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Methodological Basis for Macroeconomic Projections in Countries Exposed to Pressures and Shocks: Example of Serbia

Summary: The presented Macroeconomic Projections Model is based on a "pre-established" model for projecting the balance of payment linked with the balance of gross domestic product use. Such a model is the "authentic! one, designed by authors, i.e. based on a no theoretical concept of modelling the macroeconomic equilibrium, but it has a "heuristic" (experiential) character. The idea for designing such a model comes from the fact that theoretical models involve numerous equations that are to be solved, with numerous parameters to be estimated, including also the problem of linearity (smoothness) of long-term analytical curves, as well as the problem of an undeveloped market, a closed economy or an economy that is fragile in its relations with foreign countries, the problem of "turning" points, different internal or external shocks, etc.

Key words: Macroeconomic projections, GDP deflators, Modelling, Sustainability.

JEL: B41, C02, C62, E27, E61.

The majority of methods for long-term projections are based on the combination of conjunctive analysis, the application of developed econometric models, and the estimation of economic experts. The basic function of macroeconomic projections in all countries is that the government will follow the path of sustainable long-term development whereby it will not react on current pressures. These pressures can be political factors or shocks in the economy, either domestic or external.

In the example studied here (section 6), for the economy of Serbia, characteristically domestic political pressures in the period 2006-2010 were manifested concerning budget consumption, wages in the public sector, and pensions. In the case of Serbia, the characteristic external political pressure is currently a two-year credit arrangement for stability support signed in May 2009 with the International Monetary Fund. This arrangement implies quantitative and structural criteria, among which, the freezing of nominal wages in the public sector and the freezing of pensions are the most important ones. The hardest external shock in the recent history of Serbia was the imposing of trade and financial sanctions in May 1992.

While making projections and creating different scenarios, it is desirable to ensure that the projections are consistent through all segments of an economy. Mat-

thew Martin (1999) considers five models that are most often the subject of discussion:

- IMF's financial "framework";
- RMSM model of the World's Bank and more advanced variations of this model as RMSM-X/XX and MACOR;
- "Three-gap" model and varied structural models;
- CGE and other more complex models of funds' flow;
- Dynamic econometric models.

IMF's financial framework: In his paper about the nature of "financial programming," Bruce R. Bolnick (1999) explains the significance of this methodology as a standard tool that decision makers should apply. He emphasizes that financial programming is a quantitative method for defining monetary and fiscal targets that are a) consistent with chosen long-term goals and projected parameters, b) take into account domestic production and prices, and c) consider the external trade sector and monetary and fiscal conditions in the country. The main goals most often include targeted sizes of growth, inflation, and foreign currency holdings. Other important parameters include foreign currencies and targeted values of growth of domestic credits to the non-government sector. This model presents a good starting point for establishing a consistent frame for financial programming. The basic structure of the model is formulated in relation to the supply and demand for goods, money, and external-trade exchange. Jan G. Mikkelsen (1998) also suggests that domestic inflation and medium-term output growth are set as exogenous targets while the foreign exchange rate is variable, determined by relations on the market. As an alternative to the flexible rate, the model has the possibility of a fixed exchange rate regime, used in combination with external financing gap.

RMSM (Revised Minimum Standard Model): According to Doug Addison (1989), the basic purpose of the World Bank's RMSM model is to show what level of investments, imports, and indebtedness are indispensable in order to achieve the targeted growth rate of the GDP. Thus, the selection of this targeted growth rate will determine which level of investments will be necessary. This model, however, cannot give any instruction regarding policy as well as the level of prices that is indispensable in accordance with the specified growth level. In conditions of acute and growing misbalances, the approach to monetary policy is determined as restrictive and stabilizing. Hence, it is needless to connect price factors as endogenous in the scope of the model. This model starts from the equation of macroeconomic balance¹:

$$GDP=C+G+I+X-M$$

In this model, the GDP's growth is an exogenous and determined variable. The value of the export growth rate is also determined. This rate should represent, then, all assumptions about the demand in the countries to where the exports are directed, the market shares as well as reactions on prices, and the change in foreign exchange rates over the observed time period. In this model, investments are the

¹ C - Household consumption, G - Government spending, I - Investments, X - Exports, M - Imports.

function of the desirable GDP growth. This function can be determined in two ways: through marginal liability towards investments and marginal relation of capital and output. This, however, also presents the hardest requirement in application of the model. Any analytical functional relation of investments and GDP growth is impossible in conditions of rapid change to the economy's structure that is characteristic of countries in transition.² Demand for exports depends on demand for consumable, intermediary, and investment goods.

"Three-gap" models: "Three-gap" models improve upon the "two-gap" model. Beside the traditional "saving gap" and "external gap", they also include the "fiscal / financial gap". Omar O. Chisari and Jose Maria Fanelli (1990) explain that the inclusion of a new gap into the analysis is the result of what that characterized the development process of Latin America during the 1980s. Consider that after the debt crisis the current account problem became structural rather than transitional. In addition, if we take into account that governments of Latin American countries kept the same level of external debt, we find that external crisis also took over in the form of fiscal crash.

CGE models: CGE models are simulations that combine abstract models (AGE) — formulized by Arrow and the Debreu — with realistic economic data with the aim of finding balance in the level of supply, demand, and prices of a certain market. Ian S. Wing (2004) suggests that these particular models represent a standard tool for empirical analysis. Furthermore, they have a great application in welfare analysis and public policies influence. Shantayanan Devarajan and Sherman Robinson (2002) also analyzed results from the application of these models.

Dynamic econometric models: Such models, based on a series of econometric models, belong to the group of the most complex projections' methods. For an annual conference of the Norges Bank, Ida W. Bache et al. (2009) presented a paper, "Macro Modelling with any Models" that relates to macroeconomic projections by application of dynamic models. They consider that states that conduct inflation targeting policy should, in order to make long-term projections, apply the same methodology used in weather forecast, in other words, "ensemble modelling." The variability of the model's specification (starting conditions, parameters, and restrictions, for example) is simply included into the model by constructing a group of predictive densities through numerous models of components. The components provide explanations of various sources of variability through the model; at the end, the model explains all instabilities by applying time-varying weights on the components. In this study, it is recommended that future generations of macro models, in countries that target inflation, should put aside the problem of "uncertain instabilities" and focus on these subjects from the perspective of certain models.

The method-model: This model, presented in this paper, is in line with the IMF's financial framework and the RMSM model of the World Bank. Taking into account the importance of expert analysis and knowledge on structural characteristics and the performance of an economy in transition, this method-model is all about heuristic models. Models in which the GDP growth, share of investments, exports, ex-

² Serbia presents a typical example of a country where the economy is in transition and the State, in the period after 2000 and to the beginning of 2010, has still not passed more than half of the transitional path.

ternal-trade deficit, and parameters of state consumption limitations are targeted in determined time intervals. The same is true for projections of important current and capital inflows from abroad as well as price factors for economy in transition. The application of econometric models is avoided due to insufficient transparency and weak application conditions given the fragile transitional economy under pressure of conflict and internal and external policies and requirements. In this way, in regards to the statistical-mathematical apparatus, the model is maximally simplified. Nevertheless, complexity is emphasized in the field of the balance connectivity (the spine is made of the Balance of GDP use, “Balance of payments” and state and envisaged repayment of public and commercial debt). In one iterative adjustment of targeted variables, the criteria for sustainability and structural-dynamic plausibility are the most important. One simple, explicit approximate method of the GDP deflators’ derivation is very important as well as the deflator of aggregates of GDP use. The model demonstrated in practice — on the example of the economy of Serbia in its long transitional period — the maximal credibility, adaptability and simplicity in application. It also demonstrated good comprehension of conjuncture and transitional structural changes and effects.

1. Components of the Macroeconomic Projections’ Model

The Model of Macroeconomic Projections contains the following components:

- Projections of prices and exchange rate;
- Projections of GDP (“Gross Domestic Product”) and balance of GDP’s use in current prices;
- Projections of BOP (“Balance of Payments”);
- Projections of saving and investment balances (as derived designations – control of relation between domestic savings, national savings, and international savings as well as private savings and savings of the State);
- Plans for debts’ repayment along with indebtedness towards foreign countries.

A fundamental relation of the model is:

$$\text{GDP}=\text{C}+\text{G}+\text{I}+\text{X}-\text{M} \quad (1)$$

where:

- C = Household consumption;
- I = Gross investments + Stocks changes;
- G = Collective consumption;
- M = Imports;
- X = Exports;
- ΔX = Net exports (exports value X reduced for imports value M).

First, the model of projections of BOP was “constructed”.

The balance of GDP use is paired with the BOP and these two balances present the model’s “spine.”

Projections of the BOP and the balance of GDP use begin from certain proportions in cited fundamental balance relations, or respectively, goals of a certain development scenario that are determined as exogenous variables. This means that we dispose of the following target variables: tempo (dynamics) or share in the GDP of aggregates like household consumption, collective consumption, investments, and net exports. As we shall see, the parameters of dynamics and shares can be combined.

While designing the model, two sets of conditions are defined:

(1) Conditionally speaking, three types of scenarios can be defined:

- The pro-investment scenario;
- The social scenario (which reflects certain dynamics of household consumption); and
- The stabilization scenario (which reflects certain dynamics of price relations).
- In this moment, all projections of sustainable development are in favour of the pro-investment scenario, e.g. there is no sustainable development without the pro-investment scenario. We will see what reflects sustainability as well as non-sustainability of a certain scenario.

(2) Projections of the BOP must be derived in a foreign currency (EUR or USD) since the sustainability or non-sustainability of any scenario firstly manifests as sustainability or non-sustainability of the BOP.

In a constructed model, imputed parameters for the designing of the BOP must be derived partially in a model of projections of the GDP use.

The model of projections of the GDP and the GDP use must be derived in RSD because the “System of National Accounts” is derived in the national currency. It is clear, then, why the projections of prices and exchange rates must precede any other projections.

2. Model of Projections of the Balance of Payments

Because of the formal description of the projections model, we are neglecting the influence of domestic prices — i.e. different deflators for certain aggregates in the balance relation of the GDP use. This will, however, be considered later. As mentioned above, the body of the model is the projections for the BOP.

The BOP has two basic parts:

- Balance of current transactions and
- Balance of capital transactions.

The basic relation of the BOP is:

$$T+K = \Delta R, \quad (2)$$

where:

T = Balance of current transactions;

K = Balance of capital transactions;

ΔR = Change of foreign exchange reserves.

The upper relation means that the deficit in the balance of current transactions is more than covered by the balance of capital transactions and that the “rest” is used for foreign exchange reserves’ growth. Under “normal circumstances,” relation (3) is approximate, because there is one part of BOP that does not cross 5% of capital balance, called “errors and omissions,” e.g. the following is valid:

$$T+K+N = \Delta R \quad (3)$$

The question of “intentness” and sustainability of the BOP is reflected in N . When dealing with realized BOP, (e.g. that already presents the past), if N is big, then it can be considered as “non-identified” capital (e.g. “grey capital”). On the other hand, if we are dealing with projected BOP, then we must consider “missing capital” — the missing capital necessary to cover the current deficit and lack of growth in foreign exchange reserves.

In projections of development that depend on GDP and macroeconomic goals, the key variables in the current balance are projected: **exports and imports**. Foreign exchange reserves are likewise projected, in equivalence against projected size of imports. These three variables are liable to certain functional dependence. Other variables are the so-called “free” variables. All variables from the capital balance are “free,” but one should consider real relations. When it is about capital outflow and inflow, one should previously plan for indebtedness repayment of foreign debt (credit arrangements).

In mathematical procedure the basic characteristic is:

- Overcoming the assumption of “homogenous” development;
- Appropriately selecting macroeconomic goals that on the one hand provide a simple account, and on the other hand, provide the perceived key parameters of macroeconomic development.

Most often, the task of projections performance is for the long term (10 years). Then, the assumption of homogenous development in the whole period is too rough — i.e. it is not wise to assume a constant growth rate for the GDP over the whole period. Instead, it is about turning points in the development of an economy that suffers from shocks: debt repayment burden, inflow of foreign direct investments, possible sanctions, big arrangements with international financial institutions etc. Due to this, a splitting of intervals into shorter intervals (two, three or four years) is exerted whereby each of these intervals has assumed growth rates established.

It looks like this in formal description:

Let us distribute the total interval of projections to T sub-intervals that are designated as $t = 1, 2, \dots, T$. Let the first interval of projections include years from n_0+1 (n_0 is the starting year for which we dispose of all sizes of the BOP and the Balance of GDP use) up to the year designated with n_1 (for example 2007 = n_0 to 2012 = n_1). Let the second interval ($t = 2$) include the years from n_1+1 or n_2 ; third interval ($t = 3$) from n_2+1 to n_3 etc.

For any given interval, t begins from specified values (in projections of the GDP and GDP use):

- v_t – Real GDP growth rate in every year i , where $n_{t-1} < i < n_t$;
 δ_t – Gross investment share in the GDP in the last year of interval, i.e. in year n_t ;
 e_t – Share of export goods and services in the GDP in the last year of interval (n_t);
 d_t – Share of net exports (in absolute value) in the GDP in the last year of interval (n_t);
 j_t – Collective consumption share in the GDP in the last year of interval (n_t).

Parameter e_t is specified in the BOP table.

If n_0 is the starting year for which the specified parameters are known (as well as quantities of the BOP and the Balance of GDP use), and if, for example, the entire projections period is divided into four sub-intervals, then the matrix of starting parameters are the following:

$$M = \begin{array}{c|ccccc} & n_0 & n_1 & n_2 & n_3 & n_4 \\ & v_0 & v_1 & v_1 & v_1 & v_1 \\ & d_0 & d_1 & d_2 & d_3 & d_4 \\ & \delta_0 & \delta_1 & \delta_2 & \delta_3 & \delta_4 \\ & e_0 & e_1 & e_2 & e_3 & e_4 \\ & j_0 & j_1 & j_2 & j_3 & j_4 \end{array}$$

The quantity of the GDP in the nominal foreign currency (EUR) is transferred into the BOP because of the external economy's indicators derivations (after it has been already derived on the basis of the projected exchange rate and projected nominal GDP in domestic currency).

The first step, for coming years where the BOP is projected, the investment growth rate is derived for every year of the sub-period t :

$$q_t = \left[\frac{I(n_t)}{I(n_{t-1})} \right]^{\frac{1}{n_t - n_{t-1}}} - 1 = \left[\frac{\delta_t \cdot GDP(n_t)}{I(n_{t-1})} \right]^{\frac{1}{n_t - n_{t-1}}} - 1 \quad (4)$$

if δ_t is specified (but not derived) in the GDP use.

Based on the investment growth rate in the interval (t), quantities of investments are derived in that interval, and then the same procedure is repeated for the next interval ($t+1$), etc.

$$I(i) = (1 + q_t) \cdot I(i-1) ; n_{t-1} < i \leq n_t.$$

Hence, if the calculations of the GDP use aggregates were not performed on the basis of specified trend rates of household consumption, than the quantity of household consumption for each sub-interval is derived for each year of projection, too:

$$C(i) = GDP(i) - \Delta X - I(i) - j_t GDP(i), \Delta X = -d_t GDP(i); n_{t-1} < i \leq n_t. \quad (5)$$

The key quantity that should be derived on the basis of projected quantities in the BOP and the Balance of GDP use is the quantity of imports (goods & services). In the balance of GDP use, as well as in the BOP, a certain "partial linearity" is needed (inside the interval). It should first be reflected at quantities of household consumption, imports and exports. Due to this, then, it is necessary to project average growth rates of household consumption (l_t) on the basis (6) and corresponding corrected $C^*(i)$, in each interval (t), that provides derivation of *smoothed average growth rate of exports* (r_t), in a specified interval:

$$r_t = \left[\frac{C^*(n_t) + (\delta_t + e_t + j_t - 1) \cdot GDP(n_t)}{M(n_{t-1})} \right]^{\frac{1}{n_t - n_{t-1}}} - 1 = \left[\frac{M(n_t)}{M(n_{t-1})} \right]^{\frac{1}{n_t - n_{t-1}}} - 1 \quad (6)$$

Then, iteratively, we have:

$$M(i) = (1 + r_t) \cdot M(i-1); n_{t-1} < i \leq n_t.$$

Now, the simple relation specifies the size of exports (goods & services):

$$X(i) = GDP(i) - C^*(i) - I(i) - M(i); n_{t-1} < i \leq n_t \quad (7)$$

We can also set the projection in the way that we "connect" imports of goods and services with projected dynamics of household consumption. Even the simpler case is when d_t is specified inside the interval and not only d_t at the end of the interval.

3. Projection of GDP and Its Use

The model of GDP projections and aggregates of use has as "free" variables:

- v – Rate of real GDP growth;
- d – Share of net-exports (in absolute value) in the GDP;
- j – Share of collective consumption in the GDP;
- δ – Share of gross investments in the GDP.

Nominal quantities of GDP and certain aggregates of the balance of GDP use are derived by the application of prices calculation and deflators as described below under section 4. Derived or specified coefficients of real trends or derived other aggregates are done by the application of relation (1). The condition of linearity inside the interval requires certain smoothing of the derived quantity of household consumption so that the rate of the household consumption trend is approximate to one average. Such that, quantities of export and import of goods & services in the BOP on the basis of (6) and (7), have as little as possible rates' variations inside the interval as well.

For the projection of the GDP use and also specified free variable e_t (share of goods & services exports in the last year of interval (n_t)), we are moving to the projec-

tion of BOP, where besides imports and exports, the quantities in the current and capital balance are free and mutually connected by balance relations.

4. Calculation of Prices and Deflators

4.1 Price Projections

- First, the target inflation is specified: i_{prices} in the scope of a year (end of year);
- Then certain disparities are given by months; multiplying the disparity gives a disparity factor, i_{dis} ;

- Average current "core" inflation is calculated as $\left(\frac{i_{prices}}{i_{dis}}\right)^{1/12}$;

- The external price indices are specified (end of year);
- The average current inflation is derived as the average "core" inflation multiplied by monthly disparity factors;
- Then the current "core" inflation, in relation to December of the previous year, is derived by dividing the product of the average current inflations with the product of the monthly disparities;
- The disparity factor, then, in relation to December of the previous year, is also derived;
- The current inflation in relation to December of the previous year is derived as a product of the current core inflation to December and the current disparity factor to December;
- The current inflation in relation to the average inflation of the previous year is derived as:

$$\frac{\text{current month}}{\text{average of the previous year}} = \frac{\text{current month}}{\text{December of the previous year}} \cdot \frac{\text{December of the previous year}}{\text{average of the previous year}}$$

- Then the following is calculated: (average of the current year) / (average of the previous year);
- For the exchange rate the following is valid:

$$\begin{aligned} \text{(Exchange rate at the end of the current year)} = & \\ & (\text{Exchange rate at the end of the previous year}) * \\ & (\text{Basic price indices}) * \\ & (\text{Coefficient of supposed passing of exchange rate's growth in relation to growth of prices}); \end{aligned}$$

$$\begin{aligned} \text{(Average EUR exchange rate in the current year)} = & \\ & (\text{Exchange rate at the end of the previous year}) * \\ & (\text{Index of average prices' growth in entire current year in relation to December previous year}) * \\ & (\text{Coefficient of passing})^{6/12}; \end{aligned}$$

(USD exchange rate) =

(average EUR exchange rate) * (relation of USD and EUR);

(Exchange rate for calculation of external trade deflators) =

(4*exchange rate € + 1*exchange rate \$)/5;

(External trade deflator) =

[(Average exchange rate for calculation of external trade's deflators
_current year) / (Average exchange rate for calculation of external
trade's deflators _previous year)] * (external prices growth).

The external prices growth and the external prices growth coefficient consider the structure of imports and exports and so-called exchange relations ("terms of trade") respectively.

4.2 Calculation of the GDP Deflators and Aggregates of GDP Use

In order to derive the nominal quantities and real trends in the GDP calculation, it is necessary to estimate deflators:

The deflator for GDP for future years (when BOP is not estimated and instead of that projected) is derived based on the relation:

$$\frac{1}{k} = \frac{1+d}{i_c} - \frac{d}{i_d} \quad (8)$$

where:

- k – Deflator for GDP (coefficient);
- d – Share of net exports (in absolute value) to the GDP;
- i_c – Coefficient of inflation (current year's average to the previous year's average);
- i_d – Deflator of external trade (average to average, performance described under 5.1).

The application of the formula (8) is possible when d is specified, when d is a free variable, or when d is derived on the basis of already projected exports and imports. Nevertheless, the calculations of deflators do not require d to be a free variable in the first step — for the first year it is projected — when the estimation of BOP already exists.

This matter is handled differently when the estimation (calculation) of real trends (real growth of GDP) and the realization of the BOP for the current and previous years are known. Then, the calculation of the GDP deflator is derived through a system of equations:

$$\left\{ \begin{array}{l} v \cdot k = (l + d_0) \cdot l \cdot i_c - d_0 \cdot r_1 \\ v = (l + d_0) \cdot l - d_0 \cdot \frac{r_1}{i_d} \end{array} \right\} \quad (9)$$

from which k and l are derived and where:

d_0 – Share of net exports (in absolute value) in the GDP for the (previous year);

l – Coefficient of the total demand's real trends ($D = GDP + |\Delta|$);

v – Coefficient of real GDP trends;

Δ – ΔX (net exports: the difference between exports and imports that in transitional economies under normal circumstances is negative so its absolute value is being added to the GDP in order to illustrate the total demand.);

$r_1 = \frac{|\Delta_1|}{|\Delta_2|}$ – Nominal growth rate of net exports - in domestic currency;

i_d – Deflator of the external trade.

Equation (9) provides the calculation of the nominal GDP for the current year before enterprises' financial statements and statements of so-called structural statistics are completed. (This is important because of the "Law on Amendments" due to the "Budget Law" in the following year. The budget and household consumption calibration is performed in relation to the GDP.)

It is important to note that the deflator calculations are not completed with the GDP deflator calculation; even though, the deflator calculation is the most important calculation. For the comprehension of GDP trends in relation to the price factors the important relation is:

i_c belongs to the interval (k, i_d) which is valid under the condition that the external prices do not fall under normal circumstances, i.e. when there is no recession.

As such:

$k > i_c$ if $i_d < i_c$, or if it is about "appreciation of domestic currency";

$k < i_c$ if $i_c < i_d$, or if it is about "depreciation of domestic currency" (simultaneous "inflation and deflation").

The deflator for collective consumption is identified with the GDP deflator (k) and the deflator for household consumption with inflation (i_c). The deflator for investments, due to the calculation of real trends, then is derived easily because of the relation:

$$\frac{1}{k} = \frac{c}{i_c} + \frac{\delta}{i_n} + \frac{j}{k} - \frac{d}{i_d}$$

where:

C – Household consumption;

c – Share of household consumption in the GDP (current year);

δ – Share of investments in the GDP (current year);

j – Share of collective consumption in the GDP (current year);

d – Share of net exports (in absolute value) in the GDP (current year);

i_n – Unknown deflator of investments.

Here it is about determining whether one scenario is developmental, pro-investment or social:

- If the real investments growth is at the level or below the level of the GDP growth, then we have growth of household consumption beyond the level of the GDP growth. Such a scenario is social;
- If the investments growth is significantly beyond the GDP growth then this is developmental, a pro-investment scenario!
- If the household consumption growth is at the level of the GDP growth and the investments growth is a little bit beyond the GDP growth, then it is most probably a stabilization scenario!

5. Sustainability of a Certain Scenario

There are three basic indicators that are derived in the projections on the basis of which the sustainability of a certain scenario is being estimated: when the change of foreign exchange reserves (total foreign exchange reserves in the financial sector) is being determined so that the total foreign exchange reserves comply with imports values for 3-4 months.

The “financial gap,” then, is calculated as a fraction of the quantity “errors and omissions” that corresponds to the value greater than 5% of the sum of current deficit and the change of the foreign exchange reserves. The big financial gap indicates missing capital in projections — if it is not perceived in the capital inflow, the scenario is not sustainable.

Nevertheless, even when the financial gap is closed, or it does not indicate non-sustainability, indications of weak sustainability perspectives are possible. Consider, for example, the fragility on the level of the external economy which consequently is directly undermining price and monetary stability (forced reduction of external trade deficit implicates inflation and radical shift of foreign exchange rate).

These indicators are:

- Foreign debt service ratio (interests + repayment of capital amount/exports of goods and services) (> 22%);
- Foreign debt /GDP; (>60%);
- Share of net-exports in the GDP (>20%);
- Share of the current account deficit in GDP (>10%);
- Share of the current account deficit without donations in the GDP (>12%);
- Regarding the indicators mentioned above, it is necessary to be aware of the structural condition connected with purpose of import (consumption vs. investments).

6. Example: Macroeconomic Perspectives in Serbia in 2010-2015³

Surrounding determinants: The economic policy of Serbia is determined largely because of the development of the economic and political situation in the world. The Serbian economy is extremely dependent on investments, credit capital inflow from abroad, and indebtedness, above all, in the commercial sector. In 2009, the global

³ Projections were made in November 2009 on the basis of current data.

situation threatened to produce a non-overwhelming crisis of commercial debt, both as the hardest consequence of overspill of world financial crises and its emergence as a BOP crisis in Serbia. Serbia, however, overcame this situation because of an arrangement it made with the International Monetary Fund and the external creditors' initiative for debt refinancing:

- First, the **risks** will be more pronounced. At the *micro level*, commercial entities will be burdened for a long time by consequences of slow recovery and uncertain business perspectives. On the *macroeconomic level*, misbalances in the economy will be more obvious and more severely sanctioned by the international financial market;
- Second, the flow of cross border **capital** will be more modest. Financial protectionism is possible; In Serbia, an additional problem appears due to exhausted possibility to provide capital inflow (that covers growing external trade's deficit) from privatisation.
- Third, **regulatory requirements** on the national and the international level will be tightened. Capital withdrawal can be provoked through exogenous disturbances that are not related with occurrence / shocks in less developed economies;
- Fourth, the current **fiscal relaxation** (the budget deficit in the USA, Japan and the U.K. higher than 10% of the GDP in 2009 and 2010) will be over by the end of this year, or eventually, by the end of the next year;
- Fifth, the "fight" **against recession** can stimulate the competitive depreciation of national currencies that can cause increased **protectionism**, trade wars, and a growing instability in international economic relations.

Proposed rational economic policies:

- **The strategy and goals of the monetary policy of the Central Bank (the National Bank of Serbia) should not be changed.** Inflation should remain the focus, with the referent interest rate as the basic instrument for achieving its goals.
- **A possible fixed foreign exchange rate** would not convince market players that the exchange rate would be permanently stable in regards to the current and the future challenges for the Serbian economy. A fixed exchange rate, on any level, would direct economic policy towards the protection of unsustainable exchange rate.
- Significant **restrictions and regulations** (the limitation of capital outflows and the fixation of exchange rate, for example) should be considered only in a situation of obvious non-sustainability regarding the external liquidity position of the country. These not turbulences on the foreign currency market, but it is a situation that precedes the proclamation of a moratorium on external debts.
- For the coming years, it is very important that the economic policy followed support the development of the sector **for tradable goods**, i.e. the **export-oriented sector of the economy**.

- The task of the Central Bank in preserving price and monetary stability and establishing a platform for economic growth will be impossible if it is not met with viable reforms in the **public sector**.
- ***Synergy and coordination of monetary and fiscal policies in a direction towards a more efficient and export-oriented economy is a precondition for a new model of financial balance and economic growth.***
- The key assumption that **the model of equilibrium, where the growth of internal demand and supply is significantly faster than the GDP growth**, (based on a growing deficit in goods and services and the growing current transactions deficit financed by huge capital inflow from the foreign countries) **will not be able to function any more**.
- A variety of scenarios that start from this change of relations among dynamics are possible, but various assumptions are built into them that relate to the demand structure, capital inflow, and economic growth.

Hence:

- Imperative for each scenario is **significant reduction of current transactions' deficit** in BOP and that means - opposite to the trends up to 2008 – a **slower growth of internal demand than the GDP's growth**.

Optimistic scenario (Annex, Table 1.):

- i) *The GDP* in 2011 grows by 4%, in 2012 by 5%, then by 6%. *Net inflow of FDI (Foreign direct investment)* in 2010 about 4% of GDP (in 2009 about 3.8%), in 2011 about 4.5% of GDP, in 2012-2015, about 5% of GDP. *Net credit inflow* in 2010 is slightly positive, in 2011 significant (around 900 million €) further on approximately neutral – in order to decrease the *debt service ratio* until 2015; (with over 50% in 2010 to around 30%);
 - ii) *Reduction of the net-export share* up to 11% of GDP and in 2015 (from 22.8% in 2008 and estimated 16.3% in 2009), is based on the assumption of absolute value of deficit sustainability on the level from 2009 of around 5.1 billion € (***more modest reduction elevates debt servicing ratio***); coverage of goods imports by exports increases up to around 70% of GDP in 2015;
 - iii) *Investments* in 2010 increase by the rate of decrease in 2009 ($\frac{3}{4}$ of this decrease is compensated); 2011-2013 they increase by around 15% annually, then by 10%; **this is the key assumption for sustainable economic growth**;
 - iv) *Consumption* in 2010 decreases and then it increases gradually up to highest 3.5% - room for employment and faster growth of household consumption appears due to successive decrease of state consumption).
- Varying assumptions on foreign exchange reserves so that the *coverage of goods and services import (expressed in monthly values)*, is not reduced significantly comparing to 2009 and that the debt service ratio does not in-

crease - requires *harder reduction of net-exports share in the GDP*- up to 7% in 2015 –which also means an absolute decrease of its value!

- A *catastrophic scenario* (Annex, Table 2.) is also possible: the absence of a shifting demand structure toward the benefit of investments can cut down economic growth after 2012 — at the most 3% annually according to our estimation. Debt servicing ratio stays significantly beyond 30%. The demand growth is placed into an interval up to 1% annually; this indicates that there is no space for employment!

7. Conclusive Remarks

The presented method-model has shown all its advantages applying it to the economy of Serbia. Serbia is a typical transition country and has been exposed to numerous internal and external pressures and shocks since the nineties, and continues to be exposed to such pressures today. Since the mid-nineties, the described model has been used and improved by the authors. In the 1990's, Serbia experienced financial sanctions which introduced by the international community. After 2000 and the abolishment of such sanctions, Serbia entered a period of monetary and fiscal stabilization followed by a period of privatization and indebtedness. This has led to an accumulation of misbalances (deficits) and to the risk for financial crisis because of the lack of public sector reforms. Since mid-2008, the global financial crisis has influenced the vulnerable economy and the sustainability of the BOP and achieved levels of production and consumption were jeopardized. The projection model allows for specifying passing target quantities and parameters, validating sub-periods in which stable conditions were or will be present. The calculations are quite simple and placed in an Excel file. On the other hand, the model is complex since it requires joint BOP and GDP-use projections, as well as price and deflator calculations and external debt, savings and investments projections towards iterative adjustment of targeted quantities and parameters regarding the criteria for sustainability. A specific understanding of macroeconomic development combined with the described projection model, provides the greatest certainty in the perception of the conditions for certain development scenarios. Further, this does not require dealing with complex econometric methods and models.

The presented example for two different economic development scenarios for Serbia leads to the conclusion that assumptions and objectives can vary, but the following is unavoidable:

- First, **thorough reform of the public sector**, which will provide the dislocation of the predominant social functions through transfers and subsidies from the budget, will stabilize its share in GDP, as well as balancing the budget to a level that will determine its basic functions;
- Second, the **creation of a system and institutional conditions for the expansion of foreign direct Greenfield investments**, above all for the increasing of the share of tradable goods in the GDP formation;
- Third, growth rates of the GDP can also be lower than those projected here are (e.g., 5%, instead of 6%), but **external and internal balance** can and must be preserved;

- The reflection of such policy to which we arrive is from hundred percent's engagement of the GDP's value towards the consumption's coverage, to relation in which **the consumption overtakes 80% of the GDP**. In other words, in the observed period 2010-2015, the consumer model must be transformed to the pro-investment model based on preserved monetary stability and the deep reform of the public sector. So that, the investments dynamics goes significantly ahead of the consumption dynamics, the GDP and the domestic demand, and the domestic demand's dynamics lag behind the GDP's dynamics.

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Appendix

Table 1 Optimistic Scenario

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Real growth rates of the GDP	6.9	4.1	-3.5	1.5	4	5	6	6	6.0
Net exports-share in the GDP	-23.9	-22.8	-16.3	-16	-15	-14	-13	-12	-11
Domestic demand	11.4	6.1	-7.3	1.2	3	3.9	4.9	4.9	4.9
Investments, gross fixed investments	17.7	-1.4	-24.3	24.2	14.8	14.7	14.9	10	9.8
Consumption	11.4	7.1	-4.3	-2.5	0.6	1.4	2.2	3.4	3.3
Household consumption	9.5	8.9	-3.5	-1.6	1.9	2	2.9	3.6	3.5
Consumption of the state sector	27.8	1	-7.1	-5.9	-4.2	-1	-0.4	2.6	2.5
Exports growth rate (in €)	24.8	16.9	-13.6	3	18.6	19.6	17.4	17.4	17.4
Imports growth rate (in €)	30	15.3	-22.7	2.3	11.6	13.2	12.5	12.9	13.3
In millions €									
Goods and services balance	-6892	-7804	-5107	-5162	-5133	-5124	-5137	-5122	-5071
Inflow of short-term and long-term credits*	5317	4857	2920	3288	4435	4709	5045	5408	5801
Net inflow of short-term credits	307	965	400	200	200	300	300	500	200
Total net inflow of credits	3679	3185	828	81	896	271	-300	-205	631
Net inflow of FDI	2185	1734	1200	1290	1540	1543	1682	1833	1997
Foreign exchange reserves changes	1303	-1673	776	-1000	300	0	-200	500	1900
Inflation rate (end of the period)	10.1	8.6	7.5	7	5	5	5	5	5
Inflation rate (year's average)	6.7	11.7	8.1	5.8	5.9	5	5	5	5
Average exchange rate €/RSD	80.0	81.7	93.9	99.9	102.5	105.5	108.6	111.7	115.0
Average exchange rate €/ \$	1.37	1.48	-	-	-	-	-	-	-
Exchange rate €/RSD, end of the year	79.2	88.6	96.2	100.9	103.8	106.8	109.9	113.1	116.4

* Since 2009 without IMF.

Source: Authors' estimations.

Table 2 Catastrophic Scenario

	2007	2008	2009	2010	2011	2012	2013	2014	2015
Real growth rates of the GDP	7.5	5.5	-5.5	1.0	4.0	5.0	4.0	3.0	3.0
Net exports-share in the GDP	-23.7	-22.8	-14.5	-13.0	-11.0	-10	-9	-8	-7
Domestic demand	11.4	6.5	-13.4	-0.5	1.7	3.5	2.6	1.6	1.7
Investments, gross fixed investments	14.9	3.9	-16.5	4.0	8.7	4.1	3.2	2.3	2.4
Consumption	12.0	7.1	-12.3	-1.4	0.2	3.4	2.4	1.5	1.5
Household consumption	9.5	6.6	-13.1	0.0	1.4	3.0	2.1	1.1	1.1
Consumption of the state sector	24.7	8.8	-9.0	-6.4	-4.2	5.0	4.0	3.0	3.0
Exports growth rate (in €)	24.7	16.9	-16.8	1.9	5.7	6.6	4.4	3.4	3.5
Imports growth rate (in €)	30.1	15.3	-28.6	-1.7	0.5	3.9	1.9	0.9	0.8
In millions €									
Goods and services balance	-6892	-7804	-4376	-3998	-3575	-3466	-3296	-3067	-2810
Inflow of short-term and long-term credits	5317	4857	3827	3922	4238	4486	4711	4908	4617
Net inflow of short-term credits	307	965	-2000	0	0	0	0	0	0
Total net inflow of credits	3679	3185	-1451	696	489	-240	-613	-922	-288
Net inflows of FDI	1821	1812	996	923	975	1040	1099	1150	1204
Foreign exchange reserves changes	1303	-1774	-3922	-1400	-1100	-1700	-1600	-1300	0
Inflation rate (end of the period)	10.1	8.6	12.0	8.0	5.0	5.0	5.0	5.0	5.0
Inflation rate (year's average)	6.7	11.7	10.0	8.8	6.3	5.0	5.0	5.0	5.0
Average exchange rate €/RSD	80.0	81.7	95.1	102.4	106.8	109.9	113.0	116.3	119.7
Average exchange rate €/§	1.37	1.48							
Exchange rate €/RSD, end of the year	79.2	88.6	99.2	105.0	108.1	111.2	114.4	117.8	121.2

Source: Authors' estimations.

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