

**THE YUGOSLAV FINANCIAL DISASTER IN THE 1990'S:  
Was it Pointed Out by the Financial Yield Dynamics**

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**Srdjan Marinković**

Faculty of Economics, University of Niš, 18000 Niš, Serbia and Montenegro

**Abstract.** *The paper provides sufficient details on the development of the Yugoslav financial situation in the 1990s and analyses the reasons and consequences of the financial crisis experienced by Yugoslav society. This study reveals that numerous interest rate indicators are proved as extremely informative in explaining concrete financial crisis phenomena. The analysis was conducted referring to most recent contributions on financial theory, i.e. asymmetric information paradigm, so it could be considered as a special way to implement the theory.*

**Key words:** *banking crises, interest rate dynamics, yield curve, and default risk premium, asymmetric information*

1. INTRODUCTION AND STRUCTURE OF THE PAPER

This Yugoslav banking crisis study reveals a presence of two types of anomalies. Asset liquidity diminishing features the first type while the second shows different kinds of interventionism. The liquidity generated crisis is featured by relevant liquidity premium hypertrophy, which leads to increase in expected return/fall in prices, or failure of transactions which causes lack of liquidity on the relevant market. While the first type causes failure of transactions and as a consequence contraction of various financial markets, the other is responsible for many resource-allocation distortions. Certain interest rate variables are able to cover both elements. The real interest rate, the term structure of interest rates, the default-risk premium and the bank interest spread have confirmed their predictive power. All these elements indicate financial sector extremely exposed to illiquidity-driven disturbances, simultaneously with clear traces of pervasive interventionism. Moreover, this paper presents comprehensive empirical study describing recent-past developments in Yugoslav financial market and banking sector.

The paper starts with an introductory section. The second section contains a selected review of literature dealing with causes and mechanics of financial crisis. Section three

includes selected empirical and theoretical findings highlighting some causes and consequences of Yugoslav financial disturbances. The paper finishes with conclusion.

## 2. LITERATURE ON LEADING FINANCIAL CRISES' ORIGINS

During the last decade theoretical and especially empirical literature, inspired by some prominent statistical investigations of direct causes or banking crisis indicators, brought back to life up to that period calm controversy between two main opponent thoughts, monetarist theory (Friedman and Schwartz, 1963) and business cycle theory (Kindleberger, 1978).

Goldstein and Turner (1996) published a complete study of causes. There were identified simultaneous appearances of a number of causes. The most important are: a) macroeconomic volatility in domestic and external environment; b) lending booms, asset price collapses and surges in international capital inflows; c) large maturity and currency mismatches; d) inadequate preparation for financial liberalization; e) heavy government involvement in financial sector; f) weaknesses in accounting, disclosure and legal framework; g) distorted incentives for bank owners, managers, depositors, and finally h) inadequate foreign exchange rate regimes. Obviously, most of them are very complex variables. Links between them and banking crises incidences are serious and persistent both in institutional and historical dimension. Unfortunately, the above causes lead us just on a half way to demanded measures of crisis prevention.

Demirguc-Kunt and Detragiache (1998, p. 91) look at determinants in the former sense, using an analysis of the likelihood of a banking crisis, based on the indicators grouped into following: 1) macroeconomic indicators: rate of growth of real GDP, change in the terms of trade, real interest rate, rate of inflation, rate of exchange rate depreciation and ratio of central government budget surplus to GDP; 2) financial indicators: ratio of M2 to foreign exchange reserves of the central bank, ratio of domestic credit to the private sector to GDP, ratio of bank liquid reserves to bank asset, rate of growth of real domestic credit, and 3) institutional indicators: real GDP per capita, presence of an explicit deposit insurance scheme and index of the quality of law enforcement. Slowing down the output, *increase of real interest rate*, decreasing liquidity, credit over-expansion, explicit deposit insurance, lax of legal infrastructure and low level of GDP *per capita* confirmed as indicators most probably linked with banking crisis. Similar findings are confirmed in some other investigations (Caprio and Klingebiel, 1996).

Certain turnover in exploring causes of financial disturbances started with currency meltdowns, which involved East Asian economies during 1997. Researching Tequila and East Asian crisis, Tornell (1999) found out three determinants, which marked out economy fragility to financial crisis: the real appreciation of exchange rate, the strength of the banking system, and the international liquidity of the country, namely, inadequate foreign reserves. Similar set of factors we meet in Radelet and Sachs (1998), again lying on the Asian crisis. The authors argue that the panic of foreign investors caused the crisis, but given the warning signs of problems in the financial sector, including the declining property market, it is more likely that the panic exacerbated the problem. Panics both reveal pre-existing resource misallocation and, to the extent that asset markets overshoot, can significantly deepen the crisis as well. There are opinions agreeing upon the autonomous

mechanism of crisis developments, in other words, if market alone marks banks weak and attacks currency, banks that are directly (in balance-sheet) exposed to currency risk, the same as ones with indirect exposure (clients' exposure) might appear insolvent. Hereafter, every single panic becomes *ex post* rational event, even if it was not *ex ante*.

Recent investigation, not just related to concrete regional crisis (Stiglitz, 2000) emphasized the role played by premature financial sector liberalization, especially where existing institutions are absent, especially regulation, supervision, and other parts of the infrastructure that would support incentive-compatible behavior. This view stresses the need for sensible pacing and sequencing of financial reforms.

According to Kaufman (2000, p. 82), the main causes of banking crises are the features making banks immanently prone to fragility. Similar is true in Calomiris (1999, p. 1502), who stressed asymmetric information burdening public capability to assess accurately solvency of banks. *A propos* their opinion, banking system fragility is extremely high because banks are playing crucial role in liquidity providing. Short-term nature of bank liabilities is consequence of this unique bank role, while, the banking asset allocation is followed by private character of information. Author's opinion is that lack of clear information concerning bank asset value and their reliance on short-term liabilities are immanent to them, as well as presenting baseline of their fragility. These factors are going to be foreseen.

Besides the already mentioned characteristics of the banking sector fragility in general, extremely unstable monetary conditions could jeopardize a banking system, as part of a wider monetary system. Namely, unstable monetary unit (its external and internal value) leads to lack of long-term credit and financial market. For abnormal inflation premiums (i.e. both premium for expected inflation and its unexpected counterpart) do not accomplish interest rates level needed for matching demand and supply of long-term credit. Being matched, banking sector asset-liability becomes extremely fragile if real sector is being unmatched, generating liquidity problems into banking sector. Exchange rate volatility causes some other anomalies such as currency risk exposure of banking sector both to direct exposure (bank balance sheet) or indirect one (banks' customer accounts). Mishkin (1999, p. 1522) points out role of these mechanisms in generating twin banking and currency disturbances.

Large econometric research was done due to explanation of bank crises. Some investigations are already noted. Kaminsky and Reinhart (1999) have concluded that banking crises may lead to currency crises and *vice versa*. Demirguc-Kunt and Detragiache (1998, p.104-105) suggests that crises tend to erupt when the macroeconomic environment is weak, particularly when growth is low and inflation is high. In addition, *high real interest rates* are clearly associated with systemic banking sector problems. In a comprehensive review of studies going till today, Hawkins and Klau (2000, p.6) emphasize following leading causes of banking crises: overvalued exchange rate, inadequate international reserves, economic recession, *high real interest rate* and *credit overextension*. The idea about *interest rate* and foreign rate importance is confirmed in numerous econometric studies, among others in Eichengreen and Rose (1998). Also, researching Japanese episode, Hutchison and McDill (1999, p.19) pointed out that developments from early the 1990s, especially asset-price configuration, credit conditions and other economic determinants, that were presented during the period, significantly determined incidence of the

crisis. Two macroeconomic variables, *real interest rate* and stock market index have been found as reliable, statistically important indicator of banking sector distress.

Mishkin (1996) examining U.S. banking panics, pointed out the specific factors: substantial *increases in interest rates*, rise of *spread between interest rates on low- and high-quality bonds*, stock market decline, and the widening of the *interest-rate spread*. It is clear that all the factor dynamics could represent the same influence, i.e. rising of aggregate uncertainty, which depresses financial asset prices and raises various kinds of expected rate of return. The same factors are being analyzed in Yugoslav banking crisis episode.

### 3. DYNAMICS OF INTEREST RATES AS A YUGOSLAV CRISIS INDICATOR

The importance of interest rate dynamics as a financial crisis indicator stands from the fact that level, structure, and movement of relevant interest rates indicate crisis generators presence in the sphere of interventionism, and much more cognitive frictions to efficient financial market and financial intermediary functioning.

#### 3.1 Data sources and methodology

The Yugoslav banking crisis analysis is based on a simple statistical methodology applied to a carefully chosen data set. Real interest rates for earlier periods were published in Radmilovic and Micic (1999). Nominal interest rates regarding periods 1998-2002 were taken from NBY official source. Consumer price index (p.m.) for periods 1998-2002 are from SZS official reports. Foreign exchange rate data from NBY base are covering informal foreign market records encompassing: a) nominal interest rate (p.m.) represents weighted inter-bank interest rate, commercial paper and bank acceptances rates; b) consumer price index for periods with conflict between SZS and alternative sources data other sources were used. Euro-bond yields curve, NBY bills yield curve and FRY foreign exchange bonds yield curve are from Belgrade Stock Exchange Bulletin. Yields and duration were calculated by author and based on prices reported by Belgrade Stock Exchange.

The banking sector default-risk premium analysis was done relying on movements of average weighted interest rate on short-term banks issues (bank acceptances, CDs and bonds) and short-term non-bank sector's issues (commercial papers and bonds). We have taken in account just data on primary market, because secondary transactions very seldom take place, and these data cannot be found in reports. Considering the insignificant market participation of non-banking financial institutions, e.g. insurance companies, thrifts and security dealers, interest rate data for non-banking sector issues become real sector proxy. The figure covers the period from February 2000, to October 2001. At the same time the time series containing monthly data is frequent enough to separate the most of determinants potentially influencing this variable movement. The choice of this time frame enables some crucial regulatory influences. Simultaneously, the wartime influence had been avoided. Namely, during the war there was an over-regulation of interest rates, especially ceilings and peculiar portfolio restrictions.

The default-risk premium homogeneity as an element of the interest rate structure has been appreciated through Coefficient of variation of interest rates, for the same period of four successive years. The observation period was May, except for 1999 where we used November as a month when trading activity started to normalize. Selected periods are

relevant by both trade volume and number of issuers. There are neither serious interventions nor significant changes in legislation. Sample contains 416 units, nine units less than the total number. Nine extreme values with capitalization less than 5 per cent of average capitalization were extracted.

The interest spread analysis was done by NBY data collected from banks' monthly report on interest rates from newly approved loans and deposits. All these interest rates present amount-weighted rates. Since February 2000 weighted deposit interest rate does not include demand deposit interest rates, giro and current accounts and time-deposits maturing below 15 days and above 3 years. Figure 4 is based on data published by NBY bulletin until October 2000, and later in NBY Economic Survey, containing a bit less data. Meanwhile, series weighted loan interest rate is constructed on all relevant interest bearing assets, while series weighted deposit rate does not represent proxy for relevant bank interest expenses or banking sector's cost of capital. Inter-bank interest rate, Lombard and rediscount rate and money market rate have been excluded, giving the spread slightly overestimated.

### 3.2 Interest rate and some macro-financial variables

The role of interest rate in the banking sector problems genesis is intensively investigated phenomenon. As a follower of crisis, the tendencies have been seen in almost all contemporary financial crisis episodes. Depending on assumed relation between financial and real economic sector, it is sometimes emphasized as an indicator, but sometimes just as a cause (Minsky 1995, p. 198). Both standpoints, by our opinion, are incomplete explanation of over-reach relation between interest rate and financial crises. The analysis has to be settled down in concrete institutional and time framework. Real interest rate is considered to be one of the basic indicators enabling us to follow up stance and dynamics of a financial system. Second important benchmark in deciding whether the relevant interest rate is in equilibrium or not, appears to be the foreign exchange rate dynamics.

Figure 1 makes necessary ground for an analysis of possible monetary influences on relative alternative yields and on relative position of financial sector, as well. Two time series are presented a) real interest rate (p.m.) and b) monthly index of real foreign exchange rate. Since figures expressed in nominal terms are corrected by CPI (in case of exchange rate it is done by both foreign and domestic CPI), i.e. expressed in its real terms, values above 100 points presents positive real return, while values below the amount are negative real return of loss in real terms. Thus, the figure presents relative alternative yield on three kinds of investments: a) yield on holding foreign currency (i.e. out of domestic financial system); b) most attractive yield on YUD investment available to banks, and c) hypothetical (virtual) yield on a consumer basket, i.e. portfolio of goods and services consisting the basket. The former two kinds of investments are shown divided by third series. According to that the third series is constantly valued 100 points. Data for 1993 and the first two months of the next year are extracted from the sample. The sample covers period starting from January 1990 and finishing with March 2001. Even on the first sight, existence of two different periods become clear, the first (1990-1994) was being featured by persistent negative real rate, and the second (1994-1998) shows that real rate was reaching abnormally high levels. Those rates were corresponded by extremely adverse expected yield which, shown by auditing of banking sector of

Yugoslavia, *de facto*, were negative. Banking sector capital adequacy dangerously collapsed due to accrued credit loss provisions.

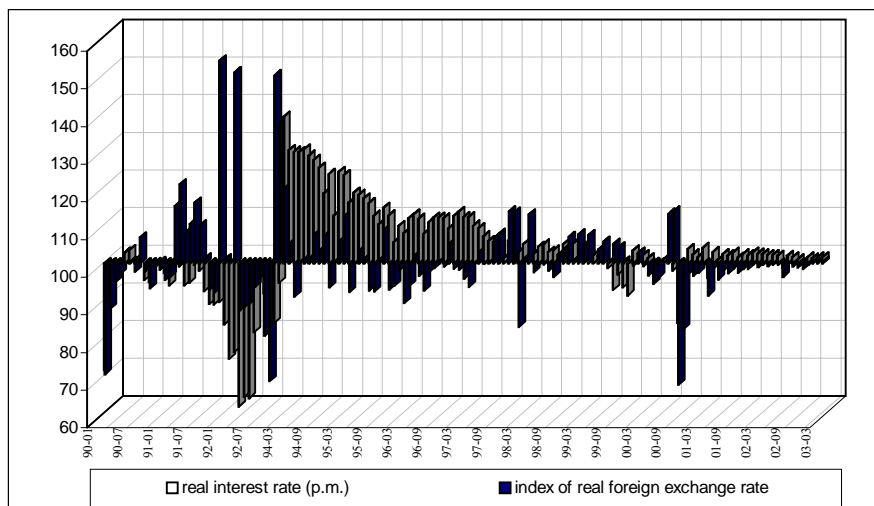


Fig. 1. Real interest rate and real exchange rate (p.m.)

Data sources: National Bureau of Statistics and Belgrade Stock Exchange Bulletin

First, what attention should be focused on, while discussing the data, is the high yield variability. Having money put into the foreign notes, during the same periods, it was possible to increase personal wealth almost twice. Those developments indicate speculative monetary strikes. At the same time, for instance, during April 1992, the most attractive yield which was realized by banks investing on YUD asset recorded losses of over 60 per cent of real asset value. This structure of alternative yields leads to huge swings in relative demand for asset, based on incomplete experience and expectation made on more - less sophisticated forecasts. Until the recent monetary reform, relative alternative yields were featured by frequent swings. Considering monetary developments, a rapid decrease of real money demand happened, simultaneously with changes in nominal money demand, which exploded. The money velocity was reaching extreme levels, constantly increasing currency to money stock ratio. At the same time, regular substitution of deposit money to currency was subject to a number of constrains, which means that currency to money ratio, without mentioned influences, probably will rise at higher level.

If the real rate parity theorem (Frankel 1979) is being accepted as theoretical equilibrium, regardless of frictions (Mishkin (1984), Cumby and Mishkin (1986)), the difference appearing between those time series must be *foreign real interest rate*. Meanwhile, since the relevant yield is computed on monthly basis, normally one can expect the variables oscillating within quite narrow band. High level of variability and divergent time series indicate outstanding real rate parity deviation, as well as huge macro-financial distortion. Specifically, real interest rate series presents excess variability and unacceptable absolute values. By the way, the analysis, to some extent, suffers from a methodological inaccuracy. First, real rate parity requires open capital account as a necessary precondition, i.e.

completely liberalized foreign capital transaction, what in the best case is not fulfilled yet. In addition, credit risk difference irrelevance is assumed. Since, real interest rate time series was constructed using nominal private sector rates data; therefore, real rate parity is not something that we can expect to be fully achieved.

### 3.3 Interest rate structure distortions

The above encompasses only a part of the entire interest rate dynamics analysis. A picture of the domestic banking system, painted-out by the interest rate apparatus, could be more picturesque if the set of apparatus incorporates interest rate structure indicators as well. Available databases make it possible to conduct analyses of both term and risk structure of interest rates.

#### 3.3.1 Term structure of interest rates

Until recent times it was not possible to derive the term structure of interest rates. There were many reasons. First, long-term fiscal issues were not available, and the very activity was under a significant influence and driven-out from free-market i.e. unregulated trading. Further, starting secondary trading over foreign exchange saving bonds SRJ enabled FRY foreign exchange bond curve constructing and comparing it with Euro-bond yield curve.

Note the considerable spread between Euro-bond yield curve (bottom line) and foreign-bonds FRY curve (middle-positioned line). Term structure of spread is defined by both term structures of yields. The lower curve is so-called humped, which means that after being downward sloping, during its short end, slope is changed, i.e. upward-sloping during its long-term section. The upper curve is upward-sloped along the entire maturity and is put so high up. As curves monetary features being the same (both are Euro-denominated), monetary risks are the same too, so yield spread will be determined by remain different issuer's qualities. The term structure of yield differential indicates market participants' attitude at external liquidity and solvency of issuer, i.e. FRY. It seems that transfer risk (external liquidity risk) was extremely highly appreciated. Reason could be either expected increase of the risk in future times or the fact that one can't be so convinced when longer-term expectations are in question, hence, cognitive friction. In favor of the second explanation stands steeply sloping and highly positioned yield curve despite favorable current external liquidity. Namely, international reserves (Jun 2002) have amount of 185.1 per cent money stock (M1), which means that YUD internal convertibility cannot come in question even if most rigorous currency board identity is taking into account. Simultaneously, the international reserve stock is exceeding 633 per cent three-month import average.

Second, the spread function between NBY bills yield curve and foreign-bond FRY yield curve not only points out market expectations on future interest rates, but also interest rate risk valuation. Since the most dynamic part of default-free yield curve is just inflation expectations, slope and position of curve are most frequently used in analyzing anti-inflation policy credibility. Inflation premium for six months' investments is at least 12 per cent p.a., which is almost identical to realized inflation rate. Yield, hence, does not include asymmetric information premium. Asymmetric influence, however, appears in those segments, which are traditionally less informational intensive, for instance, house-

holds. Non-interest rate indicators of inflation uncertainty give additional support to this opinion. Low level of monetary multiplier (1.4 for Jun 2002), currency substitution rate (over 93 per cent of savings in banking sector is foreign currency denominated), high money velocity (M1/GDP 6.36 per cent 2001) testify about monetary uncertainty, regardless the successfully controlled rate of inflation which is in frame of projected rate (14 per cent u 2002.) as well as economy that is re-monetizing (index of real money stock for 12-1994/4-2002 is 104 per cent). While the position of curve does not indicate a respective uncertainty inflation premium, only this type of premium can explain its extremely steep slope. Namely, there is no sign indicating that interest rates will be rising during the following months after persistent decreasing trend.

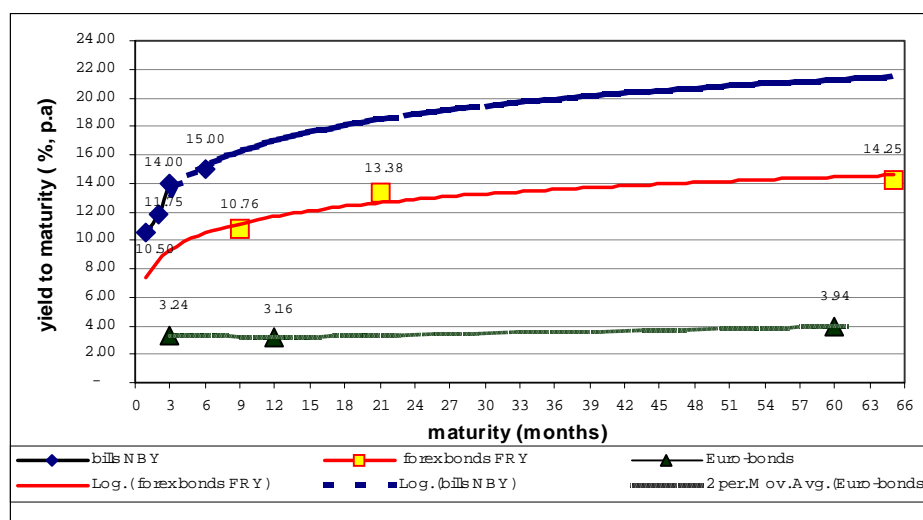


Fig. 2. Government debt markets: yield curve analysis (August-2002)

Data sources: Belgrade Stock Exchange Bulletin

This analysis is without unambiguous data about long-term inflation expectations. For, NBY bills are issued only up to six months maturity. Remaining part of yield curve represents extrapolation, which could be taken just as a lower possible yield. Extrapolated NBY bills curve shows that (supposing correct extrapolation) attempt to issue bond with Macaulay's duration longer than 60 months had to be with yield rate even more than 21 per cent (p.a.). Thus, this middle term para-fiscal debt cost of financing would be extremely high, bearing in mind that it is about the national entity with the highest possible creditworthiness. New developments, i.e. yield rate taken on issue of three months treasury bills (14.66 per cent, April 2003) clearly stands as back up of the statement. Later issues were still worse valued. Just a small percentage of national amounts were accepted at the market, and the yield rate came even over 18 per cent.

### 3.3.2 Average default-risk premium

This variable is considered the most accepted indicator of disturbances in financial sector. According to asymmetric information theory (c.f. Bernanke 1983), with absolute



terms and a tendency, high level of the premium is considered as the main indicator of developing credit crunch. This analysis derives default-risk premium as a difference in rate realized on short-term fiscal debt and short-term non-fiscal debt issues. Public sector rate is represented by yield on NBY short-term bond. It was actively traded on Belgrade Exchange from November 1995, till war broke out. It is short-term security, maturing up to 90 days, carrying explicit free-market interest rate, published at NBY bulletins. From November 2000 up to now, yield on NBY bills was used. This paper is traded on auction method. Securities are zero-coupon and issued with different maturities up to six months. Rates on commercial papers, bank acceptances and CDs have been used as a proxy for non-fiscal rate. All these papers are the same in the light of maturity, issuing rules and other procedures. Credit risk of issuers is similar, with very small differences between bank accepts and commercial papers of real sector.

*a) Level and dynamics of default-risk premium*

From figure 3, follows that default-risk premium, after initial oscillations, mostly due to high and volatile non-fiscal interest rates, since middle of 1997 to start of war is kept inside the boundaries 2.56-5.04 per cent. Ceiling regulation, considering interest rates charging on bank loans, passed through during the war period, i.e. March 29. 1999, and still was operational until September. Due to above, this period becomes irrelevant for any appraisal of interest rate indicators. Default risk premium, theoretically contains expected credit loss counterpart and certain excess amount responding to so-called asymmetric information premium (Myers and Mujluf 1984). According to Stiglitz and Weiss (1981), the main aftermath of asymmetric information will be credit rationing but also certain interest rate increase is possible. However, this analysis assumes hard budget constraint on both credit supply side and credit demand side.

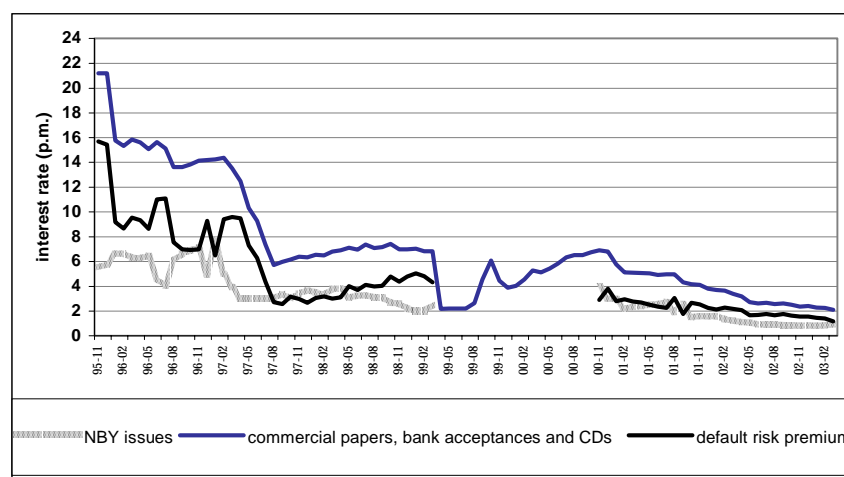


Fig. 3. Financial markets FRY: average default-risk premium  
 Data sources: Belgrade Stock Exchange Bulletin

Recent data indicate that apart from the intensifying free trade of NBY issues default-risk spread has been again brought into the mention boundary, along with slightly nar-

rowing it (3.80 per cent for December 2000, 2.25 per cent December 2001. and 1.69 per cent for June 2002). Absolute level of default risk premium (p.m.) is very depressing and just emphasizes impression taken from real rate analysis. Even lowest level of default risk premium, (1.67 per cent p.m. May 2002.) annually takes 21.98 per cent p.a. This is a couple of times bigger than premium in stabile financial systems. Having in mind the trend, we could conclude that banking system keeps recovering; though still high default-risk premium stands as an unambiguous financial crisis sign.

An additional indicator is the default risk premium homogeneity. For example, Variation coefficient has amount of 15.88 per cent in May 2001. In the same period, the default risk premium was nearly the same as default-free rate. Thus, having combined those data, it is shown that non-fiscal sector, wholly, has been estimated rather risk homogenous. Risk level, having in mind average interest rate and its dispersion, clearly distinct this sector from default-free issuers. Other periods are also featured by default risk premium homogeneity. Default-risk spread, as a premium over default risk free rate, essentially, should be mostly debtor-tailored, i.e. determined according to any default risk appraisal regarding financial claims against specific debtor. However, the fact that there is intensive asymmetric information presence is crucial for default-risk premium taking macroeconomic or structural feature. For, credit/default risk average (for entire economy) is the most relative in causing any specific interest rate. There are a number of possible reasons for that. State ownership could be in charge of this development. In state-owned productive sector, due to *de facto* identical owner, risk premium seems mostly determined by economic system itself. Its main determinant is implicit government's guarantee. Thus, in case of any failure, debtor is able to reach unlimited government support. Thereafter, default risk dispersion depends on probability that government will tolerate business failure (inadequate legal infrastructure and lack of enforcement) in concrete case (political cynicism axiom). As an enterprise gives no guarantee for its liabilities, there is credit delinquency supported by regulatory forbearance, as well as, accurate estimation of firm solvency and even its asset presents big issue. Therefore, though a factor equalizing default-risk premium is state ownership, the state influence is stretched far from direct ownership, over paternalism toward an economy and favorite entities to lack of instruments for creditor rights protection. These all are systemic determinants. Implicitly made decision not to build legal creditor protection becomes decision on target level of government paternalism in economy. Further, government rating depends on fiscal power, political attitude corresponding priority given to old or new government obligations, and explicit/implicit foreign government or institutions guarantee, and government asset available to cover government liabilities. Yet, in short-term, fiscal issue credit risk is very relative. Therefore, a government with high credit risk, whose long-term debt cannot find a way out to the market, at the same time, could be quite successful in small-scale short-term debt placement. Hence, when claims against debtor asset are not absolute and enforceable, and accounting system allows "window dressing", enterprise credit risk will depend on guarantee, i.e. guarantee's creditworthiness.

The second determinant of homogeneity of credit risk premium becomes asymmetric information. Inadequate accounting and auditing systems, as well as supervisory forbearance obstructs accurate assessment of debtor's creditworthiness and assignment of risk premium. Consequently, interest rate policy relies on average credit rating. Relevant uncertainty part or asymmetric information parts of credit risks premium influences this

variable. Those are added on already high credit risk premium determined by deteriorated perspectives of domestic economy.

*b) Banking sector's default-risk premium*

Additional banking crisis indicator is spread between interest rate real sector, which is being paid on debt instruments and interest rate banks having to pay on bank accepts and certificates of deposit, i.e. on its market liabilities. Yugoslav banking sector role has been taken down to liquidity intermediating, while interest rate structure reveals quite narrow space for credit risk intermediation activities (cf. Freixas and Rochet, 1999). Hence, money market negates overall confidence that banks are able to decrease credit risk through their expertise and diversification. Empirically, since beginning of 2000 the indicator passed through three phases: a) section with bank supremacy over non-bank (rates on non-bank issues have been higher than ones on bank issues), b) section where interest rates have been equal, and c) section with reverse supremacy.

This spread essentially is a part of default-risk premium stressing what market has to tell about relative risk of both issuers' type. In the first section, hence, from February to the end of 2000, non-bank sector has been burdened by persistently higher default risk premium. The spread is not so wide but still telling us that banking sector has favorable treatment, namely, that its role in asset quality transformation i.e. credit risk intermediation is still vital. First half of the next year, segment (b), is featured with equalized levels of interest rate charged on bank and non-bank issues, although with statistically unimportant oscillations. This turn out may indicate effects of rigorous asset classification procedure, implemented at the end of 2000. This managed to reveal huge amount of loss, which radically modified Yugoslav banking sector picture of capital adequacy. Further weakening of market position of banking sector came forth during second half of 2001. Interest rates charged on bank issues were rapidly risen. It simultaneously took place with a number of measures intended to banking sector restructuring. NBY, during the period, started to pursue decisively its prerogatives in prudential control and supervision. Until November eighteen licenses have been disposed, the same number of banks have been merged or taken over by larger banks. Additionally, over some banks bankruptcy procedures, resolution or surveillance has been conducted. Abandoning regulative forbearance against banks, what featured 2001, by our opinion, is the main reason for realized swing to negative spread in default-risk premiums. Real-sector restructuring did not follow banking sector restructuring, at least did not in its effects. Probably, this created negative spread, which means that in case of real sector restructuring acceleration, one can expect the trend reverting. Those results testify that relative softness of real and banking sector budget constraints are changed, in favor of banking sector.

*3.3.3 Interest rate spread in Yugoslav banking*

Wong (1997), and Angbazo (1997) have found that credit risk, interest rate and liquidity risk are crucial determinants of interest rate spread, apart from operating expenses, and debt to capital ratio and bank market position. Have a look on data, which can be used to assess interest spread of domestic banking. Figure 6 gives evidence that interest spread became wider since November 1995, exactly when interest rate liberalization formally started. The peak was reached on April 1996 and since then it kept decreasing.

The loan to deposit rate spread narrowing, appeared in 1998 and 1999, became aftermath of interest rate regulation, as the first by 'Codex of banks' behavior' (July 1998) which was followed by direct interest rate ceiling associate with rigorous portfolio regulation, implemented during the war and kept so long after that.

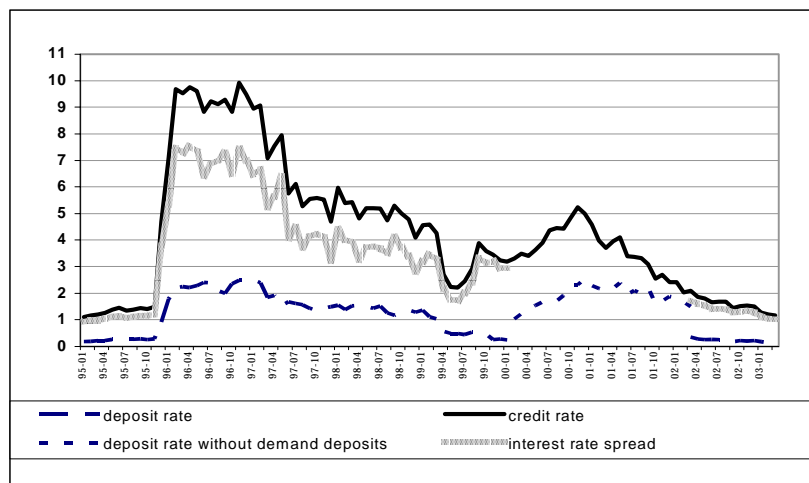


Fig. 4. Banking system FRY: interest rate spread

Data sources: National Bank of Yugoslavia Bulletin

Described interest spread dynamics is the main determinant of the banking sector net interest margin. Those variables are different mostly due to influence of non-interest bearing assets (obligatory and excess reserve), which, as a rule, makes regularly net interest margin lower than interest spread. Comparing dynamics of those variables came up to theoretically reasonable extent of coincidence, regardless mentioned methodological shortcomings related to weighted deposit rate calculations. Average (unweighted) interest spread, p.a. is persistently above estimated value of interest margin, which could be associated to influence of non-interest bearing asset and to mentioned methodological mistake. If we look at the extreme points of interest rate spread wide oscillation appears. Regarding lower deposit rate variability the spread dynamics are mostly derived from loan rate dynamics. The peak was reached on April 1996, immediately after its enormous increase driven by liberalization, (November 1995) and it is 7.54 per cent p.m. (139 per cent p.a.). Minimum spread (abstracting for interest-rate control periods) was on May 2002. Restructuring efforts conducted during last two years succeed making interest rate spread narrower than 1.41 per cent (p.m.), i.e. 18.29 per cent (p.a.). Decreasing of loan rate comes along with credit rationing, indicating on hardening banking sector budget constraint.

## 4. CONCLUSION

This study reveals that numerous interest rate indicators are proved as extremely informative in explaining financial crisis phenomena both in theory and in the concrete case as well.

Dealing with the Yugoslav crisis, we made sure that banking crisis signs could be derived even as early as the eighties. Anyway, the interest rates started to liberalize since 1995. Since that time, we have been able to follow signs of crisis. Since October 2000, all indicators witness persistent improving of both the banking sector and the financial market. However, figures alone, in absolute numbers, present an unambiguous sign of a continuing financial disturbance.

The monetary and banking reform had a positive influence in the financial area while the still slow output increase should be attributed to the fundamental weaknesses of the economic system of FR Yugoslavia. The extent, to which real economy has been revitalized during the first couple of months, is a reliable indicator of real economic costs caused by monetary instability. At the same time, the achieved output level ought to indicate to policy makers where the ceiling of economy that has not rebuilt its structure is.

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## **JUGOSLOVENSKA FINANSIJSKA KATASTROFA 90-IH:**

### **Da li je dinamika kamatnih stopa ukazivala na ishod**

**Srdjan Marinković**

*U radu se detaljno obrađuju obeležja jugoslovenskog finansijskog sistema u 1990-im i analiziraju uzroci i posledice finansijske krize kroz koju je prošlo jugoslovensko društvo. Istraživanje otkriva da se jedan broj kamatnih indikatora potvrdio kao izuzetno informativan kod objašnjenja konkretne finansijske krize. Analiza je obavljena uz osvrt na najnovija teorijska dostignuća u finansijskoj teoriji, tj. paradigmu asimetričnih informacija, tako da se može smatrati jednim od pravaca za implementaciju te paradigme.*

*Ključne reči: bankarska kriza, dinamika kamatnih stopa, kriva prinosa, premija kreditnog rizika, asimetrija informacija*