MACROECONOMIC DETERMINANTS OF THE INVESTMENT FUNDS MARKET. THE ROMANIAN CASE

Dima, Bogdan; Barna, Flavia and Nachescu, Miruna
West University from Timisoara (Romania), Faculty of Economics, Finance Department

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BOGDAN DIMA, Assistant Proffesor, PhD
FLAVIA BARNA, Lecturer, PhD
MIRUNA LUCIA NACHESCU[1], PhD Student

Abstract:
The evolution of the investment funds market is influenced by a number of factors that have a more or less significant impact upon the trend this market follows. The implementing of stimulating policies in what concerns the development of the investment funds market, strictly connected to the development of the national economy, implies both the awareness of these factors existence as well as the need of evaluating the impact they have.
The purpose of the present paper is to identify and quantify the impact of the macroeconomic variables, such as the inflation rate, interest rate or exchange rate, upon the evolution of the investment funds market in Romania.

JEL Codes: G14, C32, C52
Key words: investment funds, macroeconomic variables, impact

1. Introduction

The beginning and the development of the financial market was, is and will be determining for the decisions of the individual and institutional investors that try to identify the best investment opportunities and a way to anticipate the price variations, namely a formula for determining the future price, starting from the previsions made for the determining factors. Such a formula would allow them to be one step ahead the other investors or at least to diminish the incertitude regarding the fluctuations of those markets. These interests are found at macroeconomic level too, as the investment funds market is influenced by a number of factors that induce in a more or less important way its dynamics. The implementing of certain politics that stimulate this component of the financial market, strictly connected to the development of the national economy, implies both finding these factors and evaluating their impact. The central element of the present paper consists of identifying and quantifying the impact that the macroeconomic variables, such as the inflation rate, the interest rate, the composite index of the Stock Exchange of Bucharest and the exchange rate, upon the evolution of a rate that is specific to the evolution of the investments funds market of Romania, namely the mutual funds index IFM.

Therefore, the paper offers a VEC model and presents its methodology in the second part of the paper. The third part is dedicated to implementing the model and obtaining the results and the last part contains the conclusions that were obtained after analyzing the obtained results.

2. The methodology

In order to test the links between the performances of the investments funds and some macro-variables, a *Vector Error Correction* (**VEC**) could be involved. The **VEC** methodology

[1] West University from Timisoara (Romania), Faculty of Economics, Finance Department address: 16 Pestalozzi Street, Timisoara, 300115, Romania

presents several advantages. In particular, it allows building a model of the connections between some co-integrated variables, being extremely useful in the study of the economic fluctuations.

A **VEC** model is a particular restricted *Vector Error* (**VAR**) model designed for use with non-stationary series that are known to be co-integrated. The **VEC** has co-integration relations built into the specification so that it restricts the long-run behaviour of the endogenous variables to converge to their co-integrating relationships while allowing for short-run adjustment dynamics. The co-integration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments.

To take the simplest possible example, consider a two variable system with one co-integrating equation and no lagged difference terms. The co-integrating equation is:

$$y_{2,t} = \beta y_{1,t} \quad (1)$$

The corresponding **VEC** model is:

$$\Delta y_{1,t} = \alpha_1 \left(y_{2,t-1} - \beta y_{1,t-1} \right) + \varepsilon_{1,t}$$
$$\Delta y_{2,t} = \alpha_2 \left(y_{2,t-1} - \beta y_{1,t-1} \right) + \varepsilon_{2,t} \quad (2)$$

In this simple model, the only right-hand side variable is the error correction term. In long run equilibrium, this term is zero. However, if y_1 and y_2 deviate from the long run equilibrium, the error correction term will be nonzero and each variable adjusts to partially restore the equilibrium relation. The coefficient α_i measures the speed of adjustment of the i i-th endogenous variable towards the equilibrium.
The vector of the endogenous variables has the following representation:

$$Y_t = \left[ifm_t \; betc_t \; bet_t \; rpd_t \; bubid_t \; ri_t \; roneuro_t \; ronusd_t \right] (3)$$

Where:
If m is the mutual funds' ratio,
betc is the composite ratio of the financial market,
rpd is the average level of the „passive" interest rate (the interest rate including the bonus offered by the commercial banks for the deposits of non banking clients),
bubid is the interest rate for the deposits collected from the inter-banking market,
ri is the inflation rate calculated on the basis of monthly variations of the Consumption Price Ratio,
roneuro is the exchange rate of the ROL in respect to the EURO,
ronusd is the exchange rate of the ROL in respect to the USD.

One can notice the fact that the model takes into account endogenous variables. This way, we can presume the absence of a representative ratio for the financial markets from the MEU. In case of exogenous variable, the presumption can be regarded as „questionable". Nevertheless, preliminary tests suggest the existence of a „week integration" state of the Romanian financial market into the international financial flows. Therefore, we preferred not to take it into account. We can also see that the variables taken into account in the explanatory set are mainly nominal variables, less able to reflect the structural characteristics of the Romanian economy (exception being the inflation).

3. Results

For an analysis period starting in January 2000 and ending in June 2006, the stationary (who's results are presented bellow) (**Augmented Dickey-Fuller**, **Phillips-Perron**, **Kwiatkowski-Phillips-Schmidt-Shin**, and **Elliott-Rothenberg-Stock**) suggest the fact that all the involved variables can be regarded as $I(1)$ type variables (the data are gathered from the monthly bulletins of the National Bank of Romania and of the UNOPC).

Also, the **JOHANSEN co-integration test** suggests the existence of three co-integration relations between these variables (more exactly, the *Trace* test suggests eight co-integration relations, while the *Maximum Eigenvalue* indicates three relations; we shall consider three co-integration relations that try to "lock" the variables that are specific to the financial market and to integrate them into an individualized block in respect to the other variables).

Table 1: The JOHANSEN co-integration test for the variables of the number (3) equation

Number of included observations: 59
Linear deterministic trend
Trace Test

Number of co-integration relations	Eigenvalue	Statistics *Trace*	Critical values for a 0.05 limit	Prob.**
None *	0.634957	236.9415	143.6691	0.0000
One at the most *	0.477148	163.3766	111.7805	0.0000
Two at the most *	0.423954	116.0392	83.93712	0.0000
Three at the most *	0.337384	75.77485	60.06141	0.0014
Four at the most *	0.197264	45.73095	40.17493	0.0125
Five at the most *	0.178734	29.69068	24.27596	0.0094
Six at the most *	0.105385	15.31635	12.32090	0.0153
Seven at the most *	0.093760	7.186949	4.129906	0.0087

The *Trace* test indicates the existence of eight co-integration relations for a critical limit of 0.05
* means the rejection of the hypothesis for a critical limit of 0.05
** p values given by MacKinnon-Haug-Michelis (1999)
The *Maximum Eigenvalue Test*

Number of co-integration relations	Eigenvalue	Statistics *Trace*	Critical values for a 0.05 limit	Prob.**

None *	0.634957	73.56494	48.87720	0.0000
One at the most *	0.477148	47.33734	42.77219	0.0146
Two at the most *	0.423954	40.26439	36.63019	0.0180
Three at the most	0.337384	30.04390	30.43961	0.0559
Four at the most	0.197264	16.04027	24.15921	0.4182
Five at the most	0.178734	14.37433	17.79730	0.1522
Six at the most	0.105385	8.129406	11.22480	0.1663
Seven at the most *	0.093760	7.186949	4.129906	0.0087

The *Maximum Eigenvalue* test indicates the existence of three co-integration relations for a critical limit of 0.05

* means the rejection of the hypothesis for a critical limit of 0.05

** p values given by MacKinnon-Haug-Michelis (1999)

The quality of the estimation can be considered as "satisfactory", fact confirmed by the test regarding the unitary roots of the characteristic polynom.

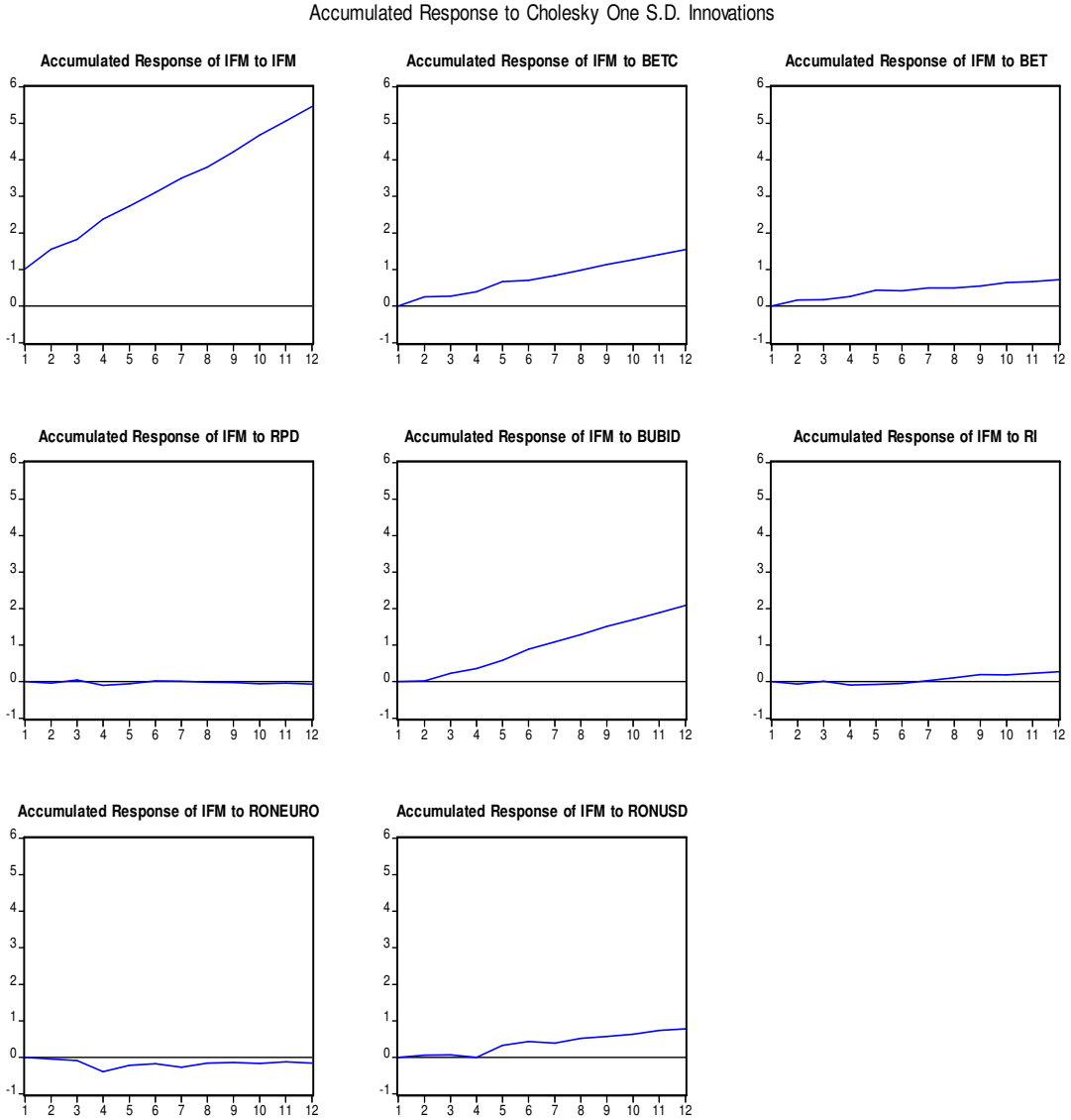
Table 2: The stability of the SVAR model

Root	Modulus
1.000000	1.000000
1.000000	1.000000
1.000000	1.000000
1.000000	1.000000
-0.208573 + 0.839023i	0.864559
-0.208573 - 0.839023i	0.864559
0.831235	0.831235
-0.565862 + 0.608823i	0.831184
-0.565862 - 0.608823i	0.831184
-0.788669	0.788669
0.119503 - 0.760917i	0.770244
0.119503 + 0.760917i	0.770244
-0.717446 + 0.252650i	0.760632
-0.717446 - 0.252650i	0.760632
-0.038977 - 0.741893i	0.742916
-0.038977 + 0.741893i	0.742916
0.548140 + 0.471472i	0.723010
0.548140 - 0.471472i	0.723010
-0.375759 + 0.592318i	0.701453
-0.375759 - 0.592318i	0.701453
0.214480 - 0.636140i	0.671324
0.214480 + 0.636140i	0.671324
-0.369641 - 0.507365i	0.627737
-0.369641 + 0.507365i	0.627737
-0.478554 - 0.192796i	0.515931

-0.478554 + 0.192796i	0.515931
0.337862 + 0.356450i	0.491129
0.337862 - 0.356450i	0.491129
0.032067 + 0.425461i	0.426668
0.032067 - 0.425461i	0.426668
0.391480	0.391480

VEC specification imposes 5 unit root(s). VAR satisfy the stability conditions.

On this basis we can estimate the impulse-associated functions (Graph 1).



By analyzing the form of these functions, one can notice that the shocks upon the considered variables have relative quick effects upon the dynamics of the financial market ratio. The „peak of repercussion" is reached in about 3-6 months, and in the 11-12 months to follow it slowly "dies". Moreover, if we compare the magnitude of the individual variables exercised impact, the results suggest the fact that the most important influence factors are represented by the general dynamics of the financial market, as well as by the interest rate from the

monetary market. *Per a contrario*, the passive interest rate and the inflation rate have little impact. The RON/USD exchange rate has a much more significant impact over the in comparison with the RON/EURO exchange rate. One possible explanation is the structure of the financial resources of the investments funds.
Similar conclusions can be obtained by analyzing the determinant factors of the ***ifm*** volatility:

Table 3: Variance decomposition of mutual funds index

Period	S.E.	IFM	BETC	BET	RPD	BUBID	RI	RONEURO	RONUSD
1	1.278584	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	1.500060	93.07823	4.223261	1.881195	0.105623	0.035464	0.300375	0.127708	0.248146
3	1.568366	89.94922	3.908837	1.727740	0.572162	2.700571	0.674302	0.236578	0.230588
4	1.793682	83.90509	3.679341	1.711537	1.467385	2.988866	1.097306	4.719941	0.430533
5	1.970582	74.70781	6.139334	2.563179	1.292449	4.400873	0.928603	5.063874	4.903873
6	2.071707	72.75475	5.603801	2.324222	1.376547	7.528702	0.856719	4.659276	4.895982
7	2.159764	72.14664	5.794365	2.319751	1.268602	8.263102	1.003745	4.604338	4.599459
8	2.229154	70.66791	6.099107	2.177621	1.212739	9.054205	1.160282	4.733885	4.894251
9	2.320345	70.41090	6.364090	2.100568	1.122736	9.774552	1.257740	4.373803	4.595615
10	2.412576	70.77459	6.301281	2.215702	1.070295	10.07236	1.163964	4.052553	4.349253
11	2.482974	70.60003	6.468184	2.103128	1.016366	10.38731	1.153056	3.855105	4.416818
12	2.555422	70.60711	6.597175	2.047635	0.977205	10.77126	1.130309	3.657483	4.211830

We can observe, that cumulated, the impact of the shocks that have affected the financial market index and the BUBID explains about 20% of the ifm volatility.

4. Conclusions

The results obtained shows the different impacts that the explanatory variables took in account have upon the dynamics of the mutual funds index. Thus, normally, the overall evolution of the financial market shows to be the main determinant of the performance of these funds.

Also, the directing interest ratio works at a minimal level of the expected efficiency, level that affects the structure of the portfolios of these funds and the obtained results.

One can notice, in the investment alternative selection process, the impact of the exchange rates between RON/Euro and RON/ US Dollar.

While in the analyzed period of time the real exchange rate associated to the investments in lei was normally under or just a little bit over the inflation rate, the traditional preference for keeping foreign currencies instead of investments in lei was more evident in the firs decade of the analyzed period (until 2002) and was maintained also in the last analyzed period (2004-2006). Taking into account the fact that in the last few years were implemented politics of controlled floating of the national currency that have lead to a relative stability of the national currency, the normal reaction of the investors should have been the change of preference towards other forms of saving. Still, this process was not as ample as it was wanted because of the psychological compound of the investing behaviour.

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