CROATIA'S CAPACITY TO FINANCE ITS FISCAL DEFICIT *

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Abstract

The paper represents an attempt to determine the level of fiscal deficit which does not require more financing than is compatible with sustainable internal and external borrowing, and which is consistent with the expected and desirable levels of macroeconomic indicators, such as economic growth and the rate of inflation. At the same time it takes into account the existing foreign trade potentials of the country as well as characteristics of foreign demand for exports. Empirical analysis has shown that Croatia has rather limited possibilities to finance its fiscal deficit. Foreign debt financing is to a large extent constrained by dynamics of exports, while the domestic debt financing is limited by a relatively low rate of growth of domestic economy. Financing through issuing money should be avoided because of possible inflationary effects.

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1
INTRODUCTION

A possibility of fiscal imbalance in the Republic of Croatia has never been completely eliminated, and a seemingly balanced budget in the last several years has been realised by, among other ways, including the receipts from privatisation in the budget revenue and not in the sources for financing excess of government expenditure over its revenue. Due to a relative abundance of the receipts from privatisation there has not been a dire need to assess capacity of financing fiscal deficit through the usual instruments: domestic borrowing, foreign borrowing and money creation. Since the capacity of financing through the privatisation of state portfolio has decreased, and since there might be a decrease in tax burden with the same level of state consumption, a question opens of how much fiscal deficit Croatia can afford and what the possibilities there are to finance it from each individual source.

The paper deals with this question not dwelling on the objective need of running a fiscal deficit, neither on the possible consequences of fiscal imbalance.

1.1 Analytical framework for assessing the financeable fiscal deficit

The method used in this paper for assessing the financeable fiscal deficit in the Republic of Croatia is the one devised by Cohen (1988) which he proposed as a tool for assessing a capacity of financing through external debt, and which Anand and van Wijnbergen (1988) integrated into the analysis of the overall capacity of financing fiscal deficit, i. e. financing a deficit through revenue from monetisation, domestic debt and foreign debt.

The applied method views fiscal deficit as a part of an overall macroeconomic picture and evaluates whether a deficit should be "acceptable" in the context of macroeconomic policy targets. The method tries to determine the level of fiscal deficit which is consistent with the expected and desirable levels of macroeconomic indicators, such as economic growth and the rate of inflation. At the same time it takes into account the existing foreign trade potentials of the country as well as characteristics of foreign demand for exports. The model is centred around the government

budget constraints and can be used to calculate the level of fiscal deficit that can be financed with a given inflation, as well as to calculate the equilibrium rate of inflation which does not require fiscal adjustment.

In accordance with the applied method the paper analyses fiscal deficit which does not require more financing than is compatible with sustainable external and internal borrowing, and with the existing targets for price increase and the rate of economic growth. The method is attractive since the model can encompass numerous factors which influence the need for a fiscal reform and thereby the very capacity of maintaining a fiscal balance. These factors, among others, are: reforms in financial sector which change the demand for base money, interest rate on domestic and foreign debt, a desirable rate of economic growth and exchange rate policy.

The model applied in this paper is based on public finance approach to inflation (Phelps, 1973, among others). The inflation in this model is explained as a residual tax, i.e. the tax that enables restoring a balance between the planned public expenditures and revenues, from traditional sources of taxation with efficient debt management. Inflation operates as a tax since it forces the private sector to decrease expenditure in order to be able to maintain the real value of money balances that it wants to hold with a given structure of the yield. Inflation tax creates a wedge between revenue and expenditure which is not compensated by any real accumulation of assets, just like in any other form of taxation. This approach does not deny the fact that in the short run there can be demand-push or cost-push factors e.g. changes in the nominal exchange rate.

Fiscal approach to a sustained inflation came into focus again after the influential article by Sargent and Wallace (1981). An important component of their approach is sustainability. Sustainability of inflation targets requires consistency between targeted rates of inflation and implicit consequences of these rates on the revenues from inflation tax, on the one hand, and on fiscal deficit, on the other.

1.2 Fiscal deficit, money creation and debt

The relation between fiscal deficit, money creation and debt can be simplified in the following expression[1]:

$$PB_t + i^D B^P_{t-1} + i^L L^N_{t-1} E = \Delta B^P + \Delta L^N E + \Delta M^0 \quad (1)$$

In this expression PB is the primary balance of the public sector, i.e. non-interest deficit. The primary balance of the public sector is the difference between the total public sector expenditures minus expenditures for interest payments and the total public sector revenue (or, for the sake of convenience - tax revenue). In other words, this is a conventional deficit minus interest payments; i^D is the nominal interest rate on domestic public debt; i^L is an interest rate on foreign public debt; B^P is the level of public debt held by domestic private sector, and L^N is the level of foreign net debt, or the level of the external public debt minus Central Bank's net foreign assets. E is the nominal exchange rate (e.g. kunas for dollars).

The left-hand side of the equation shows net expenses (expenses - taxes) of the public sector. These expenses are to be financed through issuing domestic or foreign debt or through money creation. The primary deficit refers to the overall public sector (central government + state-owned enterprises + local government + extra-budgetary funds + central bank obligations).

As will be shown later, equation (1) was formed by consolidating the identities of the public sector in its narrow sense (central government + state-owned enterprises + local government + extra-budgetary funds) and of the central bank identity. The starting point was the basic identity of base money supply which comes out of the balance sheet of monetary authorities. The balance sheet of monetary authorities is presented in Figure 1.

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[1] *If we wanted to illustrate specific case of Croatia in more realistic way, this identity should be expanded by several more elements, primarily by privatisation revenues which should not be ignored as an element of the public debt financing.*

Figure 1

BALANCE SHEET OF MONETARY AUTHORITIES[+]

Assets		Liabilities	
foreign component	E^*F^C	currency in circulation	GOT
claims on government	B^C	reserves held by commercial banks at the central bank	REZ
claims on commercial banks	K^C		
MONETARY BASE ON THE ORIGIN SIDE	M^0	MONETARY BASE ON THE USAGE SIDE	M^0

[+] *Taken from Cath (1995)*

Foreign component (net foreign assets) is made up of net foreign exchange reserves in gold and in foreign currency; claims on government is made up of net borrowing of the local government from the central bank in the form of direct loans and public debt which the central bank buys on the open market; and claims on commercial banks, actually, borrowings of financial institutions from the central bank, especially in the form of refinancing and lombard credits. We shall here largely disregard the part of monetary base which consists of direct loans to the public sector.

It comes out from the central bank balance sheet that every change in the supply of base money appears as the result of one or more of the following causes:

- changes in net foreign assets at the Central bank (due to foreign exchange transactions);
- changes in the Central Bank advances to the public sector (these changes occur through operations on the open market and/or through direct loans to the public sector);
- changes in net credit to financial institutions (e.g. through direct loans to commercial banks).

Hence we can say that a change in the supply of base money equals:

$$(M^0_t - M^0_{t-1}) = (B^C_t - B^C_{t-1}) + (K^C_t - K^C_{t-1}) + (F^C_t - F^C_{t-1})E \qquad (2)$$

where M^0 is the quantity of base money, B^C is the amount of government bonds held by the central bank, K^C is the loans from the central bank and F^C is the level of net foreign exchange reserves of the central bank.

The budget constraint of the public sector is:

$$(3) \quad (B_t^T - B_{t-1}^T) = P_t(G_t + I_t^G - T_t) + i^D(B_{t-1}^C + B_{t-1}^P) + i^L L_{t-1}E$$

where B^T is the total public debt, domestic and foreign, $P(G + I^G - T)$ is the nominal primary deficit, i.e. the difference between nominal expenditure for consumption and investments, and the nominal tax revenues. It is assumed here, which has to be particularly stressed, that the total external debt is the public sector debt. In reality public sector debt is only just a part of external debt. However, the assumption of equivalence between foreign public debt and external debt is justified since it is often considered that the state will cover the liabilities of the private sector if they are not covered by the private sector debtors themselves. L is the level of external debt. The expression shows that the domestic public debt is divided into the public debt held by the central bank and the public debt held by the private sector.

Thus a change of the public debt held by the central bank can be expressed as:

$$(4) \quad (B_t^C - B_{t-1}^C) = (B_t^T - B_{t-1}^T) - (B_t^P - B_{t-1}^P) - (L_t - L_{t-1})E.$$

It is assumed that the interest rate on domestic and foreign public debt is equal regardless whether the government borrows from the central bank or from the private sector.

When (2) is included in (4) and solved for $(B_t^C - B_{t-1}^C)$ we arrive at the expression which shows possible ways of financing the public sector deficit. The change in the base money supply which arises from direct loans to commercial sector will be left out from the equation for the sake of convenience.

$$(5) \quad (B_t^T - B_{t-1}^T) = (M_t^0 - M_{t-1}^0) + (B_t^P - B_{t-1}^P) + (L_t - L_{t-1})E - (F_t^C - F_{t-1}^C)E.$$

The equation points to the conclusion that the public sector deficit, i.e. the change in the level of the total public debt, can be financed through the issue of primary money, through borrowings from domestic private sector, through foreign borrowings and through (a decrease in) the central bank foreign exchange reserves. It can be noted that only the monetary base can be considered as a source of deficit financing, and not the entire money supply. Namely, the increase in money supply which causes inflation generates the inflation revenue for the country which is equal to the losses of other sectors due to a decline in the real value of their money holdings (cash and deposit money). However, the government revenue generated by inflationary erosion of the private sector deposits, which is, on the other hand, compensated by inflationary erosion of the private sector

loans that are not repaid, does not increase the public sector net revenue. That is why a country's net revenues are created only through an increase in monetary base.

By combining expression (5) with the budget constraint of the public sector (3) we can write as follows:

$$P_t(G_t + I_t^G - T_t) + i^D(B_{t-1}^C + B_{t-1}^P) + i^L L_{t-1}E = \\ = (M_t^0 - M_{t-1}^0) + (B_t^P - B_{t-1}^P) + (L_t - L_{t-1})E - (F_t^C - F_{t-1}^C)E. \quad (6)$$

For expression (6) to become the equation of budget constraints of the entire public sector, where the entire public sector consists of the public sector in narrow sense (nonfinancial public sector) and the central bank (financial public sector), expression (6) is to be consolidated. This means that the profit and loss account of the central bank has to be included into the public sector in its narrow sense. To simplify the equation it will be assumed that the central bank's profit is made up only of interests on foreign exchange reserves, and it is also assumed that the interest rates on foreign exchange reserves equal interest rates on foreign public debt. Furthermore, since interest rates on public debt are, on the one hand, public sector expenses in the narrow sense, and on the other hand, the revenue of the central bank, they do not appear as an element of cost in the consolidation on the right hand side of expression (6).

Thus the budgetary constraint of the consolidated public sector can be expressed as follows:

$$P_t(G_t + I_t^G - T_t) + i^D B_t^P + i^L L_{t-1}E - i^L F_{t-1}^C E = \\ = (M_t^0 - M_{t-1}^0) + (B_t^P - B_{t-1}^P) + (L_t - L_{t-1})E - (F_t^C - F_{t-1}^C)E. \quad (7)$$

When the consolidated public sector is looked at, then foreign public debt should also be taken in its net amount, i.e. foreign public debt should be decreased by the amount of foreign exchange reserve of the central bank. Namely, if all central bank liabilities (base money, i.e. currency in circulation increased by net reserves held by commercial institutions at the central bank) are taken as public sector liabilities, the central bank assets that refer to the claims on non-government domestic sectors, should be subtracted from public sector debt. Thus we can write:

$$P(G + I^G - T) + i^D B_{t-1}^P + i^L L_{t-1}^N E = \\ = (M_t^0 - M_{t-1}^0) + (B_t^P - B_{t-1}^P) + (L_t^N - L_{t-1}^N)E. \quad (8)=(1)$$

Expression (1) is, in fact, expression (8) but shown in a shorter form.

When expression (8) is shown in real terms, then the link between the net public sector claims and the increase in the real value of domestic and foreign debt, i.e. between net claims of the public sector and the money creation, and thereby the inflation - becomes more obvious. For the convenience sake, it will be assumed that the inflation rate abroad equals zero, and for the sake of transparency the real deficit of the public sector in the narrow sense will be defined as $D = (G + I^G - T) + i^D B^P/P + i^L L^N e$ i.e. as $D = (G + I^G - T) + r^D B^P + r^L L^N e$, where r^D and r^L are real interest rates on domestic and foreign public debt, and e is the real exchange rate. Hence it holds that:

$$(9) \qquad D_t = \Delta B/P_t + \Delta L^N e + \Delta M^0/P_t = \\ = \Delta B/P_t + \Delta L^N e + \Delta M^{0R} + \pi M^{0R},$$

where M^{0R} is real base money supply ($M^{0R}_t = M^0_t/P_t$), and π is the inflation rate in the country, defined as $\pi = (P_t - P_{t-1})/P_t$. The sum of $\Delta M^{0R} + \pi M^{0R}$ gives the total revenue from monetisation, which consists of seigniorage ΔM^{0R} and inflation tax πM^{0R}.

Expression (9) says that the real deficit of the consolidated public sector equals the sum total of the change (increase) in real value of domestic and foreign debt, and of the monetisation revenue. It should be added here that apart from the two stated sources of monetisation (seigniorage and inflation tax), there are other sources like single changes in the real money supply due to the changes in inflation and interest, or similar one-off changes caused by financial innovations which change demand for money.

Equation (9) which is derived here, shows, in fact, only computational identities. However, it is the base for a large part of the analysis which will be performed here. Demand for money can be influenced by macroeconomic variables like economic growth and inflation. In the same way, the changes in financial structure and in regulations can impact the expected level of revenue from monetisation. Finally, a debt issue is restricted by both creditworthiness and sustainability. All of these restrictions can be incorporated into equation (9).

1.3 Revenue from monetisation

To analyse determinants of demand for base money, it will be assumed that base money is the function of inflation rate as well as of interest rates on demand deposits and time deposits. Thus the demand for primary money M^0 is:

$$M^0/(PY) = f(\pi, i^{DV}, i^{DO}) \qquad (10)$$

Primary money is shown here as a proportion of the nominal GDP, which is marked here with PY. A more complex financial structure would include additional factors as well, such as exchange rate and interest rate on foreign currency deposits.

Expression (10) can be used to calculate the impact of changes in inflation rates and in interest rates on the base money demand, and a probable impact of these changes on the revenue which the public sector can expect from monetisation. When this information is linked with equation (9), then the fiscal consequences of inflation can be assessed.

1.4 Creditworthiness and the limits to the public debt issue

The important elements which determine a consistent fiscal policy are cost and availability (possibility) of financing abroad. The needed amount of financing depends on the cost of the existing foreign debt, $r^L L^N e$. Besides, for any given level of the total revenue requirements, the amount which should be paid from domestic sources depends on the amount of foreign financing $L^N e$ that is desired or available.

While assessing a country's capacity for foreign borrowing two elements have to be taken into account: solvency and creditworthiness. Solvency is, in fact, the capacity for servicing a debt, which means that it depends on the non-income current account of the balance of payments; on the real interest rate; on its relation to the growth rate of output; and, of course, on the initial level of debt. Solvency is considered threatened if the discounted value of expected minimal present and future consumption is bigger than the value of present wealth net of foreign debt. To be able to assess solvency, it is necessary to calculate the discounted value of present and future feasible trade surpluses, and to compare this value with the present debt. In other words, for a country to be solvent, it is only necessary that its

foreign debt grows at the smaller rate than is the rate of interest on that debt (van Wijnbergen, 1990). Such assessments show that in the largest number of debtor countries today their solvency is not challenged[2].

Still, even when solvency is not a constraint, a constraint can be creditworthiness. Creditworthiness depends on perception of creditors about the capacity and willingness of a country to pay its debt. However it is difficult to assess the precise limits imposed by the creditworthiness constraints. According to Cohen (1988), a country would not stop servicing its debt if, according to its estimate, a cost of default were smaller than the present cost of servicing the debt. Countries decide on the benefits of defaults and on the damage that the cost of debt repayment inflicts, on the basis on difference between the actual debt burden and the acceptable benchmark. Thus a common definition of "prudent" borrowing strategy is the one which will never raise debt service burden above its present level. This implies that the very fact a country runs a trade surplus does not automatically mean it runs a prudent debt policy.

Besides the problem of setting a limit to borrowing, the problem of defining a debt burden emerges. Servicing a debt not only requires the sufficient level of wealth, but also the long-lasting positive difference between the production of tradable goods and the consumption of tradable goods (net exports). It is more difficult to realise positive net exports in the country in which a larger part of resources are employed in nontradable sector of goods than in the open economy. However, if this is more difficult to be realised, there will be an ever-greater urge not to repay the debt, even if the solvency criterion is met. In this sense the relation between debt and exports is important for the evaluation of creditworthiness. However, even though the debt/exports ratio is an important indicator, it is a biased estimate of a country's debt ratio in relation to its production of tradable goods. Namely, some tradable goods that are produced in the country are sold on the domestic market. If, on the other hand, the debt/output ratio is chosen as an indicator of debt burden, then the real debt burden would be underestimated since output (gross domestic product) also includes the non-tradable goods.

According to Cohen (1988) foreign creditors find that a vital characteristic of the creditworthiness is the amount of resources that can be channelled onto the world market and exchanged for "hard" currency. From that aspect, total GDP is surely an excessively comprehensive measure,

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[2] *When the real rate of economic growth is negative, as was the case in the Republic of Croatia in 1999, then, of course, the problem of insolvency occurs at any positive real interest rate on public debt.*

and imports are too narrow a measure of debt servicing capacity. Traditionally, the size of the tradable sector has been considered as an appropriate measure, but it can turn out that the choice of this measure stems from short-termism in viewing the situation, since in the long run human and technological resources can move from the production of nontradable goods into the production of tradable goods. If the borrowing strategy were based on GDP as a measure of debt servicing capacity, that would lead to implementing a wrong policy, since the borrowing country would be stimulated to appreciate its currency so as to artificially increase the dollar value of its GDP. On the other hand, if the lending policy of the creditor were based only on exports, that could bring the debtor country to devaluate in order to stimulate exports, and the measure of wealth would again be distorted. Two biases which come out from the use of only one measure of wealth (or resources) have the opposite sign. This creates the need to choose the measure of wealth that would not depend on the exchange rate movements.

The invariant measure of wealth would thus be the linear combination of these two debt service measures which would not change with the changes in real exchange rates. That is why Anand and van Wijnbergen (1988) use weighted average of debt/output ratio, and debt/export ratio R*. In this case R* is the objectified measure of ability to service external debt, which does not rely on output only, nor only on exports, and can be expressed as follows:

$$R^* = \gamma X^* + (1-\gamma)\, Y^*. \qquad (11)$$

In expression (11) X* indicates the value of exports, while Y shows the value of domestic output expressed in the units of foreign goods, i.e. $X^*=X/e$, $Y^* = Y/e$.

In choosing the weights Anand and van Wijnbergen (1988) use the approach proposed by Cohen (1988). Cohen proposes that weights are constructed in the way that leaves no incentive to create a wedge between the real and social costs of foreign exchange, at least as far as assessment of creditworthiness is concerned. The measure of R* should thus be designed in such a way that every improvement of debt/output ratio, which results from the real appreciation, is compensated by equal or negative impact of the real appreciation on the debt/export ratio. This implies that $dR^*/de = 0$, i.e. that R* is such a measure which does nor react to real depreciation. Hence a question of how to choose the weight for export γ for which $\gamma dX^*/de = -(1-\gamma)dY^*/de$ holds. To choose such γ at which R* does not depend on the real exchange rate the following conditions have to be met:

(12) $$\frac{dR^*}{de} = \gamma \frac{dX^*}{de} + (1-\gamma)\frac{dY^*}{de}$$

The following expression for weight γ is:

(13) $$\gamma = \frac{-\varepsilon_{Y^*,e}}{(\varphi_X \varepsilon_{X^*,e} - \varepsilon_{Y^*,e})}$$

Here $\varepsilon_{Y^*,c}$ is the output elasticity with respect to the change in the real exchange rate, $\varepsilon_{X^*,c}$ is the export elasticity with respect to the change in the real exchange rate, and φ is the proportion of goods export in foreign currency, in the output in foreign currency (X*/Y*).

The acceptable external debt strategy that would allow the debt service, and hence the credibility level to be maintained at least on the present level, requires a dynamics of debt which will not lead to the increase in the B*/R* ratio. To simplify let us say that the rate of growth of resources R* is marked with n_R , so we get that:

(14) $$n_R = \frac{\varphi_X \gamma n_{X^*}}{(\varphi_X \gamma + (1-\gamma))} + \frac{(1-\gamma) n_{Y^*}}{(\varphi_X \gamma + (1-\gamma))}$$

where the nX* growth rate is the export growth rate (dX*/X*), and n_{Y^*} is the output growth rate (dY*/Y*). The n_{X^*} rate can be linked to the output growth rate in the countries into which the goods are exported. The output growth rate in these countries is marked with n*.

(15) $$n_{X^*} = \varepsilon_{X^*,Y^*}\, n^*$$

Here the ε_{X^*,Y^*} is the export elasticity (in foreign currency) with respect to the output of the countries into which the goods are exported.

When we take into account that the proportion of debt in the resources R* should not be changed if the debt strategy is to be considered acceptable, we get the following expression for the external debt accumulation, expressed as a percentage of GDP:

(16) $$\frac{e\Delta L^N}{Y} = \frac{eL^N}{Y} n_R$$

Equations (14-16) can be applied in empirical research once different elasticities have been estimated.

1.5 Creating a consistent fiscal policy

A consistent fiscal policy is such a policy that can be sustained in the medium-term period without jeopardising macroeconomic targets. Also, if a fiscal policy is consistent, then there is no need for unsustainable forms of debt financing. Unsustainable debt financing is such a debt financing where the growth rate of indebtedness is higher than the rate of increase in the resources available for debt servicing. This is a more restrictive requirement than the solvency, according to which the average real interest rate on the existing public debt should be lower than the real rate of economic growth[3].

If we assume that R* is the resource base for financing external debt, and the domestic output y is a resource base for financing the internal debt, we see the following constraints in debt issuing:

$$\Delta B/P = nB/P,\ \Delta L^N = n_R L^N, \qquad (17)$$

where n is the growth rate of the domestic output. If these constraints are interpolated in debt issue equation (9), and if variables are expressed as a percentage of GDP, then the following expression shows the deficit decrease necessary for achieving a consistent fiscal policy:

$$PSD = (d + r^D b + r^L L^N e) - (nb + n_R L^N + nm^{0R} + \pi m^{0R}) \qquad (18)$$

i.e. the deficit reduction needed = (real primary deficit + interests) - deficit which can be financed by overall resources available for financing the external debt).

In expression (18) small letters denote variables expressed as a portion of GDP.

The decrease in deficit which equals the necessary decrease in deficit PSD will match the fiscal deficit with other macroeconomic target variables. Alternatively, equation (18) can be used to calculate the "sustainable" inflation rate. In that case PSD is simply equalised with the present deficit and the rate of inflation is looked for at which the two sides of the equation are equal. Here we can run into the problem of multiple solutions.

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[3] *For solvency approach as a method of evaluating the sustainability of public debt see, for example, Blanchard et al. (1990), Heinemann (1992), Institut "Finanzen und Steuern" (1993), Rolf (1996).*

It should be noted that, when R* is used as the base for setting the limits of the external debt accumulation, the real change in exchange rate (appreciation), necessary to achieve the equilibrium of the foreign trade balance, does not affect the fiscal balance. However, the situation would be different if either exports or output were used as the only base for determining the debt capacity. If the debt/output ratio were considered, the real depreciation would increase the needed decrease in deficit, i. e. decrease the room for a fiscal expansion. If, on the other hand, the debt/exports ratio is considered, the real depreciation would diminish the fiscal adjustment requirement if export elasticity in terms of the real exchange rate were bigger than 1. On the contrary, if external debt capacity is determined on the basis of ratio which has a combination of input and output in its denominator, then depreciation does not impact the ratio. Higher costs of debt servicing caused by depreciation, i.e. the growth of external debt/output ratio are offset by additional capacity to issue foreign debt, i.e. by a decrease in foreign debt/export ratio.

2
ASSESSMENT OF THE SIZE OF THE FINANCEABLE DEFICIT IN THE REPUBLIC OF CROATIA

2.1 Demand for base money in the Republic of Croatia

Base money in the Republic of Croatia consists of two basic components: the currency outside banks and the reserves by commercial banks held at the central bank. In the last five years the average reserve requirement rate was between 26 and 32 percent of the sum of deposit money, savings and term deposits. A functional relation can be noticed between the money supply and primary money, which justifies the base money equation estimation analogously with the estimation of money supply equation.

In this paper the usual techniques for estimating money demand functions are being applied. It is also assumed that the level of base money is the function of income, of inflation rate, of the appropriate component of base money in the previous period, and of the interest rates on demand deposits, as well as on savings and term deposits, as variables of the

opportunity cost of holding money (A. Babić, 1999, Anušić, 1994).

The following variables were used in econometric estimate of the base money demand function:

RM — real base money at the end of the period. Real values were obtained by using an implicit deflator P_t based on the retail price index, and $\log RM=\ln(M/P_t)$.

INFLA — coefficient of change of the quarterly implicit deflator, and $\log INFLA=\ln(1+\pi)=\ln[1+(P_t-P_{t-1})/P_t]$.

Y — gross domestic product in constant (1990) prices.

IDV — weighted average coefficient of interest on kuna demand and term deposits at commercial banks, and $\log IDV=\ln(1+i^{dv})$, where i^{dv} is an annualised nominal weighted average interest rate on kuna demand deposits.

IDO — weighted average coefficient of interest on kuna savings and term deposits at commercial banks, and $\log IDO=\ln(1+i^{do})$, where i^{do} is an annualised nominal weighted average interest rate on kuna savings and term deposits.

IDEP — weighted average coefficient of interest on the total kuna deposits at commercial banks, and $\log IDEP=\ln(1+i^{dep})$, where i^{dep} is an annualised nominal weighted average interest rate on the total kuna deposits.

DUMQ_YY — dummy variables (where Q marks a quarter, and YY a year).

All equations were estimated by using the method of ordinary least squares. To avoid big oscillations of monthly data, quarterly figures were used. Equations are estimated for the period of the first quarter 1994 to the fourth quarter 1998. The period before 1994 was not considered since a very high inflation in that period heavily influenced the form of money demand function, which changed after the introduction of the stabilisation programme at the end of 1993 and after the inflation had been checked.

The equations were estimated in the logarithm form, which is very practical since in that case the parameter values match the elasticities of dependent variables with respect to the explanatory variables. On the other hand, the problem of using equation parameters in the logarithm form of elasticities stems from the fact that it implicitly assumes a constant elasticity which need not hold in reality.

The estimated equations for primary money demand can be found in Table D1 in the Annex.

Here is the model of money demand for which regression coefficients were econometrically estimated:

$$RM_t = \alpha RM_{t-1}^{\alpha_1} Y_t^{\alpha_2} INFLA_t^{\alpha_3} IDV_t^{\alpha_4} IDO_t^{\alpha_5} DUM3\_95^{\alpha_6} \varepsilon \quad (19)$$

The estimate of base money demand for the 1994:1 - 1998: IV period yielded the following[4]:

$$\begin{aligned} \log RM_t = {} & -6.20 + 0.43 \log RM_{t-1} + 1.06 \log Y_t + 3.87 \log INFLA - 10.86 \log IDV + \\ & (-4.02) \quad (7.89) \qquad (6.46) \qquad (3.90) \qquad (-4.52) \\ & + 3.51 \log IDO + 0.16 DUM3\_95 \\ & (4.66) \qquad (5.33) \end{aligned} \quad (20)$$

$R^2 = 0.9951$; $RKOR^2 = 0.9926$; $F = 403.19$; $DW = 2.26$, h test = -0.007.

It is obvious that the estimated equation has the characteristics of a good econometric estimate. Values of R-squared and the adjusted R-squared are high and show that the portion of the non-explained variance of base money demand is below 1 percent. The standard error of estimate is 2.7 percent which is low, and the specification validity of base money demand equation is also proved by a high value of F statistic of 403.19. Durbin-Watson test does not indicate whether the hypothesis of absence of autoregression can be accepted or not. Namely, the corresponding values of d_L and d_U are 0.649 and 2.206, hence Durbin-Watson statistic lies in the indefinite area. Since Durbin-Watson test is not appropriate for testing the absence of autoregression when one of the independent variables is a lagged dependent variable, an h test was performed (Kmenta 1997). This test showed that the hypothesis of $\rho=0$ can be accepted since the test value on which the test is based is smaller than the critical value t_{12} which is 1.753 with the 5 percent probability level.

Coefficients of all the variables have high values of t statistic, i. e. the hypothesis that regression coefficients do not significantly differ from zero can be rejected with 99 percent probability. The coefficient of the

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[4] *Very similar results were obtained when we used the inflation and opportunity cost variables expressed in the form of a rate instead of a coefficient (equation 5, Table D1). However, in the final selection of the equation for the base money demand we decided on the equation whose variables are in the form of a coefficient since it captured a longer time period. Namely, due to negative inflation rates in the first two quarters of 1994, it was not possible to carry out the logarithm transformation of such a pronounced inflation variable in that period.*

variable $logRM_{t-1}$ is 0.43 and does not indicate a high degree of inertia in the base money demand. Coefficient of the economic activity variable, which also shows the income elasticity of primary money demand is very high and amounts to 1.06. By decomposing this coefficient we come to income elasticity of the desired level of base money holdings, which is 1.85 and this is by far higher than the theoretical level of this coefficient which lies between 0.5 and 1. Such a high coefficient level of economic activity variable points to a low level of efficiency in monetary operations.

It is interesting to note that the estimated regressions have shown a positive correlation between inflation and demand for the money supply. (Equation 5 in Table D1 shows that the 1 percent increase in the inflation rate results in the increase of the real monetary base of 0.04 percent). This means that in today's conditions it is possible to increase inflation, and in that way realise monotonously increasing real revenue from the inflation tax, and hence from monetisation as well. The equation yielded such results because in the reviewed period the inflation rate was relatively low (a quarterly inflation rate reached the values between -2.7 and 3.1 percent, with the median value of 0.7 percent). However, the experience before the introduction of the stabilisation programme at the end of 1993, when the monthly inflation rate reached 35 percent, showed that in such conditions demand for money takes Cagan's form of money demand in hyperinflationary conditions. The research showed that there was the inflation rate which maximised the revenue from monetisation, and that particular rate was about 175 percent monthly (Anušić and Švaljek, 1995). Thus we can assume that in the situation of a new inflation increase in the economy, the demand equation for monetary base would again change its form. We can thus suppose that there would again be a certain inflation rate after which the real revenues from inflation tax would start to decline.

By inserting different inflation rates into equation (20) the real amounts of money supply were obtained in the time t+1 assuming that other variables will not change. Then, on the basis of these amounts of real money supply the proportion of real money supply in the annual GDP is calculated, where the assumed level of real GDP equals the level realised in 1998. These proportions of money supply in GDP were used to calculate the possible inflation tax revenue. In accordance with equation (20) this revenue was calculated as a multiplication product of the inflation rate and real monetary base. The results of this simulation of feasible real revenue from the inflation tax are shown in column 2, Table 1. We see that with the quarterly inflation rate within the interval of -6 to 32 percent, with the given form of base money demand function, the inflation tax of -0.28 to 5.64 percent of annual GDP can be collected.

After that a potential government revenue from seigniorage was calculated. Segniorage was calculated as the change in the real value of monetary base in the period t+1 in relation to the period t. The seigniorage revenue is also shown in the form of annualised proportion in GDP. With the inflation rates that existed in the past five-year period (between -2 and 4 percent quarterly) only between -0.93 and 0.90 percent of annual GDP can be collected through monetisation. As we can notice from this table, with the increase of the inflation rate the monetisation revenue rises up to very attractive levels of, e.g. 16.86 percent a month, or 67 percent annually, with the quarterly rate of 32 percent (which is equivalent to the annual price increase of more than 200 percent.) However, a word of caution here: revenue amounts calculated in this way should be understood as the upper limit of revenue at the given inflation rate. Namely, this way of calculating the monetisation revenue assumes that the central bank realises the maximum possible amount of the seigniorage; that the central bank has no additional costs to meet; that the central bank pays no interest on required reserve held in its accounts[5]; and that the central bank transfers the total amount of the seigniorage to the government budget. None of these assumptions is realistic, which is shown in the data that in 1998 the government realised the revenue from seigniorage in the amount of 351,134 kunas or of about 0,25 percent of GDP, while, as shown in the calculation, with the existing monetary base the seigniorage revenue could be double, 0.52 percent of GDP. We can also say that with the rise in inflation rate the base money demand equation would change and the real demand for money would be a negative function of the inflation rate.

For the same reason, the quarterly inflation tax revenue of 5.64 percent of GDP, at the quarterly inflation rate of 32 percent, is most probably unfeasible. Due to such a high inflation rate the real demand for base money, the basis for the inflation tax, would decrease since the population would hold the money for shorter periods of time (and the velocity of money would increase). At the same time it is certain that the demonetisation process would reappear, since the population would try to hold their assets in a more stable form (e.g. foreign currency, real estate or valuables).

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[5] *This assumption does not correspond with reality since in the Republic of Croatia the Croatian National Bank pays a remuneration at 4.5-5.5% rate.*

Table 1

INFLATION TAX, SEIGNIORAGE AND THE TOTAL REVENUE FROM MONETISATION (IN % OF GDP)

Inflation rate (%)	Inflation tax	Seigniorage	Total revenue from monetisation
1	2	3	4 = 2 + 3
-6	-0.28	-1.65	-1.93
-4	-0.21	-1.25	-1.45
-2	-0.11	-0.82	-0.93
0	0.00	-0.37	-0.37
2	0.13	0.11	0.24
4	0.28	0.62	0.90
6	0.45	1.15	1.61
8	0.65	1.72	2.37
10	0.87	2.32	3.19
12	1.12	2.94	4.06
14	1.40	3.60	5.00
16	1.71	4.30	6.01
18	2.05	5.03	7.08
20	2.44	5.80	8.23
22	2.86	6.60	9.46
24	3.32	7.44	10.76
26	3.83	8.33	12.15
28	4.38	9.25	13.63
30	4.98	10.22	15.20
32	5.64	11.23	16.86

2.2 Export demand elasticity

To estimate the elasticity of domestic export with respect to foreign demand and real exchange rate, the export demand function has to be estimated first. Many practical problems occur in econometric estimation of the export demand function of the Republic of Croatia when a conventional model is used, the one in the output level in potentially importing regions, the price levels of exporting goods, and the price levels of imperfect export goods substitutes for export goods on the import market are the basic explanatory variable. Discouraged by these problems some researchers questioned the very possibility of applying this type of analysis, as well as possible results of econometric estimate of export function in the Republic of Croatia (Drinovac, Vujčić and Galinac, 1997).

Among numerous practical problems of such estimation, the following need to be singled out. Firstly, in the last dozen of years after the country gained independence, the structure of Croatia's export has significantly changed in relation to importing countries. Hence it is very difficult to identify the main exporting regions and to estimate the export

demand function by regions. It should also be pointed out that the time series of methodologically comparable data are relatively short, since trade figures with the countries of former Yugoslavia are available only since 1992.

The second problem of estimating the export demand function appears due to the lack of statistics on import and export prices. This is why, first of all, the value of exports is shown in current American dollars and not in constant prices. Also, the lack of statistics on import and export prices does not allow the use of relative price of exports of the Republic of Croatia as an explanatory demand variable, in terms of aggregate index of import prices or aggregate index of domestic prices in the countries into which Croatia is exporting. Thus the alternative explanatory variable is the index of real effective exchange rate.

The third problem stems from the lack of reliable data on gross domestic product of some countries into which the Republic of Croatia has been exporting a large part of its total exports in the last several years. It is primarily the countries of former Yugoslavia, particularly Bosnia and Herzegovina to which, in 1998, for example, about 14 percent of total exports of the Republic of Croatia was directed. Therefore we shall estimate export demand as a proxy variable that shows a foreign demand for Croatian exports, by using imports, i.e. gross domestic product of OECD member countries, and alternatively, imports, i.e. gross domestic product of three groups of European countries: European OECD member countries; EU member countries; and the group which includes Italy, Germany and Austria[6]. Additional problem in estimating and interpreting the results is that there are no original data on imports and gross domestic products for these groups of countries, but only seasonally adjusted quarterly ones, which, to some extent, lessens the reliability of the achieved results.

Finally, the export function shows significant oscillations because of which it is difficult to provide their econometric explanation. A high portion of ship exports within total exports is one of the reasons for oscillations. Shipbuilding is characterised by long production cycles and big cyclical fluctuations on the ship market. Since ship exports account for an important part of the total exports, the cycles have a strong impact on the total exports of the Republic of Croatia. The problem could be avoided by excluding the ship exports from the total exports, but since the beginning of 1997 when a uniform classification was abandoned in favour of national classification of economic activities for gathering data on foreign trade, the

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[6] *To illustrate this, in 1998 52 percent of Croatia's exports went into OECD countries, 49.5 percent into European OECD countries, 47.6 percent into EU countries, and 40 percent of the Croatia's exports went to Germany, Italy and Austria combined.*

shipbuilding can not be excluded from it as a separate industry. Furthermore, in the last dozen of years political factors have also had an impact on demand for Croatian export products (again, the strongest impact has been felt in shipbuilding), not only because of war risks, but because Croatia has been lagging behind in joining European integration processes which has prompted the EU trade to turn to the CEFTA countries. Another reason involves relations with the countries of former Yugoslavia and the regulation of foreign trade with the countries of former Yugoslavia (Bosnia and Herzegovina, Slovenia, Macedonia and SR Yugoslavia).

Owing to the above stated problems, the results of the export demand equation estimate of the Republic of Croatia have to be taken with a great deal of caution and critically examined.

The export demand of the Republic of Croatia is estimated here using a conventional model. To achieve a greater reliability in estimating regression coefficients, and thereby the values of partial elasticities needed to calculate acceptable foreign debt, we run a number of different regressions in order to estimate the export demand function. Imports and gross domestic product of importing countries are used as alternative variables representing export demand. Apart from imports and gross domestic products other explanatory variables used here are the index of real effective exchange rate and the Deutch Mark (DM) exchange rate in relation to American dollar. Although the conventional model for estimating the export demand equation does not comprise the coefficient of DM exchange rate to American dollar, it is still incorporated in the estimate. Empirical research has shown its large significance in explaining export demand variations. Logical grounds for including this coefficient are underpinned by the fact that it can explain the part of dependent variable which results from changes in the relation of DM to American dollar. Official statistics publish data on foreign trade in American dollars, while a large part of foreign trade deals are concluded in Deutch Marks. That is why changes in the relation between these two currencies, with all other conditions unchanged, alter the exports figures published in official statistics (Mervar, 1993). It can be expected that the coefficient of DM to American dollar in export demand equation will have a negative sign, since depreciation of DM to American dollar causes a fall in the value of Croatian exports expressed in American dollars.

In estimating the export demand equation the following variables were used:

IZVOZ	exports of the Republic of Croatia in millions of US dollars.
BDP1	gross domestic product of OECD member countries in billions of US dollars, at 1990 constant prices, seasonally adjusted data.
BDP2	gross domestic product of European OECD member countries, in billions of US dollars, at 1990 constant prices, seasonally adjusted data.
BDP3	gross domestic product of 15 EU member countries, in billions of US dollars, at 1990 constant prices, seasonally adjusted data.
BDP4	gross domestic product of 15 EU member countries, in billions of ECUs, at 1990 constant prices, seasonally adjusted data.
BDPIDA	gross domestic product of Italy, Germany and Austria, in billions of ECUs, at 1990 constant prices, seasonally adjusted data.
UVOZ1	imports of goods and services of OECD member countries, in billions of US dollars, at 1990 constant prices, seasonally adjusted data.
UVOZ2	imports of goods and services of European OECD member countries, at 1990 constant prices, seasonally adjusted data.
UVOZ3	imports of goods and services of 15 EU countries, in billions of US dollars, at 1990 constant 1990 prices, seasonally adjusted data.
UVOZ4	imports of goods and services of 15 EU countries, in billions of ECUs, at 1990 constant prices, seasonally adjusted data.
UVOZIDA	imports of goods and services of Italy, Germany and Austria, in billions of ECUs, at 1990 constant prices, seasonally adjusted data.
IRET	index of real effective exchange rate of kuna, based on the industrial products' producer prices.
DEMDOL	rate of exchange of the Deutch Mark against the US dollar.
TIME	trend variable.
Y	gross domestic product of the Republic of Croatia at 1990 constant prices.

DUMQ_YY dummy variables (where Q marks a quarter, and YY a year).

Variants of econometric estimates of the export demand equation are given at the end of this chapter in tables D2 and D3. All equations were estimated by using the method of ordinary least squares. The logarithm transformation was carried out so that regression coefficients can be interpreted as partial elasticities. The estimates refer to the period of 1991:1 to 1998:3, except the estimates where imports are used as an explanatory variable for export demand, i.e. gross domestic product of European Union countries, in millions of ECUs, in the period between 1992:1 and 1998:4.

The estimate of equation 1 in Table D2 can be selected as the one with the best characteristics. It has the following form:

$$\begin{aligned} \log IZVOZ = &- 6.83 + 1.32\ \log BDP1 + 0.34 \log IRET - 0.92 \log DEMDOL - \\ &(-1.07)\ \ (2.17)\qquad\qquad (2.10)\qquad\qquad (-3.38) \\ &- 0.33 DUM1\_93 - 0.42 DUM1\_94 + 0.25 DUM3\_94 \\ &(-3.54)\qquad\qquad (-4.12)\qquad\qquad (2.75) \end{aligned} \tag{21}$$

R^2=0.78; $RKOR^2$=0.72; F=12.15; DW=1.89

R-squared and the adjusted R-squared show that the changes in chosen explanatory variables can explain more than 78 percent and 72 percent respectively of export variances of the Republic of Croatia. All the coefficient estimates in the estimated demand equation have the expected direction, and t-tests show that the values of coefficients significantly differ from zero at 95 percent probability level, except for the coefficient of the constant which shows that there is no autonomous part of exports. The calculated F value of 12.15 indicates there is a relationship between the dependent variable and explanatory variables, since it is bigger than the critical value for $F_{6,21}$ at 5 percent significance level, which is 2.49. Durbin-Watson statistic shows that the hypothesis of no correlation between residuals can be accepted with 2.5 percent probability, since with that probability level d_U value is 1.85.

At the same time this equation gives the sought partial export elasticities with respect to the exchange rate and demand of import countries. According to the estimated equation of export demand, export elasticity of the Republic of Croatia with respect to the real effective exchange rate, $E_{x^*,c}$ is 0.34. This means that the increase in the index of the real effective exchange rate by 1 percent, which equals the real kuna appreciation

by 1 percent, causes the increase in exports, expressed in American dollars, by 0.34 percent, with other conditions unchanged.

To calculate the level of acceptable foreign debt by using this theoretical framework we need to see the elasticity of domestic real output with respect to the real effective rate of exchange. This elasticity is obtained through a simple estimation of the correlation between domestic output and the real effective rate of exchange. Econometric estimation yields the following:

(22) $$\log Y = 11.95 - 0.26 \log IRET + 0.01 TIME$$
$$(34.22)\ (-3.58)\qquad (10.02)$$

$R^2 = 0.83$; $RKOR^2 = 0.82$; $DW = 1.626$; $F = 62.05$

This estimation also has the sufficient power to explain the variances of the dependent variable. The values of t-tests show that the hypothesis which suggests that parameters significantly differ from zero can not be accepted. Durbin-Watson statistic indicates that there is no problem of autocorrelation of residuals. Although gross domestic product expressed in foreign currency (in American dollars) is the variable required by the model, in this estimate we used gross domestic product as a dependent variable, in kunas, at 1990 constant prices, since GDP figure in foreign currency was not available. The elasticity of domestic real production with respect to real effective exchange rate, $E_{Y,e}$ is 0,26 percent. Coefficient of the real effective exchange rate has a negative sign, which satisfies the assumption in Cohen's model, according to which domestic production is import dependent, and this import dependency causes a negative relationship between the exchange rate and gross domestic production (Cohen, 1988).

2.3 Croatia's ability to finance its fiscal deficit

Using the calculated elasticities

$E_{X^*,e} = 0.34$,
$E_{X^*,Y^*} = 1.32$, and
$E_{Y,e} = -0.26$

we applied the expression (13) and obtained the following value of coefficient γ:

$$\gamma = 0.7766.$$

This value shows that the value of resources which should be used to determine the size of external indebtedness - and this value being invariant with respect to the changes in the real effective exchange rate - can be obtained as a linear combination of 77.66 percent of export value and 22.34 percent of domestic output value of the Republic of Croatia.

When elasticity values and coefficient gamma values are obtained, and when the selected relevant export share in gross domestic product is 22 percent, which is the actual share of goods exports of the Republic of Croatia in the gross domestic product in 1998, so that

$$\varphi = 0.22,$$

then we have obtained all entry data necessary to calculate a possible growth rate of Croatian external debt, with the given growth rates of exports and economic growth abroad. In accordance with expression (13) the rates of Croatian export growth were calculated as the product of Croatian export elasticities in relation to the output of importing countries, and of different rates of economic growth in the Republic of Croatia.

In the model the rates of economic growth in domestic economy and abroad feature as exogenously given values. Therefore for obtaining the rates of acceptable increase in foreign debt it is necessary to anticipate the feasible rates of economic growth in the country and abroad. The real rates of economic growth in Croatia we chose as achievable lie between 0 percent and 4 percent. With these growth rates in the country, and with the existing Croatian export elasticity with respect to the production of importing countries, we obtained the rates of export growth ranging between -1.32 percent to 3.96 percent. Due to the already achieved high level of economic development in importing countries, we assumed that their real rates of economic growth would be somewhat lower, between -1 percent and 3 percent. These are the assumptions on which the rates of growth of resources R, i.e. nR in Croatia were calculated using the expression (14). The results of these calculations can be found in Table 2. As we pointed out earlier, the acceptable debt strategy will be considered the one at which country's creditworthiness remains unchanged, i.e. those debt levels at which the ratio of external debt to resources available for financing external debt, is not rising. From this we derive the conclusion that a debt strategy is acceptable if the debt grows at the exact rate at which resources grow.

Figure 1

TOTAL EXTERNAL DEBT OF THE REPUBLIC OF CROATIA WITH RESPECT TO EXPORTS, GROSS DOMESTIC PRODUCT AND RESOURCES

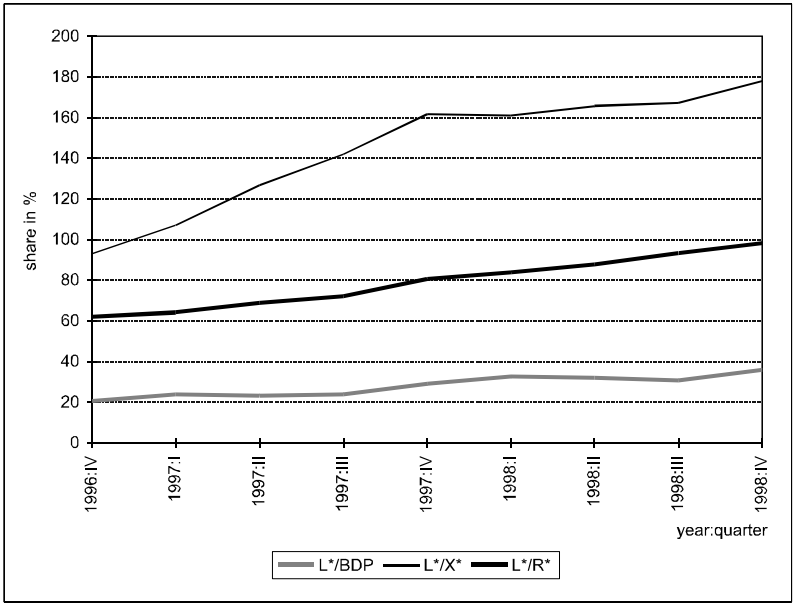

Figure 1 illustrates the past movements of relative debt ratios of the Republic of Croatia, and shows the shares of total external debt of the Republic of Croatia in exports, in gross domestic product, and in resources. Since it was not possible to compare foreign debt figures in a longer time period, only the figures from the preceding nine quarters were used, in which the obligations towards London and Paris clubs were included in the external debt. It can be noticed that a share of external debt, and particularly of net external debt in the resource measure of the country was significantly growing in the preceding nine quarters, which leads us to the conclusion that the foreign debt strategy of that period had a negative impact on creditworthiness of the Republic of Croatia.

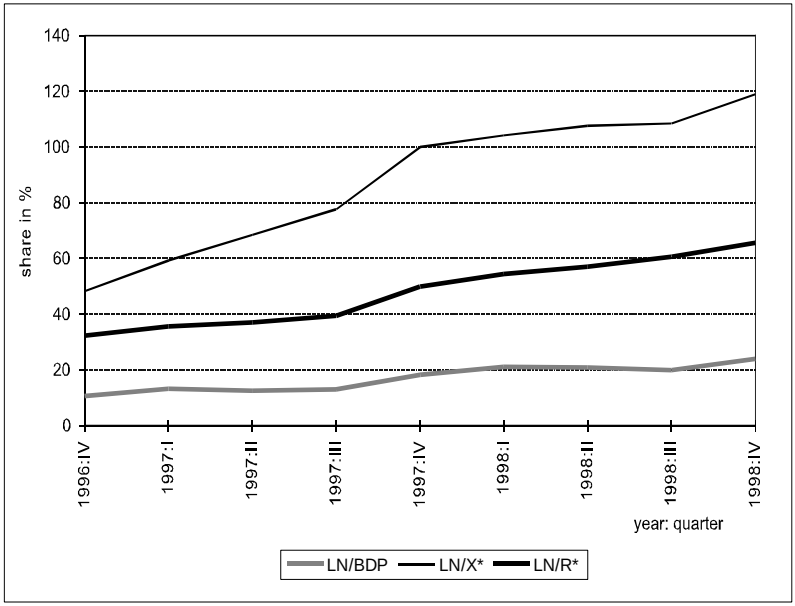

Figure 2

NET EXTERNAL DEBT OF THE REPUBLIC OF CROATIA WITH RESPECT TO EXPORTS, GROSS DOMESTIC PRODUCT AND RESOURCES

We know that, as shown in expression (16), deficit (in this precise case the balance of trade deficit) equals the change in debt (here it is the level of foreign debt) which, in turn, equals the product of debt growth rate and debt in the previous period. Due to this equality the obtained growth rates of external debt can, in accordance with expression (16), also be interpreted as acceptable shares of foreign trade deficit in gross domestic product of the Republic of Croatia, with the given rates of economic growth in the country and abroad.

Thus the figures in Table 2 show that at the real rates of economic growth in Croatia ranging from 0 percent to 4 percent, and at the real rates of economic growth in importing countries ranging from -1 to 3 percent, foreign debt of the Republic of Croatia can grow between -0.57 and 3.98 percent per year. In other words, the share of foreign trade deficit in gross domestic product of the Republic of Croatia, at the rates of economic growth in the stated ranges, should be between -0.57 and 3.98 percent per year, without increasing the share of foreign debt in the denominator of debt indicator, which is invariant with respect to the changes in the real effective exchange rate. With a combination of the rate of economic growth of, say, 1 percent in the Republic of Croatia, and the rate of economic growth of -1 percent in countries into which Croatia is exporting, the Republic of Croatia

should have a surplus in foreign trade if it wants that its share of foreign debt in the value which is a linear combination of exports and output, remains unchanged. If we chose a more realistic combination of growth rates, e.g. 1.5 percent in the Republic of Croatia and 1 percent abroad, foreign debt of the Republic of Croatia could grow at the rate of 1.42 percent.

Table 2

ACCEPTABLE RATES OF FOREIGN DEBT GROWTH

Rates of growth in the country / Rates of growth in importing countries	-1	-0.5	0	0.5	1	1.5	2	2.5	3
0	-0.57	-0.29	0.00	0.29	0.57	0.86	1.14	1.43	1.72
0.5	-0.29	0.00	0.28	0.57	0.86	1.14	1.43	1.71	2.00
1	-0.01	0.28	0.57	0.85	1.14	1.42	1.71	2.00	2.28
1.5	0.28	0.56	0.85	1.14	1.42	1.71	1.99	2.28	2.57
2	0.56	0.85	1.13	1.42	1.71	1.99	2.28	2.56	2.85
2.5	0.84	1.13	1.42	1.70	1.99	2.27	2.56	2.85	3.13
3	1.13	1.41	1.70	1.99	2.27	2.56	2.84	3.13	3.42
3.5	1.41	1.70	1.98	2.27	2.56	2.84	3.13	3.41	3.70
4	1.69	1.98	2.27	2.55	2.84	3.12	3.41	3.70	3.98

It can be seen that the estimated export demand equations and the interdependence of gross domestic product and real effective exchange rate in the Republic of Croatia indicate that the room for acceptable debt is very restricted so that a very small debt increase of 4 percent can lead to deteriorating of foreign creditworthiness of the Republic of Croatia. If we look back several years ago, we see that the external debt of the Republic of Croatia in 1997 increased by 39.2 percent in relation to 1996, in 1998 by 28.9 percent in relation to 1997. In 1999 the increase of external debt was not so pronounced, but due to the kuna depreciation and the fall of the dollar value of the exports, the share of external debt in GDP (i.e. in exports or in the combination of GDP and exports) worsened. If the external debt ratio continues to grow, creditworthiness of the Republic of Croatia will worsen which could seriously weaken the possibility of getting a loan abroad. This empirical research shows that a turnaround in macroeconomic policy is necessary and urgent. Also domestic economy should stop the trend of relying on foreign savings.

It will be repeated that the basic assumption of the present research was that the total external debt is actually the public debt. However,

if we assume that apart from the public sector there is the private sector which can borrow abroad and has the need to borrow, then the room for foreign public borrowing is very restricted. Namely, if all the sectors of the Republic of Croatia can borrow abroad not more than 4 percent of GDP so that the external debt share does not deteriorate, and if there is a need of the private sector to borrow up to 2 percent of gross domestic product, the public sector will be able to borrow only up to the remaining 2 percent of gross domestic product.

Up to now we have been considering only the possibility of financing the public sector through foreign debt and monetisation. Besides these two methods, the government can be financed through domestic debt. Hence when assessing the possibility of financing the public sector consistently with other macroeconomic aims, domestic debt of the government also has to be taken into account. Interest rates on the existing domestic debt are very high and vary between 5 and 12 percent, averaging 5.4 percent. Interest rate on domestic instruments issued after 1993 are even higher. Domestic debt is largely denominated in foreign currency and through this is indexed, so we can say that the 5.4 percent interest rate almost equals the real interest rate on domestic debt. With the interest rate of 5.4 percent and the rate of economic growth of, say, 3 percent, any more intensive relying on financing through domestic debt would bring about the explosion of costs of debt repayment expressed as a percentage of the gross domestic product. We can conclude that with the existing rate of growth and the interest rates on domestic public debt, domestic debt is not an appropriate source of financing public consumption. Thus the maximum acceptable amount of financing in the country would be the one which would not alter the share of domestic public debt in GDP. With the 2 percent rate of economic growth, the rate of increase of domestic debt or a deficit which is financed by issuing public debt in the country could also be 2 percent of gross domestic product without jeopardising the stability requirement of domestic debt.

If we calculated feasible government revenues from monetisation and acceptable financing of the government through debt, we could come to a public sector deficit which would be consistent with the set aims with respect to the rate of economic growth and inflation rate. Thus we can notice that with rate of economic growth of 1.5 percent, with 1 percent rate of economic growth abroad, and with the target inflation rate of 2 percent, financeable public sector deficit should not exceed 4.38 percent of gross domestic product. This deficit can be considered the maximal upper level of public sector debt since it is based on the assumption that it is possible that the whole additional amount of foreign currency obtained

through debt is made available to the government. It is also assumed that the government issues debt domestically in spite of the high interest rate on domestic public debt.

With any other higher debt level economic disruptions would occur which would threaten the realisation of macroeconomic policy. If the government more heavily relied on foreign finances it would endanger the possibility of repaying this very foreign debt. This would, in turn, jeopardise the possibility of taking more loans abroad since foreign creditors would perceive this danger, and that would bring down the creditworthiness of the country. All of this could provoke shocks in the balance of payments and necessitate changes in foreign currency rate which would additionally threaten economic stability. Further reaching out for financing through domestic debt would cause, as mentioned earlier, the growth in the share of costs of debt repayment in gross domestic product and in the government budget, and would leave less room for maneuver in achieving other public sector tasks. It may also incur a new debt with the main purpose of financing the repayment of the existing debt. Finally, monetary expansion, as the third source of deficit financing, could have disastrous consequences for price stability, and thereby for the stability of the overall economy, thus indirectly threatening the ability of achieving the desired rate of growth.

3
CONCLUSION

Empirical analysis has shown that Croatia has limited possibilities to finance its fiscal deficit. Foreign debt which up to now was considered as an interesting possibility because of relatively low interest rates and because of the availability of capital on foreign markets, is to a large extent limited by dynamics of imports, which is the basic resource generator for the repayment of foreign debt. The extent of financing the government through domestic debt is limited by the low rate of growth of domestic economy. Financing through issuing money should be avoided because of possible inflationary effects. Thus we can conclude that in such conditions the country should keep its consumption within the limits of collected revenues since any other fiscal policy could produce serious problems in financing fiscal deficit and in debt repayment, so that in the end it could endanger the realisation of economic stability and growth.

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APPENDIX

Table D1

ESTIMATES OF BASE MONEY DEMAND FUNCTION

Equation	1	2	3	4	5*
Dependent variable	**LogRM**				
Independent variables					
C	-7.03	-7.25	-7.18	-6.18	-5.90
(t-stat.)	(-2.61)	(-2.56)	(-2.98)	(-4.02)	(-4.53)
p -vrij.	0.02	0.02	0.01	0.00	0.00
logRM(-1)	0.49	0.60	0.61	0.43	0.39
(t-stat.)	(5.27)	(7.67)	(9.06)	(6.46)	(8.50)
p -vrij.	0.00	0.00	0.00	0.00	0.00
logY	1.08	1.01	1.00	1.06	1.05
(t-stat.)	(3.74)	(3.26)	(3.79)	(6.46)	(7.20)
p -vrij.	0.00	0.01	0.00	0.00	0.00
logINFLA	2.65	1.33	1.60	3.87	0.04
(t-stat.)	(1.56)	(0.80)	(1.13)	(3.90)	(3.25)
p -vrij.	0.14	0.44	0.28	0.00	0.01
logIDV	-5.88			-10.87	-0.36
(t-stat.)	(-1.51)			(-4.52)	(-6.16)
p -vrij.	0.16			0.00	0.00
logIDO	2.40			3.51	0.17
(t-stat.)	(1.88)			(4.66)	(6.60)
p -vrij.	0.08			0.00	0.00
logIDEP		0.38	-0.44		
(t-stat.)		(0.19)	(-0.26)		
p -vrij.		0.85	0.80		
DUM3_95			0.12	0.16	0.18
(t-stat.)			(2.51)	(5.33)	(6.60)
p -vrij.			0.03	0.00	0.00
R^2	0.98	0.98	0.99	0.995	0.996
$RKOR^2$	0.98	0.97	0.98	0.993	0.993
SGO	0.05	0.05	0.04	0.03	0.02
N	19	19	19	19	18
F	154.00	160.26	180.25	403.19	416.85
DW	1.52	1.25	0.98	2.26	2.39

** In this equation inflation variable is expressed in the form of a rate, so logINFLA=ln(π)= ln(P_t-P_{t-1})/P_t.*

Table D2

ESTIMATES OF EXPORT DEMAND FUNCTION I

Equation	1	2	3	4	5
Dependent variable	**logIZVOZ**				
Independent variables					
C	2.75	2.87	2.87	3.24	0.62
(t-stat.)	(1.28)	(1.24)	(1.34)	(1.90)	(0.20)
p -vrij.	0.21	0.20	0.19	0.07	0.84
logUVOZ1	0.41				
(t-stat.)	(2.00)				
p -vrij.	0.06				
logUVOZ2		0.45			
(t-stat.)		(1.95)			
p -vrij.		0.07			
logUVOZ3			0.46		
(t-stat.)			(1.95)		
p -vrij.			0.07		
logUVOZ4				0.47	
(t-stat.)				(2.28)	
p -vrij.				0.03	
logUVOZIDA					0.45
(t-stat.)					(2.01)
p -vrij.					0.05
logIRET	0.32	0.27	0.26	0.31	0.32
(t-stat.)	(1.96)	(1.83)	(1.81)	(2.07)	(2.00)
p -vrij.	0.06	0.08	0.08	0.05	0.06
logDEMDOL	-0.88	-0.85	-0.84	-0.85	-0.80
(t-stat.)	(-3.24)	(-3.20)	(-3.20)	(-3.31)	(-3.15)
p -vrij.	0.00	0.00	0.00	0.00	0.00
DUM1_93	-0.33	-0.33	-0.33	-0.33	-0.32
(t-stat.)	(-3.47)	(-3.40)	(-3.40)	(-3.40)	(-3.30)
p -vrij.	0.00	0.00	0.00	0.00	0.00
DUM1_94	-0.43	-0.43	-0.43	-0.43	-0.44
(t-stat.)	(-4.14)	(-4.14)	(-4.14)	(-4.14)	(-4.34)
p -vrij.	0.00	0.00	0.00	0.00	0.00
DUM3_94	0.25	0.25	0.25	0.25	0.24
(t-stat.)	2.69	2.69	2.69	2.69	(2.61)
p -vrij.	0.01	0.01	0.01	0.01	0.02
R^2	0.78	0.78	0.78	0.78	0.77
$RKOR^2$	0.71	0.71	0.71	0.71	0.71
SGO	0.09	0.09	0.09	0.09	0.09
N	27	27	27	28	28
F	11.72	11.60	11.60	12.27	11.80
DW	1.87	1.89	1.89	1.88	1.88

Table D3

ESTIMATES OF EXPORT DEMAND FUNCTION II

Equation	1	2	3	4	5
Dependent variable	**LogIZVOZ**				
Independent variables					
C	-6.83	-4.55	-4.74	-3.74	-15.24
(t-stat.)	(-1.07)	(-0.77)	(-0.80)	(-0.80)	(-1.39)
p -vrij.	0.30	0.45	0.44	0.44	0.18
logBDP1	1.32				
(t-stat.)	(2.17)				
p -vrij.	0.04				
logBDP2		1.22			
(t-stat.)		(1.96)			
p -vrij.		0.06			
logBDP3			1.26		
(t-stat.)			(1.97)		
p -vrij.			0.06		
logBDP4				1.37	
(t-stat.)				(2.26)	
p -vrij.				0.03	
logBDPIDA					1.62
(t-stat.)					(-2.02)
p -vrij.					0.06
LogIRET	0.34	0.29	0.28	0.29	0.25
(t-stat.)	(2.10)	(1.88)	(1.87)	(2.01)	(1.76)
p -vrij.	0.05	0.08	0.08	0.06	0.09
logDEMDOL	-0.93	-0.85	-0.84	-0.85	-0.81
(t-stat.)	(-3.38)	(-3.21)	(-3.21)	(-3.30)	(-3.12)
p -vrij.	0.00	0.00	0.00	0.00	0.01
DUM1_93	-0.33	-0.33	-0.33	-0.32	-0.31
(t-stat.)	(-3.54)	(-3.44)	(3.40)	(-3.40)	(-3.22)
p -vrij.	0.00	0.00	0.00	0.00	0.00
DUM1_94	-0.42	-0.43	-0.43	-0.43	-0.45
(t-stat.)	(-4.12)	(4.16)	(-4.21)	(-4.27)	(-4.39)
p -vrij.	0.00	0.00	0.00	0.00	0.00
DUM3_94	0.25	0.25	0.25	0.25	0.24
(t-stat.)	(2.74)	(2.68)	(2.65)	(2.70)	(2.59)
p -vrij.	0.01	0.01	0.02	0.01	0.02
R^2	0.78	0.78	0.78	0.78	0.77
$RKOR^2$	0.72	0.71	0.71	0.71	0.70
SGO	0.09	0.09	0.09	0.09	0.09
N	27	27	27	28	28
F	12.15	11.62	11.64	12.23	11.61
DW	1.89	1.89	1.89	1.87	1.88

LIST OF SYMBOLS

1. General marks

Δ	changes in values
t	period
*	value expressed in foreign currency
ε	elasticity

2. Other symbols

b	share of public debt in output
B^C	public debt held by the central bank
B^P	public debt at held by the private sector
B^T	total public debt
D	conventional fiscal deficit
d	share of conventional fiscal deficit in output
E	nominal exchange rate
e	real exchange rate
F^C	foreign exchange reserves held by the central bank
G	current expenditures of the public sector
GOT	currency in circulation
i^D	nominal interest rate on domestic public debt
i^{DO}	nominal interest rate on savings and term deposits
i^{DV}	nominal interest rate on sight deposits
i^L	nominal interest rate on external debt
K^C	total direct central bank credits
L	total external debt
L^N	net external debt
m	share of base money in output
M^0	base money
M^{0R}	real base money
n	growth rate
P	price level
PB	primary balance of the government budget (primary deficit)
PSD	required deficit reduction
R	resource measure based on GDP and exports data
r^D	real interest rate on domestic public debt
r^F	real interest rate on foreign public debt
REZ	reserve requirement
X	goods exports
Y	output
γ	weight for exports
φ	share of goods exports in output
π	inflation rate