FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH*

Velimir Šonje**

1 INTRODUCTION

Literature which examines the relationship between financial development and economic growth raises more questions than it answers. Still, it has no dilemmas regarding the existence of a positive correlation between financial development and economic growth.[1] This empirical study also confirms this fact. Controversies arise over the factors that determine the strength of the relationship between financial development and economic growth, and over the ways of shaping government intervention, if any, in order to establish and reinforce the positive relationship between financial development and economic growth. There are various theoretical models which provide different answers to these questions.

This paper deals with the issues concerning the relationship between financial development and economic growth which are important at this moment of development of the Republic of Croatia. Some issues are not included

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* *This paper was originally published in* ***Economic Trends and Economic Policy (Privredna kretanja i ekonomska politika)****, 1999, No. 73, 241-280.*

** *Velimir Šonje, Raiffeisenbank Austria d.d. Zagreb.*

[1] *Goldsmith (1969) was the first who convincingly proved the existence of this relationship. All subsequent studies confirmed it (see for example King and Levine, 1993, and the review in: Pagano, 1993). Goldsmith used a sample of 35 countries for the period between 1860 and 1963 to show the relationship between income and financial depth measured by the ratio between bank's assets and GDP. He also showed that in periods of rapid growth, financial depth grows faster than income. More details about measuring financial depth can be found in this paper.*

here since their theoretical elaboration is insufficient, their empirical results are questionable and they are of relatively small importance to our financial system. This refers primarily to the role of new financial instruments, to non-banking intermediaries, and to the role of equity market. We do not imply here that these intermediaries are not important for Croatia, or that they will not have an important role in the financial market in the near future. Actually, in the years to come, their importance will grow faster than that of banking intermediaries, as there is a rule which states that with higher level of economic development non-banking intermediaries (insurance companies, investment funds, etc.) increase their share in the financial service market. However, only in 5-10 years can we expect these intermediaries to reach a significant portion of the current intermediary role of the banking sector. At this moment, Croatia is a typical moderately developed country when it comes to the intermediary role of the banking sector, but as far as non-banking financial intermediaries are concerned, it is still at the level of underdeveloped countries.[2]

The first part of this paper analyzes the relationship between financial development and economic growth in a simple financial environment. Money is the main form of savings, banks are the only financial intermediaries, and the banking market, i.e. deposit and credit market, function perfectly. In the second part of the work we introduce an assumption of imperfect functioning of the market, which results in market failure. Here we analyze the relationship between financial development and economic growth in a situation in which the market failure reaches dimensions which cause a banking system crisis and introduce the need for its constant control through government intervention. This part deals with bank supervision and deposit insurance. The third part of the work deals with institutional solutions which could help establish and reinforce a positive correlation between financial development and economic growth in Croatia.

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[2] *Based on the data from Levine (1997), a range of different financial indicators was calculated for Croatia in 1997 using the same indicators applied in 1990 study for less developed, moderately developed and highly developed countries. With an approximate 14 percent share of central bank assets in GDP, Croatia resembles a feature of a highly developed country (as the average share of less developed and moderately developed countries is around 30 percent). With the ratio of commercial bank assets in GDP reaching 74 percent, Croatia is a typical moderately developed country (in 1990, highly developed countries averaged 160 percent). However, since the ratio of market capitalization of the Zagreb stock exchange in relation to GDP is 23.3 percent, and the stock exchange transactions turnover in Zagreb and Varaždin Stock Exchanges reached 2 percent of GDP in 1997, Croatia belongs to the group of less developed countries. In 1996 income of the insurance sector reached about one third of the income of the banking sector, while the assets of the former accounted for about 3 percent of GDP or approximately 5 percent of the banking sector assets. Therefore, this paper will not pay special attention to the analysis of the insurance sector.*

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SIMPLE MODELS WITH A PERFECTLY FUNCTIONING BANKING MARKET

According to Schumpeter (1912; quoted in Levine, 1997) economic growth was a product of interaction between financial and real innovations. John Hicks (1969, quoted in Levine, 1997) held a similar view, stating that finance played a crucial role in industrialization of the now developed countries. However, research into dynamic forces that are active in the long run was expelled from the mainstream economic thought during most of the 20th century. This happened due to the influence of John Maynard Keynes, a theorist of short-term fluctuations and crisis. According to Keynes, growth (or more precisely, short-term cyclical boom in economic activity) was primarily a product of a country's ability to maintain the interest rate at a level sufficiently low to stimulate investment.[3]

Although every reduction of complex systems of ideas to their main assumptions necessarily falls into a fallacy of superficiality, we can still say that Keynes' view of the financial system was based on the so-called paradox of thrift. Economists got to know this idea from Boisguillbert,[4] and Keynes reinterpreted it in the light of price rigidity: high interest rates attract savings, but discourage investments; a decrease in investment lowers real income, and smaller income means less savings; income decrease has a stronger effect than an increase of interest rates, so eventually inventories are accumulated, the surplus of supply is created, as well as deflationary pressure and recession, due to downward price rigidity.

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[3] *Keynes analyzed only the short-term effects, thus neglecting the role finance have in the long run. He subjected financial markets to government intervention, i.e. to the government controlled aggregate demand. This approach resulted from his belief that private financial markets, particularly the stock markets, are the destabilizing factor of modern capitalism. (He used the term "animal spirit" to describe investment activities in those markets). Therefore, it is not surprising that Keynes' followers regarded the financial sector as secondary, emphasizing the primary relationship between growth and "real" entrepreneurship (Robinson, 1952, p. 82, in Levine, 1997, p. 688).*

[4] *Boisguillbert, Becher alongside Quesnay are significant names of the school of physiocrats. Owing to the faith in the functioning of a free market (shared by all the physiocrats), Boisguillbert drew on the same assumptions as Keynes did a century and a half later, to reach completely different conclusions. According to Schumpeter (1975, p.235), Boisuguillbert warned about the barriers that the government sets on circulation of income: taxes, export customs, and regulatory intervention in agriculture and industry.*

The recession scenario shown above assumes a closed economy where gross investment equals national savings (simultaneous internal and external equilibrium), money has no substitute, and the banking market functions perfectly. The equilibrium interest rate ensures stationary equilibrium in the money and credit markets. As money has no substitute, the accumulated reserves are "sterile", i.e. they cannot perform any monetary function. However, if money had a substitute, an increase in money interest rate would stimulate the use of alternative quasi-monetary assets and recession could be avoided.

"Inside" money, i.e. the money created by the banking system in the process of money-credit multiplication, would be an obvious substitute for "outside" or reserve money. Furthermore, if inside money is considered as an institutional innovation in the sense in which Schumpeter saw it, it can be viewed as complementary in the process of capital accumulation. Actually, it can be demonstrated that the Keynesian scenario need not occur if "inside" money is present, i.e. if there is a developed banking system. The same situation can occur in conditions where financial innovations (liberalization) allow for various currencies in asset portfolio, including the quasi-monetary forms.

Besides the sensitivity to changes in theoretical assumptions regarding money, the post-Keynesian theoretical innovations were encouraged by the fact that it is not possible to conclusively prove a negative correlation between the interest rate and GDP, especially in the long run[5]. Therefore, Keynesian economists analyzed the monetary transmission mechanisms along other lines, which Keynes would find unacceptable if judged by his "Treatise on Money".[6] They have come up with a result, today known as Tobin's effect (Tobin, 1965). It maintains the assumption that money and physical capital are the only assets. Reserve money is the only money. An exogenous increase in the money supply

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[5] *Blanchard and Fischer (1992, p. 18) calculated the coefficient of linear correlation between the residual of ARIMA process for quarterly GDP and the same process for interest rates (with US government bonds with a maturity of three months, which most empirical studies take as the relevant interest rate). The current correlation is positive (0,14), but not very far from zero. The correlation disappears after a quarter (-0.01); reaches its maximum after two quarters (0.30); but starts decreasing again in the third quarter (-0,14). Using a more recent technique of structural vector auto-regression, Bernanke and Blinder (1992) found there was a short-term impact of interest rates on unemployment, but in the long-term this impact disappeared. The results are valid for the United States of America, and the short-term here refers to two years. Therefore, the results of Bernanke and Blinder can be interpreted as a proof that the monetary policy of the US is efficient in the short run. Friedman and Kuttner (1992) obtained a similar result for interest rates measured by the spread between interest rates on commercial bills and government bonds. However, all these results are valid only for a large and closed economy, such as that of the USA.*

[6] *In "Treatise on Money", Keynes clearly states that inflation is not desirable, as it can threaten to destroy the functions of money.*

causes an increase in prices. The increase in prices increases the opportunity cost of keeping the money, as well as the expected yield on investment. Thus, monetary expansion stimulates substitution of money for physical assets. Investment demand and income increase. In this way the transmission mechanism which functions through nominal interest rates is substituted by a transmission mechanism which functions through inflation.

It is possible to see Tobin's effect functioning in two ways. In literature, the first mechanism is known as "money rain": reserve money comes from nowhere, as if employees of the central bank were throwing packages of cash at people on the street. The second mechanism is fiscal intervention: the government spends collected inflation tax on public investments.

Tobin's effect depends on a rapid substitution of money with capital goods in the portfolio and on the assumption of a closed economy. If we think of the real portfolio of money substitutes with a bit of more imagination, we can no longer be certain about the result. If we assume that the portfolio contains money substitutes denominated in foreign currency, inflation could stimulate the demand for it (and a depreciation of the exchange rate), before influencing the change in the demand for capital goods. The same effect can appear with the opposite sign: deflation need not cause a decrease in demand for capital goods as its effects will be depreciated by an increased supply of assets in foreign currency (with an appreciation of the exchange rate). Therefore, with a richer portfolio and opening up of the economy, the external sector and its related financial instruments can absorb internal shocks thus annulling the Keynesian effect (or at least making its explanation far more complex).

At this point of our analysis we will introduce inside money created in the process of monetary-credit multiplication. According to Gale (1983), this minor variation of assumptions can create the "anti-Tobin's effect". Namely, a part of the money supply created in the process of multiplication is not created through substitution of capital goods with money, but through an increased demand for capital goods financed by bank credits. If we only observe new debtors who have both money and capital goods in their portfolio, we might notice Tobin's effect: inflation stimulates them to substitute their demand for money with demand for capital goods. The old debtors, however, who borrowed money before in order to invest in capital goods, now demand more money in order to pay back their debts, so the substitution of money with capital goods need not appear on the level of national economy.

The thesis regarding inside money, which is created as a complement in the process of capital accumulation, and not as an asset substitute of physical capital, is typical of the so-called "Stanford school of financial development" (Gurley and Shaw, 1960). If viewed in that light, the role of interest

rates can be contrary to the one it plays in the Keynesian models. One can imagine how an increase of deposit interest rates could stimulate an inflow of bank deposits (savings). If banks perform their role of financial intermediaries well, a positive effect on savings, on investment and on growth will be seen. Furthermore, McKinnon (1973) showed that a small variation of assumptions can confirm this result even when there is no inside money. His model functions in the following manner: the absence of inside money means that investments are financed from internal company sources. Therefore, entrepreneurs have to accumulate outside money before they start investing, hence the correlation between the growth of physical capital and real money, which is present in conditions of high (real deposit) interest rates. That is why McKinnon considered the relationship between ratio of investments to GDP (I/Y) and real deposit interest rates to be bell-shaped (Mihaljek, 1993, p. 730). He also emphasized that the optimal real deposit interest rate can be even higher than the one with which the ratio of I/Y reaches its maximum, if a variable of investment quality which grows simultaneously with real deposit interest rate, is introduced into the model. On the other hand, low interest rates and a high and variable inflation cause financial dis-intermediation and recession. This effect is known as McKinnon's hypothesis of "financial repression".

The models presented above assume a closed economy and perfect functioning of the banking market. Therefore, there is no need for explicit modeling of the financial intermediaries' market. Differences in results arise due to differences in assumptions. In the Keynesian models money is a part of the assets portfolio and has no close substitute. Entrepreneurs rely on external sources of financing. The transmission mechanism of monetary policy works through: monetary expansion - decrease in interest rates - growth of investment and income[7]; or through: monetary expansion - growth of inflation - substitution of money demand for capital goods demand - growth of investment and income[8]. The

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[7] *Since the end of the 1970's, the relation between money and income has weakened (either because of change in the speed of money circulation, or other new money substitutes - not included in the definition of money aggregates - have begun to perform the functions of money). However, this does not imply that a Keynesian mechanism of monetary transmission is not operational. The only difference is that the role of money aggregates can be considered insignificant in comparison to a role of the interest rate (Bernanke and Blinder, 1992; Friedman and Kuttner, 1992).*

[8] *In the USA, Blanchard and Fischer (1992) found a weak and negative correlation between innovations of price level and GDP level, and a positive one, though weak, when the variables are shown in the form of the first differentials of natural logarithms (the innovation is residual, i.e. irregular component of the univariant time series ARIMA model). The assumption that inflation can be viewed as an exogenous variable whose manipulation can influence real output, has now been mostly rejected. Real output and prices are two endogenous variables that react to exogenous shocks*

functioning of these transmission mechanisms can be questioned if existence of a greater number of various assets, including close money substitutes, is allowed, or if one views money accumulation and capital goods accumulation as complementary (Stanford school of financial development). This complementarity can appear due to the correlation between creation of internal money and the process of investment (Gale), or due to the need for money accumulation before investment in the self-financing model (McKinnon).

2.1 Indirect investigation of the transmission mechanism through money demand functions

Before the appearance of structural vector auto-regression models, which have only been used for the past five to six years, the proof of functioning (or more correctly: of a possibility of functioning) of the Keynesian transmission mechanism through interest rates, was searched for through evaluation of money demand functions such as $m = f(y,i)$, where m is real money, y is real income, and i is nominal interest rate or some other measure of opportunity cost of holding the money. If the existence of a statistically significant elasticity of money demand with nominal interest rates could be demonstrated, it would follow that nominal interest rate could be decreased with the intentional creation of a money supply surplus. If this is included in a structural model of the IS-LM type (with or without extensions for the external sector), where the IS function which shows the negative relationship between investment and interest

simultaneously, and economists research various forms of these reactions through structural vector auto-regression models. Gerlach and Smets (1995) used this technique to compare monetary transmission mechanism in the G-7 countries. A simulation of the influence of a 1 percent growth of nominal short-term interest rate through a SVAR model has demonstrated the existence of a short-term impact on real output (which ranged from the minimal -0,5 percent in Italy after 9-10 quarters of a year, to the maximum of -1,5 percent in Germany and Japan after the same time period), where each impact on the real output disappeared after 6-7 years in all of the G-7 countries which the authors considered stable. However, the impact on deflation turned out to be permanent, with certain countries even reaching inflation in the initial short-term period. In Italy it lasted 6 quarters after interest rates had been raised, 7 in France, and as many as 10 in the United Kingdom. Therefore, these results show different movements of real GDP and prices, depending on the country observed and the time interval that elapsed since the appearance of the exogenous shock. It is possible that there is simultaneous appearance of inflation and a decrease of GDP, of deflation and of a decrease of GDP, or of deflation and an increase of GDP, so there are no indications of inflation and output being connected in any way through a simple cause and effect relation.

rates[9] plays an important role, then a transmission through interest rates is possible if full employment is not present in the economy. Of course, this is just a possibility.

The approach to transmission mechanism based on money demand entirely neglects the structure, the level of development, and the way in which financial markets function. The relationship between a financial system and growth is viewed exclusively through price variations (the price of goods in Tobin's model or the price of money in the original model) which can be stimulated through government intervention. This type of approach directly follows the assumption that the financial market functions perfectly, so in every moment there is a unique and well defined interest rate which equalizes savings and investments.

During the 1960's, few functions of money demand were estimated correctly. Estimates, such as the one shown here, by Meltzer (1963, p. 225), based on yearly data from 1900 to 1958 for USA, where W is wealth (w is the real wealth), m is real money, i is the nominal interest rate, and t-tests are shown in parenthesis below the actual parameters, were very rare. All these rare estimates pointed to a possibility of functioning of the Keynesian mechanism of monetary transmission. Having in mind the level of development of econometrics at the time (the beginning of 1960's), there was little room for doubt:

$$(1)\quad \ln m = -1.48 - \underset{(-21.8)}{0.949} \ln i + \underset{(42)}{1.11} \ln w \qquad R^2=0.992$$

During the 1970's and 1980's, the old models of money demand began to systematically show great forecasting errors for the stock of money in circulation ("the case of the missing money"), and the financial liberalization which widened the range of financial assets in the portfolio began to cause problems because of the role interest rate played in estimations[10]. Dynamic models of money demand were developed which successfully solved a part of the evaluation problem in developed countries (Filosa, 1995). At the same time, a large number of research into money demand in developing countries appeared, which pointed to the instability of the evaluation and to a small or non-existent role of nominal interest rate in the money

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[9] *If investments do not depend on the interest rate, the IS curve is vertical, so the movements of the LM curve have no effect on income, but are completely reflected in the changes of the interest rate.*

[10] *It can be noted that this is in accordance with theoretical elaboration. Let us just remember that the Keynesian effect becomes questionable when we allow for the existence of a greater number of money substitutes in the assets portfolio, which is exactly what happens in the processes of financial liberalization and financial innovation.*

demand function (Anušić, Rohatinski and Šonje, 1995). This apparently confirms the conclusion that proper functioning of the Keynesian transmission mechanism requires a developed market of domestic public debt, a central bank which regulates the money supply through open market operations and a certain level of limited substitution between various forms of assets, as these conditions allow for more significant variations of the interest rate, which can have an effect on the real output. However, these assumptions (especially the first two) are not valid for most developing countries.

A problem with the role of interest rates in developing countries (explained by the lack of developed public debt market) arises due to the domination of direct loans to the government by the central bank, i.e. due to the transfer of substantial seigniorage of central banks, collected through inflation tax. There is no good side to this, since such a system threatens with inflation and does not allow for fine-tuning of money demand through open market operations.

It is important to note that this conclusion assumes a correction of the quasi-Keynesian thinking shown through Tobin's effect. This thinking is closer to Keynes' original thoughts which did not tolerate high inflation, but was based on the important role of government's corrective role. It is noted here that inflation and inflation tax prevent the development of public debt market, without which transmission through interest rates becomes impossible. If there is a developed government debt market, the government can issue debt, the central bank can intervene through purchases in that market in order to prevent the growth of interest rate (or encourage its fall), and the government can then finance investments and stimulate growth with accumulated funds. This approach has a built-in inflationary bias, but it does not need a central bank which would only take care of price stability. The monetary authority needs to be either subordinated to fiscal authority, or should have an especially adjusted objective which would take care of unused capacities and buy government debt until an inflationary threat arises. An "enlightened government" is also needed which refrains from the placement of funds collected in this manner into consumption, and spends seigniorage on investments. This will have a greater return in the long run than alternative private investments (so that crowding out private investments in favor of government investments, in the long run brings about net social benefit.)[11]. Finally, we should also note that this approach assumes the public debt market to be the main transmission mechanism of monetary policy, where the role of the banking sector can be neglected.

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[11] *It is very uncertain whether any government can allocate resources efficiently. Most economists believe that history has showed, judging by the experience of most countries, that the answer is negative.*

Can we come to a direct conclusion regarding the nature of the functioning of the monetary transmission mechanism based on the behavior of the money demand in Croatia? I believe that on the basis of the results known to us so far, we can conclude that the Keynesian mechanism of monetary transmission does not function in Croatia. In the first evaluation of the money demand function in Croatia,[12] Anušić, Rohatinski and Šonje (1995) found an almost unitary income elasticity of money demand (0.98) and a very weak interest rate elasticity (-0.07) which, although being somewhat greater than the typical interest rate elasticity in developing countries, is still significantly smaller than the interest rate elasticity of money demand in developed countries. According to their results, a demand for real money demonstrates the greatest sensitivity to the monthly rate of inflation.

The sensitivity of money demand to inflation has been obtained through the use of the same method[13] applied on the data for the period between March 1992 and March 1997 (Šonje, 1997)[14]. This indicates a possibility of a permanent and stable influence of inflation. According to Anušić, Rohatinski and Šonje (1995), the inflation parameter was -0.7589 while according to Šonje (1997) the same parameter was - 0.7543 in the equation which included depreciation rate as a ratio of opportunity cost of holding the money; or -0.8254 in the equation which included interest rate as a ratio of opportunity cost of holding the money. However, the results from the 1997 study and the results from the 1995 study conducted by Anušić, Rohatinski and Šonje, had significantly different values for other variables. In the 1997 study, the inertia parameter was smaller at 0.6883, or 0.6997 in the second equation, while Anušić, Rohatinski and Šonje found this parameter to be 0.8857. Together with a greater short-term income elasticity (0.41 in the 1997 study compared to 0.112 found by Anušić, Rohatinski and Šonje), the long-term income elasticity[15] from the 1997 evaluation was 1.31 in the first and 1.37 in the second equation, while Anušić, Rohatinski and Šonje found it to be 0.98. However, when it comes to interest rates, there is an even greater difference in the results. Interest rates became statistically significant only when they reached the level of significance of 20 percent which is usually considered insignificant.

Furthermore, the mentioned 1997 study evaluated the nominal partial adjustment model, in which the price level was explicitly included on the right-hand side of the equation, as an explanatory variable. The results obtained

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[12] *The evaluation refers to the period between January 1991 and October 1994.*

[13] *Partial adjustment model - PAM.*

[14] *Detailed results of the study have never been published and are thus included in the Appendix to this paper, in Table A2.*

[15] *The value of the long-term parameter is obtained by dividing the short-term parameter by one minus the inertia parameter.*

were interesting. The inertia parameter did not change when compared to the evaluation of the real money model. The long-term price level parameter was very close to one, proving the unitary price elasticity of demand for nominal money. The income elasticity increased slightly, reaching a value of approximately 1.4. The parameters of other variables decreased and lost some statistical significance: with inflation in the first equation the parameter was -0.2088, while with the second equation it was -0.1747. Interest rate and depreciation rate parameters were not significant even at 20 percent level.

Therefore, inflation leads to demonetization (a decrease in real money), which indirectly denies the possibility of transmission through Tobin's effect, since it is difficult to imagine a longer period in which real money decreases or stagnates, and investment and GDP rise. Due to the lack of a more significant role of interest rates the transmission through interest rates is also uncertain. In the case of Croatia, these facts can be explained if we look at how the public debt market and the banking sector have been developing.

After 1993, there were two parallel processes in Croatia: the process of consolidation of public finance and the process of rehabilitation of the banking sector. Up to the beginning of the 1990's and in the first two years of war, public and banking sectors did not have clearly differentiated functions. A weak tax administration, a chaotic taxation system with too many tax rates differentiated according to criteria which were not clear, together with high inflation, limited the government's ability to collect funds for public spending and to stabilize the fiscal system. The banking system served as an alternative source of financing for the realization of the country's objectives. Since 1993, especially after the high inflation was reduced, the fiscal function began to separate itself from the function of banking intermediation. With the development of tax administration, significant growth of economic activity and the resultant growth of the tax base, and due to the Oliver-Tanzi effect[16], government revenues started to recover quickly, eliminating the need to use the banking system as a quasi-fiscal instrument. Furthermore, in 1994, the country recorded a fiscal surplus which allowed for fiscal financing of the rehabilitation of banks whose credit policies, during the years, were not governed by economic criteria, thus accumulating large amounts of bad debts on their balance sheets. In such conditions, the main goal of economic policy creators was to decrease the dependence of banks on the government, which can be seen in the ratio of the claims on the government in the total assets of the banking system. At the end of 1993, as much as 42.2 percent of the total assets of commercial banks in Croatia were concentrated in claims on the government, and most of these were not tradable ("old foreign currency savings"). For comparison,

[16] *Anušić, Rohatinski and Šonje (1995, p. 92-96).*

the Czech Republic had the same ratio for the same year at 6.7 percent, Poland had 26.5 percent, Hungary 25.4 percent, Mexico 20.1 percent, Slovenia 23.6 percent, USA 12.7 percent, Germany 13.1 percent and Austria 18.8 percent (IMF, 1998). Most of these countries could trade their public debt freely, which means that one could "read" its price on the market, as well as estimate the yield for each new issue of government debt. In Croatia, such market could not start to develop at the end of 1993 nor in 1994, due to the already described high exposure that the banks had towards the government. The amount of bank claims on government, which was twice the amount that could be considered "normal" for a transition country in 1993, was an accumulated expression of the "perverted" nature of the system which functioned by using bank's depositors' money for government needs, instead of tax payers' money. It should be emphasized that this system was established during the period of the so-called self-management socialism, which was not economically and politically sustainable and thus contributed to its own downfall.

When in July 1996 the first issues of short-term treasury bills appeared, the interest rates that the Ministry of finance had to accept at auctions was much higher than the interest rate for loans available abroad. Furthermore, long-term domestic debt market was practically non-existent, as there was no demand for it. In such a situation, the only rational solution was to borrow from abroad and decrease the net debt towards domestic banks[17]. The domestic market had structural obstacles which defined the level of interest rates. These structural obstacles came from the banking sector, and the three most important of them were:

a) the already mentioned great initial exposure of banks towards the government,
b) inefficiency of banking intermediation (compared to the volume of transactions, the costs were too large),
c) a large portion of bad assets in the placements to the private sector and non-existence of the market for claims on government.

We shall pay special attention to banks later on. It is obvious that the monetary transmission mechanism cannot act merely through the public debt market or exclusively through the deposit and credit market (through the banking system). Both market segments are parts of an entire financial market. Both have an impact on each other, and they stimulate or hinder each other's development. Therefore, the transmission mechanism approach which emphasizes transmission through the public debt market, can be seen as incomplete. In what follows, we focus on banks.

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[17] *Which was accomplished.*

2.2 Examination of the relationship between financial depth and the level of development in transition countries.

One of the main indicators of financial depth, also the best defined and easiest to measure, is the ratio of commercial bank assets to gross domestic product. The values of this indicator for transition countries are given in Table 1. The same ratio was used by Goldsmith (1969) in the first study which managed to prove the relationship between this ratio and income (GDP per capita). Later studies confirmed this result (Pagano, 1993). Furthermore, Goldsmith (in Levine, 1997) demonstrated that in periods of rapid growth the ratio of financial depth grows faster than income, which was also confirmed by other studies. There are also studies which demonstrated, through the use of alternative indicators of financial depth (money, quasi-money and other interest bearing liabilities towards GDP, as well as credits of the private sector towards GDP), that the initial ratio of financial depth is a good forecast of income growth in the next three months (King and Levine 1993). Therefore the study of these ratios represents a crucial analytical tool for the examination of the relationship between financial and economic development.

Transition countries in Table 1 are ranked by the main indicator: the ratio of commercial bank assets to GDP in 1996. The Czech Republic and The Republic of Slovakia are ranked higher than other countries due to historical reasons (the high ratio existed at the beginning of the transition). Croatia, Slovenia, Poland and Hungary follow suit, while other countries have a significantly lower ratio of financial depth and are at a lower level of development measured by GDP per capita. The same conclusion is also valid for the ratio of private sector credits to GDP. Furthermore, almost the same result is valid if financial depth is measured from the liabilities side, i.e. through ratio of the most widespread money aggregate M3/GDP. The difference between the advanced group with Hungary at the last place, can be clearly seen in comparison with the second group led by Latvia. The M3/GDP indicator of financial depth is greater for Hungary and Poland than for Slovenia and Croatia. This can be explained by the peculiarities of Slovenia's and Croatia's "old foreign currency savings", whose exclusion from the measure of monetary aggregate M3 causes an artificial decrease in the M3/GDP ratio when compared with other countries. Finally, if we examine the ratio of the private sector credit to GDP, the countries are again ranked in the same order as they were when the ratio of bank assets to GDP was examined.

Simple regression results shown in Table 2 confirm the hypothesis regarding the relationship between financial and overall development in transition countries. In all the regressions GDP per capita played the role of the dependent variable[18]. The independent variables are shown in columns with t-test results in parenthesis below the parameters.

The constant member was included in the regression because of a possibility that even with zero ratios of financial depth, income can still be present. However, in all the regressions it is close to zero, which indicates that in transition countries income cannot appear without financial intermediation (and vice-versa): financial development and growth occur simultaneously and in parallel.

The strongest connection exists between economic development and the ratio of private sector credit to GDP. A one percent increase in this ratio for any country can be expected to result in a GDP per capita increase of 92.4$. Influence of other financial ratios is much weaker. If we use a binary variable (HRVSLO) to remove the mentioned measurement error which arises due to exclusion of the "old foreign currency savings" in Croatia and Slovenia, the value of the parameter in the M3 equation is diminished, indicating that inclusion of Croatia and Slovenia in the sample greatly contributes to the strength of the relationship between financial depth and development for the whole sample.

[18] *GDP per capita was also calculated for 1996 based on the data from IMF IFS, February 1998.*

Table 1.

INDICATORS OF THE FINANCIAL DEPTH AND CHARACTER OF FINANCIAL SECTOR FOR 15 TRANSITION COUNTRIES IN 1996

Country****	GDP per capita	Assets*/ GDP	M3/ GDP	Private**/ GDP	Assets***/ GDP	Credits***/ GDP	Quasi money/ M3	GDP/ M1	GDP/ M3
	in US$	in percentage							
Czech Rep.	4500.0	117.1	81.7	62.2	32.2	0.0	60.9	3.1	1.2
Slovakia	3512.0	84.8	70.6	31.7	31.4	5.2	57.7	3.4	1.4
Croatia	4323.0	63.6	34.5	29.5	12.5	0.2	68.7	9.3	2.9
Slovenia	9493.0	63.4	38.0	28.1	14.1	0.6	79.8	13.0	2.6
Poland	3490.0	59.7	47.2	19.6	26.8	4.5	63.4	5.8	2.1
Hungary	4239.0	58.3	42.3	22.5	56.0	20.3	56.2	5.4	2.4
Latvia	1935.0	37.9	24.3	7.6	16.8	0.8	35.4	6.4	4.1
Estonia	2864.0	36.0	27.0	18.1	15.5	0.0	23.8	4.9	3.7
Mongolia	319.0	26.1	22.4	11.2	20.4	7.3	49.1	8.8	4.5
Moldova	416.0	20.0	16.7	7.0	23.5	5.3	30.5	8.6	6.0
Belarus	1132.0	19.4	15.2	6.8	12.7	4.8	42.5	11.4	6.6
Lithuania	2116.0	19.4	17.2	10.8	11.1	0.0	33.2	8.7	5.8
Russia	2983.0	16.5	16.3	7.4	13.6	8.3	46.2	11.4	6.1
Ukraine	850.0	11.7	11.6	1.4	13.4	7.7	32.5	12.7	8.6
Armenia	404.0	8.8	8.3	5.6	15.7	4.2	26.6	16.5	12.1
Average	**2838.4**	**42.8**	**31.6**	**18.0**	**21.1**	**4.6**	**47.1**	**8.6**	**4.7**

** Total commercial banks' assets (all ratios based on the nominal data in national currencies).*

*** Private sector credit as defined by IFS (International Financial Statistics) methodology.*

**** The central bank assets. The data for Croatia differs from the one specified in footnote 2 by 1.5 percentage points because the latter one refers to 1997 while the former one refers to 1996.*

***** Credits of the central bank to the Government.*

****** Bulgaria Tajikistan and Turkmenistan have not been analyzed because they did not submit reports to IMF for the period of analysis. Romania was excluded because of unreliable indicators of credit (no credits to private sector) and GDP. Albania, Kazakhstan and Azerbaijan are not included, because of unreliable or unavailable data on GDP. The GDP for Moldova for 1996 was calculated as the GDP for 1996 increased by the inflation rate (retail prices), and the expected rate of change of real GDP from UN Commission for Europe: Economic Survey of Europe in 1996-1997. GDP per capita for Czech Republic, Hungary, Poland, Slovakia, Slovenia, Russia and Ukraine was taken from Central European Quarterly IV/97. Vienna: Creditanstalt. The overall GDP for Hungary for 1996 in forints was estimated on the basis of this data. Other data for Hungary refer to 1995, so the ratios for Hungary should be interpreted with reserve. They could be slightly underestimated. GDP per capita for the remaining countries was calculated on the basis of the IFS data. by applying the average annual exchange rate of local currencies against USD.*

Note: the monetary aggregate M3 that is used in the table represents a sum of money and quasi-money. It includes foreign currency deposits. It is comparable to our M4 when money market instruments and bonds are deducted from it.

Source: The author's calculations based on International Financial Statistics, February 1998, Washington: IMF.

Table 2

RESULTS OF INCOME PER CAPITA REGRESSION FOR FINANCIAL DEPTH INDICATORS FOR 15 TRANSITION COUNTRIES

	Constant	Assets/ GDP	Private/ GDP	M3/GDP	HRVSLO	R^2 adj.	F
Equation 1	761.98 (0.89)	48.46 (2.96)				0.40	8.75
Equation 2	1178.49 (1.50)		92.39 (2.76)**			0.37	7.61
Equation 3	986.05 (1.01)			58.71 (2.27)**		0.28	5.16
Equation 4	599.79 (0.9)			52.30 (3.05)*	4412.26 (4.21)*	0.71	14.76

Note: The figures in parentheses below the parameters are the t-test values.
**significance level 1 percent*
*** significance level 5 percent.*

In the Appendix, the reader can find the same indicators of financial depth for 66 "non-transition" countries in 1996. Econometric estimates for these countries. comparable to the estimates for transition countries. are shown in Table 3. The estimates differ substantially. The first difference occurs at the substantially positive constant in the first equation. When compared with the other two this equation confirms that the impact of the overall bank assets is the smallest. The same result has been obtained for transition countries. However. the statistically significant constant of USD 4,136 per capita makes no economic sense, so the estimate can be considered as unreliable (because such a high income per capita cannot exist without a banking system). The second difference concerns much higher values (and also higher values of statistical tests) of the parameters with participation of the private sector credit and M3 in GDP compared to transition countries. The estimates can be considered reliable because of the t-test values and because constant members do not substantially differ from zero. The third difference is reflected in the fact that for this sample the M3 parameter has a higher value than the private sector credit parameter, while for transition countries it is the other way round. The fact is that only the third equation substantially deviates from the results of other research (Levine 1997; see below)[19]. It can be assumed therefore that it was this estimate that the problem of omitted variables affected the most. Another relevant explanation is the one taking into account the nature of the mechanisms of monetary transmission. In the sample

[19] *Normally, the impact of credit on the private sector is stronger than that of a wide monetary aggregate.*

of 66 countries there is a large number of countries with a stable financial-institutional structure and a stable behavior of money demand. This is why there is a narrower correlation between the monetary measure of financial depth and the level of development than in transition countries. This observation is particularly important because it explains why the parameters that go along with credits and the monetary aggregate are so substantially lower in transition countries than in other countries.

Table 3

RESULTS OF INCOME PER CAPITA REGRESSION FOR FINANCIAL DEPTH INDICATORS FOR 66 COUNTRIES (WITHOUT TRANSITION COUNTRIES)

	Constant	Assets/ GDP	Private/ GDP	M3/BDP	R^2 adj.	F
Equation 1	4135.73 (2.14)	74.79 (4.98)			0.279	24.76
Equation 2	477.87 (0.25)		207.61 (7.21)		0.448	51.95
Equation 3	-1444.73 (-0.55)			233.70 (5.49)	0.320	30.12

Note: The figures in parentheses below the parameters are the t-test values.
** Significance levels are not designated because the sample was large.*

With respect to the impact of the private sector credit/GDP ratio on the level of development in transition countries we can draw the same conclusion that was made in other similar research that included a much larger number of countries and a longer period of time (King and Levine, 1993 according to: Levine, 1997). It follows that credits to the government substantially reduce the impact of financial deepening on growth[20] which can be interpreted as a proof of superior allocative efficiency in the private sector. It also follows that not much can be done with monetary expansion alone because the correlation between monetary measure (M3/GDP) and the income per capita in transition countries is questionable. A much stronger relation between this measure of financial depth and the level of development in non-transition countries can be explained with more developed mechanisms of monetary transmission. Therefore we can recommend the following to the creators of economic policy in transition countries:

[20] *If we take into account that credit to government is a substitute to the private sector credit from the bank's point of view.*

countries can achieve substantial economic growth even with substantial limitations of national savings and very imperfect mechanisms of monetary transmission if they manage to relieve their banking systems of the need of financing fiscal deficit. But the question is - what variables of economic policy affect financial deepening (development) and the overall economic development? We are dealing with this question below.

We shall restrain ourselves to a simple regression analysis the goal of which is to establish principal determinants of financial depth. Financial depth is measured by the private sector credit/GDP ratio. One of the independent variables is inflation rate and it is used for indirect testing of McKinnon's hypothesis of financial repression which forecasts the negative effect of inflation on financial depth and economic development. If the inflation parameter is negative, it indicates that the financial repression hypothesis is correct because a high and variable inflation[21] causes financial disintermediation in a banking sector.

The next candidate on the list of independent variables is the real interest rate. If McKinnon's hypothesis of complementarity is correct, the high real interest rate should be in positive correlation with financial depth at least in the case of developing countries.

The next candidate on the list of explanatory variables is the share of the central bank's assets in GDP. King and Levine (1993) proved that this ratio drops with the growth of income and financial depth, so negative value of the parameter can be expected. We should note here that there could be two causes of a negative relation. If there is a positive relation between this ratio and inflation, it indicates that inflation is a mechanism of the transmission of the central bank's high share into a relatively low ratio of financial depth. In such a case a problem of collinearity between the inflation and the ratio of the central bank's assets to GDP can occur. Another transmission mechanism can work through the domestic public debt market. If this market is relatively big and if the central bank plays a major role in it, either by operating in an open market or by direct credit to the government[22], a collinearity may then appear among the independent variables in a regression that would include in its right side both this ratio and the ratio of the domestic public debt to GDP. In this study. we would expect a negative relation between the domestic public debt and financial depth. This relation will not be tested here due to the lack of data.

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[21] *Positive relation between the rate of inflation and its variability has been empirically established. For more on the results for Croatia see: Jurković (1989), Škegro (1992) and Šonje (1993 and 1994).*

[22] *In most of the transition countries it can be expected that the mechanism of direct lending to the government plays an important role, because the domestic public debt markets are not developed enough.*

The results in Table 4 show that in transition countries only inflation has (expected) negative impact on financial depth. A real interest rate does not affect financial depth in any of the estimates presented. The ratio of the central bank's credit to the government to GDP. i.e. the share of total the central bank assets in GDP (equations actually differ by these variables) also does not affect the ratio of financial depth in transition countries. The conclusion on the negative role of inflation can be considered as quite solid because it cannot be affected by a variant of specification when other independent variables are included or excluded.

Table 4

DETERMINANTS OF FINANCIAL DEPTH IN 15 TRANSITION COUNTRIES

	Constant	Inflation	Real negative interest rate	Assets** / GDP	Credits***/ GDP	R^2 adj.	F
Equation 1	30.36 (5.47)x	-0.45 (-2.78)xx				0.32	7.74
Equation 2	32.51 (5.07)x	-0.68 (-2.31)xx	-0.36 (-0.95)	0.41 (0.51)		0.26	2.67
Equation 3	22.47 (2.52)xx	-0.57 (-2.54)xx	-0.34 (-1.06)		0.43 (1.52)	0.38	3.82

Note: The figures in parentheses below the parameters are the t-test values.
The ratio of private sector credits to GDP is used as a measure of financial depth.

* *Annual inflation rate in 1996. Real negative interest rate is calculated as an arithmetic difference between the average interest rate on deposits (Source: International Financial Statistics. IMF) and inflation rate in 1996.*
** *Total the central bank assets.*
*** *The central bank's credits to the state.*
x *Significance level 1 percent*
xx *Significance level 5 percent*

Other variants of estimates have also been tried but they are not presented here because of the bad results that they have yielded[23]. We can therefore conclude that McKinnon's hypothesis of financial repression is obviously correct as far as the repressive role of inflation is concerned, but we have not found any evidence that high real interest rates help deepen the financial markets. Although this estimate should be interpreted with a high level of caution we can safely say the parameter that goes along with a real negative interest rate is also negative (although not significantly). This leads us to a detailed analysis of the role of the negative interest rate in the context of imperfect deposit and credit markets in the following section.

Although this analysis can be criticized for the size of its sample, its method of measurement of variables and a problematic specification (many variables have probably been omitted) that is reflected in low values of the F-test. the conclusion about the negative value of the parameter that goes along with inflation is very solid. The negative sign and the statistic significance of the parameter that goes along with the inflation rate cannot be affected by including or excluding other variables. Since McKinnon's hypothesis of financial repression is applicable here, and not Tobin's effect (by means of high and variable inflation), we can conclude that the best that the creators of economic policy in transition countries can do is the following:

a) minimize the pressure on financing of fiscal deficit through the domestic banking system in order to achieve relatively faster growth of credits to the private sector,
b) minimize inflation in the positive values zone,[24]
c) create a stable banking system.

[23] *Estimates without a constant made no sense. Expectedly, multicollinearity occurred in the estimate in which nominal interest rate accompanies inflation. There were other significantly bad estimates - the ones where inflation and/or real interest rate were excluded and only the variables related to the central bank assets were kept.*

[24] *There is no evidence on such negative correlation between an economic activity and inflation that would suggest that deflation is beneficial for growth.*

3
AN OPEN ECONOMY WITH IMPERFECT DEPOSIT AND CREDIT MARKETS

The above- mentioned work of Ronald McKinnon is the best way of showing how the results of models change even with the slightest modification of assumptions. While in a closed developed economy with perfect deposit and credit markets McKinnon promoted financial liberalization and high real interest rates, his conclusion for an open developing country with imperfect deposit and credit markets is unambiguous: government intervention is desirable, or else banking and currency crises can occur simultaneously (McKinnon and Pill, 1995).

The McKinnon-Pill model describes a situation after a stabilization during which the financial system was liberalized and market errors started occurring in it as a result of imperfect distribution of information. Domestic sources of savings are limited so the share of domestic investments that exceeds the savings is financed from foreign savings. International creditors are ready to invest in the government after stabilization and liberalization. because they expect productivity growth over the long-term. The domestic banking system intermediates in financial and informational transmission between foreign savings and domestic investments.

In conditions of full certainty and perfect information any borrowing abroad (which creates a deficit in the balance of the current account) is dynamically optimal. The production growth in the sector of internationally tradable goods keeps the balance of the current account stable in the long-term. However, if we eliminate the assumption about perfect information, the real productivity growth can be lower than it was expected. In the conditions of imperfect distribution of information, the private sector can have overoptimistic expectations about productivity growth. An error of the banking system. that can occur, say, because of deposit insurance[25], can boost exaggerated optimism in the

[25] *The point here is not that the introduction of an explicit system of deposit insurance increases the probability of market failure occurring in the financial system. On the contrary, the introduction of an explicit and reliable deposit insurance system instead of an implicit and unreliable insurance through "soft loans", can reduce the risk of market failure. It should also be kept in mind that deposit insurance is used here as an example of market failure. If deposits are not insured in any way, it does not mean that market failure can not occur in a financial system. We still have the problem of the negative selection of clients whose ex ante quality is unknown. This is known in economics as a "lemon problem" (Akerlof, 1970). For theoretical elaboration of the problem in a context of a banking system, see Stiglitz (1985) and Stiglitz and Weiss (1981).*

private sector. If their deposits are insured, depositors are less sensitive about risky behavior of banks. Bankers then have an opportunity to enter into riskier projects and charge higher interest rates. The deposit insurance allows them to behave as if they expect a growth of productivity after stabilization and liberalization that is higher than the one really expected. Since the private sector has no means of an autonomous creation of expectations about productivity growth (banks are "specialists" for conveying information about economy because of imperfect information), this sector creates its expectations by observing the behavior of the banks (looking at interest rates, dynamics of credit expansion etc.). And the behavior that banks exhibit in the conditions of insured deposits suggests that the productivity growth will be higher than is really expected. The private sector thus creates overoptimistic expectations, also borrowing abroad above the optimal level. When the debts become due, there follows a financial and currency crisis and recessionary balancing of the country's external position.

There is nothing irrational in the scenario outlined by McKinnon and Pill (1995): "*It is not irrational being wrong if the error cannot be discovered on the basis of the information available.*" (McKinnon and Pill, 1995, p. 17). The exaggerated optimism of the private sector is a result of an imperfect distribution of information, which, in turn, results in an "anti-Keynesian" situation where the problem is not in excessive savings, but rather vice-versa - in insufficient savings, or in exaggerated investments of questionable quality. Such conditions create space for government intervention if the creators of the economic policy have different preferences, that is, different expectations (more conservative) about productivity growth than the private sector does. McKinnon and Pill warn that closing of the financial account in the balance in the payments is not a solution in this case, because productivity growth in the sector of internationally tradable goods can be expected after stabilization and liberalization. In such case, net inflow of capital from abroad would be a normal thing. For this reason, deficit of the balance of the current account is justified, the only question here being its share to GDP and exports and dynamics. The solution should be sought in combining strong monitoring of banks and taxing capital inflow in a way. For example. the same rate of legal reserves that is applied to domestic sources of financing could also be applied to international sources, in order to equalize their relative price.[26]

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[26] *The conventional wisdom today is that the problems of market failure of a liberalized financial system can only be solved with appropriately selected and coordinated measures in bank monitoring, bank restructuring and financial market development (Sundararaajan, 1996). Crucial role of supervision of banks in the transition countries that experienced sudden capital inflow after liberalization has also been recognized (Ize, 1996). Finally, it should be noted that the negative relation between real interest rate and financial depth, that has emerged in the regressions in Table 4 can be interpreted as an indication of how important this analysis is.*

The appeal to establish strong bank supervision has become important again in the light of the latest financial and currency-related crises that have taken place because banks played their intermediary role badly (Russia in 1998). Since the early eighties. around one hundred countries have experienced some aspect of a banking crisis. It can be seen here that banking crises take place regardless of the level of development of a country. Also. the depth of the accompanying recession does not depend on the initial level of development. For example. in 1991-1993, Finland experienced a cumulative drop of GDP of 14.1 percent, plus the losses resulting from bad loans of the banks in the amount of around 8 percent of GDP (Koskenkyla, 1995; IMF, 1996). The crisis was preceded by a period in which annual growth rates of total bank credits moved between very high 15 percent and 30 percent: "*Unlimited growth of credits followed the deregulation of interest rates and capital flows, which caused strong increase of losses per credit. This is considered as the main cause of the problem.*" (Koskenkyla and Vesala, 1994)[27]. According to Nyberg and Virhiala (1994), generally expansive macroeconomic policy and bad bank supervision are also among the causes. The Finnish experience is so typical that we can consider it representative and relevant even for transition countries.[28] In the light of the conclusions from the preceding chapter - that the share of private sector credits in GDP is closely correlated to the level of development - this experience clearly outlines the boundary to which it is possible to encourage harmonious financial and real growth. This boundary can be found at that growth rate of private sector credits at which banks can still keep good control over the quality of their assets. This rate is very hard to evaluate empirically on macroeconomic level.

The amount of losses caused by banking crises can be tremendous. There were many cases where the share of bad loans exceeded 40 percent of the total bank placements (Argentina, Estonia, Chile, Norway, Poland,

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[27] *Excessive growth of credit (compared to the growth of GDP) and the fast growth of prices frequently indicate deterioration in the quality of the banks' portfolios and a growing exposure to risks. (IMF, 1996; Haussman and Gavin, 1995).*

[28] *Finland is unique by the depth and length of its recession. Sundararaajan and Balino (1991) and Drees and Pazarabasoglu (1995, according to: IMF, 1996) used an example of eight countries to show that there was a significant negative correlation between a bank crisis and real output. The correlation does not necessarily have to be manifested by recession. Mere significant slowing down of growth may hurt quality of banks' assets. Some authors believe that the recessionary impact of a banking crisis depends on financial depth: the bigger it is, the stronger negative impact on real output will the intensity of crisis create. De Castello Branco, Kammer and Psalida (1996) found a minor negative impact of the Baltic States banking crises on the real output. The result is in the line with low values of financial depth indicators shown in this study. In respect of this, it can be speculated that the depth of recession in Finland can be explained with the fact that, financially, it is a very developed country.*

Lithuania, Kazakhstan, Russia). Since these cases include numerous transition countries, it seemed logical to explore the strength of relation between financial crises and financial depth and indirectly draw conclusions about the impact of banking crises on the overall economic growth. Banking crisis index was created for that purpose.

Banking crisis index (BCI) is calculated in two steps. In the first step, data on the critical period of the crisis are used (see Table 5). The value of the two digits designating the year in which the critical period finishes is reduced by five for every year between the end of the critical period and 1998. The figure thus obtained is then divided by 98. For example. it has been assumed for three transition countries within a 43-country sample that they still have serious financial problems. For this reason, this ratio equals one. The value for Belgium, Netherlands, Germany, Portugal and Singapore, countries which did not have banking crisis, is thus zero. The value for Israel is 0.194 (=(84-13*5)/98) because 13 years passed between 1983 and 1998. This element calculated in the first step may be called indicator of relevance of banking crisis.

In the second step, the value of this indicator is multiplied by the share of bad assets in the total assets in order to correct "relevance" for "depth" of the crisis, so to reach the value of banking crisis index. Therefore:

(2) $BCI = ([N-5*n]/98)*R$,

where N is the year that marks the end of the critical period, n is the number of years between the end of the critical period and the present time, while R is the percentage share of bad assets in the total assets of a banking system in the moment of crisis. BCI will be higher with the given R if the crisis is more relevant (recent), and vice-versa.

For creation of the index, the data from IMF review (1996) were used and 43 countries were included in the sample (see Table 5). The said review contains the data on the share of bad assets for the majority of the sample countries. It was possible to calculate the share for a few other countries on the basis of the data on the share of bad assets in GDP, while for the remaining countries this share had to be estimated[29]. The following information has been

[29] *If banking supervision in a country is weak, the information about actual loan losses will then remain concealed. However, the problem will emerge on the other side. It will manifest itself through high interest margin and/or high inflation, the negative impact of which on financial depth has already been established. In any case, the difficulties with comparable international measurement of the share of bad assets are so big, that the estimate used here probably does not affect much the reliability of the bad asset measure.*

used for the estimation: the description of the event (from the IMF review), information on the level of development (income per capita and the banking sector assets/GDP ratio), information on recent financial development and information on the duration of the critical period of the banking crisis. Based on this information, the estimate of the share of bad assets could have the following values:

1 for developed countries where information did not indicate any serious systemic problems recently (Canada, Ireland, Israel, United Kingdom).

10 for developed countries or developing countries where information indicated problems recently (Greece, Japan, New Zealand, South Africa).

20 for developing countries where information indicated very serious problems recently (Jamaica, Swaziland).

The information given in Table 5 is used in the regression analysis that shows the impact of banking crisis on financial depth, measured by the share of private sector credits (PSC) in GDP (t-tests are given in parenthesis):

$$(3)\quad PSC = 69.721 - 1.549\,BCI \qquad R^2 = 0.17 \qquad F = 8.39$$
$$(9.76)\quad (-2.90)^{30}$$

Table 5

BANKING CRISIS INDEX (BCI) AND THE PRIVATE SECTOR CREDITS (PSC)/GDP RATIO FOR 43 SAMPLE COUNTRIES

	Critical period	Bad assets/total assets (*R*)	First element	BCI	PSC/GDP
Argentina	1980-95	39.0	0.8	31.8	18.7
Australia	1991-92	6.0	0.6	3.8	77.7
Austria	--	0.0	0.0	0.0	97.0
Belgium	--	0.0	0.0	0.0	66.6
Brazil	1994-98	10.0	1.0	10.0	26.5
Canada*	1983-85	1.0	0.2	0.2	64.8
Chile	1981-83	19.0	0.1	1.6	54.2
Costarica	1994-98	10.0	1.0	10.0	17.6
Cyprus	--	0.0	0.0	0.0	88.6
Dominican Rep.	1992-95	5.0	0.8	4.1	19.0
Denmark	1988-92	9.0	0.6	5.7	32.8
Ecuador	1995-98	10.0	1.0	10.0	28.6
Finland	1991-94	13.0	0.8	9.8	61.1

[30] *Significant on 1 percent level of a two-sided t-test.*

France	1991-98	20.0	1.0	20.0	81.5
Germany**	--	0.0	0.0	0.0	104.9
Greece*	1991-95	10.0	0.8	8.2	23.0
Guatemala	1980-90	10.0	0.5	5.1	16.2
Honduras	--	0.0	0.0	0.0	22.9
Honduras***	1987-98	23.0	1.0	23.0	22.5
Ireland*	1985	1.0	0.2	0.2	35.7
Israel*	1983-84	1.0	0.1	0.1	72.4
Italy	1990-95	10.0	0.8	8.2	51.8
Japan*	1992-98	10.0	1.0	10.0	183.0
Malaysia	1985-86	32.0	0.3	8.5	74.3
The Netherlands	--	0.0	0.0	0.0	105.6
New Zealand****	na	10.0		5.0	92.1
Philippines	1981-87	19.0	0.3	6.2	48.4
Poland***	1991-98	38.0	1.0	38.0	19.6
Portugal	--	0.0	0.0	0.0	62.3
Singapore	--	0.0	0.0	0.0	96.0
South Africa	1980-98	10.0	1.0	10.0	137.2
Spain	1977-85	4.3	0.2	0.9	71.2
Sri Lanka****	1990-93	13.2	0.7	9.2	25.1
UK*	1984-95	1.0	0.8	0.8	122.9
USA	1980-92	4.1	0.6	2.6	65.8
Columbia	1984-85	15.0	0.2	3.1	20.9
Venezuela****	1994-98	41.0	1.0	41.0	8.4
Jamaica*(xx)	1994-98	20.0	1.0	20.0	28.5
Swaziland*	1995	20.0	0.8	16.3	18.6
Indonesia	1992-98	12.0	1.0	12.0	55.4
Iceland****	1985-93	3.6	0.7	2.5	48.9
Mexico	1994-98	18.0	1.0	18.0	18.2
Croatia***	1991-98	20.0	1.0	20.0	29.5

xx *The PSC/GDP ratio for Jamaica is for 1995 because data for 1996 were not available. The data for all other countries are for 1996.*

* *R (the share of bad assets in the total assets) values were imputed in the last step of creation of the index.*

** *In Germany. financial problems occurred after the unification; however. they were dealt with as fiscal problems.*

*** *These are the transition countries in the sample. R for Croatia is the author's subjective estimate. equal to an average share of bad assets during the 90's. In the case of Poland. the loans specified in the IMF review as "questionable" were taken into account when the estimation of bad assets was being made.*

*** *R for these countries has been estimated on the basis of the data on the fiscal cost of the consolidation of banking system. For New Zealand, the data on the critical period were not available. so the imputed values of R were arbitrary divided by 2.*

Source: IMF IFS, February 1998 and the author's calculations.

This regression remains open for further elaboration and research. However, it still suggests it is highly probable that there is a negative impact of banking crisis on financial depth and, indirectly, on the level of economic growth. To a lesser extent, this high probability follows from the statistical characteristics of regression; to a larger extent, it follows from the fit of results and experience in many countries. If we presume that the parameter evaluated here is stable, we could say that the ongoing banking crisis, which manifests itself in some country as a 20 percent share of bad assets, actually means 31 percentage points less of the PSC/GDP ratio. Lost financial depth was lost in an error-cumulating process within the capital allocation process[31]. This "loss" is turned into a real development loss through the parameter of the relation between financial depth and the level of development. However, it is not possible here to calculate even a remotely accurate quantitative estimate of this loss. There are indications that it is large, but further research needs to be done, paying more attention to the quality and comparability of statistical data.

4
INSTEAD OF CONCLUSION: A FEW INDICATIONS ON GOOD ECONOMIC POLICY

As mass manifestations of cumulative errors in a capital allocation process, banking crises can have very high real costs in terms of lost growth and development. The same goes for inflation, which gives way to financial disintermediation (McKinnon's hypothesis of financial repression). On the other hand, economic policy makers should not give up the possibility of short-term anti-cyclic activities (a Keynesian type of intervention); however, they should keep in mind that: (a) the efficiency of such activities also depends on whether there is a financial system which ensures the interest rate transmission of monetary policy; (b) excessive expansive activities may cause a banking crisis after an excessive credit expansion during which banks lose control over quality of their assets and enter the error-cumulating phase within a capital allocation process. It is very hard to

[31] *The share of bad assets in the total assets of a banking system is a measure of cumulative error in the allocation of capital. It is called cumulation of error because, once the bank grants a loan to a bad debtor, it is not easy to stop lending and/or getting out of lending relationship if the client is important. New loans are thus approved, old debts are reprogrammed, claims are swapped with shares and other similar operations are done. The bank thus remains "locked up" in its relation with the bad debtor. This way, the bad debtor absorbs more of the bank's credit potential and the initial error in the allocation is cumulated.*

imagine an economic model which could indicate an "optimal" combination of banking regulation, inflation and occasional short-term expansion. It would be very hard to collect data for such model, particularly the ones about the quality of banks' assets. Proper processing of such data can take as many as several months and researchers.

Still, theoretical analyses and empirical research clearly indicate that, in a post-stabilization phase typical for transition countries, the "Keynesian" circumstances characterized by surplus of savings over investments do not represent a relevant diagnosis of the situation. The system should be observed in the light of the situation described by McKinnon and Pill (1995). This situation is characterized by surplus of domestic investments over domestic savings, which is financed by inflow of capital. Here, the inflow of capital depends on the behavior of banks, which are "specialists" for processing of economic data. Possible successes that might come out of expansive policy in such situation are disproportional to the social developments that could result from excessive credit expansion. The costs are made because of cumulation of banks' errors in capital allocation. These are reflected in the share of bad assets in the total assets of banks and in the related interest rates and interest margins (the difference between lending and deposit interest rates)[32].

The problem of development of a banking system thus becomes the central issue of the entire economic development. The question of regulating access to a banking market, operating in it, and exiting from it, is becoming the key issue. Its solution will decide whether the creators of economic policy will manage to minimize market error in performing the specialist function of banks. One thing is certain (the problems that occurred in some Croatian banks in 1998 are the evidence of it): the search for optimal policy will be neither easy, nor simple. In all Baltic and post-socialist countries. the transition has turned out to be a very rapid process of institutional transformation during which a large number of new private entrepreneurs has emerged in the market in a relatively short period of time (a few years). A part of them is inexperienced in performing banking operations; the other part is "dishonest", in terms that their ambitions are limited to using their banks as "internal" banks for financing projects of small groups of connected persons; only the third part includes skilled bankers - entrepreneurs, capable of managing other people's capital reasonably and efficiently.

The typical situation in all advanced transition countries up to the mid-nineties was marked by lack of an explicit deposit insurance scheme. Its non-existence did not mean that the banks could fail. It actually meant an implicit

[32] *A bank has to have a source of financing for the provisions for actual and potential losses, so higher margins can be expected in such conditions.*

insurance for all deposits. Since government with its taxpayers' money is always behind such "insurance" scheme, this system meant that the profit from banking operations is private and losses are public. Such a system cannot be viable in a democratic country. For this reason, advanced transition countries started switching to the systems of explicit deposit insurance in the nineties.

Besides being politically unviable, such a system is also economically unviable, because it facilitates development of two kinds of market errors: negative selection and moral hazard. The negative selection and moral hazard are true enemies of the "specialist" function of the banks in the processing of economic data. Both negative selection and moral hazard perform distort the motivation of the bankers.

Moral hazard is a phenomenon known from the insurance theory. If insurance premium is too low, the insured person will treat his/her property more carelessly when it is insured than when it is not. In banking, moral hazard can manifest itself in the deposit collection process. If deposits are insured, savers pay less attention to the quality and reputation of the bank in which they deposit their money. They care more about profit or interest rate. This, in turn, stimulates banks to compete in offering ever-growing interest rates on deposits. If this unwanted process emerges, there is also a danger of negative selection. That is, higher interest rates on deposits require higher interest rates on credits. The best debtors are those who will stop borrowing from such a banking system, because they are generally capable of finding alternative sources of financing by emitting their own securities or by borrowing abroad. When interest rate is higher, potential debtors come up as loan applicants. On average, they are less likely to be able to repay the loan. This causes lower quality of assets and accumulation of bad debts. This problem is even more noticeable in an economic system with undeveloped auditing and high transaction costs of gathering and processing of data on enterprises. Such systems do exist in transition countries.

If a system of explicit and limited deposit insurance[33] is introduced instead of a system of implicit insurance of all deposits, it can reduce the risk of moral hazard and negative selection. However, such a system has to be very well shaped and incorporated in the complex system of the overall regulation of the banking system. Garcia and Lindgren (1996, p. 5) underline the irreplaceable role of strong banking supervision, which functions in a legal environment that allows closing or reselling of a bank before it becomes insolvent (when actual and potential losses are higher than the capital and reserves of the bank). If this condition is not met, then the deposit insurance system will come under a strong

[33] *The system of limited insurance means a system in which deposits are insured only up to a certain amount.*

pressure. Problems in banks will become visible only when they become insolvent. Thus, if the business operations of insolvent banks become too lengthy, their real cost will be reflected in higher payments of insured deposits than it would be the case had the business operations of bad banks been stopped before the insolvency. The same authors also mention a few more characteristics of a well-shaped insurance deposit system:

a) the system has to be explicitly regulated by a special law;
b) the system has to be compulsory for all who collect savings; banks themselves should pay premiums; in case an insurance fund has had significant expenditures, it must be possible to assess an ex post additional premium to those banks which are not facing difficulties;
c) insurance must be valid up to a certain amount of deposit;
d) in case of insolvency of a deposit insurance fund, the ways of its additional financing must be known in advance;
e) payment of insured deposits must be very quick;
f) premiums must be diversified by risk, if possible;
g) a premium that would ensure sufficient amount of funds for covering the expenditures in "normal" circumstances should be estimated in advance; this premium must be higher in the countries with a higher concentration in banking system.

Croatian deposit insurance system was introduced in July 1997 and it has fully met the characteristics a), b) and c); it has partially met d) and e)[34], while it failed to meet f) and g). Quarterly premium of 0.2 percent is linear and it does not differ banks by levels of risk, which is a substantial shortcoming in the conditions when there are banks in banking market that clearly differ from each other by the level of risk. Even bigger shortcoming of the system is the fact that the amount of premium and the speed of "filling up" of a deposit insurance fund seriously lag behind the real potential problems in banking that have emerged in 1998. The banks that ended up in troubles in 1998 were the aggressive ones that had had exceptionally rapid growth (and that had gathered savings exceptionally fast) in 1996 and 1997[35]. In the mid-1997, when the deposit insurance system was initiated, troubles in those banks could be seen already (Croatian National Bank.

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[34] *Even after the payment deadline has been extended to 6 months upon initiation of bankruptcy proceedings of a bank, we can still say that the deadline is reasonably short, but that its further extension would probably affect the credibility of deposit insurance scheme in the eyes of depositors.*

[35] *The possibility of rapid growth of savings deposits should partly be searched for in a model of implicit insurance of all deposits that was applicable by mid-1997 (no bank in Croatia has failed before mid 1997).*

1997), but the possibilities for creating a strong deposit insurance fund[36] and for providing a legal base for strong and rapid interventions in the business operations of those banks (in order to change their behavior rapidly) were limited. State Agency for Savings Deposits Insurance, and Bank Rehabilitation Act (Official Gazette No. 44/94) was passed in 1994, in a different economic environment. That act clearly defined the Agency's sources of funds as insurance premiums, income from business operations and subsidies from the state budget (Article 3). Insurance premiums required for creation of a strong insurance fund would be prohibitively high and would cause undesired large growth of interest margins. The idea has never been realized for this reason. It was decided that the account of the Agency would be "filled up" gradually, while the option of rehabilitation was left in reserve for bigger problems. This option was originally envisaged as a solution of the problems inherited in four large banks; however, as early as in April 1998, it was used again in the case of Dubrovačka Banka.

The bank rehabilitation option can be observed as a model for management of a serious crisis, when the government is willing to sacrifice taxpayers' money in order to save a bank. From that bank's depositors' point of view, this option is an equivalent of 100 percent insurance of deposits. Full insurance of deposits is not an unknown solution, particularly in crisis situations. For example, when systemic banking crises broke out in Finland and Sweden in 1992 and Japan and Argentina in 1995, the governments temporarily froze the limited deposit insurance systems in order to prevent the outflow of capital (Garcia and Lindgren, 1996). Such moves convert the problems of moral hazard and negative selection into reality, so 100% insurance schemes are usually applicable within a short period of time, in which the government prepares a strategy for crisis resolution.

Croatian rehabilitation option is somewhat more sophisticated than the option in which all deposits are declared as insured, because it reduces the risk of moral hazard and negative selection. The thing is - private protagonists in a market cannot know in advance whether bankruptcy proceedings or a rehabilitation will be initiated for a bank that has ended up in unbridgeable difficulties. The central bank estimates the possibility and cost-effectiveness of rehabilitation and offers a solution to the government. However, besides the advantage mentioned, this model has numerous shortcomings. First, it is non-transparent in terms of high degree of discretion that the central bank administration has in making decisions on the troubled bank. A high-degree

[36] *In mid-1998, the Agency had at its disposal funds that could easily cover in a few smaller banks; however, these funds are not even remotely sufficient for covering insured savings in Glumina Banka (smaller medium-sized bank which was insolvent).*

discretion generally creates distrust, because it is hard for public to fully understand and control the decision-making process. Second, this model puts savings depositors in various banks in a different position. It puts them in a different position *ex-post*, after the decision on a bank's fate has been made. Although the conditions should be the same for all, a large saver loses his deposit in a bank that the administration has condemned to bankruptcy. However, the same saver keeps his deposit if the administration decides that rehabilitation should be carried out instead. Thus, we have a space for intensive lobbying for rehabilitation (which costs taxpayers more). On the other hand, new systemic errors in allocation of capital are thus encouraged. Such mistakes can occur if depositors believe that large banks are too big to go bankrupt and that they will be rehabilitated if they end up in troubles; also, if they believe that small banks are too small to be saved, so that they will go bankrupt if they end up in troubles, merely to demonstrate the effect of financial discipline. If the public has such size-discriminating expectations, market structure will freeze and healthy pressure of market competition will be reduced significantly. Third, it is completely illogical that the central bank estimates the possibility and cost-effectiveness of the rehabilitation. It can provide some data or an informal opinion, but formally proposing solutions where taxpayers' money is involved is totally inappropriate. There are two reasons for this. First, the central bank becomes the first target of lobbyists and media campaigns, which could substantially affect its reputation and reduce its capability of performing its main task: keeping stable prices and national currency. Second, the central bank has reached the position from which it can have significant influence on spending of taxpayers' money in a rehabilitation process, which means that it has to cooperate closely with the government and its agencies when preparing its estimates. This derogates its autonomy. The central bank should use discretion when deciding on the fate of those banks whose capital adequacy ratio is lower than the prescribed one, although still positive - because in that case neither the depositors' money nor the taxpayers' money is directly questioned yet. Only the owner's money is at stake. However, when net value of a bank becomes negative, the central bank should not get involved in the final decision on whether the creditors of the failed bank will be alimented with the money of (current or future)[37] taxpayers.

Consequently, overall banks' management system in Croatia, including the system of limited deposit insurance, is currently being formed. Croatia is in a transitional phase from a system with implicit 100 percent deposit

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[37] *This is the money of the existing taxpayers, if the government recapitalizes a bank with liquid funds in order to solve the problem of solvency and liquidity at the same time. It would be the money of future taxpayers if the problem of liquidity was solved and the capital of bank was increased through recapitalization in form of government bonds, in order to satisfy the prescribed capital adequacy ratio.*

insurance to a system with limited insurance. Many limiting elements of the old system are still active in this phase. It is hard to anticipate accurately the direction in which the new system will be developing in near future. It will be determined by political and economic process in which methods of solving current problems in some small and medium banks will have a crucial role. Still, a few crucial elements that future system should incorporate can be specified here:

a) deposit insurance premium should be diversified by risk;
b) the rehabilitation option as we know it should be abolished, particularly in the part that regulates the main role of the central bank in estimating possibilities and cost-effectiveness of rehabilitation, whereas the government should take over the modalities of crisis management;[38]
c) funds that are at Agency's disposal should be substantially increased by increased premiums, budget transfers or conversion of other reserve funds;[39]
d) wider power of bank regulators should be ensured in phases when banks with potential problems are still not in the zone of insolvency (new Banks Act, that is currently undergoing a parliamentary procedure, deals with most of it).

The importance of a stable banking system can never be stressed enough. The research in this study has shown a close relation between financial depth and economic growth. It has also shown that social costs of banking crises are exceptionally high. These crises should be observed as an evidence of cumulative errors in allocation of capital. As we could see, these errors can be significantly increased when, often with good intention, expansive economic

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[38] *A model similar to the present one could be retained, in which the central bank would only have a counseling role in cases of problems in specific banks. Also, any form of rehabilitation could be discarded and the government should be able to declare temporary 100 percent insurance of all deposits. At the same time, introduction of legal provisions allowing the government to make such decisions autonomously or at the initiative of the central bank should be considered.*

[39] *Increased premiums and budget transfers are not easy options, because they include clearly visible social costs (increase of interest and/or tax burden). However, it is possible in principle that the purpose of a major share of the existing funds of the required reserve be changed and transferred to the deposit in the Agency by way of forming a savings deposit insurance fund (the operation would not have monetary effects because the Agency has an account in the central bank). This operation would make risk free deposits (claims from the central bank) risky, because the deposits would proportionally decrease in the Agency if insured deposits in bankrupt banks were paid. This means that banks would have to form provisions for these assets. That would include developing a mechanism for establishing the percentage of reserves based on the probability of payment of insured deposits, and amend the Agency Act in such way that it allows this option.*

policies are pursued in order to obtain short-term increase in growth (or in order to support the growth that has been autonomously stimulated by real factors). There are clear indications (although not final accurate calculations) that the profit from a short-term expansive policy is not even remotely comparable to the long-term costs which become visible later, when cumulative errors in allocation of capital in expansion phases prevent normal functioning of the system of financial intermediation. This is why the development of the market for public debt is only possible in the context of a stable banking system. The development of such market is possible only when aiming at faster building of a transmission mechanism that would provide impact on real output through variations of interest rates is complemented by efforts to build stable banking system at the same time. Furthermore, the level of economic development can be maximized over the long term if the country achieves low inflation, develops stable banking system and does not encumber that very system with a need for permanent financing of fiscal deficit. This way, major part of savings is allocated to private sector. All conclusions about banking system are also applicable to non-banking financial intermediaries, who are not specially analyzed in this study because they are relatively unimportant at this moment of development. However, transition has so far turned out to be a very rapid institutional transformation and in a few years we can expect a different relief of Croatian financial system, where banks will occupy relatively smaller space and the form of government regulation will be determined by the experience which is to be acquired in the year or two that are ahead of us.

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APPENDIX

Table A1

INDICATORS OF THE FINANCIAL DEPTH AND CHARACTER OF FINANCIAL SECTOR FOR 66 "NON-TRANSITION" COUNTRIES IN 1996

Country	Assets*/ GDP	M3 / GDP	Private**/ GDP	Assets***/ GDP	Credits**** / GDP	Quasi money/ M3	GDP/ M1	GDP/ M3
Argentina	28.6	20.8	18.1	10.1	2.8	69.1	15.6	4.8
Australia	91.9	66.4	77.7	10.6	6.1	71.2	5.2	1.5
Austria	173.9	90.4	97.0	13.3	0.4	81.8	6.1	1.1
Belgium	257.8	83.8	66.6	11.8	1.1	79.3	5.8	1.2
Brazil	43.6	27.2	26.5	21.9	3.7	80.7	19.0	3.7
Canada	88.8	61.5	64.8	7.2	3.8	69.1	5.3	1.6
Chile	58.5	40.7	54.2	45.6	12.9	77.7	11.0	2.5
Hong Kong	566.1	175.7	162.1	38.9	0.0	91.7	6.8	0.6
Columbia	30.5	22.5	20.9	12.9	0.8	50.2	8.9	4.4
Costarica	42.6	43.1	17.6	29.9	0.0	78.0	10.5	2.3
Cyprus	155.1	100.3	88.6	33.4	13.8	84.2	6.3	1.0
Denmark	98.6	61.5	32.8	16.8	1.5	47.6	3.1	1.6
Dominican Rep.	28.2	26.5	19.0	6.4	0.7	56.5	8.7	3.8
Equator	38.7	35.3	28.6	15.4	1.0	73.7	10.8	2.8
Finland	93.0	54.5	61.1	9.5	0.3	34.0	2.8	1.8
France	147.5	68.6	81.5	6.7	0.7	66.3	4.3	1.5
Germany	166.5	66.6	104.9	10.8	0.7	62.7	4.0	1.5
Greece	73.1	47.6	23.0	38.8	12.7	69.2	6.8	2.1
Guatemala	23.5	25.3	16.2	1.9	0.7	63.6	10.8	3.9
Honduras	34.6	31.4	22.9	13.2	2.6	59.6	7.9	3.2
Iceland	56.1	37.6	48.9	10.8	2.9	77.2	11.7	2.7
Indonesia	65.2	52.1	55.4	14.8	0.7	81.4	10.3	1.9
Iran	34.1	40.9	17.6	35.6	18.2	51.9	5.1	2.4
Ireland	71.6	55.0	35.7	12.1	0.3	73.9	7.0	1.8
Israel	117.7	84.4	72.4	16.7	4.0	91.8	14.5	1.2
Italy	100.2	59.9	51.8	17.5	9.0	46.0	3.1	1.7
Japan	297.9	112.3	183.0	11.7	6.3	66.5	2.7	0.9
Jordan	145.0	92.2	65.2	61.9	18.1	67.7	3.4	1.1
Kenya	53.2	46.1	28.2	21.9	11.1	66.9	6.6	2.2
Korea	77.7	45.7	61.8	14.0	0.5	77.8	9.9	2.2
Kuwait	111.7	79.0	34.2	12.4	0.4	83.0	7.5	1.3
Laos	21.9	14.3	8.3	14.0	0.2	69.2	22.8	7.0
Lesotho	83.0	35.8	18.1	63.1	4.3	52.2	5.8	2.8
Madagascar	20.1	18.7	9.7	16.1	8.8	28.8	7.5	5.3
Malawi	20.2	17.2	5.8	13.1	2.1	52.6	12.3	5.8
Mali	22.9	24.5	13.2	23.4	5.9	24.1	5.4	4.1
Mauritius	77.6	75.5	44.7	22.7	1.2	83.1	7.8	1.3
Mexico	20.2	27.9	18.2	9.1	0.4	70.9	12.3	3.6
Morocco	69.0	61.9	42.9	20.2	6.0	27.6	2.2	1.6

Namibia	60.6	43.4	50.5	12.8	6.2	53.6	5.0	2.3
Nepal	36.0	37.7	23.9	24.5	9.9	62.3	7.0	2.7
Netherlands	189.6	85.5	105.6	12.6	0.7	65.7	3.4	1.2
New Zealand	102.0	84.9	92.1	13.9	3.3	58.3	2.8	1.2
Nicaragua	43.4	41.3	28.5	134.3	109.1	77.2	10.6	2.4
Niger	10.7	12.3	4.3	10.1	5.6	27.4	11.2	8.1
Norway	98.5	55.0	72.3	23.4	1.2	29.8	2.6	1.8
Oman	37.3	27.7	26.6	14.1	0.8	69.2	11.7	3.6
Pakistan	46.6	44.9	24.8	19.9	14.0	45.9	0.0	0.0
Panama	270.2	68.4	78.3	37.8	15.8	84.8	9.6	1.5
Paraguay	34.4	29.6	23.1	23.5	5.5	70.9	11.6	3.4
Peru	30.4	22.9	19.1	17.8	0.4	73.8	16.7	4.4
Philippines	79.3	53.8	48.4	25.7	10.9	80.3	9.4	1.9
Portugal	149.5	80.6	62.3	22.8	1.2	63.3	3.4	1.2
Singapore	160.6	84.4	96.0	81.2	0.0	75.8	4.9	1.2
South Africa	160.3	57.7	137.2	7.7	3.0	52.9	3.7	1.7
Spain	134.7	79.1	71.2	21.0	4.2	64.6	3.6	1.3
Sri Lanka	39.1	33.0	25.1	20.8	6.9	69.2	9.8	3.0
Switzerland	281.8	138.1	167.2	19.6	1.4	74.5	2.8	0.7
Tanzania	17.3	21.8	3.1	15.1	7.9	45.3	8.4	4.6
Tunis	72.1	46.6	63.5	11.6	0.5	53.5	4.6	2.1
Turkey	76.5	38.1	23.5	20.8	6.1	83.8	16.2	2.6
UK	129.6	92.0	122.9	7.7	4.0	72.5	4.0	1.1
USA	78.7	59.0	65.8	6.4	5.4	72.5	6.2	1.7
Uruguay	67.0	39.3	28.9	27.4	8.7	83.9	15.9	2.5
Venezuela	20.8	20.9	8.4	36.6	5.9	42.9	8.4	4.8
Zambia	21.3	17.9	8.6	71.8	64.7	62.8	15.0	5.6

*Note: Explanations for * can be found in the notes under Table 1.*
Source: Author's calculations based on IFS, February 1998, Washington: IMF.

Table A2

RESULTS OF MONEY DEMAND RESEARCH
- PARTIAL ADJUSTMENT MODEL

Independent variable	Equation 1	Equation 2
constant	0.1176 (1.257)	0.0569 (0.609)
m_{t-1}	0.6883 (20.237)	0.6997 (23.467)
y_t (real output measured by retail sales)	0.4079 (7.009)	0.4112 (7.231)
π_t (inflation rate of retail prices – monthly)	-0.8245 (-8.642)	-0.7543 (-7.761)
i_{1t} (nominal interest rate on time deposits in kuna *a vista*)	-0.0011 (-1.497)	
i_{2t} (nominal interest rate on time deposits in kuna)	0.0001 (1.409)	
e_t (nominal depreciation rate of exchange rate HRK/ DEM – monthly)		-0.2036 (-1.844)
D_t (dummy variable – equal to one – in October 1993)	-0.1600 (-3.848)	-0.1646 (-4.029)
Tests		
R^2 (adjusted)	0.991	0.991
Standard error of estimation	0.041	0.040
DW	1.987	1.968
Durbin's h – test	0.163	-0.355

Notes: Period of estimate: 1993:3 - 1997:3. Dependent variable is real M1 (m)[40].
t-values are shown in parentheses below the parameters.
Source: Šonje (1997).

[40] *See CNB Bulletin, Table A1, page 27 and methodological explanation in Bulletin.*