DIRECT AND BACK REACTIONS BETWEEN REAL AND NOMINAL ECONOMIC CONVERGENCE

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Abstract

The Maastricht criteria towards adhesion to euro area address the nominal economic convergence inside the European Union. However, the nominal economic convergence is sustainable only it is based on the real economic convergence. In this context, the paper approaches the relationships (structurally, and functionally) between real economic convergence and nominal economic convergence from the perspective of mutual support. To this end, a cybernetic methodology is used, based on feed-direct, and on feed-back connections between the two types of economic convergence, in order to put into evidence the ways in which the two convergence processes lead, in fact, to a pair of economic convergence. As a result, the channels of communications inside the pair of economic convergence, as well as the magnitude and the speed of the two causal reactions are examined and evaluated.

Keywords: real economic convergence, nominal economic convergence, feed-direct, feed-back

JEL Classification: B41, E32, F15

1. Introduction

Based on the distinction made previously between the real economy and the nominal economy, we may also examine the contingent[1] or necessary inter-conditioning between the process of real convergence (RC) and the process of nominal convergence (NC). Such action is very useful both theoretically and methodologically, to determine causalities or conditionings in the structural or dynamic linkage[2] of the two mentioned processes.

2. Theoretical reasons to analyse inter-conditioning

First, considering the structural character of the real convergence (demonstrated previously), we may estimate that effects of this convergence will influence the nominal convergence, based on the axiom saying that the functions of a system represent expressions of its structure. Therefore, as a state vector of the analysed economic system gets increasingly closer to that of the benchmark[3], the new structure will influence the values or trends which measure the nominal convergence. We can conclude from here that the process of nominal convergence can only be sustainable if a process of real convergence occurs (concomitantly or immediately after). In other words, we may say that as long as the elements of nominal convergence are not absorbed at the level of the real economy pattern, the nominal convergence is reversible.

Second, once the „image" of the nominal convergence has been „embedded" into the pattern if the real economy, there is a feed-back relation from the process of real convergence to that of nominal convergence, considering that economic macro-stability is usually measured using the indicators/criteria of nominal convergence. Thus, there is a permanent and continuous reciprocal exploration between the two processes of economic convergence.

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[1] Here the term of contingent has it meaning from logics (proposed by **Aristotle**): possible and non-necessary, usual, produced frequently from the practical point of view.

[2] We remind just two of the inter-conditionings already marked by the literature: a) the **Maastricht paradox**: real convergence can have an adverse effect on the nominal convergence (particularly at the level of inflation); b) the **Balassa-Samuelson** effect.

[3] This evaluation is, of course, symmetric: the effects of the real process on the nominal one will produce not just in the case of convergence, but also in the case of divergence, the transmission channel still being the structure of the analysed economic system.

Third, there are own[4] phenomena of the real economy which take place according to an autonomous causality but which, once they get into the structural modifications of this type of economy, become firm causes or conditionings for the nominal phenomena.

All these considerations, of maximal generality, are as many motivations to investigate the real convergence and the nominal convergence as a binomial. Although this study is concerned only with the process of real convergence, the above considerations, and the following methodological considerations, will cause a permanent analytical and interpretative "swinging" between the two categories of processes of economic convergence.

3. Methodological reasons to analyse inter-conditioning

First, all the phenomena specific to the real economy are measured in currency, by reason of aggregation or comparability. The monetary expression of these phenomena makes a direct connection with the financial flows (and within them, as shown before, with the nominal flows) specific to the process of nominal convergence. In other words, RGS[5], by their dimension, dynamics and structure generate, directly, NGS. In turn, NGS (for instance, the bank credits) generate some of the constitutive conditions of RGS.

Second, the existence of the real and nominal anchors for a whole series of micro and macroeconomic variables is due to introduce directly (and reciprocally) causalities and conditionings between the two convergence processes. Thus, the real anchors can influence the nominal variables, while the nominal anchors can influence the real variables. Furthermore, there may be direct interdependencies between the real and nominal anchors themselves, involving themselves reciprocally either at the level of the dimension or at the level of the dynamics, or at the level of the direct concatenation, within the general economic process.

Third, the modelling of the general economic process cannot be done without taking into account, simultaneously, both of the real and the nominal variables. This means that the modelling of the process of economic convergence will have to integrate both the process of real convergence and the process of nominal convergence, within a unitary, coherent and consistent model. This is an extremely important methodological reason to analyse the inter-conditioning between the two pair-processes[6] of economic convergence.

4. Classes of inter-conditioning between the RC and NC

Based on what was said above, we propose to identify the classes of inter-conditioning existing (category of required inter-conditioning) or which may exist (category of contingent inter-conditioning) between the process of real convergence and that of nominal convergence.

The modality we will use is the causal or conditional one, that is, we will examine at the abstract, general level, a list of classes of such inter-conditioning.

As methodological „vehicle" we will use the investigation of the transmission channels for the real impulse and of the nominal impulse, between the two categories of economic convergence.

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[4] Own, meaning that they are autonomous in relation with those from the process of nominal convergence, same as, in principle, there are own phenomena in the process of nominal convergence itself.

[5] As we remember, we noted with RGS the expression „real goods and services", and with NGS we noted the expression „nominal goods and services".

[6] Some analysts consider a third process of convergence which should accompany the real convergence and the nominal convergence: it is the so-called institutional convergence. Our opinion is that: a) on the one hand it is true that next to the well-known five nominal convergence criteria there is one more – alignment of the central bank's legislation to the related European legislation – and that it was rightfully shown that this is not a nominal criterion (not by our economic standards used to evaluate the concept of nominal, because by the logic standards, it should, nevertheless, be nominal), but rather an institutional one; b) on the other hand, however, institutional convergence is not a category of economic conversion. In conclusion, our opinion is that although we can accept the idea of a process of institutional convergence, when we speak of economic convergence there are only two species of convergence, real and nominal.

5. Transmission channels of the nominal impulse on to the real variables

a. a first such a channel is that of the *nominal banking interest rate*. The real variable on which it impacts may be either one belonging to the internal aggregate demand[7] (consumption or governmental expenditure[8]) or one belonging to the aggregate internal offer (investments). The nominal impulse[9] we mentioned[10] has an action with different orientations, according to the real variable which is affected: if the nominal banking interest rate increases, the impulse on the consumption and investments can be one of decreasing (according to the classical curve of the demand, to the increase of prices ceteris paribus), but the impulse on the governmental expenditure may be one of increasing (due to the necessity of a premium to the interest rate of the state securities used to finance the budget deficit);

b. a second transmission channel is that of *inflation*. The impact of inflation on the real economic variables is produced in the form of the decrease of demand (for consumption – both for strictly necessary goods and for long term goods or services – or equipment), according to the classical curve of the demand. In general, the decrease of the purchasing power of the monetary unit[11] will decrease the solvable demand (of the actual demand, in Keynesian terminology), which will decrease the aggregate offer (both internal and external). Therefore, the inflation transmission channel of the nominal impulse on to the real economy is meant to reduce particularly the real variables of level. However, since the dynamics of the real variables of level may have structural effects in the real economy, this impact will supposedly affect adversely the real convergence too (seem especially as a structural convergence);

c. A third transmission channel is that if the *real exchange rate*. Although the exchange rate which is used in the calculations of economic rationality of the real economy is the nominal exchange rate, the behaviour pattern of the real economy will be similar to that one observed for the wage[12], taking into consideration the real exchange rate. The impact is transmitted particularly on to the foreign balance, at the level of the current account deficit (first on the commercial balance). This can affect both the degree of openness[13] of the economy as such, and the structure of this degree of openness. Or, the degree of openness of the economy is (as we shall see in the study) one of the criteria of real economic convergence.

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[7] Methodologically, it may seem to have here an inadvertence, because the gross formation of capital (considered here as belonging to the internal aggregate offer) is a component of the internal demand (internal absorption minus the import). Taking into consideration that the gross investments (and the net investments, particularly) make the internal offer to vary, we allowed ourselves the methodological license to consider the gross formation of capital as operating from the perspective of the internal aggregate offer.

[8] The affectation of the governmental expenditure refers to the fact that the financing of the general consolidated budget deficit by issuing state securities takes the banking interest rate as benchmark to determine the interest rate for the respective state securities.

[9] Although one may argue here that it is not the nominal interest rate, but the real interest rate which influences the economic behaviour (the behaviour of demand for bank credits – irrespective of their destination), we consider that the involved economic agent is informed and warned on the **Fisher** relation – real interest rate = nominal interest rate – inflation. (NB: as it is known, this simplified formula of the relation is valid for small values of the involved economic measures, the full, general, relation being: $(1 + r_n) = (1 + r_r) \cdot (1 + i)$, where r_n is the nominal interest rate, r_r is the real interest rate, and i is inflation). Therefore, the economic subject makes the necessary adjustment during the decision-making process.

[10] In principle, we might prolong the mentioned causality to the level of the monetary policy interest rate, but we must notice that the transmission of the monetary policy interest rate impulse on to the banking interest rate is a nominal-nominal channel, not a nominal-real one. Therefore, we will subsequently make our analyses only on the nominal variable which is proximal in relation to the affected real offer.

[11] As it is known, this is the very rigorous definition of inflation.

[12] Case in which, although the economic subject „meets" directly the nominal wage, the calculations of economic behaviour pertaining to the choice between the two „goods" – time for work and free time – are made on the basis of the real wage.

[13] As it is known, the degree of economy openness is determined as proportion of the foreign trade (exports plus imports) within the GDP.

6. Transmission channels of the real impulse on to the nominal variables

Concerning the transmission channels of the real variables impulse on to the nominal variables, we consider that these have the nature of the gaps from the real economic variables. Several such categories of channels (gaps) can be identified.

    a. <u>dimensional gaps</u>: they refer to breaching some fundamental relations of the economic process, breaching which induces pressures (increasing, decreasing or blocking the variation) on some nominal variables. For instance, an actual GDP higher than a potential GDP[14] induces pressures on price increase, transmitting thus an inflationist impulse (the effect is not symmetrical, an actual GDP lower than a potential GDP will not transmit a deflationist impulse to the economy). Of course, this is the most general dimensional gap possible but, dimensional gaps can be identified at the level of GDP structure, which may impact on the nominal variables. For instance, at the level of the actual GDP utilisation, a higher proportion of the final consumption than of the gross formation of capital may indicate the possibility for an inflationist impulse, the economic growth being dependent on the consumption component of the internal aggregate demand. Also here, if the net export is negative, this means a net outflow of capital through the current account, which reduces the offer of capital on the internal currency market, impacting on the exchange rate which increases (the national currency devalues[15]). The dimensional gaps of the real variables are "linked" theoretically; their significance and even the actual transmission mechanism of the impulse generated by these gaps depend on the general hypotheses of the accepted economic theory. But, irrespective of the accepted economic theory, the dimensional gaps of the real variables are, necessarily, potential generators of impulses on the nominal variables[16];

    b. <u>kinematic gaps</u>: the kinematic gaps of the real economic variables act similarly with the dimensional gaps, with the difference that their impact is produced due to the difference of relative variation between the involved variables and not just due to the differences at a certain moment. Theoretically, there may be two categories of such kinematic gaps:

    - <u>kinematic gaps</u> between two distinct real economic variables. Some of the most important correlations of the macroeconomic theory refer just to the gaps of kinematics between two distinct variables of the real economy[17];

    - <u>kinematic gaps</u> within the same real economic variable, but which acts in distinct economic sectors, or in distinct institutional sectors[18], or in different countries, such as for instance the differences of work productivity kinematics between the secondary[19] and tertiary sectors leads to inflation [20] differences between the two sectors; otherwise, here lies the origin of the famous Balassa-Samuelson[21] effect. Unlike the dimensional gap, the kinematic gap is

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[14] By actual GDP we understand the GDP which is actually created, while the potential GDP is the GDP possible to be created by the full utilisation of the available production factors.

[15] We will notice here a sui-generis mechanism of automatic monetary stabilizer: the monetary appreciation leads to monetary depreciation and vice versa, by modifying the structure of the net export within the GDP.

[16] It is, of course, a much more difficult problem (however, not in the scope of this study) that of the intensity, amplitude or duration with which such a dimensional gap affects the nominal variables.

[17] Consider just the well-known example of the correlation between work productivity kinematics and the kinematics of the gross average wage, in which work productivity must increase faster than the wage in order to have a non-inflationist, sustainable growth).

[18] We remind that the economic sectors are: primary, secondary, tertiary, quaternary, and the institutional sectors are: households, non-financial firms, financial firms, public administration, private administration and the rest of the world.

[19] It is accepted rather tacitly, that the secondary sector produces (tradable goods) and the tertiary sector produces (non-tradable goods).

[20] Rigorously, inflation is the rate of the general price (weighted average price of the analysed period).

[21] In fact, when we study the mentioned effect of the kinematic gap on the price, we deal with the internal version of the **Balassa-Samuelson** effect (version termed **Baumol-Bowen**) effect, the external version being the one which studies the

not transmitted directly to the nominal variables, rather it needs a vehicle (also real) which to make this transfer of the impulse. In our example, this vehicle is the workforce and its circulation between the secondary and tertiary sectors (the economic rationality of this circulation is based on the workforce opportunity cost), which entails wage homogenization in those sectors;

c. structural gaps: this category refers to the structural differences existing between two entities segmented methodologically (or from other points of view) of the real economy. For instance, there may appear impulses on the nominal economy if the proportion of the economic sectors with high price volatility or with administrated prices or with prices affected by the foreign prices (by pass-through) is significant within the structure of GDP formation. Of course, the structural gaps have a much more important impact when they affect two different countries[22]. We will have here the well-known problem of the adverse effects, too. An adverse effect, in general, is an effect not anticipated, although expected, just due to the differences of economic structure (from the perspective of different criteria) existing in the "focus" of emanation of a real shock (for instance, a variation of the demand or offer of goods or workforce) and the rest of the system in which the shock propagates[23].

The figure 1 shows a synoptic view on the reciprocal transmission of impulses between the real economic convergence and the nominal economic convergence process.
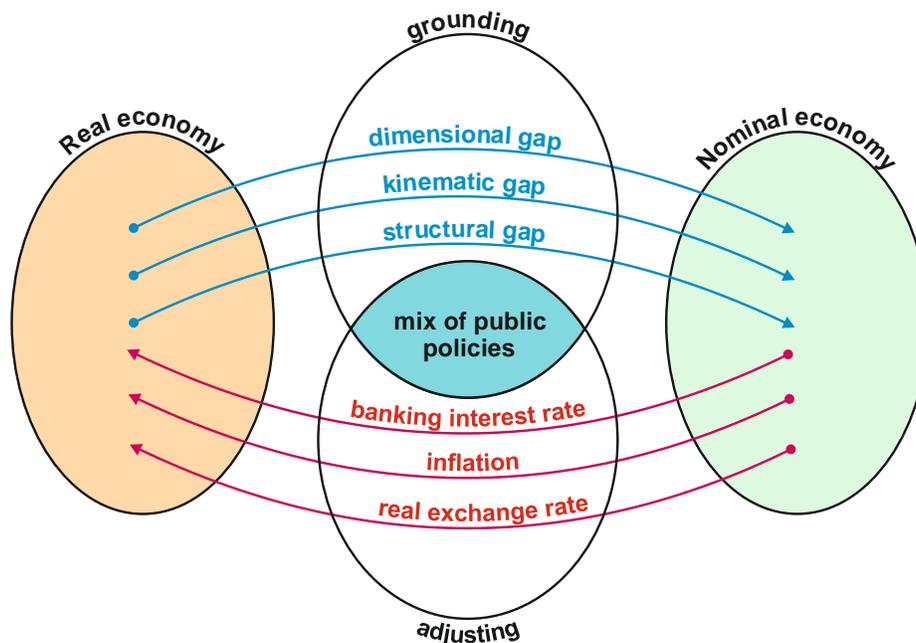

Figure 1 – Channel of transmission of impulses between real economy and nominal economy

Source: author

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impact of the kinematic gap on the real exchange rate. However, the abstract mechanism of the two versions is logically equivalent.

[22] Do not forget that, ultimately, the elimination of the structural differences between the EU member states (that is, exactly the process of real economic convergence) is the generator of the Maastricht paradox.

[23] Of course, the higher is the level of integration of a given economic system (the globalized economy representing, obviously, the maximal level of integration, if we limit to our native planet), the higher are the imminence and transmission speed of a real shock within that system. But, both the imminence and the transmission speed of the real shock are inversely proportional to the probability of appearance of an adverse effect, because the adverse effect is favoured by the structural differences (structural gaps – both in the real economy and in the nominal economy), while the structural differences are inversely proportional to the degree of integration.

7. Indicators of real economic convergence and indicators of nominal economic convergence

Through the transmission channels discussed above, in fact, flow the impulses of the variation of macroeconomic indicators involved, that is, the impulses of the indicators assigned to the real economic convergence process, and those of the indicators assigned to the real economic convergence process, respectively. Principled, the indicators of the nominal economic convergence are just the Maastricht Treaty's criteria. Regarding the indicators assigned to the real economic convergence, we propose eight such indicators (Dinga, 2012), grouped by three classes, as follows (table 1):

Table 1

The classes of the real economic convergence criteria/indicators

			Depth		Theoretical stability	
			Rather deep	Rather shallow	Rather stable	Rather unstable
Class of the catching-up criteria	average domestic offer	$\bar{s}_d$		x	x	
	degree of external openness (	r_e^o		x		x
	average monthly gross nominal wage	SB	x		x	
	structure of revenues formation	y(k)	x			x
Class of the sustainabili-zation criteria	rate of net national saving	r_{EN}		x	x	
	average work productivity by tradable sectors	$\bar{\omega}_L(t)$	x			x
	structure of GDP utilization (structure of expenditure formation)	y(q)	x			x
	account balance of the foreign payment current account	r_{X-M}		x	x	
Class of the resilience criteria	sectoral revenue structure	y(j)	x			x
	rate of domestic absorption	r_{AI}	x		x	
	government dimension	g		x	x	
	employment rate	r_o		x	x	

Source: Dinga, Emil. Rebuilding Economics. A Logical, Epistemological, and Methodological Approach. Lambert Academic Publishing. Saarbrucken, Germany, 2012, p. 256.

In order to ensure the stability, more exactly, the sustainability of the nominal economic convergence once a country entered ERM2 and then the euro zone, it is crucial that the real economic convergence support the nominal one. The main feed-direct impulses from the indicators assigned to the real economic convergence to the indicators assigned to the nominal economic convergence are shown synoptically in figure 2.
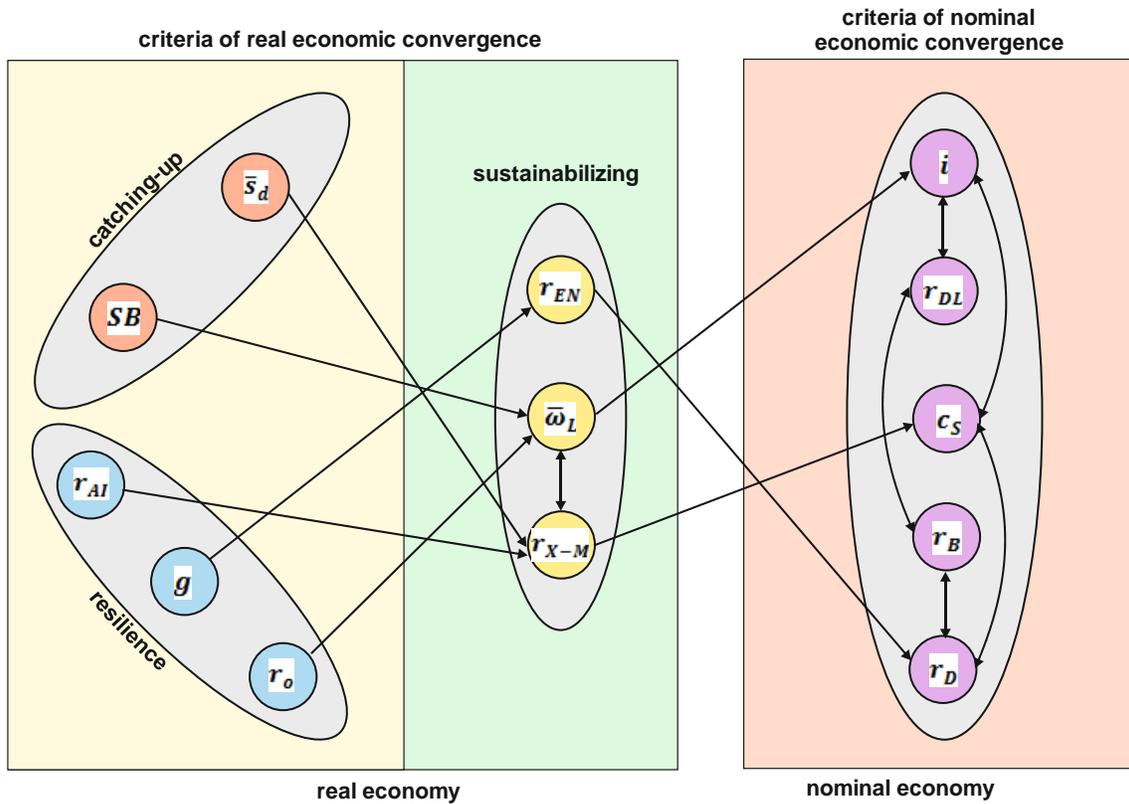
Figure 2 - Basic causal impulses between real economic convergence criteria and nominal economic convergence criteria

Source: Dinga, Emil *(coord),* Internal study of CFMR – Department of Fiscal-Budgetary Studies, 2018

Based on the scheme in Figure 2, we can now establish the causal chains (series) from the real economic convergence criteria to the nominal economic convergence criteria as follows:

$$\text{I.} \quad \bar{s}_d \to r_{X-M} \to c_S \to \begin{cases} (1) \to i \to r_{DL} \to r_B \to r_D \\ (2) \to r_D \to r_B \to r_{DL} \to i \end{cases}$$

$$\text{II.} \quad SB \to \bar{\omega}_L \to i \to \begin{cases} (1) \to r_{DL} \to r_B \to r_D \to c_S \\ (2) \to c_S \to r_D \to r_B \to r_{DL} \end{cases}$$

$$\text{III.} \quad r_{AI} \to r_{X-M} \to c_S \to \begin{cases} (1) \to i \to r_{DL} \to r_B \to r_D \\ (2) \to r_D \to r_B \to r_{DL} \to i \end{cases}$$

$$\text{IV.} \quad g \to r_{EN} \to r_D \to \begin{cases} (1) \to r_B \to r_{DL} \to i \to c_S \\ (2) \to c_S \to i \to r_{DL} \to r_B \end{cases}$$

$$\text{V.} \quad r_o \to \bar{\omega}_L \to i \to \begin{cases} (1) \to r_{DL} \to r_B \to r_D \to c_S \\ (2) \to c_S \to r_D \to r_B \to r_{DL} \end{cases}$$

We can draw the following qualitative conclusions:

(1) there are five channels of transmission from the real economic convergence criteria, only those of the type of sustainability (two of the catching-up criteria and three of the resilience criteria), to the real economic convergence criteria of the type sustainability, which actually implements the interface with nominal economic convergence criteria;

(2) given that there are cross-conditions (either causes or correlations) between the five criteria of nominal economic convergence, each impulse driven by the real economic convergence criteria breaks out as soon as it reaches the first convergence criterion nominal economy in two parallel channels;

(3) any impetus from the real economic convergence criteria ultimately affects all nominal economic convergence criteria through the inter-conditioning mechanisms in the nominal economy;

(4) of the five channels, channels I and III, although they go from different real impulses (the average domestic offer, the rate of internal absorption, respectively), since within the criteria of real economic convergence are exercised over the same sustainability criterion the trade balance or the current account) then follows the same impulse paths;

(5) similarly, things are happening with channels II and V which, although starting from different real impulses (gross average wage, respectively the employment rate), because within the criteria of real economic convergence are exercised on the same criterion of sustainability (average labour productivity or total factor productivity) then follows the same „impulse path" links.

8. Conclusions

Real and nominal economic convergence are not at all two independent processes one to another. Firstly, the real economic convergence provides the economic bases for the nominal economic convergence, whilst the nominal economic convergence returns on the real economic convergence by adjusting the real economic processes or by signalling some specific unbalances at the macroeconomic level. Second, no one between them can achieve its purpose without the other do the same. A theoretical model to get the economic convergence with EU must build a mix between the public policies aimed at to „govern" the real economy and the public policies aimed at to „govern" the nominal economy. The paper tried to describe this reciprocal and permanent „dialog" between the process of real economic convergence and the nominal economic convergence, by mutual fine tuning adjustment through the identified indicators measuring the two economic processes.

Selected bibliography