CHAPTER 14. SERBIAN CREDIT MARKET AFTER THE TURMOIL[1]

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Abstract:

The chapter explores current stance of developments in Serbian credit market, by looking at credit aggregates and interest rates. Although, there are signs of weak credit market, full scale credit crunch is so far avoided thanks to efforts coordinated by the key stakeholders: IMF, National Bank of Serbia and foreign banking groups. The chapter provides an econometric analysis of the macroeconomic and macro-financial determinants of the credit growth for Serbia. We employed multiple linear regressions and found country risk premium, exchange rate risk premium and real exchange rate to be the variables with power to explain credit growth. The chapter also discusses some policy options to address "credit cuts – rising rates" scenario, squeezing out SMEs, excessive liability formation and credit euroization.

Key words*: banking industry, credit crunch, financial crisis, net interest margin, interest spread, Republic of Serbia.*

INTRODUCTION

Although it is probably too early to attempt a definitive evaluation of any consequence of the recent global financial turmoil, in what follows we will try to shed some lights on the issue of worsening conditions on a local credit market.

For the Republic of Serbia last quarter of 2008 and the first quarter of 2009 were no doubt turbulent times. After several good years - a lasting period of rapid credit growth, the global crisis spilled over into the local market. Depositors' rush joined forces with foreign capital outflows, which taken together distressed both the local

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banking industry and the currency market. National currency rapidly lost its value against the Euro, international reserves started melting down as well as banks' own resources that immediately caused contraction in credit activity. In less than a decade Serbian credit market passed through diametrically opposed states of disequilibria. Policy makers failed to smooth credit growth and left the economy dangerously exposed to the boom-bust cycle.

In remainder of the chapter we will search for evidence of rapid transformation of Serbian credit market from "credit boom" to "credit crunch". The chapter proceeds as follows. Section two introduces basic concepts of credit market disequilibria and main dilemmas in that regard. Section three firstly reviews the dynamics of main credit aggregates and then turns to discussing interest rates. Section four deploys multiple linear regressions to explore and evaluate determinants of credit growth. Section five discusses a set of policy options. In the final section we go on to conclude.

CREDIT MARKET DISEQUILIBRIA – THE CONCEPT OF CREDIT CRUNCH AND BASIC DILEMMAS

Credit restrictions are often more than simple reflection of changes in available resources. The restrictions go hand in hand with the "flight to quality" behaviour, i.e. portfolio readjustment toward safe asset(s), with monetary claims or government debt being the most suitable candidates. The behaviour is well-known as monetary channel that transmits banking disturbances (explained in Friedman and Schwartz, 1963). Since Bernanke's (1983) seminal paper, it is well understood that apart from the monetary channel, banking disturbances influence economic activity by decreasing the efficiency of credit intermediation, and consequently by rising the costs of credit intermediation. Hence, rising spread between credit interest rate and deposit rate additionally constrains the business operations. Namely, this means that end-users of banking intermediation are being awarded less for financial surpluses and pay more when use bank funds to finance their deficits. Moreover, credit restrictions typically hit harder those economic sectors that are already the most dependent on banking sector, i.e. SMEs and start-ups (Dennis, 2008; Toçi and Hashi 2009, Yigui and Shumin, 2010). The lack of credit resources available to the SMEs is another way for credit market to influence a given economy. All those elements might colour credit crunch phenomenon.

Despite its unquestioned practical importance, credit crunch is not uniquely defined concept. It might come as a surprise that economic theory delivers many definitions of credit crunch. Among the simplest definitions is the one given by Udell (2009, p. 1), which defines "a credit crunch as a significant contraction in the supply of credit

reflected in a tightening of credit conditions". Similarly, Bernanke and Lown (2001, p. 207) define it as "a significant leftward shift in the supply curve for bank loans, holding constant both the *safe real interest rate* and the *quality of potential borrowers* (italics added)". It means that less funds would be available to borrowers at any given loan rate. Although, the definition is centred around adjustments of credit supply, it does not exclude that in some specific occasions the curve would shift to the left so as to increase the loan rate with less visible effect on the volume itself. The definition might look clear enough and in a way elegant as it could be in theory, but to operate with it empirically is not as easy as it might appear. First of all, both elements that we need to stay constant are expected to change as credit conditions worsen. The safe interest rate would probably reflect portfolio readjustments toward safe assets, while quality of borrowers would change either because economy perspectives and business climate would change, or because the main creditors would shift to less aggressive credit allocation.

Further, conditions of credit supply and demand are mutually dependent. That makes it extremely hard to distinguish what comes first: if supply accommodates to changes in demand or *vice versa*. A part of the complexity comes because quantities, credit supply or credit demand, are not directly observable. The official reporting practice gives us notice only about the quantity of funds which creditors and borrowers agree to exchange upon. We have never an idea if the demand is in excess or maybe the supply. Therefore, an empirical study of any credit crunch episode must look at the changes in amount of credit outstanding in order to pinpoint any trend reversals.

It follows that there is no clear idea whether credit crunch represents an exclusively supply-side phenomenon or otherwise, comes about as some mixture of developments stemming from both supply and demand side of the credit market (Ghosh, 2010). The issue is important for the policy stance, since if the contraction of credit is caused by weak credit demand it is probably only another reflection of economy's slowdown. If not, the causality is exactly the opposite, and merits scrutiny.

In addition, credit crunch can be taken as an independent cause of economic slowdown if the credit contraction is not followed by simultaneous contraction in the banks' financial resources, while in cases when loanable funds reduce in extent of reduction of financial resources (i.e. without additional amplifying portfolio shift toward safe assets) credit crunch is rather channel that transmit already present crisis signals. Thus, it does not cause but rather propagates an economic crisis. If contraction of funds available to creditors for lending (loanable funds) precedes credit cuts, fewer funds available to borrowers are only the mirror image of fewer funds available to creditors. This phenomenon is known as capital crunch.

Otherwise, the credit cut is to be a consequence of banks' assets reallocation, or determinants that spur substitution out of claims that are now *given* or *perceived* riskier. Any deeper analysis must go further to discuss what drives the asset substitution. If the creditors were driven out of lending to private entities because of their autonomous perception of relative risk (private entities are perceived riskier), the way to solve the problem differs from the path taken to be right response if the reallocation is forced by regulator (given riskier). Berger and Udell (1994) found the risk-based capital regulation, imposed to creditors during the banking and saving and loans crisis in the 1990s, responsible for the credit crunch. Similarly, Bernauer and Koubi (2004) found the same pattern in US and Japanese policy response to endangered bank solvency.

If the bank solvency protective measures can precipitate credit crunch, does the same hold for liquidity protective measures? If the former is the case, most plausible outcome would be shrinkage of liabilities and assets, while if the latter is the case plausible outcome would be flight to quality. Certainly, both lines of policy response may end up having the same outcome: fewer funds available to private sector. The type of banking problems that Serbia faced in the fall of 2008 was predominantly liquidity driven. The bank solvency was not an issue of primary concern, hence the authorities have seen no reason to employ solvency protection measures. The initial package of measures taken by NBS and Serbian Government was designed to stop depositors' run. The change in reserve requirement policy released excess dinar liquidity and made existing international reserves available to meet exploding demand for foreign assets, while holding back downward pressure on the national currency. It was an effective firefighting measure (Marinković and Jemović, 2011). Increase of official rate (2-weeks repo), which took place when crisis already broke out, was somewhat contradictory to the previous measures, and raises the question whether there was a bit of confusion in policy response.

In the banking systems (and credit markets) which depend on external funds, liability contraction, and thus capital crunch, becomes the explanation that is more plausible. Therefore, in searching for culprits, thorough analysis must examine the driving forces of external capital movement. Kaminsky and Reinhart (1999), Staikouras (2004) and Reinhart and Rogoff (2008) found that credit crunch often comes jointly with other financial disturbances, e.g. with liquidity squeeze, or currency crisis. There is a rationale for this empirical regularity. Bank liquidity squeeze and currency crisis (closely related to balance of payment crisis) have something in common. Both *can be* a consequence of shrinkage of bank resources, with former being a consequence of a bank run and the latter a consequence of a foreign credit outflow. In those circumstances, banking sector is forced to respond to loosing funds. As an immediate effect of contracting liability side of the balance sheet, reduction of reserve assets position occurs. Further effects will depend on

whether the reserve assets position is returned to its previous level, or to the contrary, reserves-to-deposits ratio rise above its pre-crisis level. Precisely this will determine in what extent contraction of liability side will be transformed into contraction of credit activity.

FROM CREDIT BOOM TO CREDIT CRUNCH: SPOTLIGHT ON CREDIT MARKET CONDITIONS

Bank credit aggregates

Republic of Serbia, as well many other countries, initially managed to speed up the growth of its credit market by opening its capital account. At the very turn of the millennium credit growth to private sector was set up for rising, and the trend of two-digit growth rate continued for several years. Strong credit growth was deemed excessive by many observers and was accompanied by the rise of external or foreign currency denominated debt of private sector, which exacerbated economy's fragility especially in the event of a global downturn and sudden reversal of foreign credit flow. The rapid credit growth has already been documented in some of the fast developing neighbouring countries (Djankov et al., 2007). The growth has been an ardently debated issue in academia, but not all of the researchers have been aware of its possibly adverse consequences. There are many papers (Kraft and Jankov, 2005; Cottarelli *et al.* 2005; Boissay *et al.*, 2005; Égert *et al.* 2006; Kiss *et al.*, 2006; Zdzienicka, 2009) that present some evidence in favour of the importance of credit growth in the region. It is easy to understand that ones that are more recent were more alert to the danger. Some of earlier published papers found that credit-to-GDP hike can be explained as convergence toward equilibrium. Kiss *et al.* (2006) conclude that the rapid credit growth experienced in recent years in the Central and Eastern Europe is basically considered to be equilibrium convergence path (with some reservation in regards to Baltic states). Bossay *et al.* (2005) findings confront the aforementioned view, in a way that exhibited credit growth cannot be explained solely on the basis of fast economic growth, declining interest rates or the catching-up in incomes. Additionally, they suggest that the choice of exchange rate regime can be usefully implemented as a determinant of credit growth. With strong reliance on foreign resources, as a common feature, countries in the region were able to boost foreign credit inflow opting for more rigid exchange rate regime. We shall return to the issue of credit growth determinants in later sections of the chapter.

Whether or not the credit growth has been excessive, and if it has, how much of it has been equilibrium divergence, still is a matter of debate. Nevertheless, one can be quite sure about the link between pre-crisis credit growth intensity and the impact of recession that follows it. By exploring severity of recession in Central and

Eastern European countries, Llorca and Redžepagić (2009) found an empirical regularity that the countries which were most able to boost foreign capital inflow, at the same time were the ones which were very hard hit by the crisis, underling that the fast growing lays at the very roots of the incoming recession.

Some earlier studies (Marinković, 2009a) found clear-cut reversal in bank credit to private sector. After years-long continuously rising bank credit to private sector, things turned soar in the last quarter of 2008. The cut in available resources was short-lasting and largely caused by deposits contraction. Most recent data show (see Table 2 for quarterly decomposing) no evidence of remarkable contraction of credit activity, although growth deceleration seems unquestionable.

Table 1:Bank Credit to Private Sector (yearly data)

	2006	2007	2008	2009	2010	2011	2012[1]
BCPS (in bln. RSD)	572.4	802.4	1,082.4	1,236.8	1,560.3	1,656.4	1,738.6
BCPS (in mln. EUR)	7,246	10,127	12,217	12,899	14,790	15,829	15,778
BCPS/GDP (in %)	31.09	35.57	37.39	44.54	53.64	51.87	–
BCPS growth rates (y-t-y)							
In RSD	17.30	40.18	34.89	14.26	26.15	6.15	4.96
Deflated by CPI	10.04	26.29	24.21	7.19	14.37	−0.78	4.02
In EUR	26.95	39.77	20.64	5.58	14.66	7.03	−0.32
Memoranda							
Net NPL/Net loans	4.12	3.81	5.29	8.53	N/A	N/A	N/A
Gross NPL/Gross loan	N/A	N/A	11.3	15.7	16.9	18.8[1]	N/A

Notes: [1] *Data on February;*

Data on bank credit to private sector, and consequently year-on-year growth rates, are given in nominal terms (RSD), deflated by CPI based inflation, and in Euro terms as well. The difference between Euro and CPI deflated growth rates is largely the consequence of PPP disparities. Huge real appreciation of local currency during 2011, made the Euro growth rate standing over those deflated by CPI. It is also the case with the period before the currency-banking turmoil. Rapid depreciation that followed the turmoil at the end of 2008 and early in 2009 reversed that trend. It is again the case with the first two months of the current year.

For the first time, on yearly basis, credit growth rate (deflated by CPI) becomes negative in last year. Although the growth rate, when converged to the Euro, still

stays positive, it is clear sign of sudden stop. The scope of the problem might be far less benign if the stock of nonperforming loans remained unaltered. Unfortunately, the issue of nonperforming loans (NPL) measured either as a share of net NPL to net of charge-offs total loans or as a share of gross NPL to gross loans, set up for increasing in 2007, and the trend continues all the way up to now.

Direct cross-border financing

The data presented above (Table 1) are concerned with credit activity of local banks, and therefore completely ignore sources of local credit growth that come from overseas, bypassing the local banking industry. Since 2006, direct cross-border borrowing of enterprises becomes equally important flow that feeds credit boom. It was seen as a way to circumvent prudential regulation (reserve requirements) which made banks' borrowings from abroad prohibitively expensive. In the Table 2 below, presented are the data on cross-border loans together with the data on bank credit to private sector, for the last seven quarters. The data for cross-border loans comes also from official NBS statistics. However, although the data cover end-of-period amounts outstanding (in Euro), they are not completely comparable. The data on bank credit to private sector are regularly reported net of charge-offs, while cross-borders are reported in gross amount. Taking into account growing issue of nonperforming loans, and having in mind that all the cross-border loans are granted to the corporate sector, we can conclude that falling share of cross borders in total credit probably indicates that credit environment is becoming more hostile for corporate sector.

Table 2: Credit aggregates – quarterly survey on recent data (in mln. EUR)

	2010		2011				2012
	Q3	Q4	Q1	Q2	Q3	Q4	Q1[1]
Bank Credit to Private Sector	14,109.7	14,790.4	15,000.7	15,551.3	15,800.6	15,829.9	15,778.9
Cross-borders	9,816.2	9,617.4	9,427.6	9,288.5	9,090.9	8,988.0	9,132.3
Total Credit	23,925.9	24,407.8	24,428.3	24,839.8	24,891.5	24,817.9	24,911.2
Share of Cross-borders	0.41	0.39	0.38	0.37	0.36	0.36	0.36
Memorandum							
Gross NPL/Gross loans	17.8	16.9	17.1	18.6	18.8	N/A	N/A

Notes: [1] Data on February;

By looking at the aggregate figures we see no alarming trend in the credit activity. This is because a pre-emptive action prevented the worsening of credit conditions to deteriorate into the full-blown, sharp credit crunch. It has been well understood early in the crisis that more pronounced foreign capital outflow would have much

stronger detrimental impact on the credit market dynamics if the authorities took no action. The multilateral policy response at hand is known in public discourse as the "Wiener gentlemen agreement". The agreement was signed by representatives of parent banking groups and NBS, initiated and come into place under auspice of IMF. Although the agreement was there to provide the same extent of foreign bank credit exposure to the local credit market (initially assessed at 10.8 billion Euros) for the following year, it was rolled over for an additional year. In return, NBS offered some concessions to the foreign banks, i.e. full access to Serbian Dinar- and Euro-denominated liquidity arrangements. It was then that currency swap auction facility has been introduced, although it has actually never been used in full capacity. The agreement has simply provided a temporary insurance against credit crunch. Although the agreement is not enforced by the law, it is so far considered to be reasonably waterproof and binding. In the future it will last for as long as all the parties continue to consider it beneficial. The coalition that assembles the main stakeholders succeeded in alleviating the incoming credit crunch, but it was a firefighting measure capable of postponing the issue against a milder and shorter-lasting crisis, but not indefinitely.

Interest rate dynamics and cost of credit

A part of the credit market story could be told by simply looking at the market volume. In order to move on and unfold another part of the story we must explore what happened to the price of credit, i.e. interest rates. However, volume-price relationship in credit markets differs from those which have been seen in markets where is reasonable to assume that prices have neither sorting nor incentive effects. In such markets it is assumed that excess demand will drive the price up, the same as excess supply will drive it down. We know from the theory that interest rate, i.e. the price of credit resources, often times does not clear the market, since creditors, faced with excess demand, much rather credit-ration the borrowers than are inclined to charge higher rates.

It is assumed in theory that even in tranquil times there is some rationing of credit supply (Stiglitz and Weiss, 1981). Credit rationing, which is *per se* supply side phenomenon, is taken to be a regular follower of credit markets with imperfect information, regardless of whether there's a crisis or not. One way of testing for presence of credit rationing is to explore the credit price (loan rate) stickiness. If the rate is indeed sticky it would imply that no matter how tight credit conditions may be, loan rate would stay the same. Berger and Udell (1992) assume that credit rationing most likely occurs in the time periods in which credit crunch is operative, but they fail to find conclusive results that loan rates are sticky after all. Therefore, it might be beneficial reviewing what happens to the loan rate, as well as other asset and liability rates as a sign of changing conditions in credit markets.

As underlined in Bernanke and Lown (2001) two key variables that have to hold constant in order to apply the above credit crunch definition, are safe (risk-free) interest rate and average quality of borrowers. The best proxy for the safe rate is the yield offered on government securities. Serbian public debt market offers issues which vary in the currency of denomination. It would be wrong to assign too much weight in analysis to RSD denominated treasury issues, since the market is shallow, but the data are still informative, especially in comparison to RSD denominated credit rate. The difference between them, if they are of the same maturity, is known as a default risk premium. The default risk premium is huge, but marks no change in last year, as opposed to the rates which determine it, that indeed have decreased over time. Solely on the basis of this development, we can conclude that Serbian credit market is perhaps slowly calming down.

The yield on treasury bonds denominated in the Euro (series A) cannot be calculated on the assumption of constant maturity, since all series mature on May 31st each consecutive year. Any data point concerns the yield on bond maturing next year, and consequently, the reported yields are related to bonds with remaining maturity of not more than five (as of March) and not less than two quarters (as of December). But the differences are next to irrelevant, since the yield curve was almost flat most of the time. This yield, when compared with the yield on bond issued with the same maturity and the same currency by the relevant foreign government, has great potential to explain credit growth in a capital-importing country.

The role of official reference rate (2W repo rate) depends on the strength of interest rate channel of monetary transmission. The interpretation of the role of this rate is fairly similar to that of RSD treasury issues.

The rate which most significantly influences the local credit market is EURIBOR. This is the chief international reference rate for the Serbian credit market, widely used by local banking industry both when raising and lending funds. The data in the Table 3 concern LIBOR, but the differences are rather irrelevant.

Table 3: Selected interest rates on bank assets and liabilities (in %, p.a.)

	2010		2011				2012
	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Cost of bank funds[1]							
LIBOR (6M EUR)	1.13	1.18	1.50	1.76	1.70	1.56	1.24[2]
Deposits (3–12M EUR)	3.58	4.66	4.20	4.29	3.68	4.69	4.37
Deposits (3–12M RSD)	9.05	10.63	11.76	10.73	9.87	9.64	9.40
Yield on bank assets							
Treasury forex bonds[2]	3.45	4.64	5.68	5.35	6.00	6.49	6.10

	2010		2011				2012
	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Treasury bills (6M)	12.40	14.73	12.87	12.18	11.90	10.85	10.48
Repo rate (2W)	8.90	11.17	12.12	12.22	11.39	9.82	9.50
Credit rate (RSD)	29.51	28.46	28.12	27.66	27.46	25.73	25.98
Credit rate (EUR)	9.66	8.28	9.54	9.65	8.55	9.96	8.65

Notes: [1] *Data concern weighted average for reported month, except for LIBOR, which is end of period rate;* [2] *Data on February;* [3] *Yield on treasury bonds (series A) concerns changing maturity.*

Several, for credit market very informative, financial indicators could be constructed simply by comparing some of those rates. Besides already mentioned default risk premium, for instance, difference between LIBOR and the local currency deposit rate of identical maturity yields the so called nominal interest rate differential, which is very useful in determining the way funds will flow across borders. Similarly, by comparing the yield available on treasury securities denominated in different currencies but issued under the same jurisdiction we get market appraisal of the so called pure exchange rate risk, while comparing the difference between yield on the same currency but different jurisdiction issues we get country risk premium.

An extremely important variable is spread between credit and deposit interest rate. This is why the next section is entirely devoted to discussing the spread and some similar indicators. Contrary to other surveys (e.g. Vuković, 2009, p. 106), which employed real interest rates, we use nominal rates to construct interest rate spread, since the latter approach has the virtue of largely avoiding mismeasurement problems that come from unknown inflation- expectations. Nevertheless, this framework is less able to capture the changes in credit market tightness.

Interest spread and bank net interest margin

Interest spread is the difference between the yield rate on average interest earning assets and the cost rate on interest bearing funds, with both elements expressed in percentage terms. Bank net interest margin (hereafter NIM), on the other hand, is computed by comparing net interest income, being simply the difference between interest revenue and interest expense, with average earning assets. Clearly, the bank interest margin and spread need not be identical unless there are zero non-interest bearing funds. NIM *per se* includes impact of all the interest rates on the bank income and, as such, explains better bank efficiency, but it also reflects changing composition of assets and liabilities. It is not flawless indicator of even bank pricing policy, let alone credit conditions. However, since banks' efficiency drives the credit market it deserves to be considered.

Table 4: Net interest margin and interest spread (in %, p.a.)

	2006	2007	2008	2009	2010	2011
NIM	7.46	6.54	7.76	6.90	6.20	6.10[1]
NIM (max)	26.01	16.78	21.90	10.16	N/A	N/A
NIM (min)	3.57	2.77	4.93	3.18	N/A	N/A
Spread, RSD	10.82	6.05	10.79	6.72	6.88	7.73[2]
Weighted loan rate	15.88	11.13	18.11	11.78	12.43	14.24[2]
Weighted deposit rate	5.06	4.08	7.32	5.06	5.55	6.51[2]
Memoranda						
ROA	1.7	1.7	2.1	1.0	1.1	1.3[1]
ROE	9.7	8.5	4.5	4.5	5.4	6.5[1]

Notes: [1] Data on third quarter; [2] Data on second quarter;

NIM (Table 4 and 5) is calculated as explained above. Data on levels are from official NBS statistics, while the data on distribution (maximum and minimum) completely comes from Bank Scope database (Bureau van Dijk). The latter data are ratios directly selected from the database or recalculated from annual financial statements that come from the same data source. The data encompass majority of banks that operate in Serbian banking industry (over 99 percent of total assets). After turbulent 2008, NIM set up for decreasing. Interestingly, for the last five years no bank have reported negative NIM, while the maximum skyrocketed at more than 25 per cent. In spite of high margin, the banking industry reports rather modest level of profit efficiency measured by return on assets, as well as return on equity. In none year ROE has been reported in two-digit numbers, while ROA exceeds two per cent level only once. Such results may indicate that some sources of inefficiency of local banking industry drives conditions on the credit market. It probably belongs to diseconomy of scale, or huge overheads.

When expressing the interest rate spread as weighted average, one gets figures pretty much the same as those for net interest margin. In addition, both measures have the same flaws. The key issue in calculating NIM comes from the fact that most of credit granting and deposit taking activity related revenues and expenses enters no item relevant to calculate NIM. If the rates aren't reported on the effective rate basis, the same holds for the spread. Further, the multicurrency structure of bank assets and liabilities make things complicated both in calculating average weighted spread and margin. By pooling the data on local currency denominated arrangements with those on foreign currencies we get the assessment with no real economic meaning. The following table (Table 5) presents data on spread separately for main currencies and two basic product lines: consumer (or retail) banking, and business (or corporate) banking, with results on Euro-denominated arrangements separated from results on local currency denominated ones.

We should note that looking simply at the spread developments over time may be misleading, since the same spread may appear with deposit and lending rate moving simultaneously, with the same pace in the same direction. This is why we supplement the data on the spread with the data on relevant deposit and credit rates. This way we could track the changes which may indicate forces that drive one market, but that are completely irrelevant for the other. For instance, the increase in deposit rates during the turbulent times may be attributed either to increasing bank demand for deposits, or to undermined public confidence in bank soundness.

Table 5: NIM and spread – quarterly survey on recent data (in %, p.a.)

		2010		2011				2012
		Q3	Q4	Q1	Q2	Q3	Q4	Q1
I	NIM	6.30	6.20	6.20	6.20	6.10	N/A	N/A
	Interest rate spread on							
II=1–2	Consumer finance, EUR	6.08	3.62	5.34	5.36	4.87	5.27	4.28
1	Loans in (pegged to) EUR	9.66	8.28	9.54	9.65	8.55	9.96	8.65
2	Deposits up to one year	3.58	4.66	4.20	4.29	3.68	4.69	4.37
III=3–4	Consumer finance, RSD	20.46	17.83	16.36	16.93	17.59	16.09	16.58
3	Short-term loan rate[1]	29.51	28.46	28.12	27.66	27.46	25.73	25.98
4	Deposits up to one year	9.05	10.63	11.76	10.73	9.87	9.64	9.40
IV=5–6	Business finance, EUR	5.22	4.60	4.34	4.93	4.43	3.98	2.74
5	Loans in (pegged to) EUR	8.20	8.26	7.85	8.68	8.18	7.91	6.68
6	Deposits up to one year	2.98	3.66	3.51	3.75	3.75	3.93	3.94
V=7–8	Business finance, RSD	6.68	5.17	5.24	5.98	6.57	6.31	3.87
7	Loan rate[2]	15.72	16.49	17.76	18.28	17.51	16.17	13.24
8	Deposits up to one year	9.04	11.32	12.52	12.30	10.94	9.86	9.37

Notes: [1] *weighted average of rates on revolving, credit card loans and overdrafts for households;* [2] *weighted average of rates on export, investment and working capital loans to businesses.*

Estimating loan to deposit rate spread on this way demands right choice of a pair of rates. In order to control for interest rate risk we matched the rates of loans and deposits with as close as possible maturity. In official statistics the rates are reported among maturity baskets. Researchers' best choice is maturity of less than a year since majority of loans and deposits comes exactly with this maturity. All rates present terms prevalent on the relevant arrangements made in reporting period, since they are able to fully express the way conditions change on the market.

Several regularities appear. To begin with, the spread is much higher for consumer finance. The difference is especially apparent in arrangements denominated in local currency. The difference is driven almost completely by the loan rate. It is a well-known fact that banks charge consumer loans with higher rate, and it is persistent over time. Thus, pooling the rates for all different kinds of loans would blur the picture. Differentiating allows for tracking down such features, which would not be the case if weighted average were used. Secondly, the spread is higher for local currency denominated than for the Euro denominated arrangements. Although it is true that higher inflation may explain some differences between the comparable rates expressed in different currencies, it is for the spread largely offset, since both loan and deposit rates are expected to accommodate for an anticipated inflation. We say largely, because even spread may account for inflation. Nevertheless it is in much lesser extent than appears in the data. The higher spread in local currency denominated arrangements may be an outcome of banks' strong propensity to lend in foreign currencies, since it is a way to match currency structure of assets to that of liabilities. High exchange rate volatility (and uncertainty) might be also a determinant that spurs substitution out of RSD denominated claims.

Unequal access to credit market and SMEs

The studied effect on aggregates, rates and spread implicitly assumes that any change in credit conditions comes without sorting effect. However, an equally important side effect of worsening credit conditions comes from changed structure of borrowers. It is well-established empirical fact that credit crunch is squeezing out small businesses and entrepreneurs. Bruno (2009) shows that a capital crunch may have different impact on small and large businesses, depending on structure of a heterogeneous banking system. The author stresses that a shock to the capital of the bank specialized in financing of small businesses leads to a reduction of credit availability higher than a similar shock to the capital of the bank specialized in financing of large firms would bring about. Nevertheless, whether or not the banking industry is heterogeneous, there's no doubt that a conservative credit policy favours the biggest, financially sound ones. However, what makes them sounder than smaller competitors?

Although the issue certainly deserves to be considered, we here won't delve into details, not because it is not important but rather because discussing the ways of solving this issue is well beyond the motivation that led us to write this chapter. Just briefly, we would like to underline that a significant share of the problems which are frequently assigned to credit market malfunctioning, actually originates from the economy's structure. Namely, the first choice of any company in financing its growth is trade finance. How much can trade credit offset the credit cuts? It may be difficult for small companies to expand trade credit to other small companies because they too are being "crunched out". Dominant position of the biggest corporations on the buying and selling markets assures enjoying trade credit from smaller suppliers or buyers. Therefore, SMEs are discriminated both by the banking industry and their dominant trading partners. Probably the key strategic battleground for the government is promotion of competition. This is the way to free market forces (financial and markets for goods and services) from the influence of dominant power structures. As Raghuram and Zingales (2003, p. 168) put it forcefully: "free market tends to jeopardize ways of doing business that rely on unequal access".

FROM CREDIT BOOM TO CREDIT CRUNCH: AN EXPLORATORY STUDY OF CREDIT GROWTH DETERMINANTS

The survey above looks like a series of snapshots of developments in Serbian credit market and its banking industry. In this section we will proceed with a more rigorous analysis. The basic purpose of the following analysis is to point to the main driving forces of local credit market.

Methodology, variables definition and data set

Here we employ multiple linear regressions in order to study the relationship between credit growth and a set of macroeconomic and macro-financial variables. Both the sets of dependent and explanatory variables are chosen according to theory suggestions and subject to data availability.

We have experimented with two different regressands: bank credit to private sector and total credit to private sector. Both are able to indicate the changes in volume of credit market, with some differences between them. The latter one is simply a sum of bank credit to private sector and cross-border loans. Since dependent variables, when expressed in levels, are strongly trended, we chose to first of all transform them into growth rates and then proceed with regressions. Time series contains monthly observations for last six years, for which the data were available.

Several variables are regular candidates for the set of explanatory variables. In what follows we will present definition of variables, data source and rationale behind including each of them.

Output (industrial production) is constructed as the industrial production rate of change. Indexes are adjusted from the original source so as to have the same base (December 2006 = 100), since the original source operates with yearly change of baseline data point. The variable is introduced to capture the influence that comes from credit demand to the amount of credit outstanding. Although, the industrial production is not a proxy for credit demand as good as the actual GDP data, it is better suited for such an analysis because of monthly frequency. Visual inspection of data indicated that there might be a time-lagged influence of industrial production on credit growth. We experimented with zero (static) and three months lag (dynamic specification), while the table below shows only results for the dynamic specification, which proved to be a better specification.

Lending to deposit rate is the ratio of average weighted lending rate (total loans) to average weighted rate on bank total deposits. It captures efficiency of credit intermediation. Note that it is a ratio, not a spread itself. Despite the shortcoming of representing the rates as weighted average, which has been discussed previously, this was the only data available for the entire period.

Growth in *deposits* entered the set of explanatory variables in order to capture importance of local financial sources in feeding the lending boom and/or causing a crunch. In some specifications growth rate relates to the rate of change of Euro denominated total deposits, while in others it is CPI deflated. In both cases it is expressed as the rate of change in the reporting month relative to the previous month.

Possible *crowding out* effect controls for the influence of bank credit to the public sector. For the sake of this analysis, public sector is taken more broadly than usual. It is an aggregate of banks' claims vis-à-vis National Bank of Serbia, general and local governments, and public-owned enterprises. The core of this position is made of the claims to the NBS, mostly mandatory reserves and repo-stock. Therefore, it captures both the effects of regulations (mandatory reserves) and "flight to quality" behaviour (repo-stock and treasury issues).

What follows is a set of variables intended to capture the relative importance of external sector to the local credit market dynamics. If foreign capital plays a crucial role in explaining credit dynamics, a right proxy able to capture differences in conditions available locally and abroad might also turn out to be beneficial for the analysis. A variable of prime choice arguably ought to be the interest rate

differential. We chose not to include the interest rate differential as it is, but to separate it into its main components.

By decomposing nominal interest rate differential into the *country risk premium* and the pure exchange rate premium we were able to catch divergent forces that were blended into the nominal differential. The difference between yield on domestic asset denominated in foreign currency under domestic jurisdiction (represented by Republic of Serbia Forex bonds, known as A series) and Listed Federal Securities (LFS) mimics a market appraisal of country risk. Listed Federal Securities (LFS) are issued by the German federal government, with residual maturity of not less than a year. The yield is thus taken to represent the rate on foreign assets (under foreign jurisdiction) denominated in foreign currency. The country risk premium comprises both default and political risk premium.

The difference between yields on domestic asset denominated in domestic currency and domestic assets denominated in foreign currency under domestic jurisdiction boils down to what is known as a *pure exchange risk premium*, since those assets differ only in terms of currency of denomination and expose agents solely to the exchange rate risk. It is calculated by subtracting yield on Republic of Serbia Forex bonds from two weeks repo rate.

Drawing on a recent study of credit growth determinants in Serbia (Mladenovic and Palic, 2009) some proxy for the exchange rate volatility also joined the regressors' set. E-GARCH (1, 1) model provided a time series of daily data on conditional variance, which is then re-sampled at monthly frequency. Different from the previous study, the variable is not exchange rate volatility itself, but conditional *volatility of deviations from uncovered interest parity* (UIP). UIP is a non-arbitrage equilibrium condition which links the yields on two comparable assets denominated in different currencies. The UIP has been set with local (BEONIA) and the referent foreign (EONIA) overnight interbank interest rates. If UIP holds, neither one of participants will be awarded an extra return. If deviations from UIP remain persistent, and therefore predictable, the funds will flow in or out of the country, depending on the direction of deviations. Thus, the volatility of deviations is expected to have adverse effect on foreign capital inflow and consequently on bank credit to private sector. This variable is the third element which together with country risk premium and exchange risk premium explains economic interest of foreign creditors.

Real interest rate differential is computed as the difference between real rate local banks pay on local currency deposited for six months, and real Euro LIBOR rate (6 months maturity). Since the pair of chosen rates represents deposit rates, the

variable portrays relative attractiveness of domestic vis-à-vis foreign bank financial sources.

Real exchange rate (RER) enters the set of explanatory variables expressed either as base index or alternatively as percent deviation from trend. Real exchange rate RSD/EUR is derived from a nominal exchange rate index, adjusted for relative consumer prices in Serbia and the Eurozone. The trend was specified as a linear six year long time series. A slope coefficient is calculated for the entire period and relevant monthly data are further interpolated. The final data set is calculated as percentage deviation of actual real exchange rate data from the data expressing the trend. It is deployed to capture the influence of exchange rate, which does not directly concern the credit market.

Finally, we investigate the interactions between credit growth and a dummy variable that is taken to be unity for months that belong to the turbulent times, and zero otherwise.

Table 6: Multiple linear regression results

Independent variable	Dependent variables – Credit to Private Sector growth					
	Bank Credit to Private Sector (BCPS)			Total Credit to Private Sector (TCPS)		
	(1)	(2)	(3)	(1)	(2)	(3)
Intercept	−2.194 (−0.36)	−1.240 (−0.21)	4.701 (0.96)	−3.424 (−0.72)	−2.937 (−0.61)	2.371 (0.62)
Output (indust. production)	−0.001 (−0.017)	0.020 (0.58)	0.024 (0.68)	0.010 (0.38)	0.023 (0.79)	0.020 (0.72)
Lending to deposits rate	−0.718 (−0.84)	−0.727 (−0.93)	−1.091 (−1.34)	0.434 (0.65)	0.292 (0.45)	−0.163 (−0.25)
Deposits growth (EUR)	–	−0.224 (−1.95)*	−0.258 (−2.28)*	–	−0.045 (−0.47)	−0.029 (−0.33)
Deposits growth (CPI)	−0.075 (−0.57)	–	–	0.061 (0.59)	–	–
Crowding out	−0.072 (−0.62)	0.005 (0.05)	0.028 (0.25)	−0.007 (−0.08)	0.045 (0.49)	0.014 (0.16)
Country risk premium	−1.442 (−3.63)**	−1.219 (−3.14)**	−0.951 (−2.95)**	−1.045 (−3.36)**	−1.029 (−3.22)**	−0.904 (−3.57)**
Exchange risk premium	0.021 (3.85)**	−0.012 (−1.99)*	0.012 (1.82)*	0.008 (1.99)*	0.008 (1.49)*	0.008 (1.73)*
UIP volatility	−0.006 (−0.06)	0.001 (0.02)	−0.004 (−0.05)	0.020 (0.29)	0.021 (0.312)	0.017 (0.26)

Independent variable	Dependent variables – Credit to Private Sector growth					
	Bank Credit to Private Sector (BCPS)			Total Credit to Private Sector (TCPS)		
	(1)	(2)	(3)	(1)	(2)	(3)
Real interest rate differential	0.199 (1.62)*	0.122 (0.99)	0.072 (0.59)	0.003 (0.03)	−0.026 (−0.26)	0.011 (0.12)
RER (level)	0.073 (2.50)*	0.047 (1.53)*	–	0.046 (2.01)*	0.037 (1.44)*	–
RER deviation from trend	–	–	0.054 (1.05)	–	–	0.086 (2.12)*
Dummy (crisis)	−0.170 (−0.14)	−0.006 (−0.01)	−0.024 (−0.02)	1.074 (1.14)	1.306 (1.42)	1.150 (1.29)
R^2	0.692	0.721	0.711	0.761	0.760	0.776
Adjusted R^2	0.598	0.637	0.624	0.689	0.688	0.708
F	7.421	8.541	8.126	10.539	10.485	11.436

*Notes: Numbers in parenthesis are t–values; * Statistical significant at level of 10%; ** Statistical significant at level of 1%.*

Baseline results

The regressions' results separated significant variables from those which exert no real influence on credit growth. Statistically the most significant variable is country risk premium. It is estimated with predicted sign, i.e. inversely related to credit growth.

The second component of nominal interest differential, a (pure) exchange rate premium, is also significant but contrary to above stated it exerts positive influence. It is a part of extra return garnered to foreign creditors and hence stimulates credit capital to flow in from abroad. The divergent influence of these components justifies decomposing procedure. If aggregated, the premia would offset each other, and the inference would be spurious.

Amongst internal (domestic) driving forces it is deposit growth which exclusively exerts some influence on credit aggregates. As expected, the variable is important only for bank credit to private sector, whereas it shows no significance for total credit to private sector.

Somewhat surprisingly, the results completely reject the importance of the chosen crowding out proxy for the growth of credit to private sector. Since mandatory reserves and repo stock take by far the biggest part of bank credit to public sector, the results imply that both mandatory reserve policy and repo operations failed in

serving their purpose. The most plausible explanation for this empirical regularity is that repo operations, contrary to policy maker's intentions, actually have had expansionary effect on credit aggregates. The ultimate success of such a monetary policy instrument critically rests on the assumption that liability side of bank balance sheet remains intact. However, it rarely does really. Interest rate differential, boosted by the seep repo rate, stimulates foreign credit inflow.

Be that as it may, the apparent irrelevance of inflation as an overall driving force for variables considered, deserves a closer scrutiny. Deposit growth deflated by CPI, as well as real interest rate differential seem to be less important than their exchange rate counterparts. It is widespread and pervasive use of foreign currency, both in raising funds and lending them further, that is responsible for absolute predominance of the exchange rate over the inflation rate. Real exchange rate (RER) appears significant in explaining both bank credit to private sector and total credit to private sector, with no real difference if the variable is expressed in levels or in percent deviations from the trend. The positive sign of regression coefficient means that strong local currency drives the credit market up, while weak currency pulls it down. Therefore, as underlined earlier, in the ambience of excessive euroization, the exchange rate becomes a prevalent choice in economic calculus of credit market agents.

POLICY DISCUSSION AND OPTIONS

In this section we review what we see as the possible answers to the issue from the policy perspective. We will review those which are most discussed in business circles and academia: i) public interventions from supply side, and ii) addressing excessive credit and liability euroization. Note that the list of policy responses is not exhausted by including those two policy packages.

Recently, an ardent debate has taken place on issue whether Serbia needs a state-owned development bank. When a crisis starts shaking the credit market and credit crunch comes to the point where there is no much left for free market to do, voices for public intervention overpower its opponents. However, how much, if any, of the boom-bust credit cycle can be attributed to market failure? Firstly, there were huge misalignments (persistent, long-standing deviations from uncovered interest parity, overvalued real exchange rate etc.) created by the exchange rate mismanagement. Secondly, the government drains credit market, by diverging loanable funds from private sector to the public debt. Thus, the origin of the problems seems to be very much a policy failure.

The ultimate effect of a development bank project is going to be limited and perhaps unsustainable. The funds for this purpose are going to be difficult to raise (on the respectable amount anyway) without crowding out private sector. In addition, Serbian government currently borrows the funds from the market at the rate and maturity which prohibits it to be competitive lender on the credit market. If the credit supply shoots up without adequate safety margin (default risk premium) it would only serve the purpose of temporary financial relief of some privileged clients, with no sustainable positive effect (Marinković and Golubović, 2011). This policy approach is expected to have nothing but fire fighting purpose with short lasting effects on credit market conditions. Instead of intervening with additional credit supply we propose more responsible fiscal policy. If, however, development bank succeeded in being a functional platform for bailing in the private banking industry in economic growth and export oriented lending, then there may be some rhyme and reason in the initiative after all.

The second issue which surely deserves to be considered is excessive credit and liability euroization. The fragility of credit market is not exclusively a story of supply-demand disequilibria, or rising rates, but also relates to structure of the credit portfolio. We have seen that the econometric analysis supports importance of exchange rate in determining credit growth. It is well documented fact that credit dollarization comes closely linked with liability dollarization (Luca and Petrova, 2008; Marinković, 2009b), which further corroborates that banks are well insulated from the exchange rate risk. However, while direct (balance-sheet) exposure to currency risk is avoidable by matching currency composition of assets with that of liabilities, it does not mean that lending (or pegging loans) in foreign currency makes no change in bank risk profile. In small open economies in transition, currency risk tends to turn into default risk. This, so called, spillover of the exchange-rate risk into default risk works either directly by undermining payoff capacity of foreign currency borrowers, or by triggering a vicious circle of mutual weakening of credit demand, supply and economic activity (Božović et al., 2009). Fortunately, national provisioning and capital adequacy regulation recognize this threat, and charge banks with additional regulatory costs when they lend in (or peg to) foreign currencies.

One of the most controversial issues of all is to what extent exchange rate policy can contribute to the eurization (see Licandro and Licandro, 2003). Šošić and Kraft (2006) showed that in case of Croatia market participants replied in an asymmetrical fashion to real exchange rate misalignments. Undervalued local currency induces a portfolio shift toward a stronger foreign currency, while overvalued local currency typically fails in provoking reversal. Underlined asymmetric response is nothing more than a consequence of slow confidence recovery. It is easy to undermine public confidence, but takes much more time to reestablish it. The case of Serbia clearly

supports this regularity. Several switches between depreciation-appreciation regimes have had little if any changes in the level of financial euroization.

Recently proposed policy agenda (NBS, 2011; criticized in Vuković, 2011) brings no novel approach in trying to solve the issue. It is based on three pillars: First and foremost, it advocates for responsible fiscal and monetary policy able to support macroeconomic as well as financial stability and growth. The second pillar contains measures that would promote the Serbian Dinar as the right choice for long-term investments. Primarily, the government is suggested to issue long-term debt in the local currency. However, those attempts proved to be unsuccessful on earlier occasions. In order to succeed in this effort the task earmarked in the first pillar must be fully achieved. The same precondition holds in case of the third pillar, which assumes mutual effort of NBS and the banking industry to establish a private market of financial instruments for currency risk management. Private market protection against currency risk is, alas, prohibitively costly in the ambience of monetary instability.

Authorities also do not dismiss the use of wider set of prudential measures in favour of local currency. It is a clear sign that authorities fear the free market competition. Preferable tax treatment of Dinar denominated saving instruments, discriminating policy of mandatory reserves, and policy of risk assessments affect the preference set. Those measures imply additional costs to those who are using (or indexed in) a foreign currency. The ultimate effect is subject to the level of extra (by regulation imposed) levy and it has been already proved to possess limited effect.

The first pillar, if implemented fully, makes the other two pillars superfluous. Moreover, it cannot be enforced with the other two pillars, because the ultimate effect of those measures, critically depends on the first one. Discussed policy packages remain closely connected, at least in terms of the ultimate precondition on which both packages critically rest. It brings more responsible and well-balanced fiscal policy on the forefront of policy responses.

CONCLUSIONS

The data on credit aggregates shows no alarming trend toward melting down of credit activity, although there are clear signs of credit growth decelerating. This is because a pre-emptive action prevented deterioration of credit conditions into the sharp credit crunch. The coalition that assembles the main stakeholders (foreign banks, National Bank of Serbia, IMF) was forged to alleviate the severity of the inevitable credit crunch. This firefighting measure has mitigated the problem, but with no power nor leeway to do so indefinitely.

It is now clear that the policy makers failed to smooth the adverse developments in the credit market dynamics and left the economy dangerously exposed to the proverbial boom-bust cycle. The econometric analysis carried out in this chapter underlined the importance of external determinants of credit growth. Exchange rate related determinants: real exchange rate, country risk premium as well as pure exchange rate risk premium proved to be the more significant amongst various tested variables, in explaining credit growth trajectory.

The study underscores the importance of exchange rate management as a tool to avoid huge misalignments, for which responsible fiscal policy, until recently almost forgotten policy front, represents a necessary precondition and a potent instrument.

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DATA APPENDIX

Data	Source
GDP – Domestic	National Statistical Bureau
Industrial Production	NBS, Real Sector Database
Inflation – Domestic (CPI)	NBS, Real Sector Database
Inflation – Foreign (HCPI)	Eurostat
Bank Credit to Private Sector	NBS, Balance Sheet of Banking Industry
Bank Credit to Public Sector	NBS, Balance Sheet of Banking Industry
Deposits	NBS, Balance Sheet of Banking Industry
Cross-borders – External Debt of Enterprises	NBS, External Sector Database
LIBOR	British Banker Association
EONIA	European Central Bank
BEONIA	NBS, Beonia Database
Interest rates – Domestic, Various	NBS, Interest Rates Database
Exchange rate RSD/EUR	NBS, Exchange Rates Database
Nonperforming Loans	NBS, Quarterly Reports, Various Issues
NIM, ROA, ROE	NBS, Quarterly Reports, Various Issues
NIM (distribution)	BankScope, Bureau van Dijk