banks injected fresh capital into their subsidiaries in Croatia (CNB 2008: 32-33). This can be seen from Figure 10 where the funds contributed by owners increased sharply between 2006

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**Figure 8:** Interest rates (%, right axis) and share of indexed loans in total loans (%, left axis)

Source: CBBH, CNB.
The considerations in this paper show how the monetary base is affected by the link between local banks and their foreign parent banks in a banking sector which is dominated by foreign-

and 2007 although the capital adequacy ratio was on a high level. By contrast, there was no such significant development of owners’ funds in Bosnia and Herzegovina.

6 Conclusion

The considerations in this paper show how the monetary base is affected by the link between local banks and their foreign parent banks in a banking sector which is dominated by foreign-
owned banks. As has been shown, an increase in the indebtedness (loans and deposits) of local banks to their parent banks led to purchases of foreign exchange by central banks in order to fulfil the requirements of a currency board (Bosnia and Herzegovina) or to limit the pressures on the exchange rate (Croatia).

The underlying cause of these capital inflows was a high demand for loans prior to the recent financial and economic crisis. In order to get the required reserves, banks exchanged parts of these foreign sources for reserves with the central bank, which in turn increased the monetary base. Central banks reacted mainly by increasing existing and introducing new reserve requirements in order to limit the growth of the money supply. However, banks tried to circumvent these measures by relying on equity capital as a source of growth. Thus, the ability of the central bank to control the money supply was limited.

The outbreak of the recent financial and economic crisis had shown the vulnerability of banking sectors which rely on foreign sources for credit financing, since Western European banks went on to reduce their exposures to CESEE countries. Particularly Bosnia and Herzegovina has been faced with a high outflow of capital since the end of 2008. This has been the result of a withdrawal of funds by Western European banks from their subsidies in Bosnia and Herzegovina. This substitution of foreign funds by domestic deposits is a phenomenon which occurred also in other CESEE countries. However, since domestic deposits did not increase significantly in times of economic crisis, credit dynamics stagnated in many countries.
References


