STATISTICAL INSIGHTS ON CAPITAL MARKETS IN CENTRAL AND EASTERN EUROPE – A COMPARATIVE APPROACH

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Abstract
Capital markets play an important role in the economies of the world as they support economic development. The present paper conducts an analysis of the young financial markets of Central and Eastern Europe with the focus on two selected markets: Romania and Hungary. In these countries, the capital markets are studied from the perspective of two components: stock exchanges and mutual funds market. The paper tries to identify the influence of several defined macroeconomic factors (GDP, inflation, unemployment, and savings) and industry-related indicators (stock market return, number of companies listed at the stock exchange, number of mutual funds, total net assets of mutual funds) on the evolution of the two components of the capital markets (stock exchanges and mutual funds). The methodology employed envisaged a regression analysis using data from the period 2003-2019. The paper uses a comparative approach from two viewpoints: it compares stock exchanges with mutual funds in each country and it compares the two financial markets, Romania and Hungary with one another. The study concludes that macroeconomic factors influence more the evolution of the stock exchanges than the evolution of mutual funds and that in Romania the impact of the macroeconomic factors on capital markets was higher than in Hungary in the analyzed period.

Keywords
Capital markets; stock exchanges; mutual funds; macroeconomic factors; mezzo-economic factors; Romania; Hungary.

Introduction

Financial markets represent an important part of any economy, including those from Central and Eastern Europe and therefore have been studied extensively by different researchers from different perspectives (Tvaronaviciene, 2019; Stoltz, 2020; Nicolescu

& Tudorache, 2016, 2018, 2020; Androniceanu, Gherghina, & Ciobănaşu, 2019; Swiecka et al., 2020). Capital markets as an essential component of financial markets constitute an influencer of economic development in all economies. The analysis of the factors that influence capital markets is therefore a topic of interest for the researchers (Cevik et al., 2016; Sabău-Popa et al., 2014). Capital markets have different components, out of which of interest for the present research are the stock exchanges and the mutual fund markets and the way they are influenced by different macro-level factors and mezzo level factors. Each of the two components of the capital markets can be characterized by different indicators. For stock exchange markets, the most popular measure for its performance is represented by the stock exchange indexes (Horobeţ & Belaşcu, 2015), which usually are computed by looking at the most performant companies traded (Vychytilova, 2018). For mutual funds, common measures of the market are the mutual funds' assets (Lemeshko & Rejnus, 2015; Filip, 2018) and how they relate to the Gross Domestic Product, namely, the mutual funds' assets as a percentage of GDP.

Macroeconomic factors are seen as influencers for capital markets (Albu, Lupu, & Călin, 2014; Tsaurai, 2018) and some of the factors analyzed are the Gross Domestic Product (GDP), consumer price index, money supply, interest rates, exchange rates, unemployment, exports as it is considered that there are linkages between macroeconomic variables and stock prices (Horobeţ & Dumitrescu, 2009; Celebi & Honig, 2019, Nicolescu et al., 2020). Other influencers of capital markets, such as the investment behavior, are identified by the literature (Ferreira et al., 2012; Filip, 2018; Sindelar & Budinski, 2019) emphasizing the importance of knowledge when deciding on complex decisional aspects (Vătămănescu et al., 2016, 2017). Mezzo factors (industry level factors) are less present in the literature (Agarwal & Khan, 2019), while micro-level factors are present to a limited extent, more than mezzo-level factors, but less than macro-level factors. Examples are micro-level factors (corporate profits, news about companies) or the internal factors (earnings per share, dividend book value) that influence the development of the stock exchanges (Shah, 2018; Islam et al., 2017).

The present study considers two-factor categories: the macroeconomic factors and mezzo factors or industry level factors. The research analyzes as macroeconomic factors: GDP, inflation, unemployment and savings, and as mezzo level factors: stock market return, number of companies listed at the stock exchange, number of mutual funds, total net assets of mutual funds. Before looking at how the above mentioned macroeconomic and mezzo-economic factors influence capital markets, it is of interest to see how capital markets in the two countries evolved. The present paper is organized as follows: the next section looks at the characteristics and the evolution of the capital markets in the two countries from a comparative perspective; the third section presents the methodology used for the empirical research; the fourth section presents the results of the empirical research and the level of influence of the macroeconomic factors on the two components of the capital markets and the last section includes the conclusions, also presented through a comparative approach.

Capital markets in the two countries – similarities and differences

The capital markets in the two countries present both similarities and differences in terms of characteristics and evolutions, as illustrated by the literature, the country, and the financial reports of different institutions and the available statistics.

Romania is a large country in terms of the number of inhabitants (around 20 mils.) in comparison to Hungary that has a population half-size (around 10 mils.), but in terms of the level of economic development even from the beginning of 1990, the level of economic development (measured through the GDP/capita) was higher in Hungary than in Romania (in 1990 GDP/capita in Romania was 1680$ and in Hungary was 3349$). The gap diminished over time but not entirely as in 2018 the Romanian GDP/capita of 12301$/capita represented 77% of Hungary's GDP/capita of 15938$ (Global Economy, 2020). Such macro-level aspects influence the development of capital markets in these countries, as it is acknowledged that historical circumstances, needs, and possibilities of each country impact the evolution of financial markets (Bajus & Stasova, 2015).

The similarities between the capital markets in the two countries include aspects such as:
- in both countries stock exchanges have been reopened after 1990 (Jaba et al., 2013): The Budapest Stock Exchange in 1990 and the Bucharest Stock Exchange in 1995, illustrating that both markets are young financial markets with limited experience.
- in both countries, the development of the capital markets and the stock exchanges have been connected to the processes of mass privatization that took place at the beginning of 1990 in many Central and Eastern European countries to retrocede the properties that have been nationalized during the communist period (Bajus & Stasova, 2015; Radu, 2012).
- both countries are perceived as having small capital markets, rather underdeveloped markets with a limited number of participants and transactions (Jaba et al., 2013), with low liquidity (Boghean, 2014) and inefficient and little performant markets (Bajus & Stasova, 2015; Bukowski, 2014).
- both countries have adopted and continue to adopt laws specific to financial and capital markets that are concordant with the European Union legislation. For instance, laws that protect minority shareholders (Boghean, 2014). In their early days, both markets have been affected by the instability of the financial legislation and by the lack of transparency regarding information about issuing companies. In the last years, the European directives envisage a stricter regulation of the financial markets, and the transposition of those in the national legislation is seen by some as being a factor that generates instability (Radu, 2012) and even negative effects in some countries in Central and Eastern Europe (Uhrin, 2019).
- in both countries the stock exchanges have been affected by the launch of the global financial crisis in 2007, with consequences in stock market crashes in 2007-2008 as stock market indexes diminished at half or more (Radu, 2012). In Romania, BET had in 2008 the value of 2901 as compared to 9825 in 2007, and in Hungary, BUX had the value of 12241 in 2008 as compared to 26235 in 2007 (BSSE, 2018). Both capital markets halved their degree of capitalization in 2008 as compared to 2007 and the year 2009 was the weakest year for all capital markets in the world, including the two studied ones (Dabrowski, 2010).
- both markets are dominated by foreign banks (Fidrmuc et al., 2013) and the consequences are that the robustness of the financial systems in these countries is influenced by the sturdiness of the foreign banks that dominate them (Magas, 2010) on the one hand, and, on the other hand, the faster transmission of the financial contagion due to the strong financial interdependencies between countries.
- in both countries, there are Fund Management Associations (AAF in Romania, BAMOSZ in Hungary), as professional organizations that have the role to promote the idea of

collective investments and to support the organizational, legislative, and professional framework in which its members operate.

- both countries have banking economies that are based rather on bank loans with the investors investing rather in bank deposits than in investment funds (Diaconaşu & Asăvoaiei, 2011; IMF, 2019, as it is well known that bank credits dominate domestic financing in Central and Eastern Europe (Iorgova & Ong, 2008). During the economic crisis period when the interest rates reached values close to zero (as an anti-crisis measure), investors started to look for alternative saving methods and moved their savings in investment funds (especially monetary funds) as they offered better returns than the bank deposits (Diaconaşu & Asăvoaiei, 2011).

- after the economic crisis, in both countries, monetary funds decreased in importance, so that in Romania in 2018-2019 there was no monetary fund and in Hungary, 13 monetary funds were representing a third of the total number of monetary funds existing in the country in 2015 (EFAMA, 2012-2019).

In terms of differences between the capital markets in the two countries, there can be mentioned:

- the early experiences with mutual funds at the beginning of the 1990s were quite different in the two countries. In Romania, the initial experiences with mutual funds were connected to events that generated a strong negative image in the eyes of the population of the country. There were two mutual fund crashes (SAFI in 1994 and FNI in 2000), due to which many investors lost totally their investments. The consequences were related to a high level of distrust of the population and potential investors in mutual funds, as these were associated with fraud (Copil, 2013), aspects that have affected the mutual funds market for a long time. In Hungary, the mutual fund market developed from the very beginning with no unpleasant incidents and no massive image losses. The mutual funds were administered from the very beginning by management companies that were branches of foreign multinational financial companies (mainly banks) and there was a positive image associated with them.

- in Hungary investments are dominated by foreign capital, while in Romania most investment comes from national capital (Boghean, 2014). This illustrates a higher dependency of Hungary on foreign capital and a higher degree of independence of the capital market in Romania, which at the same time represents also a limitation of the investment sources.

- another difference stands in the way how the financial supervision is organized. In Hungary, the financial supervision of the capital markets is done by the National Bank (Magyar Nemzeti Bank), while in Romania the financial supervision of the capital markets is done by the Financial Supervisory Authority (ASF) that is an independent body subordinated by the Romanian Parliament.

- the investors' preferences at the stock exchange before the economic crisis were different in the two countries: in Hungary traditionally investors opted for assets with fixed earnings. In 2003 80-90% of the capital market assets in Hungary were bonds and monetary assets, while in Romania the trading of shares was the majority, as bonds started to be traded in Romania later (only in 2001) (EFAMA, 2012-2019).

- after 2015, it was accelerated the development of other fund categories (guaranteed funds and equity funds) with more rapid development in Hungary (85 funds in 2015-2019) as compared to Romania (three funds in 2015-2019). The assets of these funds grew rapidly in the total net assets of mutual funds in Hungary (46% of total net assets in 2019) as compared to Romania (1.5% of total net assets in 2019) (EFAMA, 2012-2019).

The literature includes several studies that analyzed the financial and capital markets in the region and the main themes of interest were: the efficiency and the performance of capital markets

(Bajus & Stasova, 2015; Boghean, 2014; Bukowski, 2014; Vychytilova, 2018; Stoltz, 2020; Nicolescu et al., 2020); the contagion effect and the financial markets integration (Delyuvaite, 2016; Fidrmuc et al, 2013; Horobeţ & Belaşcu, 2015; Feldkircher, 2015); the level of financial knowledge perceived as being rather low (Brokesova et al., 2017; Beckmann, 2013; Swiecka et al., 2020); the relationship of the capital markets with the national economy and the influence of different factors on the capital market (Cevik et al., 2016; Sabău-Popa et al., 2014; Nicolescu, 2020); the evolution of mutual funds (Bejus & Stasova, 2015; Filip, 2017a, 2017b; Lemesko & Rejnus, 2015; Tudorache et al., 2015).

Research methodology

The research methodology was based on the construction of two regression models that test the influence of specific macroeconomic and mezzo-economic factors on the evolution of the stock exchanges and mutual funds as components of the capital markets. The two components of the capital markets considered were measured through stock exchange indexes (SEIndex: BET and BUX) and mutual funds assets as a % of GDP (MFAs). Consequently, these two indicators represent the two dependent variables that were considered as measures for the components of the capital markets.

The independent and explanatory variables considered were the macroeconomic factors, as recognized by the literature, namely, Gross Domestic Product in billion $ (GDP), inflation in percentage (INFL), unemployment in percentage (UNEMPL), and savings in billion $ (SAV), as well as the mezzo-level factors: stock market return (SMRE), number of companies listed at the stock exchange (NoCSE), number of mutual funds (NoMF), total net assets of mutual funds (TNA).

The two countries considered are Romania and Hungary, as young financial markets from Central and Eastern Europe. The data was collected for the period 2003-2019 (according to the availability of data) for all considered indicators in both countries, using as sources international statistics published by The Global Economy and by ICI.
There were tested two multiple linear regression equations for each country according to the two different dependent variables considered and the same macrolevel explanatory variables and adapted mezzo-level variables. The two regression equations tested for each country are the following:

$$\text{SEIndex}_{i,t} = \beta_0 + \beta_1\,\text{GDP}_{i,t} + \beta_2\,\text{INFL}_{i,t} + \beta_3\,\text{UNEMPL}_{i,t} + \beta_4\,\text{SAV}_{i,t} + \beta_5\,\text{SMRE}_{i,t} + \beta_6\,\text{NoCSE}_{i,t} + \varepsilon_{it} \tag{1}$$

$$\text{MFAs}_{i,t} = \beta_0 + \beta_1\,\text{GDP}_{i,t} + \beta_2\,\text{INFL}_{i,t} + \beta_3\,\text{UNEMPL}_{i,t} + \beta_4\,\text{SAV}_{i,t} + \beta_5\,\text{NoMF}_{i,t} + \beta_6\,\text{TNA}_{i,t} + \varepsilon_{it} \tag{2}$$

Where, β_0 is the intercept; β_1, β_2, β_3, β_4, β_5, and β_6 are the regression coefficients for the GDP, the inflation, the unemployment, the savings, stock market return, the number of

companies listed at the stock exchange, number of mutual funds and total net assets, and t and i subscripts represent the country and the year. ε_{it} is the error term.

The following section, comprising the results of the empirical research, also comments on the validity of the regression equations.

Macroeconomic and mezzo economic influences on stock exchanges and mutual funds markets – a comparative analysis

The results of the regression analyses illustrate the extent of influence of the considered macroeconomic and mezzo-economic factors on the indicators that characterize both the stock exchanges and the mutual fund markets. Tables 1 and 3 present the level of influence of the macroeconomic factors (GDP, inflation, unemployment, and savings) and mezzo-economic factors (stock market return, number of companies listed at the stock exchange, number of mutual funds, total net assets of mutual funds) on the two dependent variables considered (the stock exchange index, mutual funds assets as a % of GDP) in the two countries. The existence of the influence was measured through the analysis of the p-value for the F test and the coefficients of determination. Tables 2 and 4 present the regression coefficients values and the associated p-values, indicating for each relationship if it is statistically significant or not and for the statistically significant relations, indicating the direction and the extent of the influence.

The regression equations are valid for both dependent variables in Romania, as all p-values for the F test (see Table 1) are lower than 0.05. The coefficients of determination illustrate that each dependent variable is influenced to different extents by the macro and mezzo economic explanatory variables considered. The variation of the mutual funds' assets (as a percentage of GDP) is explained in the highest proportion (97.7%) by the proposed model. At the same time, the stock market index is explained in a proportion of 80.1% by the macro and mezzo variables considered.

Table 1. The validity of the regression model – Romania

	Romania	
	BET index	**Mutual funds assets (% of GDP)**
R Square	0.88107	0.986354
Adjusted R Square	0.801784	0.977256
Significance F *(p-value)*	0.001005	7.08E-08

Source: authors' calculations

The analysis of the regression coefficients for Romania illustrates that some regression coefficients are statistically significant, while others are not. The evolution of the BET index is influenced by the GDP and by the inflation with a 95% probability and by the savings and the stock market returns with 90% probability. Accordingly, when the GDP increases with one bill. $, the increase in the BET index is 72.20 points with a 95% confidence level.

Table 2. Regression model's coefficients – Romania

	Romania			
	BET index		**Mutual funds assets (% of GDP)**	
	Regression Coefficient	**P-value**	**Regression Coefficient**	**P-value**
Intercept	6530.387	0.413921	0.694536	0.63643
GDP (bill. $)	72.20789	0.036542*	1.04E-05	0.998681
Inflation	-539.482	0.000293*	-0.01623	0.526986
Unemployment	528.0145	0.441061	-0.05547	0.700117
Savings (bill. $)	-265.721	0.063189**	-0.00903	0.655903
Stock market return (%)	25.39871	0.073813**	-	-
Number of companies listed at the stock exchange	-60.5488	0.234491	-	-
Total net assets of mutual funds (mill. $)	-	-	0.000519	9.32E-06*
Number of mutual funds	-	-	0.003249	0.477666

Note: * Confidence level 95%; ** Confidence level 90%
Source: authors' calculations

In Romania, when the inflation increases by 1%, the BET index decreases with 539 points with a 95% confidence level. Similarly, looking at the relationship between the BET index and the stock market return, it can be observed a direct and positive relationship. The indicator of mutual funds assets as a percentage of GDP is influenced by the total net assets of mutual funds, an expected relationship. Macroeconomic variables (such as GDP, inflation, unemployment, and savings) are rather influencers for the indicators related to the stock exchange, as also found by other authors (Albu, Lupu, & Călin, 2014: Horobeţ & Dumitrescu, 2009). The mutual funds (measured as mutual funds assets as a percentage of GDP) are less influenced by macroeconomic indicators in Romania (Nicolescu, 2020), being influenced only by the total net assets.

In Hungary, the regression equation is valid for the two considered dependent variables, as all p-values for the F test (see Table 3) are lower than 0.05.

Table 3. The validity of the regression model – Hungary

	Hungary	
	BUX index	**Mutual funds assets (% of GDP)**
R Square	0.806301	0.92955
Adjusted R Square	0.677168	0.882583
Significance F *(p-value)*	0.007852	0.000104

Source: authors' calculations

Table 4. Regression model's coefficients – Hungary

	Hungary			
	BUX index		**Mutual funds assets (% of GDP)**	
	Regression Coefficient	**P-value**	**Regression Coefficient**	**P-value**
Intercept	44126.21	0.180116	0.728037	0.813556
GDP (bill. $)	-19.7242	0.933578	0.04624	0.371054
Inflation	-1073.34	0.315312	-0.51075	0.093209**

Unemployment	-2229.49	0.023199*	0.058418	0.755238
Savings (bill. $)	452.8497	0.534689	0.037587	0.864272
Stock market return (%)	36.72393	0.604176	-	-
Number of companies listed at the stock exchange	-185.558	0.727412	-	-
Total net assets of mutual funds (mill. $)	-	-	0.000724	0.028773*
Number of mutual funds	-	-	-0.00816	0.48306

Note: * Confidence level 95%; ** Confidence level 90%
Source: authors' calculations

Analyzing the coefficients of determination for Hungary, it can be observed that mutual funds are more influenced by the regression equation (88.2%) in comparison with the stock exchange (67.7%).

The analysis of the regression coefficients (see Table 4) illustrates that the macroeconomic factors influence to a low extent the stock market and the mutual funds market in Hungary. According to the present research and the regression coefficients that are statistically significant, the BUX index is only influenced by the unemployment with a 95% confidence level, while the mutual funds' assets (as a % of the GDP) is influenced only by inflation with a 90% confidence level and by the total net assets with a 95% confidence level. The considered mezzo level factors (industry variables) except for total net assets for the mutual fund market, do not have an impact on the development of the two different components of the capital market in Hungary.

Conclusions

The paper illustrates that the level of development of stock markets and mutual funds is different in the two countries, with Hungary being more developed for both components. In this context, the influence of the macroeconomic factors on the components of capital markets in the two countries presented different patterns, while mezzo-level factors have similar influences. The main conclusions of the research are as follows.

Firstly, macroeconomic factors do influence capital markets in Central and Eastern Europe. From the 28 tested relationships in total in both countries, 8 were statistically significant. The findings confirm other studies' results (Albu, Lupu, & Călin, 2014; Horobeț & Dumitrescu, 2009; Celebi and Honig, 2019; Tsaurai, 2018; Nicolescu, 2020) as GDP, inflation, unemployment, and savings were also found to be capital markets' influencers.

Secondly, macroeconomic factors influence to a higher extent stock exchange markets than mutual funds markets, in Romania, while in Hungary the impact of macroeconomic variables seems similar for both stock exchange and mutual fund markets. The mezzo-level factors considered impacted the capital markets only via the total net assets that were an influencer of the mutual fund markets in both countries. There were five factors in total (in both countries) that influenced stock market indicators, as compared to only three factors in total that influenced mutual funds.

In Romania, there were more macro factors (GDP, inflation, and savings) as compared to Hungary (unemployment) found to have a statistically significant influence on stock exchange indexes. As far as the mutual funds are concerned, there were only mezzo-level factors that showed statistically significant relationships for Romania (namely the total net assets) and two factors, one macro-level factor (inflation) and one mezzo-level factor (total net assets of mutual funds) for Hungary.

Thirdly, the overall impact of macro-factors is higher in Romania (larger number of factors as influencers – three in total), as compared to Hungary (one factor in total), while the impact of mezzo-factors is similar between the two countries.

Based on the results of the study, we can assume that the more developed the capital market is, the lower is the influence of macroeconomic factors on its different components. Similarly, stock exchanges seem to be more affected by macro-level influencers, while mutual funds are less affected by macro-level influences and probably more affected by industry level and micro-level influences. The results of the present paper have both theoretical and practical implications. From a theoretical point of view, the present research contributes to the literature in the field, with the study of the influence of new macro and mezzo level factors on two components of the financial markets (stock exchange and mutual funds). At the same time, new insights on the topic of specific countries in Central and Eastern Europe are comprised. From a practical point of view, the paper can have implications for both investors' decisions (at an individual level), as well as for managerial decisions (administrators of mutual funds) when deciding where to invest and decide either to acquire shares at the stock exchange or units at mutual funds. Future directions for the development of the present research can include more of these types of factors in the analysis and to extend the number of countries studied.

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