

DEVELOPMENT OF AN AUTOMATIC STABILIZATION PROCEDURE AND A LOGICAL SCHEME FOR THE INDICATORS THAT ARE ASSOCIATED WITH THE NOMINAL ECONOMIC CONVERGENCE CRITERIA FOR INFLATION AND FOR GENERAL GOVERNMENT DEFICIT AND SURPLUS AS PERCENTAGE OF GDP

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Abstract:

It is well-known that the member countries of the European Union (EU) must go through the stage of meeting the nominal economic convergence criteria imposed by the Maastricht Treaty in order to become part of the euro area. Thus, the states that remain outside the euro area, especially those in central and eastern Europe, who wanted and have committed themselves to the stages of entering the euro area, must go through the caudal forks of nominal economic convergence criteria. From the nominal convergence criteria, both in theory and in practice, it is distinguished as difficult to achieve in particular the harmonized inflation and the general government deficit and surplus as percentage of GDP. Fulfilling them (in particular, the budget deficit) in an automatic manner, although among the wishes of the European institutions, is an additional impediment. Therefore, the article aims to provide a logical model of ensuring the automatic stabilization of the two criteria of nominal economic convergence selected: - inflation and budget deficit.

Keywords: European integration, automatic stabilization, nominal convergence

JEL Classification: G01, E63, H30, P11

1. Introduction

In the paradigm of European integration in the euro area, the nominal economic criteria of convergence play a fundamental role. Therefore, selecting only inflation - a representative element for the monetary criteria of nominal convergence - and the public budget deficit - a representative element for the fiscal-budgetary criteria of convergence, is of course a simplification of the solution regarding the automatic stabilization of the nominal convergence.

Regarding the monetary criteria, selecting as a target the inflation, we recall that according to the National Bank of Romania, it is particularly noteworthy: the channel of the economic agents' expectations regarding the inflation, the channel of the interest rates practiced by the financial institutions, the credit channel and the exchange rate channel.

At the same time, regarding the monetary policy, in the case of Romania, the exchange rate is under a managed float regime, and the monetary aggregates are monetary anchors, but with a less visible role, in the context in which the inflation targeting strategy is mainly pursued by the NBR through the interest rates of monetary policy and less through the monetary mass.

Monetary market operations aim at orienting interest rates and managing liquidity on the market, as well as communicating the manner in which monetary policy orientation in the market occurs, pursuing the injection and respectively liquidity absorption. The injection and respectively the liquidity absorption are assimilated in a previous paper (Ailincă coord., 2018) with the expenditure function, respectively with revenue collection to the state budget from the fiscal-budgetary policy. Given that this way of systematization allows us to classify the automatic stabilizers according to the liquidity supply / withdrawal in / out of the economy, we note that the nominal economic convergence criteria imply the reduction of the inflation and the deficit respectively, so rather the activation of the withdrawal function of liquidity in the economy.

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In order to handle automatically the budget deficit, if we consider the flat tax regime and not the progressive tax system (as in the case of the new Member States preparing to join the euro area) it might be rather necessary and appropriate to act more on the elements of budgetary expenditure. However, framing the deficit within the criterion limit (3% of GDP) implies rather the withdrawal of liquidity from the economy, so the mode of action must be by reducing fiscal-budgetary expenses, or by increasing revenues or in both ways, so that the gap between those two to be reflected by reducing the budget deficit below the reference threshold.

At the same time, for simplification we assume that the automatic stabilizers selected for inflation and the balance of the general budget consolidated in the GDP act individually, directly only on a macroeconomic policy, without a more complex action, for example simultaneously in the monetary and fiscal policies (as it is happening in reality).

If we analyse the automatic stabilization of the two criteria inflation and budget deficit from the perspective of the typology of shock on which it acts, we could observe that it is rather of the nature of the supply than of the demand, assuming the necessity of liquidity absorption once the reference is exceeded. At the same time, we can consider for the ease and effectiveness of the analysis that the trigger is the exceeding of the reference imposed by the two criteria: inflation and the general government deficit and surplus as percentage of GDP. Of course, in the case of a fine adjustment, only the proximity of the reference (similar to the idea of using a "motion sensor") could trigger the automatic stabilization mechanism, which would be put into operation.

If we consider that automatic stabilizers are generally selected from the classical discretionary instruments, they are identified, on the one hand, in the case of monetary policy, with the following instruments: exchange rate, automatic open market operations pursuing liquidity injection and respectively absorption, the interest rate at the permanent automatic credit facility and the deposit facility, the automatic rate of the RMO in lei, the automatic rate of the RMO in foreign currency (i.e. their projection on a progressive or regressive structure), and in the case of fiscal-budgetary policy with: personal income tax, corporate profit tax, para fiscal levies (contributions), transfers (social assistance) (social aid, social subsidies, minimum guaranteed income) and transfers (unemployment benefit). At least theoretically, it is not excluded that in the future, to be conceived a design of automatic stabilizers beyond the classical instruments existing today in monetary and fiscal-budgetary policies.

In the case of treating the inflation criterion or the general government deficit and surplus as percentage of GDP, the reduction or the gap is compared with the reference (the liquidity absorption), so the inflation stabilization instruments can be: the exchange rate, the automatic open market operations that follow the absorption of liquidity, the interest rate at the permanent automatic deposit facility, the automatic rate of the RMO in lei, the automatic rate of the RMO in foreign currency, and in the case of the budgetary balance mainly the direct tax instruments. The aspect is valid only in the case where there are no simultaneous liquidity injection measures, in this situation all the monetary operations must be taken into account, following only the net - the result between injection and withdrawal of liquidity.

In a previous paper (Ailincă coord., 2018) we mentioned a number of elements necessary to be fulfilled by an automatic stabilizer such as: - to have an immediate character, - to be contingent (efficient in relation to the purpose pursued), - to function only as needed (the saturation principle) and to have the amplitude needed to immediately take action. Therefore, the logic schema should reflect these properties and repeat the steps / algorithms required whenever necessary to make the gap between inflation and reference zero and even less than zero.

At the same time, the above work mentions the need to respect some design stages. Thus, it should start from: identifying problems and defining the purpose of stabilization (general purpose), the object required to be subject to stabilization or the sphere of action needed to stabilize the management institution (initiation); the analysis of resources

(implicitly a cost-benefit analysis between discretionary and / or non-discretionary measure) and of the determinants and triggers (formulation and evaluation of resources), the general way by which this can be accomplished (the mechanism: stimulation or inhibition), and the concrete modality or form of implementation of the stabilization, more precisely the strategies for achieving the targets (planning and implementation), as well as the evaluation, control and possible correction of the results.

In the present case, the general purpose of stabilization concerns the monetary policy and respectively, the fiscal policy; the particular goals of stabilization (the objects subject to stabilization) are inflation and the general government deficit and surplus as percentage of GDP. At the same time, the management institutions are the central bank (for inflation) and the government respectively (for the balance of the general budget consolidated in GDP). Regarding the establishment of triggers, we will consider exceeding the reference for inflation respectively for the general government deficit and surplus as percentage of GDP, as well as the concrete form of stabilization, in our case, as we have established above: by draining liquidity. It should be noted that, the general government deficit and surplus as percentage of GDP cannot pose problems in the reference ratio as long as it is positive, only the negative gap between budgetary revenues and expenditures requires the problem of stabilization within the criterion limit. Therefore, when we refer to the idea of general government deficit and surplus as percentage of GDP stabilisation, we will only reflect in the analysis the budget deficit situation.

2. Shortcomings in the proper design of automatic stabilizers for nominal convergence criteria

A possible shortcoming, however, could be the fact that the automatic stabilization in the convergence criteria paradigm may be at odds with the need to stabilize a national economy or a region. The injection of liquidity in the economy (implicitly the budgetary expenses) ensures a better stabilization of an economy and not the absorption of liquidity, or inflation often implies a tempering of it within the criterion, solved in the literature, but also in practice, with the withdrawal or absorption of liquidity from the money market and implicitly from the economy.

Moreover, in general, an automatic stabilizer is guided by the anti-cyclical character of the economic behaviour, aiming to say to a monetary or fiscal relaxation during the period of economic decline, while during the boom period to a consolidation of the fiscal-budgetary policy. Or the stabilization of the nominal economic convergence criteria presents the "risk" of not overlapping over the real situation of the economic cycle, more exactly over the "loop" of the economic cycle to which it should be compliant, thus counteracting its action. This risk is quite evident also due to the fact that the economic boom in the contemporary period is quite diluted as concerning the social and economic effect, while the recession has an immediate, clear, powerful and sometimes lasting effect in the socio-economic plan, often affecting the most disadvantaged categories of society. This fact may emphasize the lack of synchronization of the two types of stabilization - the stabilisation of the economy as a whole and the stabilisation of nominal convergence criteria.

Theoretically, the duration of action of the automatic stabilizers should be short-term, and the benefits / effects of stabilization should be relatively long, so the tempering of inflation and the budget deficit should occur over a relatively long, noticeable horizon, say for a minimum of three years. Also, the depth of their effects should be large, going into the depths of the sectors of the national economy, but this aspect is less identifiable when we refer to the nominal variables of the economy, as in the case of nominal economic convergence criteria.

If we look at the property regarding the ability to remove an undesirable effect or obtain a positive effect, in the case of the convergence criteria followed the automatic stabilizers are rather deviant, by avoiding or reducing the overcoming of the reference threshold. This aspect is mainly outlined on the basis of the manner in which the criteria are formulated - the criteria being formulated in the negative sense, of penalizing the passing of references and not of "rewarding" their fulfilment by the EU member countries.

Given that the nominal convergence criteria are intended to be met not in one country, but at the level of an entire region - namely the euro area, we can say that there is a real opportunity to design automatic stabilizers with action beyond the borders of a single region of a country. Thus, the mixed version of a national automatic stabilization component and a regional component should not be neglected by the academic environment and decision makers.

If we refer to the effectiveness of the automatic stabilizers, then, in the case of inflation and the general government deficit and surplus as percentage of GDP, we should select only the representative stabilizers with high stabilization efficiency. At the same time, the selection of several automatic stabilizers with reduced efficiency would require understanding of their cumulative effect, which is more difficult to evaluate and integrated into the model.

3. Methodology

The article outlines, in the absence of a literature on this subject, the need to systematize the functioning of automatic stabilizers on the criteria of nominal economic convergence. In particular, we will refer to two convergence criteria: inflation and the general government deficit and surplus as percentage of GDP (budget deficit). The approach is theoretical, logical and with insertions of interdisciplinary elements in order to obtain an adequate design of the automatic stabilizers for the selected nominal economic convergence criteria.

4. The stabilization procedure and the elaboration of the logic scheme

If we look at the problem of automatic stabilization in the form of a system, more exactly in the form of an interaction between various elements and with the outside in order to reach a goal or a purpose (Ctortojaje, 2004), then our automatic system should perform the control (more precisely the evaluation, command, adjustment and supervision) to meet the selected convergence criteria (inflation, respectively the general government deficit and surplus as percentage of GDP).

Therefore, the system should have at least two components: the element or variable to stabilize (note it V_{ss} or the variable subject to stabilization) and the mechanism of automation (MA). Specifically, the system has input variables (exogenous, which influence the state of the system), status variables (dependent on the input variables, and describing the current state of the system) and the output variables (dependent on the input and state variables, with the role of transmitting, besides, the information regarding the state of the system). In this case, the output variables are all the input variables subject to automatic transformation. The input variables are: the variable subject to stabilization (V_{ss}) and the reference (r) - they are compared, and according to the fulfilment ($V_{ss} < r$) or non-fulfilment of the stabilization condition the necessary command is executed. Both the reference and the variable subject to stabilization change over time (an aspect valid only for inflation, for the budget deficit the reference being fixed), and the problem of regulation consists in the elaboration of a command which to ensure an output variable at / below the reference.

Thus, the automatic adjustment mechanism must be designed so that the value of the output variable is brought to / below the reference value in an automatic manner, based on a regulation law. It must be able to receive and process any changes to the system (the variable subject to stabilization and its transmission mechanism) and to bring the variable subject to stabilization in the desired status. Therefore, the automation mechanism should contain a comparator (noted C),

which will provide the necessary information on the current state of the process and compare it with the reference. It must allow a switching command to the regulator (noted R) depending on the deviation from the reference. The controller generates the controls so that the adjustment objective can be achieved, transmitting the adjustment commands to the mechanism of execution (noted ME), which must implement the regulator command.

We can consider the problem of regulation having as solutions: - diminishing the effect of disturbances on the gap between the variable subjected to stabilization and reference (probably also by controlling the influence of the determinants and especially of the instruments) and through - the problem of pursuing the fulfilment of the reference value.

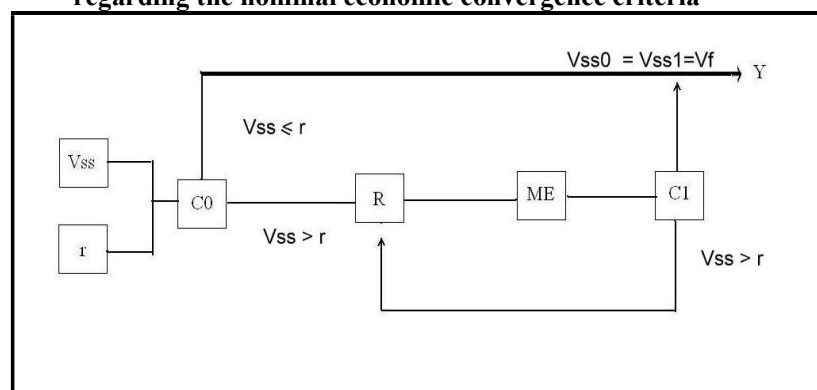
If we consider the automation mechanism according to the operating principle, we can consider that it can work according to the effect or the cause. If we consider that the adjustment has to be made after the effect, we must consider that it involves bringing the process output value to / below the reference value by permanently measuring the output and comparing it with the reference value. If we consider that the adjustment is made according to the cause, maintaining the output value at / below the reference value is done by permanently measuring the perturbations and / or the reference and adjusting them so that, when the perturbations and / or the reference are subject to changes, the output variable does not suffer changes. If we consider that the system of the automation mechanism can work after both, cause and effect, then the system of automation is a mixed one.

If we consider adaptive capacity, we can consider that the automation mechanisms are adaptive or predictive. In the case of predictive mechanisms, the control size is adjusted according to the predicted evolution of the output variable based on an internal model of the adjustment process.

In conclusion, in a simplified way, the automation model must take into account the gap between the stabilized variable and the reference, and when the stabilized variable is greater than the reference, the execution mechanism must reduce the monetary mass entered in the system (or in the case of inflation adjustment. to temper besides the monetary mass, the exchange rate or to increase interest rates on permanent deposit facilities or on minimum reserves in lei or in foreign currency, when these have on the based an inflation-generating loan process). In the case of fiscal-budgetary policy, the tempering of the monetary mass entered into the system can be done by reducing public expenditures, increasing the budgetary revenues or by both ways, preferring for simplification, the use of only the most efficient method (that is to say, the use of the most effective instrument in achieving the stabilization objective). The execution mechanism executes the command to reduce the money, respectively to adjust other instruments until V_{ss1} (the output variable) is smaller than r (the reference).

Simplified, the logic scheme for automatic stabilization of the nominal economic convergence criteria is shown in the figure below (Figure no. 1):

Figure no.1 Logical scheme of the functioning of the automatic stabilization mechanism regarding the nominal economic convergence criteria



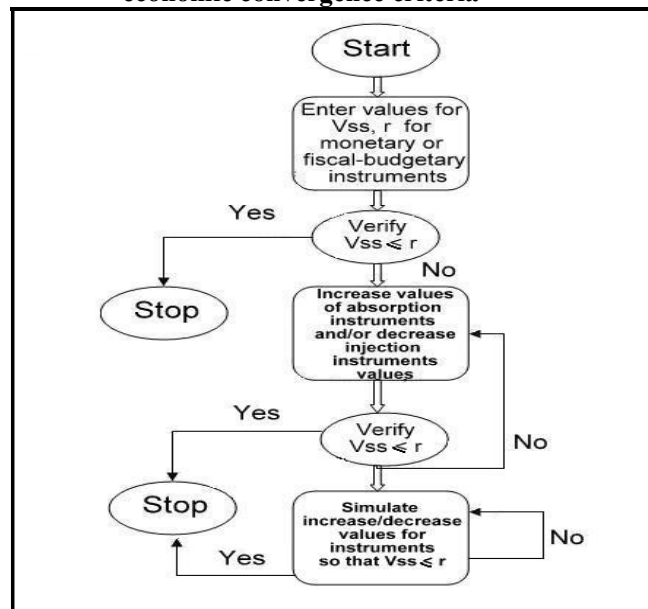
Source: author's conception. Notations: V_{ss} - variable subject to stabilization or target variable, r - its reference, $C0$, $C1$ - comparators, at the two moments t_0 and t_1 , R - regulator, ME - mechanism of execution.

This logic scheme can be schematically transposed into an operating model (see Figure no. 2).

Of course, the verification between the variable subjected to stabilization and the reference leads us in two situations: that of fulfilling the criterion, when the variable is under reference and that of exceeding the criterion. The two situations, in practice, in econometric analysis are described by two equations. We will thus adjust, even if the volume of data is precarious, the equation of non-fulfilment of the criterion (used as a guiding equation) to that of the fulfilment through successive scenarios, so that we can obtain situations of compliance with the criterion (whether we are talking about inflation or the general government deficit and surplus as percentage of GDP).

As we create equations that are aiming directly to the criterion fulfilment, we can track also the difference (the gap or differential) between the variable subjected to automatic stabilization and reference and its classification in the two situations of violation of the criterion and of compliance, of course adjusting the equation of violation, so that by successive scenarios to achieve the criterion. This difference, if we adjust it with the reference (in the case of inflation, the reference being an external factor of any monetary policy decision, being established at EU level) we obtain exactly the necessary value of the variable subject to stabilization and we check it comparing to the reference. Of course, the direct reaching of the gap/differential makes more closely and more easily the variable subject to the automatic stabilization to the reference, but none of the modalities can be considered wrong, merely alternative forms of solving the problem of automatic stabilization.

Figure no.2 Functioning of the automatic stabilization mechanism regarding the nominal economic convergence criteria



Source: author's conception. Notations: Vss - variable subject to stabilization or target variable, r - its reference

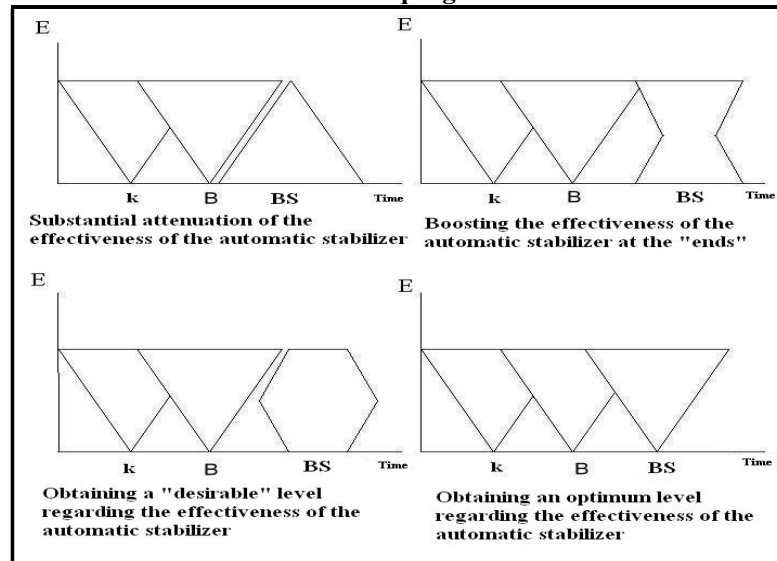
It should be noted, beyond the above, the effectiveness of the sought stabilizer or the quantitative dimension of it. If its effectiveness is reduced, the implementation of automatic stabilization may not be the happiest adjustment economic policy formula. For example, in the paper "Economic sustainability through adjustment policies in the context of globalization" (Dinga, coord., 2011), the quantitative dimension of the effectiveness of an automatic fiscal stabilizer, E refers to the product between the action rate and the action base. $E = -k * B$, the rate and base being substitutable. I consider it necessary to introduce a third component of effectiveness. And in the ideal case, even a fourth one, of a qualitative type.

The third dimension would be the social base structure (noted BS), that is, the elements on which it acts, for example: number of employees (in the case of the wage and income tax

instrument, in the case of analysing the general government deficit and surplus as percentage of GDP), number of companies (in the case of the corporate income tax instrument), etc. The equation becomes: $E = -k * B * BS$. The structure, the basis can be essential in obtaining the efficiency on each tranche (e.g. of salary income, in case of analysing the tax on wages and income) and especially on the whole, at the global level of the stabilization instrument.

The fourth element, is rather qualitative, it could describe a series of qualities or criteria of the base structure (note: QBS or the quality of the base structure), by which we could establish the classification in tranches (stages or levels). For example, employees with a certain number of children or in care people or in the case of corporate income tax, companies reinvesting in environmental protection, etc., or in the case of a monetary instrument, financial and credit institutions to which these monetary instruments apply, who invest in social or environmental projects. Therefore the equation can become $E = -k * B * BS * QBS$. But the criterion of quality of the structure of the base is rather of ensuring social efficiency, than strictly of achieving the quantitative efficiency of the stabilizer. So, in this phase, we strictly limit ourselves to $E = -k * B * BS$. In the case of stabilization of the general government deficit and surplus as percentage of GDP, this element (SB) can become extremely important, while, regarding the monetary criterion of inflation, the rate or the base are the foundations of the stabilizer's efficiency. The figure below graphically shows the possible influences of the structure of the automatic stabilizer base, depending on its shape, when we consider the base and the rate having a progressive form.

Figure no.3 Possible influences of the structure of the base on the efficiency of the automatic stabilization in the case of nominal economic convergence criteria, when the rate and the base of the stabilizer are progressive



Source: author's conception. Notations: E - the quantitative efficiency of the automatic stabilizer, k - the action rate, B - the action base, SB - the "social" structure of the action base.

5. Conclusions

Although the Maastricht Treaty and other programmatic documents of the European Union speak of the need for automatic stabilization, at least in the case of the budget deficit, there is no concrete, tangible, theoretical form of EU assistance on such design on the criteria of nominal economic convergence.

Thus, this article aims to describe the elaboration of an automatic stabilization procedure and a logical scheme for the indicators that are associated with the nominal economic convergence criteria for inflation and respectively for the general government deficit and surplus as percentage of GDP.

Beyond the successful design of automatic stabilizers, macroeconomic policy managers at national level, but also at EU level, should mainly consider the effectiveness of automatic stabilizers or their quantitative dimension. If their effectiveness is reduced, then the implementation of automatic stabilization may not be the only solution to be used in macroeconomic policies, requiring the support of discretionary policies as well.

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