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THE CONNECTION BETWEEN RESOURCES AND ALLOCATIONS. THE BEHAVIOUR OF PUBLIC CENTRAL ADMINISTRATION: THE ROUMANIAN CASE

Keywords: public revenues, public expenditures, public decision, impulse function

ABSTRACT

The aim of this paper is to emphasize how the correlations between public resources flows and their allocations are manifesting. The results obtained suggest the existence of some "fast" adjustment processes between them, inducted by the intrinsic characteristics of the fiscal policy, and also by the specific behaviour of Romanian public authorities, particularities traced by the way of adoption and application of the public decision.

1. INTRODUCTION

The implementation of the fiscal policy, as a sine qua non condition, suppose that some structural-functional correlations between the resources mobilised by the different levels of public administration and their assignment to be met. The configuration of these correlations derives from the nature of economical restrictions on the one hand and from the implicit utility function of these authorities in the other hand. In another way, the decisions to collect and to allocate the public resources are based, on the one hand, on the restrictions inducted by the volume and structure of the resources that can be collected and by the quality of allocation and reallocation mechanism, and, on the other hand, by the social and political objectives assumed by the public decision-makers.

For emergent economic systems, that are facing a deep reconfiguration of functional and institutional structure, and a redefinition of the social objectives, these correlations

receive specific particularities. The list of the factors that determine these particularities is the following, in a minimal manner:

- restrictions in the supply side;
- imperfections of the financial resources collection and allocation mechanism;
- the incipient state of institutional infrastructure;
- imperfect and asymmetric information for different social actors;
- uncertainty in public decision process that stimulates a behaviour from public decision-makers that is opportunistic and time inconsistent.

The main components of the fiscal policy, the formation and allocation of the public resources, and the correlations between them have been actively studied in the last decades. Important contributions were made by Blachard (1985), Barro (1989) and Emerson et al. (1992). Also, concerning the research on dynamic equilibrium of public revenues and expenditures, focusing on the role of fiscal policy regarding public deficit and public debt, important contribution had Turnovski (1993) and Amador (1999).

2. THEORETICAL FUNDAMENTS

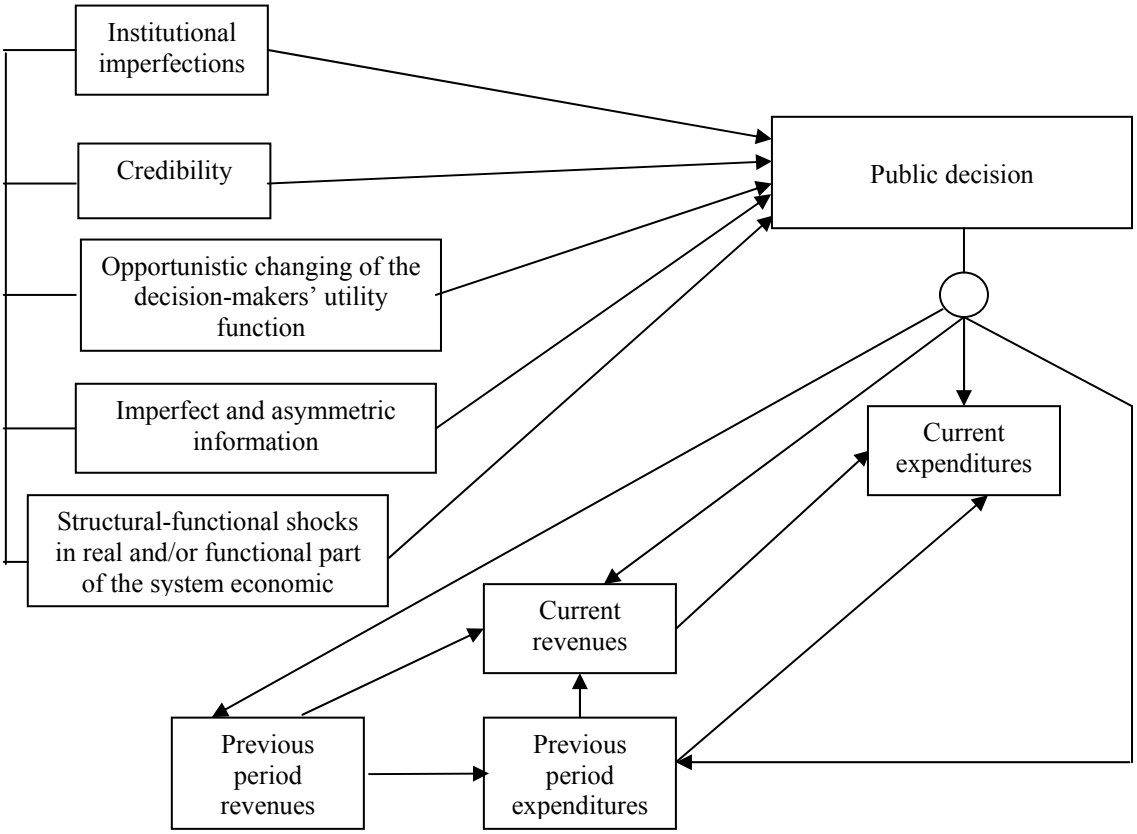
The analysis of *de facto* correlations between revenues flows and expenditures flows at the superior level of public administration presumes, as it comes also from the previous remarks on different conceptual approaches, the identification of the implicit form of the utility function that is relevant for this level of administration.

It must to remark that this identification has, usually, an *ex-post* nature. So, it is very difficult to make an *ex-ante* setting-up. For sure, the existence of some formal objectives for the public administration makes possible the statement of some hypothesis, which gives us the possibility to estimate the form of the utility function for public decision-makers. A critical aspect is represented by the credibility of the informational signal that is transmitted by the public decision-makers, especially for an economic system still in transition that generates the mentioned time inconsistency of the public policy. More, the state of economic development, the limited number of public resources sources and the imperfection of the allocation mechanisms imposes frequent restatements of public decisions which influences public revenues and public expenditures flows.

So, the dynamic of the revenues and expenditures could present significant up and downs for the evolution pattern. “The capacity of reaction” of the public authorities in modifying the economic and social conjuncture is limited by the imperfection of both institutions and mechanisms involved in public decision-making process. So, we could presume the existence of some inertial behaviors in the budget parameters evolution. To emphasize these contrary tendencies, it is necessary to select an analytical framework able to reflect the autoregressive character of revenues and expenditures flows and the manifestation of uncorrelated shocks at their level. This framework should also emphasize the bi-univocal connections between revenues and expenditures.

This analytical framework could be presented in this manner (figure 1):

Figure 1 The connection "revenues-expenditure" in a transition economic system



As this framework shows, subsidiary factors of public decision direct to the configuration of revenues and expenditures' current and previous levels. More, the levels of these variables from previous periods are influencing the current ones, and the shocks occurred are affecting in a non-linear way the dynamic of the current budgetary parameters. The exact configuration of the public revenues flows and their allocation derives from the combination of the inertial effects and the multiplicative shocks. It must also be remarked that because public financial flows are just partially self-determined, the structural-functional changes in the economic system as a whole have a significant contribution. So, because transition economic systems are in a deep transformation, the level of economic activity output could be very fluctuant, which tends to lower the gathering base of public resources that can be mobilised by the public authorities and to determine severe restrictions in the efficiency of allocation mechanisms.

3. METHODS AND RESULTS

A useful framework for presenting and testing the described connections is represented by VAR models (*Vector Autoregressive Model*), which allow us to analyse the dynamic of inter-correlated time series and to reveal the stochastic shocks at the level of considered variables. The general form of endogen variables vector for a model of this type is:

$$Y_t = [ch_t \; v_t] \quad (1)$$

where *ch, v* represent the variations in the level of public expenditures and revenues in the current period t, variations that can be expressed as:

$$x_t = \ln\left(\frac{X_t}{X_{t-1}}\right) * 100 \quad (2)$$

For presenting how such a model can be applied in approaching the inter-connections between public revenues and their allocation, in an instable economic system, as in Romania, we propose an analysis made for January 1997 – December 2003 period, which was shaped by important changes in the fiscal policy and in the behaviour of the public authorities.

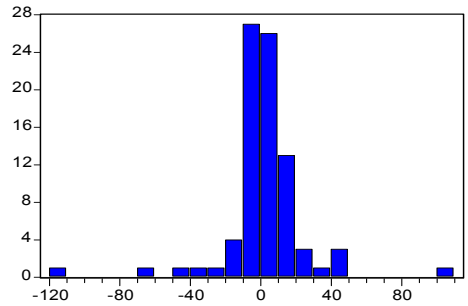
Data

Data that we used represent monthly, un-cumulated values of collected public revenues and carried out public expenditures, from the **Annual budgetary execution account**, in constant prices. For eliminating the effects of the specific seasonality of public resources collection and allocation, original data was de-seasonalised using X12-ARIMA procedure.

The sources of data are represented by the 2002 **Annual Report of Romanian National Bank** and the 2003 **Monthly Bulletins** of the central bank.
The analysis period is limited at the specified range because of inadequate available data and for assuring their homogeneity.

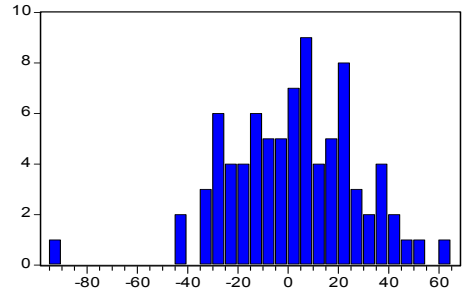
Static characteristics analysis

Analysing budgetary parameters characteristics for the period January 1997 – December 2003, we can state the following
a) General features



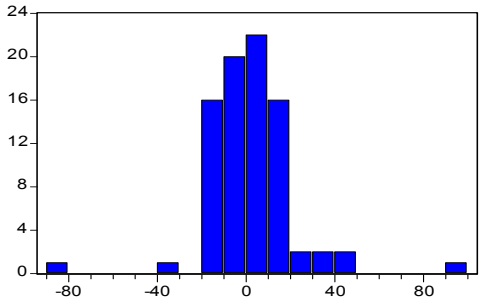
Serie: Variatia veniturilor (ajustata sezonal)
Perioada 1997:02 2003:12
Observatii 83

Medie	2.580276
Mediana	3.119411
Maximum	109.0107
Minimum	-111.0279
Abatere standard	23.90960
Skew ness	-0.446675
Kurtosis	12.71890
Jarque-Bera	329.4239
Probabilitate	0.000000



Serie: Variatia cheltuielilor (neajustata sezonal)
Perioada 1997:02 2003:12
Observatii 83

Medie	2.936301
Mediana	4.328075
Maximum	61.54430
Minimum	-91.96808
Abatere standard	25.26899
Skewness	-0.395168
Kurtosis	4.219665
Jarque-Bera	7.304741
Probabilitate	0.025930



Serie: Variatia cheltuielilor (ajustata sezonal)
Perioada:1997:02 2003:12
Observatii: 83

Medie	2.352577
Mediana	1.627505
Maximum	93.31286
Minimum	-84.53153
Abatere standard	19.56103
Skewness	0.298555
Kurtosis	11.44773
Jarque-Bera	248.0339
Probabilitate	0.000000

b) Stationarity

The stationarity tests indicates that revenues and expenditures variations could be, in a suitable way, treated as a I(0) process: $I(0)$:

I. Augmented Dickey-Fuller test

Revenues

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-10.37903	0.0001
Test's critical values:	1%	-3.513344	
	5%	-2.897678	
	10%	-2.586103	

* *MacKinnon critical values* (1996)

Expenditures

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.744937	0.0000
Test's critical values:	1%	-3.513344	
	5%	-2.897678	
	10%	-2.586103	

* *MacKinnon critical values* (1996)

II. Phillips-Peron test

Venituri

		t-Stat ajustat	Prob.*
Phillips-Perron test statistic		-20.84953	0.0001
Test's critical values:	1%	-3.512290	
	5%	-2.897223	
	10%	-2.585861	

* *MacKinnon critical values* (1996)

Cheltuieli

		t-Stat ajustat	Prob.*
Phillips-Perron test statistic		-21.66177	0.0001
Test's critical values:	1%	-3.512290	
	5%	-2.897223	
	10%	-2.585861	

* *MacKinnon critical values* (1996)

c) Co-integration relations

Johansen co-integration test leads to following conclusions (the test was made by assuming the hypothesis of a deterministic and restricted constant trend):

Unrestricted Co-integration Rank Test

Co-integration relations number	Eigenvalue	*Trace Statistic*	5 % Critical value	1 % Critical value
Any **	0.336795	48.90608	19.96	24.60
At most one **	0.201063	17.28444	9.24	12.97

*(**) Denotes the rejection of the hypothesis for a 5% (1%) threshold

The Trace test point to the existence of 2 co-integration relations

Co-integration relations number	Eigenvalue	*Max-Eigen Statistic*	5 % Critical value	1 % Critical value
Any **	0.336795	31.62164	15.67	20.20
At most one **	0.201063	17.28444	9.24	12.97

*(**) Denotes the rejection of the hypothesis for a 5% (1%) threshold

The Max test point to the existence of 2 co-integration relations for a 5% threshold and also for a 1% threshold.

Estimating the coefficients and the quality of the model

A) Coefficients

The estimation of the general model parameters described by the relation (1), in its unrestricted form, leads to following results:

	EXPENDITURES VARIATION	REVENUES VARIATION
EXPENDITURES VARIATION (-1)	-0.573810	0.001657
	(0.13129)	(0.15737)
	[-4.37049]	[0.01053]
EXPENDITURES VARIATION (-2)	-0.394355	-0.204598
	(0.14940)	(0.17908)
	[-2.63952]	[-1.14249]
EXPENDITURES VARIATION (-3)	-0.343012	-0.214908
	(0.15120)	(0.18123)
	[-2.26863]	[-1.18582]
EXPENDITURES VARIATION (-4)	-0.339615	-0.059164
	(0.13077)	(0.15675)
	[-2.59703]	[-0.37745]
EXPENDITURES VARIATION (-1)	-0.155512	-0.788399
	(0.11441)	(0.13714)
	[-1.35922]	[-5.74888]
EXPENDITURES VARIATION (-2)	-0.059337	-0.403322
	(0.13739)	(0.16468)
	[-0.43189]	[-2.44910]
EXPENDITURES VARIATION (-3)	0.043527	-0.132516
	(0.13730)	(0.16457)
	[0.31703]	[-0.80524]
EXPENDITURES VARIATION (-4)	0.140185	-0.017134
	(0.11125)	(0.13335)
	[1.26010]	[-0.12849]
C	6.251110	6.394470
	(2.16519)	(2.59527)

	[2.88709]	[2.46389]
R^2	0.365003	0.402928
adjusted R^2	0.292432	0.334692
F-statistic	5.029602	5.904857
Probability function (log)	-328.4934	-342.8068
AKAIKE informational criterion	8.544137	8.906502
SCHWARZ informational criterion	8.814074	9.176439
AKAIKE informational criterion		17.39952
SCHWARZ informational criterion		17.93940

B) Residuals analysis

Portmanteau autocorrelation test for residual variables for this model leads to following results:

Lags	Q-Stat	Prob.	Adj Q-Stat	Prob.	df
1	0.283000	NA*	0.286628	NA*	NA*
2	0.827977	NA*	0.845760	NA*	NA*
3	3.652043	NA*	3.781303	NA*	NA*
4	5.880512	NA*	6.128623	NA*	NA*
5	7.545110	0.1097	7.905694	0.0951	4
6	11.03746	0.1996	11.68509	0.1658	8
7	15.00347	0.2412	16.03668	0.1896	12
8	23.94956	0.0906	25.99078	0.0542	16
9	25.77310	0.1734	28.04877	0.1082	20
10	27.20681	0.2949	29.69027	0.1952	24
11	31.49510	0.2955	34.67226	0.1796	28
12	36.51204	0.2670	40.58776	0.1419	32

Note: the test is valid only for lags bigger then number of lags considered in the VAR model. df represents the number of degrees of freedom for asymptotic distribution χ^2 statistic (calculated).

These values allow us to reject the self-correlation between residual values. But:

Null hypothesis – residual variables are (multivaried) normal:

Component	Skewness	χ^2	df	Prob.
1	-1.858006	45.45380	1	0.0000
2	-0.843460	9.367092	1	0.0022
Common		54.82089	2	0.0000

Component	Kurtosis	χ^2	df	Prob.
1	11.06188	213.9384	1	0.0000
2	5.022216	13.46080	1	0.0002
Common		227.3992	2	0.0000

Component	Jarque-Bera	χ^2	Prob.

1	259.3922	2	0.0000
2	22.82789	2	0.0000
	259.3922	2	0.0000
Common	282.2201	4	0.0000

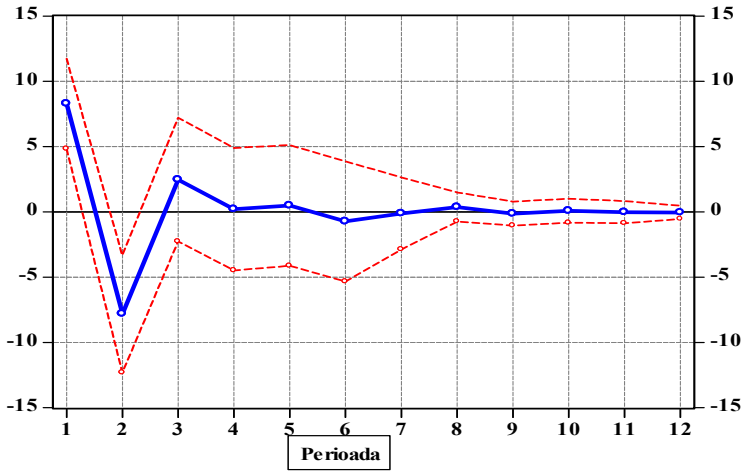
It could be observed that the hypothesis of residual variables non-normal distribution can't be rejected in a satisfying way.

The model includes characteristic roots that are, in the modulus, inferior to unity (the biggest of them is equal to 0.775), allowing the limitation of negative effects on the model stability thanks to superior order integration. At last, the "weak" exogenity hypothesis could be rejected for each of the two variables.

Expenditure-revenues impulse function

Based on these results we could consider that this model satisfactory describes the connection between implicated variables. Its use allow us to make an approximation of the impulse function form, which estimates the public expenditures evolution caused by a shock in the revenues level. (the model of *generalised impulses* for decomposing the factors – chart 1):

Chart 1 Effects on expenditures caused by a shock in revenues level



4. DISCUSSIONS

As the impulse function shows, a shock in the public revenues determines a more than proportional time correlated growth in expenditures level, followed in a two period interval by a "down" adjustment, and after that inducted effects are "fainting" in a two

quarters period. In our opinion, the described situation reflects an "over-reaction" of public authorities, and an attempt to restore initial budgetary parameters.

It is important to remark that the ensemble of these effects is "short-termed", reaching maximal levels in first post-impact quarter. In other words, changes in the configuration of public decision mentioned determinants are fast and instable rebounded upon the dynamic of revenues and expenditures flows, determining frequent inter-correlated adjustment.

The uni(bi)-periodical character of the disturbance effects suffered by the mobilised resources by the fiscal authority on the allocation mechanisms could be envisaged analysing the contribution of these disturbances to stress the volatility of public expenditures (table 1):

Table 1 Decomposing public expenditures variance (%)

Period	Standard error	Expenditures (implicit factors)	Revenues (explicit factors)
1	16.43942	100.0000	0.000000
2	19.94404	98.23887	1.761133
3	20.11704	96.60440	3.395601
4	20.12922	96.54319	3.456811
5	20.17362	96.28753	3.712465
6	20.51308	94.95766	5.042338
7	20.56513	94.88896	5.111038
8	20.57013	94.88324	5.116762
9	20.57092	94.88287	5.117126
10	20.58645	94.83898	5.161019
11	20.60418	94.79893	5.201071
12	20.60649	94.79722	5.202779

Note: *Cholesky* factors decomposition

It could be observed that the "peak" of the effects inducted by an impulse of public revenues on expenditures volatility is reached in about two quarters, without any significant changes to appear later, and that the ampleness of this "peak" is relatively limited.

We consider that these results envisage relatively clearly the mentioned inertial reactions and multiplicative shocks combination which characterizes adaptive processes appeared at the public resources flows level.

We insist that these results should be interpreted with care, on the one hand because the insufficient data volume, and on the other hand because the structural and functional changes of the economic system, institutions, instruments and fiscal policy mechanisms in analysed period.

More, even that the used VAR model can be described, in a satisfying way, as a "stable" model, it is obvious that its viability could be considered just a "short-term" one, in which adjustment processes at the implied variables level are incomplete.

It is necessary to mention some imperfections of the adopted conceptual framework. So, it is critically that a set of public decision determinants is mentioned, without any formal description of the way that they lead to the manifestation of the mentioned "over-reaction".

It is possible to state that "institutional imperfections", "opportunistic change of public decision-makers utility function", "credibility" or "structural shocks" are, intuitively, factors of a pro-cyclical fiscal policy, and in this case, "over-reactions" are, more or less, inherent. But, this kind of approach don't give an unquestionable proof for *de facto* existence of this sort of fiscal policy.

Despite of these limitations, we consider that the image derived from the use of the proposed model is a realistic one and this model is able to catch some essential features of the way in which the fiscal policy react at changes in hypothesis, in an economic system that has a deep instability, like the Romanian one.

5. CONCLUSIONS

The analysis presented in this paper had in mind to envisage the way of manifestation of the correlation between public resources and their allocation.

Results obtained suggest the existence of some "fast" adjustment processes inducted by the intrinsic characteristics of the fiscal policy, and by the specific behaviour of the public authorities, particularities that are active in adoption and application of the public decision.

The main analytical development directions are:

- Widening of conceptual framework taken into consideration explicitly determinant factors of correlation between public revenues and public expenditures;
- Adoption of some alternative methodologies for empirical testing of these determinants way of manifestation;
- Taking into consideration the case of another emerging economic systems<

Simulating the implications resulted for the way of conception and application of the fiscal policy.

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