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FOREIGN CAPITAL INFLOW STRUCTURE: THEORETICAL EXPLANATION AND CONNECTION WITH MACROECONOMIC INDICATORS IN THE YEARS 2008 AND 2009

The paper analyses a not yet well-examined topic of foreign capital inflow structure. It develops a simple theoretical background for the concept and verifies its importance for five main macroeconomic indicators in the years 2008 and 2009 on the data provided by the World Bank for 213 countries and territories with the help of correlation analysis. The results show that both on the theoretical and empirical levels foreign capital inflow structure is important for countries and should be reflected in their economic policies.

Key words: foreign capital inflow structure, balance of payments financial account, long-term capital, short-term capital, magic square, world crisis.

According to [1–6], one of the main transmission channels through which the current world financial and economic crisis spread itself to individual economies in the years 2008 and 2009 was the financial / foreign capital channel. Countries with high openness to foreign investment inflows were therefore likely to suffer more in these years.

The degree of the crisis' impact through the financial channel was, however, amplified by the structure of foreign capital inflows into the country: important long-term inflows of short-term capital and foreign credit due to their volatility made some economies less stable and together with other factors deepened and lengthened their recessions: e.g. Malta, Cyprus, the Baltic states (Estonia, Latvia and Lithuania); Romania, Russian Federation and Ukraine experienced a deeper decline than similar economies with a different foreign capital inflow structure; see [1; 6].

In this respect, the current crisis resembles to some extent the problems ofthe South-Eastern Asian economies during the Asian financial crisis of 1997, see [7; 8; 9]. The topic of optimal foreign capital inflow structure, however, remains almost uncovered in the world, Czech and Russian economic literature and in countries' monetary, fiscal and other economic policies. The aim of this paper is thus to attempt to fill this gap by:

Creating a simple theoretical background for the concept;

Roughly estimating the importance of previous long-term or short-term capital and foreign credit inflows for the main macroeconomic indicators at the world level in the years 2008 and 2009.

The paper is divided into two parts: into the examination of theoretical aspects of the problem (ad a)) and into the empirical verification (ad b)).

1. Suggested theoretical background for the foreign capital inflow structure

According to research of the author of this paper[2], in the current economic literature there is no specific model of foreign capital inflow structure, of its influencing factors and of optimal share of long-term and short-term and credit capital. The analysis is mostly conducted at the level of total foreign capital in- and outflows (*TFC*), the role of which as a transmission channel of financial crises / recessions into the economy is shown on Figure 1.

In this paper, we go further by decomposing *TFC* into two parts and expressing them with the help of a country's balance of payments financial account, the approach based on [1; 5; 6; 10]:

a) *Long-term, stable, capital*, measured by foreign direct investment inflow or balance[3], *FDI* (defined as investment in equity of at least 10% with lasting interest, reinvested earnings and intra-group loans); and

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[1] The research was performed in the databases SCOPUS and EBSCO.

[2] This paper was elaborated in the framework of the VŠE IGS research project No. F2/5/2011, «Importance of Financial Markets for International Business in a Globalized World Economy». Previous research on this topic was presented at the 3rd International PhD Students Conference: New Economic Challenges at Masaryk University in Brno on the 3rd of June 2011.

[3] In reality, important capital inflows can be offset by similarly important outflows. Balances as net values are therefore more adequate indicators of the long-term and short-term foreign capital and credit inflow into the country.

Fig. 1: Scheme of financial / foreign capital transmission channel for an economy
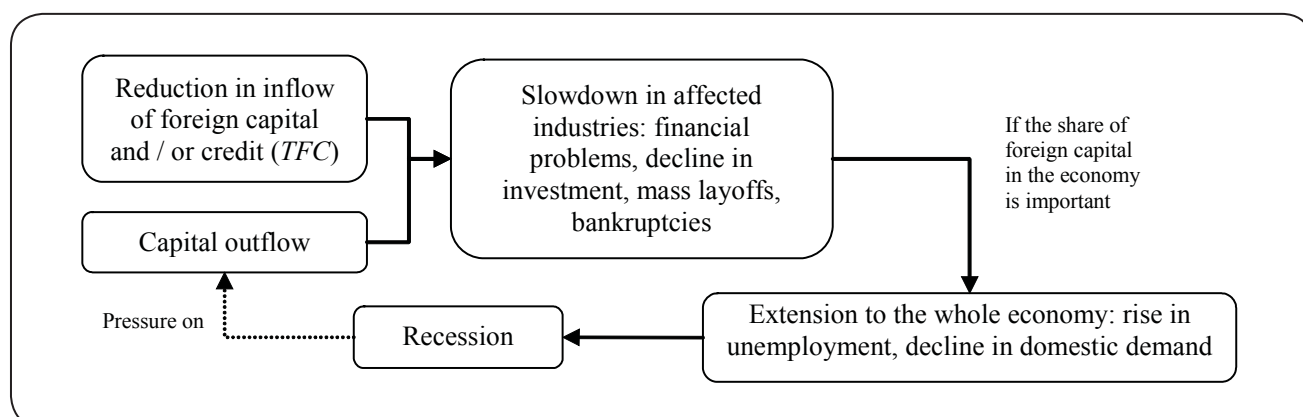
Source: [5, p. 139], self-prepared graph.

b) *Short-term, speculative and volatile, capital*, measured by portfolio investment inflow or balance, *PFI* (defined as acquisition of a smaller share in equity, of bonds and assets without lasting interest) and *foreign credit*[4] not included into other types of capital, measured by other investment, *OI* inflow or balance[5].

Both the *FDI* and *PFI+OI* are most likely dependent on long-term characteristics of an economy, e.g. the economic level and size of a country, and on several short-term factors, the most important of which at the theoretical level are domestic and foreign (world) interest rates, IR_D and IR_F.

1.1. Interest rates and the foreign capital inflow structure

In theory, higher IR_D caused by inflation and other factors attract short-term capital through higher revenues, as e.g. in carry trade deals, and motivate domestic economic agents to recur to foreign credit, which can be measured by an increase in *PFI+OI*, as e.g. in the case of the Russian Federation, see [11; 12; 13]. On the other hand, lower IR_D are beneficial for long-term capital, as domestic credit becomes more available for foreign subsidiaries, which is attractive for *FDI*.

For example, [14 p. 10] states that «*foreign direct investment… can be even indirectly related to them [changes in the domestic interest rate] if foreign investors finance direct investment by loans in local currency. The growth of domestic interest rate then causes an inflow of short-term foreign capital and an appreciation of the exchange rate, which will also act against the inflow of foreign direct investment*» (translation into English), which was empirically proven for the Central and Eastern European countries, e.g. for the Czech Republic and Slovakia in [15; 16, 17].

However, for both cases, IR_D should be different from its «normal» level, which is equal to IR_F^*, IR_F augmented by the risk premium and costs arising from capital barriers, otherwise investors and domestic economic agents are indifferent between countries, and *TFC* will be at their minimum. The curve of the *TFC* should therefore be U- or C-shaped against IR_D (depending on the axes of the graph).

In reality, the importance of IR_D is often offset by other short-term factors, for example, the country's rating, exchange rate volatility, current macroeconomic situation and outlook (inflation, unemployment etc.) and prior foreign capital inflows into the country; see econometric studies on the topic for the Central Europe, e.g. [18; 19].

1.2. Optimal foreign capital inflow structure

To theoretically estimate the optimal foreign capital inflow structure, the optimum share of the *FDI* or *PFI+OI* in *TFC*, a standard cost-benefit model can be used, which on one side works with the gain for the economy from *TFC*, constant against changes in their structure, and on the other hand – with the risk / instability resulting from the share of *PFI+OI* in *TFC*. The gain can be formally expressed e.g. as additional growth in GDP or employment; and risk – e.g. by

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[4] Foreign credit can also be considered relatively volatile in comparison with long-term capital, as its inflows can easily be ceased.

[5] Financial derivatives as the last part of the balance of payments financial account according to the 5th edition of the IMF Balance of payments manual are omitted.

weighted average of possible macroeconomic losses in case of a financial crisis or by any other similar indicator: standard deviation of possible scenarios, *PFI+OI* compared to the country's foreign exchange reserves and other.

Optimum share of *FDI* and *PFI+OI* in *TFC* is then the one, at which the gain from *TFC* equals the risk / instability resulting from *PFI+OI*: other variants represent either a possibility of further growth for the share of *PFI+OI* in *TFC* (the gain is higher than the risk) or unnecessary high instability for the economy (the gain is lower than the risk).

This optimal foreign capital inflow structure can, in theory, be attained withthe help of the monetary policy by affecting IR_D and / or through capital inflow and outflow barriers (laws, rules etc.) influencing IR_F*. In all cases, the monetary and other policies should reflect this structure if the country wants to remain stable.

1.3. Graphical representation of the theoretical model

The above presented theory can be expressed graphically under the ceteris paribus condition, see Figure 2.
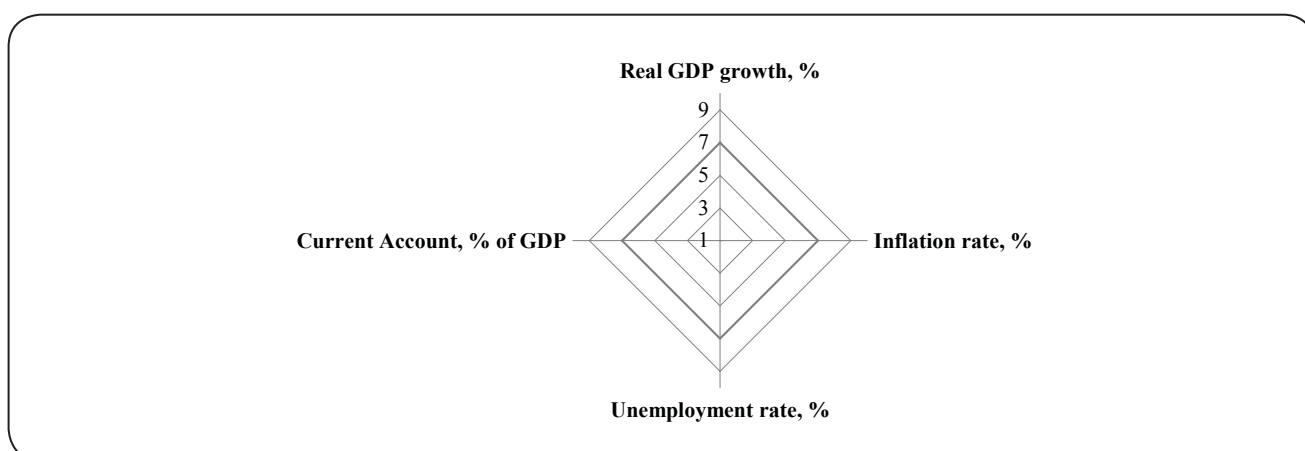
Fig. 2: Domestic interest rates as the main influencing factor and the optimum of the foreign capital inflow structure
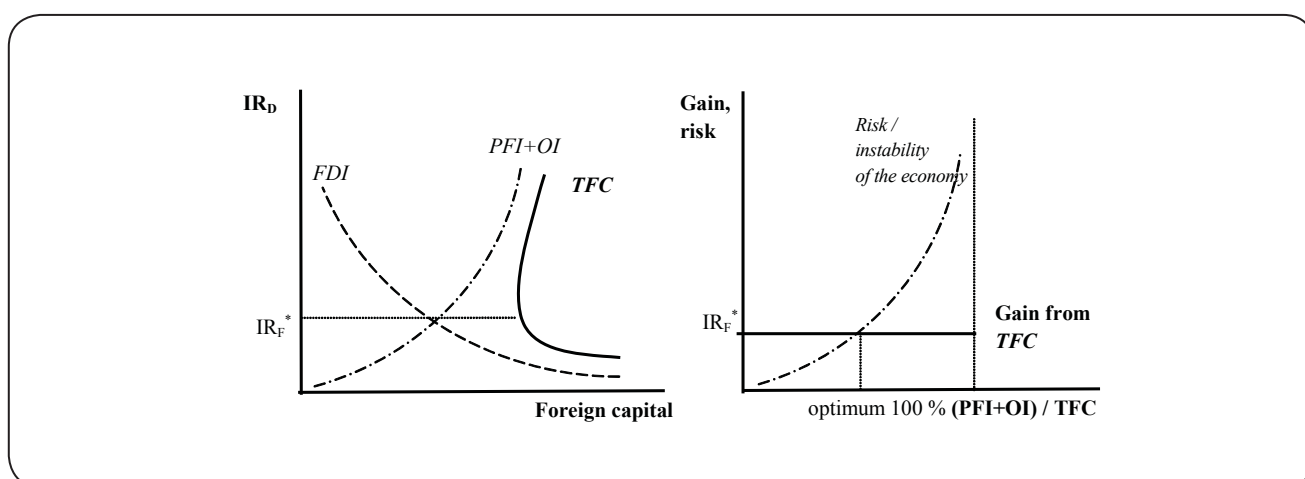
Source: [3, p. 4; 5, p. 140], self-prepared graph.
Note: The gain from TFC is constant against the (PFI+OI) / TFC.

Fig. 3: Original magic square model

Source: [20; 21], self-prepared graph.

2. Empirical verification of importance of the foreign capital inflow structure during the recent world financial and economic crisis

The empirical verification is based on the yearly data provided by the World Bank, World Development Indicators and Global Development Finance databases, in total, for 213 countries (including autonomous and dependent territories) for the years 2003–2009, in order to reflect the pre-crisis economic boom[6].

2.1. Measurement and methodology

In this paper five macroeconomic indicators are used: yearly real GDP growth rare, g, inflation rate (consumer price index, CPI), π, unemployment rate, u, basic balance as percentage of GDP, BB, and government budget balance as percentage of GDP, GB; forming an extension of the so-called «magic square» model depicted on Figure 3, the EMS / «magic pentangle», see [3; 20; 21][7].

In order to reflect the current trade deficits in the world, the EMS / «magic pentangle» model is based on the so-called basic balance as the indicator of external balance of countries instead of the current account balance in the «magic square». The basic balance can be described as the non-debt financing of current account deficits, see [15; 16; 17] and is calculated as a sum of the current account balance, the capital account balance and the FDI (in the balance form), see [10; 17; 22; 23].

The five indicators are also aggregated into one complex index of economic performance (EMS), a weighted average with equal weights (according to the logic of the «magic pentangle»), in such a manner, so that greater values of the EMS represent a positive situation and vice versa (unemployment and inflation rates are taken with negative signs, inflation rate is taken as an absolute value in order to reflect both rise and fall in prices):

$$EMS = 0,2 * g - 0,2 * |\pi| - 0,2 * u + $$
$$+ 0,2 * BB + 0,2 * GB \qquad (1)$$

The foreign capital inflow structure elements, FDI and $PFI+OI,$ are measured as long-term averages, 2003–2007, of net inflows of foreign direct invest-

ment and portfolio and other investment and are expressed as % of the countries GDP. The two elements are then aggregated by subtraction into one indicator[8]:

$$Structure = FDI - (PFI+OI) \qquad (2)$$

Mutual relationships between the above mentioned variables are calculated with the help of cross-sectional correlation analysis (Pearson correlation coefficients, PCC). Statistical tests and confidence intervals for correlation coefficients, however, cannot be used, as 213 countries represent the whole population; see [24][9].

2.2. Results

Table 1 contains cross-sectional correlation coefficients between the values of EMS, GDP growth rates, inflation rates, unemployment rates, basic balance and government budget balance for the years 2008 and 2009 (the world financial and economic crisis) and the five-year, 2003–2007, averages of *TFC* and *Structure* for the whole data file (population).

Tab. 1: Results for 213 countries

	2008 against 2003–2007		2009 against 2003–2007	
	TFC	**Structure**	**TFC**	**Structure**
EMS index	**-0.2013**	**0.3112**	**0.0301**	**0.2272**
GDP growth rate	0.0655	0.1492	-0.0565	0.0551
Inflation rate	0.0893	0.0343	0.1973	-0.0969
Unemployment rate	0.1546	0.0784	0.3805	-0.1542
Basic Balance	-0.0813	0.2488	0.1684	0.1423
Government budget balance	-0.4651	0.4198	-0.3692	0.3071

Source: World Bank data; own calculations.

It can be seen that empirical results prove the theoretical conclusions stated in the first part of the paper: the relationship between the *Structure* and *EMS*, i.e. overall performance, is positive (ca. 0.31 in 2008 and 0.23 in 2009) and, in absolute terms, is greater than the one between the *EMS* and *TFC* (ca. -0.2 in 2008 and 0.03 in 2009).

In other words, countries with higher import of long-term capital, *FDI*, tend to have coped better with

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[6] The year 2003 was the first one when financial flows in the world started to grow after the preceding recession.

[7] In the light of the recent Euro area debt crisis the current economic literature stresses the inclusion of public finance indicators into economic models, especially into the «magic square» and its derivatives.

[8] Due to the net values of *FDI* and *PFI+OI*, the use of division for the indicator would be mathematically incorrect.

[9] Due to the fact that the number of unobserved countries is very small and that the countries with missing values are usually less important in terms of *TFC*, this assumption, in the opinion of the author, can be regarded as acceptable.

the crisis, especially in the case of the government budget balance (correlation – ca. 0.42 in 2008 and 0.31 in 2009), the basic balance (ca. 0.25 in 2008 and 0.14 in 2009) and the GDP growth rate (ca. 0.15 in 2008 and 0.06 in 2009). Correlation is, however, rather weak, especially in the year 2009, presumably, due to the transmission of the problems from the financial to the real sector.

The results also seem to reflect the current trends in the world economy: high inflows of foreign capital seem to be significantly related with government deficits (ca. -0.47 in 2008 and -0.37 in 2009).

Concluding remarks

The paper attempted to introduce into the economic literature the concept of foreign capital inflow structure (shares of long-term and short-term and credit capital in countries' foreign capital inflows) by creating a simple theoretical background and conducting a small empirical / econometrical research on the importance of this structure for macroeconomic performance of countries in the years 2008 and 2009, i.e. during the recent world financial and economic crisis.

According to the theoretical assumptions, the main influencing factors of foreign capital inflow structure are domestic and foreign interest rates. The optimal structure is then the one, at which the gain from foreign capital is equal to its risk.

According to the empirical results, countries importing more long-term capital indeed showed better results during the crisis, especially for government budget balances, basic balances and GDP growth rates.

These findings create a new dimension, challenges and limitations for the monetary and other economic policies of the state, as well as for further theoretical research on the matter. Their present ignorance, in the opinion of the author, may thus increase local and global instabilities existing in the near future.

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СТРУКТУРА ПРИЛИВА ИНОСТРАННОГО КАПИТАЛА: ТЕОРЕТИЧЕСКОЕ ОБОСНОВАНИЕ И СВЯЗЬ С МАКРОЭКОНОМИЧЕСКИМИ ПОКАЗАТЕЛЯМИ В 2008 И 2009 гг.

В статье рассмотрена мало исследованная проблематика структуры прилива иностранного капитала в экономику. В ней разрабатывается простое теоретическое обоснование данного понятия и эмпирически проверяется его значимость для пяти макроэкономических показателей в 2008 и 2009 гг. на данных Всемирного банка для 213 стран и территорий с помощью корреляционного анализа. Результаты исследования показывают, что на теоретическом и практическом уровнях структура прилива иностранного капитала значима для стран и должна быть отражена в их экономической политике.

Ключевые слова: структура прилива иностранного капитала, финансовый счет платежного баланса, долгосрочный капитал, краткосрочный и долговой капитал, магический четырехугольник, мировой кризис.

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