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**Debt-Creating Capital Flows and their  
Macroeconomic Implications in Ukraine**

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**Ukraine**

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## **Debt-Creating Capital Flows and their Macroeconomic Implications in Ukraine**

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### **Abstract**

This paper investigates the macroeconomic and financial stability risks associated with foreign borrowing by corporations and banks in emerging markets; it estimates the effects of debt-creating flows for the Ukrainian economy by applying a multiple-regression analysis; and assesses the foreign debt position from the point of view of a 'safe' debt level. On the basis of estimates and conclusions thereby derived, the author proposes a spectrum of capital flow management measures that may smoothen the swings in capital flows and reduce the build-up of associated vulnerabilities.

**Key Words:** capital flows, crisis, interest rates, investments, exchange rates, regulation.

## **Introduction**

Estimating the macroeconomic effects of foreign capital flows deserves special attention for an emerging market economy, since foreign capital can augment domestic savings as well as accelerate productive investments, promote financial deepening and risk diversification. At the same time, international financial markets can play multiple roles in transmitting and causing various types of crises.

As of January 1<sup>st</sup> of 2014 Ukraine's gross external debt amounted to 142.5 bn USD or 78.4% of GDP; and bore witness to a high degree of openness of the national economy to international capital flows. According to World Bank data on emerging markets and developing economies, in 2011 Ukraine entered into the group of the 'top ten borrowers' on international capital markets. Together, the 'top ten borrowers' accounted for 65% of the total external debt owed by emerging markets and developing countries.

The goal of this study is to investigate the macroeconomic and financial stability risks associated with foreign borrowing by corporations and banks in emerging markets; estimate the macroeconomic implications of debt-creating flows in Ukraine; assess the Ukrainian foreign debt position from the point of view of a 'safe' debt level; and propose a spectrum of capital flow management tools that may smoothen swings in capital flows and reduce the build-up of associated vulnerabilities. To attain this goal, both quantitative and qualitative methods of research are employed.

The study is divided into four chapters encompassing the various aspects of debt-creating capital flows, their macroeconomic impact, and policy responses aimed at mitigation of adverse effects. The next chapter, Chapter 2, describes the drivers and effects of foreign capital flows for an emerging market economy, based on reviews of existing literature. Chapter 3 identifies the main risks of foreign capital flows, taking into account the Ukrainian experience. Chapter 4 presents some multiple-regression models that quantify the effects of debt-creating flows for the Ukrainian economy. Chapter 5 outlines the problem of external debt thresholds, and sets out recommendations for regulation of capital flows by national authorities.

## **Drivers and Effects of Foreign Capital Inflows: Theoretical Considerations**

Neo-Keynesian models of a 'poverty trap' and 'big push' place emphasis on scarce domestic capital and low national savings as the drivers of foreign capital inflows (from both private and official sources) to poor countries. In the framework of these models a lack of domestic saving for urgent investments, foreign exchange deficit for the imports of capital goods and out-of-date technologies hamper economic development in poor countries and therefore call for foreign financing.

Neo-classical growth theory suggests that marginal products of capital in poor countries is much higher compared to marginal products in advanced

countries, because of the scarcity of capital and low labour productivity. Such disparities induce capital flows from advanced to developing countries, until the marginal product of capital equalises in both groups of countries.

The reality of recent decades, in developing and emerging economies, proved that both types of models have significant theoretical shortcomings. First of all, they left out the problem of capital flow volatility; which undermines macroeconomic stability and depresses domestic investments in developing and emerging economies. Secondly, these models ignored the large share of domestic savings in poor countries which turned into capital flight (abroad). Thirdly, they disregarded the problem of channeling of foreign funds for consumption purposes or unproductive investments by financial intermediaries.

In this regard Blanchard (2007) and Calvo (1998) suggest that capital inflow to emerging countries, debt-creating flows in particular, tend to be driven by financial market imperfections (liability dollarisation, limited access to long-term capital and equity finance) rather than domestic saving and investment decisions.

Rodrik and Subramanian (2009) argue that developing economies are more likely to be constrained by investment opportunities rather than their availability of savings; in such circumstances, foreign finance can often aggravate the existing investment constraints by appreciating the real exchange rate.

A series of financial crises in the 1990s and then a more recent global crisis, in particular, evidenced that large surges in capital flows carry macroeconomic and financial stability risks. On the macroeconomic front, capital inflow surges induce economic overheating, inflationary pressures, excessive appreciation, credit booms and asset price bubbles. Moreover, temporary capital inflow leads to an appreciation of the exchange rate, which in turn undermines competitiveness in the tradable sector, causing long-lasting damage even when inflows reverse.

The main worry from the financial fragility side is that large capital inflows lead to excessive foreign borrowing and foreign currency exposures, which fuel domestic credit booms and asset price bubbles. This phenomenon distorts the allocation of economic resources in the recipient economy and entails significant adverse effects in the case of sudden stops. In many cases, abundant foreign borrowing is generated by herd behavior and excessive optimism on the part of foreign lenders; as well as by underestimation of foreign exchange and liquidity risks on the part of borrowers.

Recent experiences suggest that capital inflows tend to reverse suddenly and in a synchronized manner, causing sharp currency depreciation and severe balance sheet dislocations. A lot of empirical studies have established a strong association between surges in capital inflows, their composition, and the likelihood of debt, banking, and currency crises in emerging market economies (see, for example, International Monetary Fund (2012)).

In many emerging markets banking and currency crises have been triggered by capital outflows, and such outflows led to large employment and

output losses. Moreover, capital flow reversals pushed a credit bust and asset price deflation with significant consequences for real economic activity. These dynamics were exacerbated by the fire sales of domestic assets, which further resulted in exchange rate devaluation, financial stress, debt crisis and mass bankruptcies.

### **Ukrainian External Debt Position and Related Problems**

The experience of Ukrainian integration into world capital markets has confirmed the classical scenario of boom-and-bust cycles. Having quite modest external debt at the end of 2003 (23.8 bn USD), Ukrainian entities accumulated 101.7 bn USD or 82.6% of GDP of gross external liabilities by the end of 2008. The main debtors have been represented by non-financial enterprises and banks, which owed 79.4% of the nation's total external liabilities.

Growing corporate engagement in capital markets has been driven by companies actively participating in international business transactions, a lack of long-term capital on the domestic market, and a strong demand by international investors for higher yields. However, the underestimation of global and country risks led the excessive debt-creating flows to the Ukrainian economy that in the context of weak corporate governance and poor financial sector supervision magnified the boom-and-bust cycles and increased macroeconomic volatility.

Having a large current account deficit (7% of GDP in 2008), quite low currency reserves (equivalent to 29% of gross external liabilities), weakly-supervised financial sector and unstable export earnings (steel products and agricultural commodities represent 53.5% of national exports), Ukraine has become highly vulnerable to external shocks after opening up its capital account.

Ukrainian financial and non-financial firms borrowed 5.2 bn USD in 2005, 8.7 bn USD in 2006, 17.5 bn USD in 2007 and 13.9 bn USD in 2008 on international capital markets (see Table 1). At first stage, large foreign capital inflows stimulated financial sector development in Ukraine, reduction in real domestic interest rates, acceleration of investments in fixed capital and growth in domestic consumption. Private foreign borrowing has been the main driver of a domestic credit boom and real estate price growth. Ukrainian bank loans released to households and non-financial corporations in Ukraine expanded: from 32.5% of GDP as of 1 January 2006 up to 63.5% of GDP as of 1 October 2008.

**Table 1.** *Net Foreign Capital Flows to the Corporate Sector of Ukraine, MLN USD*

Chanel of inflow/ outflow	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Debt securities floated by banks	253	873	1853	3 695	-723	-1 249	-134	-1 026	-346	185
Debt securities floated by non-financial firms	675	470	576	118	-481	934	917	640	1 160	888
Medium- and long-term banks' loans for Ukrainian banks	123	752	2226	6 831	8 309	-2023	-1986	-3600	-1692	-2080
Medium- and long-term banks' loans for non-financial firms	2920	3125	4051	6 905	6 858	-1311	2 488	4 169	5 450	301
<b>Total flows</b>	<b>3971</b>	<b>5220</b>	<b>8706</b>	<b>17549</b>	<b>13963</b>	<b>-3649</b>	<b>1285</b>	<b>183</b>	<b>4572</b>	<b>-706</b>

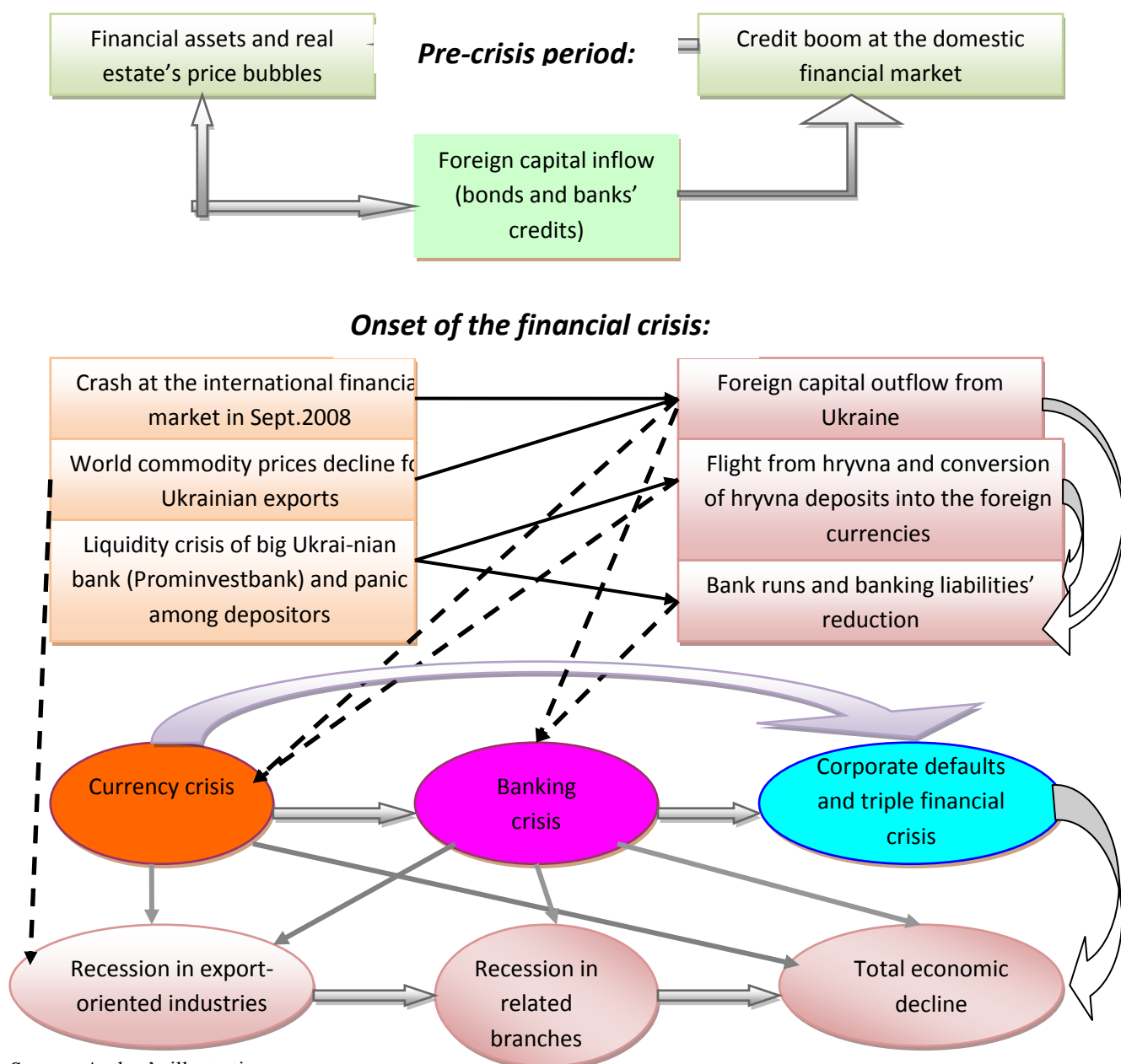
Source: National bank of Ukraine, author's calculations

However, increased external indebtedness in Ukraine has not relied on strong fundamentals; and both financial and non-financial sectors accumulated significant risks on their balance sheets. Triggered by global shocks in 2008, a period of large capital inflows has been followed by a sharp retrenchment and reversal of capital flows. Since September 2008, Ukraine has experienced a capital outflow; in 2009 net outflow of portfolio investments and foreign bank loans amounted to 3.6 bn USD (see Table 1).

In 2008 global shocks were transmitted to the Ukrainian economy through international trade and financial linkages. Deterioration in terms of trade, and shocks to world interest rates, triggered the crises. Linkages among different sectors of the Ukrainian economy, the mechanisms of the financial crisis' origin and channels of crisis transmission in 2008 – 2009 are depicted in Chart 1.

Ukraine had a combination of currency, banking and corporate debt crises which were partially associated with sudden stops in capital flows. By Quarter 2 of 2009 the hryvna, the national currency, devalued by 60% against the US dollar, the 'EMBI+Ukraine' spread amounted to almost 2500 base points, the population had withdrawn 23.4% of all hryvna deposits from banks and some of the banks had become insolvent.

**Chart 1. Ukraine in 2008-2009: Financial Crisis Origin and Transmission**



Source: Author's illustration

The financial crisis in Ukraine incurred large economic costs: real GDP declined by 7.8% in Quarter 4 of 2008 and by 14.8% in 2009. Industrial production declined by 21.9% in 2009. Macroeconomic variables, i.e. consumption, investment and employment, plus imports and exports, also registered significant declines. In 2009 final consumption shrank by 12.2%, investments in fixed capital by 41.5%, imports and exports decreased by 43.8% and 36.6% respectively.

Thus, the Ukrainian experience confirmed that unregulated capital flows to an emerging market economy with weak banking and corporate sectors



undermines financial stability and enhances macroeconomic volatility. The above-mentioned results are explained, to a large extent, by unproductive allocation of a significant share of foreign capital and unsustainable growth in external debt. Foreign borrowing by Ukrainian companies fuelled domestic demand but failed to proportionally raise domestic production.

Growth rates in Ukraine's GDP lagged far behind the pace of accumulation of external debt. Real GDP increased by 7.3% in 2006, by 7.9% in 2007, by 2.3% in 2008 as Ukrainian external debt in dollar terms, deflated by the US Producer Price Index (PPI), increased by 34.6%, by 42.8% and by 20.8% respectively (see Table 2). In 2010 and 2012 the pace of accumulation of external debt exceeded growth rates in real GDP, again.

**Table 2.** *Growth Rates of Ukrainian GDP and Exports versus External Debt Accumulation Rate, %*

	2006	2007	2008	2009	2010	2011	2012	Annual average 2006-2012
Real GDP growth rates	7.3	7.9	2.3	-14.8	4.1	5.2	0.2	<b>1.5</b>
Real exports growth rates (deflated by US PPI)	10.2	23.5	27.5	-34.0	23.5	22.3	-0.9	<b>10.2</b>
Real external debt accumulation rates (deflated by US PPI)	34.6	42.8	20.8	4.3	9.3	1.6	5.1	<b>26.1</b>
<b>Discrepancies between real GDP and external debt growth rates</b>	-27.3	-34.9	-18.5	-19.1	-5.2	3.6	-4.9	<b>-24.6</b>
<b>Discrepancies between real exports and external debt growth rates</b>	-24.4	-19.3	6.7	-38.3	14.2	20.7	-6.0	<b>-15.9</b>

Source: author's calculations based on data of National bank of Ukraine, State Statistics Committee, US Bureau of Labor Statistics

In general, through 2006 – 2012 annual growth rates of real GDP in Ukraine averaged only 1.5%; versus 26.1% in the annual rate of external debt accumulation. Thus, the average annual discrepancy between real GDP and external debt growth rates amounted to 24.6%.

Foreign borrowing by Ukraine residents has not been followed by an adequate, related growth in exports. For instance, in 2006 gross external debt in real terms increased by 34.6%, but the exports of goods and services by 10.2%; in 2007 debt increased by 42.8%, but exports by 23.5%. In total, in the course of 2006 – 2012 the annual discrepancy between real exports and external debt growth rates averaged 15.9%. Such discrepancies induced detrimental effects for the Ukrainian economy after new foreign financing had disappeared.

In the post-crisis period Ukraine followed the trodden path, although foreign capital inflows have moderated. As of 1 January 2014 gross external debt liabilities of Ukrainian entities amounted to 142.5 bn USD or 78.4% of

GDP, while net debt liabilities (gross liabilities minus debt assets and official reserves) amounted to 105.1 bn USD or 58.2% of GDP.

Summing up: foreign capital inflows to the Ukrainian economy have been driven by abundant global liquidity and excessive borrowing by Ukrainian corporations. However, the pace of external debt accumulation proved to be unsustainable, as the size of the Ukrainian economy and its capacity to generate foreign exchange have not grown in line with its foreign indebtedness.

### **Estimation of the Effects of Debt-Creating Flows for Ukrainian Economy**

To investigate the implications of foreign capital flows I used time-series data for the Ukrainian economy, and applied econometric techniques. My earlier studies on the Ukrainian economy confirmed that huge foreign borrowing by Ukrainian corporations and banks fuelled a domestic credit boom and private consumption growth. Larger foreign borrowing is associated with lower domestic interest rates, broad monetary growth and bank loan portfolio expansion: correlation coefficients among corresponding variables ranged from 0.56 to 0.78 (see Vakhnenko (Bogdan), 2008).

For a current study I have run some regressions and found that net foreign capital inflow/ net borrowing by the non-governmental sector are significant explanatory variables, across various specifications of macroeconomic and financial variables for Ukraine. Debt-creating flows to Ukraine proved to be statistically significant in the models of gross capital formation, domestic interest rates and real effective exchange rate. In addition, I revealed a positive impact of capital inflow and negative impact of capital outflow on GDP dynamics.

From the one hand, I found that foreign capital inflows had a pro-cyclical effect on Ukrainian GDP and induced exchange rate changes unfavorable for the development of the tradable sector. From the other hand, foreign borrowing by Ukrainian corporations has been an important source of fixed capital investments and a factor influencing financial deepening in Ukraine, via access to long-term capital with moderate interest rates.

To identify the main implications of foreign capital inflows for the Ukrainian economy I specified some multiple-regression models that included foreign loans as independent variables. Empirical research was based on quarterly data for Ukraine spanning Quarter 4 of 2004 to Quarter 2 of 2013, i.e. our dataset consists of 35 observations. The starting point of our sample was chosen in view of foreign capital flow patterns. Up to 2004 only the Ukrainian government and state-owned companies borrowed funds on international capital markets (the latter under government guarantees). But since then Ukrainian companies and banks, including private ones, have started floating eurobonds and attracting foreign bank loans without government support.

At the first stage of my empirical research I tested all the variables that may affect real GDP. Among these, investment in fixed capital as well as foreign capital inflow to the corporate sector of Ukraine proved to be positively

correlated with real GDP. The correlation coefficient of the growth rates of real GDP with net foreign borrowing by the private sector is 0.68. However, other important data series, which may explain GDP dynamics (e.g. quality of human capital, the total factor productivity, technological innovations) were lacking. Therefore a multiple-regression model could hardly be used. Moreover, taking into account mutual (direct and reverse) effects of capital flows on economic growth, the Granger Causality Test seemed to be preferable. The Granger Test is based on quarterly data and encompasses the whole sample (see Table 3).

**Table 3.** *Pairwise Granger Causality Tests*

Date: 10/23/13 Time: 14:25			
Sample: 2004Q4 2013Q2			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
FOR_CAP_COR1 does not Granger Cause GDP_GROWTH	32	3.46272	0.0458
GDP_GROWTH does not Granger Cause FOR_CAP_COR1		4.24705	0.0249

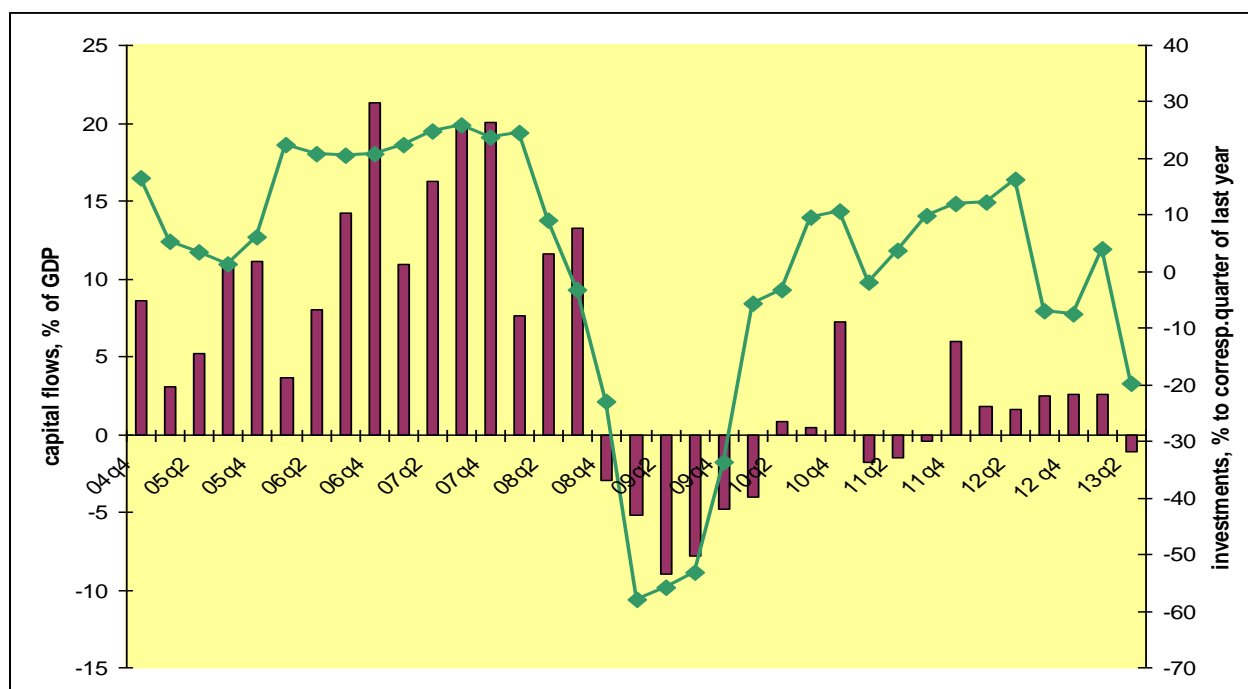
Source: author's estimation.

According to the Granger Test estimates the null hypothesis 'FOR\_CAPITAL does not Granger cause GDP\_GROWTH' has been rejected, since  $p = 0.046$  and  $F\text{-Statistic} = 3.46$ . This means that foreign capital inflow is one of the determinants of GDP growth, in the short run. However, the Granger Test also confirmed that GDP growth causes foreign capital inflows ( $p = 0.025$ ,  $F\text{-Statistic} = 4.25$ ). Thus, for the Ukrainian economy we found a two-way causation between GDP dynamics and foreign capital flows. Alongside a positive correlation coefficient, this result implies that foreign capital surges enhance growth in Ukrainian GDP, while a foreign capital drought deteriorates GDP dynamics.

At the second stage of the empirical research, I found that foreign capital flows to the private sector have a statistically significant effect on fixed capital formation. The correlation coefficient of growth rates of investments in fixed capital with foreign borrowing by banks and non-financial firms (lagged for one quarter) constitutes 0.64. Evolution of these variables through 2004 – 2013 is depicted in Chart 2.

In general, among the potential determinants of gross capital formation the most significant proved to be the bank deposits, profits made by Ukrainian enterprises and foreign private borrowing. Variable PROFIT represent the own funds of enterprises available for fixed investment financing. Variable DEPOSIT approximates loanable funds for fixed investments from domestic sources, as variable FOR\_CAP does for investments from foreign sources.

**Chart 2. Fixed Capital Formation in Ukraine and Foreign Private borrowings in 2004-2013**



Source: Author's illustration based on the data of National bank of Ukraine and State Statistics Committee of Ukraine

Based on these findings I specified the following regression (t-statistics are given in parenthesis):

$$\text{OK\_RAT} = 1.28 \cdot \text{DEPOSIT} + 0.63 \cdot \text{PROFIT} + 1.04 \cdot \text{FOR\_CAP}(-1) - 16.83$$

(1)

(2.41)
(2.64)
(2.67)
(-4.42)

$$R^2 = 0.61; \quad F\text{-statistics} = 15.96.$$

where OK\_RAT denotes growth rates of gross capital formation, % to a corresponding quarter of last year;

DEPOSIT - growth rates of term deposits in the banks of Ukraine, % to a previous quarter;

PROFIT – quarterly profits of Ukrainian enterprises, % of GDP;

FOR\_CAP(-1) - net foreign borrowings by Ukrainian corporations and banks, lagged 1 quarter, % of GDP.

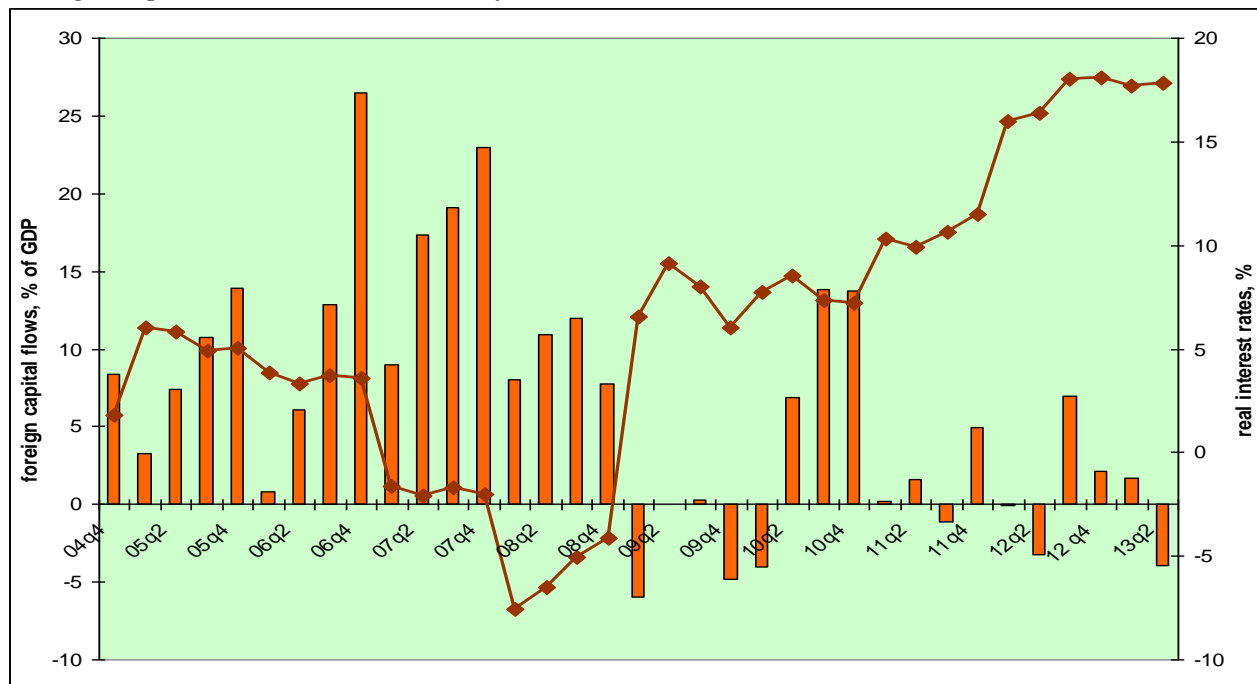
Estimated coefficients of the model (1) show that foreign borrowing by Ukrainian corporations equivalent to 1% of GDP is associated with the acceleration of fixed capital formation by around 1 percentage point.

Next I tried to identify the macroeconomic factors that influence the behavior of real interest rates on banks' loans in Ukraine. The most significant factors proved to be:

- growth rates of broad money, % to a previous quarter (M2\_RAT);
- net foreign borrowings by Ukrainian banks, corporations and government, lagged 1 quarter, % of GDP (FOR\_CAP(-1));
- amount of public and publicly guaranteed debt, % of GDP (P\_DEBT).

Economic theory predicts that expansionary monetary policy brings real interest rates down, while public debt accumulation brings interest rates up via a ‘crowding out’ effect and higher credit risks assumed by investors in government bonds. Foreign capital inflows augment loanable funds available for Ukrainian borrowers and thus reduce the price of capital, i.e. interest rates. The correlation coefficient of real interest rates with net foreign borrowing by all sectors (lagged for one quarter) constitutes  $-0.62$ . The negative relationship between foreign capital flows and real interest rates on the domestic capital market is clearly evident from the graphic representation (see Chart 3).

**Chart 3. Real Interest Rates on Domestic Loans in Ukraine and Debt-creating Foreign Capital Flows in the Course of 2004-2013**



Source: Author’s illustration based on data of National bank of Ukraine and State Statistics Committee of Ukraine

To estimate the effects of above factors on domestic real interest rates a model (2) has been specified (t-statistics are given in parenthesis):

$$\mathbf{R\_INTER = -0.29 * M2\_RAT - 0.17 * FOR\_CAP(-1) + 0.37 * P\_DEBT + 0.79 * MA(1)} \quad (2)$$

(-4.23)                      (-2.89)                      (9.99)                      (6.97)

$$R^2 = 0.85.$$

where R\_INTER denotes ex post real interest rates on banking loans to non-financial enterprises of Ukraine with a maturity of 1-5 years;

MA (1) - autoregressive component of the first order.

Estimated coefficients suggest that inflows of foreign banks' loans or eurobonds floatation by Ukrainian residents equivalent to 1% of GDP is associated with domestic real interest rates reduction by 0.17 percentage points.

Next I tried to identify the factor influencing the dynamics of the real effective exchange rate (REER) of Ukrainian hryvna relative to the currencies of main trade partners of Ukraine. Time series for REER of hryvna was obtained from Ukrainian page at International Financial Statistics of IMF.

I derived the independent variables for the next model based on the correlation coefficients with REER dynamics. They are

- real GDP per quarter, deflated to 2004 prices, mln UAH (REAL\_GDP);
- capital account balance of the Ukrainian balance of payment, mln USD (FIN\_ACCOUNT);
- public and publicly guaranteed debt as a % of GDP (P\_DEBT).

Such dependencies are explained by the following. Real GDP growth is associated with labour productivity growth in many cases, and results in real exchange rate appreciation (the so-called 'Balassa-Samuelson Effect'). Public debt accumulation, with a predominant share of external debt, leads to a deepening of negative balance on net external assets, which, in their turn, puts devaluation pressure on the real exchange rate (for details see P. Lane and G. Milesi-Ferretti (2001)). As to capital account impact, net inflow of foreign capital to the Ukrainian economy causes the hryvna's appreciation; while net outflow of capital causes the hryvna's depreciation.

Having regressed REER on real GDP, public debt volume and capital account balance I derived the following equation (t-statistics are given in parenthesis):

$$\begin{aligned} \text{REER\_CH} = & \mathbf{0,0002*REAL\_GDP} - \mathbf{0,45*P\_DEBT} + \mathbf{0,001*FIN\_ACOUN} + \\ & (9.27) \qquad \qquad \qquad (-5.66) \qquad \qquad \qquad (3.45) \\ & \mathbf{0,80*MA(1)} \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad (3) \\ & (8.18) \end{aligned}$$

$$R^2 = 0.83.$$

where REER\_CH is a cumulative change of REER index relative to December 2004.

According to the regression (3) 100 mln USD of foreign capital inflows to the private and public sector predicts an appreciation of the hryvna's REER of around 0.1 of a percentage point. Thus, net foreign capital inflow puts upward pressure on the real effective exchange rate and deteriorates national

competitiveness. In the same way, capital outflow results in real effective exchange rate devaluation.

In this regard Mohan (2004) argues that exchange rate volatility has significant employment, output, and distributional consequences in developing economies which are not comparable to the effects in advanced economies. Since developing countries specialise in labour-intensive, low- and intermediate-technology products – which are sold on highly competitive markets – profit margins for these producers are very thin and sensitive to exchange rate movements.

Summing up: the regressions (1) – (3) confirm that for an emerging market economy debt-creating flows appear to have a significant impact on the growth and decline of real GDP, fixed capital formation, domestic real interest rates and REER of the national currency. I also found that capital flows promote GDP growth at the upturn stage and deepen the GDP decline at the downturn stage. Moreover, unstable capital flow is an important determinant of real exchange rate volatility. Thus, we derived strong evidence of macroeconomic and financial stability concerns associated with capital flows to an emerging market economy.

### **Regulation of Capital Flows and External Debt Threshold**

As of 1 January 2014 gross external debt liabilities of Ukrainian entities amounted to 142.5 bn USD, or 78.4% of GDP, while net debt liabilities (gross debt liabilities minus debt assets and official reserves) amounted to 105.1 bn USD, or 58.2% of GDP. Appropriate questions in light of this: does the Ukrainian foreign debt position create a crisis risk and hamper prospects for long-term financial stability? Is further build-up of net external liabilities to be dampened? And are capital controls or macro-prudential policies to be imposed?

Economic theory acknowledges that once an external debt-to-GDP ratio crosses a given threshold it raises the probability of crisis and enhances volatility; dampening economic growth. Early ‘debt overhang’ theories predict low private investment and low economic growth in highly-indebted countries because of macroeconomic uncertainty and high taxation, which reduce the expected return on investments. Krugman (1988) and Sachs (1988) suggest that heavy debt burdens act as implicit tax on the resources generated by a country, which reduces both the size and quality of domestic and foreign investments.

A lot of empirical studies have been devoted to the estimation of the debt overhang threshold – the level of debt ratio at which the marginal effect of debt on growth becomes negative. Most of them conclude that the debt overhang threshold doesn’t exceed 35% of GDP for low- and middle- income countries.

‘Debt Intolerance’ proponents argue that poor countries become vulnerable to crisis when external debt crosses 15 – 25% of GDP (see Reinhart et. al., 2003). Cordella, Ricci and Ruiz-Arranz (2005) suggest that in countries with

good policies and institutions, and easy access to private capital, the debt overhang threshold is between 15% and 30% of GDP.

In line with these findings, Reinhart and Rogoff (2004) proved that for emerging market countries prudent external debt thresholds are close to 15 – 30% of GDP. In their later paper Reinhart and Rogoff (2009) argue that while safe debt thresholds hinge on country-specific factors, such as a country's record of default and inflation, the likelihood of an external debt crisis rises substantially when the external debt of an emerging economy crosses the level of 30 – 35% of GNP.

In its credit history, since the mid-1990s Ukraine defaulted in 1999 (sovereign default) and in 2008 – 2009 (numerous corporate defaults). In both cases defaults were triggered by global factors, e.g., deteriorating terms of trade, rising interest rates, lost access to international capital markets.

Ukraine bore an external sovereign debt equivalent of 51% of GDP at the end of 1999 and 13.6% of GDP at the end of 2008. Having a moderate sovereign debt level on the eve of the global financial crisis, the Ukrainian government avoided debt difficulties. However, some Ukrainian corporations – Naftogas, Interpipe, Industrial Union of Donbas, XXI Vek, Alfabank, Nadra, Ukrgasbank, Finance and Credit, First Ukrainian International bank, Ukprrombank – defaulted; and restructured their foreign liabilities. At the end of 2008 long-term Ukraine external debt amounted to 66.1% of GDP.

All the above facts suggest that Ukraine is 'intolerant' to those debt levels considered to be acceptable in developed countries. The current Ukrainian external debt position (78.4% of GDP) incurs significant default risks, which may materialise after a loss of access to international capital market.

After the global financial crisis Catão and Milesi-Ferretti (2013) also tried to define the external debt threshold, but they extended their investigation to include the total of a country's external assets and liabilities, both gross and net. Their initial sample consisted of 70 countries, of which 41 are emerging markets, spanning 1970 – 2011. They found that net foreign debt liabilities (gross debt liabilities minus debt assets and minus official reserves) in excess of 35% of GDP are associated with steeper crisis risk.

If we compare the external debt threshold cited above with the current Ukrainian position we ought to conclude the following: the amount of gross external debt liabilities of Ukraine and speed of external debt accumulation enhance macroeconomic volatility and raises the probability of currency, banking or capital account crises. Such a situation definitely requires a regulatory policy response.

Regulation of capital flows to emerging economies is a very important lever, which helps to reap benefits from cross-border capital flows; while guarding against potential macroeconomic and financial stability risks. A commission of experts chaired by J. Stiglitz, concluded: "Governments should have the space to undertake capital account management techniques as part of their development and risk management strategies" (see: United Nations, 2009).



A system of globally-enforced financial regulation combined with global monetary policy coordination could reduce existing distortions; and allow countries to reap the benefits of capital flows while limiting the related risks. However, as the Committee on International Economic Policy and Reform (2012) argues, political realities complicate multilateral discussions of banking regulation; while monetary policy tends to be conducted with domestic rather than global imperatives in mind. Given these practical difficulties, governments may need to resort to a ‘second best’ approach: in which they seek to manage capital flows at the national level. Macro-prudential policies can play a key role in this process, by imposing judicious and targeted regulations on banks.

A new literature on welfare economics suggests that some restraints on capital inflows via well-targeted and temporary capital controls can help counter the destabilising systemic impact of booms and busts in capital flows (see Jeanne et. al., 2012).

In line with the above theoretical considerations, Ostry and others (International Monetary Fund, 2011) found that countries either with capital controls (especially on debt liabilities) or with prudential measures in place exhibited greater growth resilience during a global crisis. Regressing the change in real GDP growth during 2008 – 2009 they derived positive and statistically significant coefficients in individual regressions on (i) capital controls; (ii) foreign exchange-related prudential regulations.

Capital flow management measures should be designed to reduce both the volatility of capital flows and the risks to financial stability. The regulatory framework should address the specific risks generated by capital flows (i.e., their short-term nature and volatility, financial institutions’ credit and currency risks exposure, etc.) while leaving the door open for long-term and productive capital flows.

Against the main risks that inflow surges bring the following instruments may be deployed by Ukrainian and other emerging markets governments:

- unremunerated reserve requirements (URR) or “Tobin tax” on short-term foreign borrowings by residents and portfolio inflows (with a purpose to reduce incentives for borrowing abroad, to restrict short-term external borrowing and to curb the domestic credit boom);
- tightening debt-to-income and loan-to-income ratios for the borrowers in domestic banks, making ratios conditional on currency denomination of debt (to curb the domestic credit boom, to mitigate systemic risks, to rein in house price boom);
- differential reserve requirements on banks’ liabilities in local currency and in foreign currency (to sustain the credit growth in foreign currency, to restrain the banks’ reliance on foreign exchange funding);
- tightening limits on net open currency position of financial institutions (to target foreign exchange risks assumed by banks, to

address systemic liquidity risks, stemming from foreign currency funding);

- countercyclical/ time-varying capital requirements for banks (to sustain excessive leverage, building capital and liquidity buffers, to promote a prudent risk management by banks).

Capital controls and macro-prudential measures are to be used and adjusted in a counter-cyclical manner, i.e. raised during a boom and lowered during a downturn. Such regulations would smoothen swings in capital flows and contribute to macroeconomic and financial stability. Moreover, capital flow management measures would reduce the build-up of vulnerabilities on domestic corporate balance sheets.

## Conclusions

Ukrainian experience confirms that debt-creating capital flows to emerging market economies accelerate domestic investments and promote financial deepening, on one hand: as well as induce inflationary pressures and excessive appreciation of the exchange rate, credit booms and asset price bubbles, on the other hand. In unfavorable times capital inflows tend to reverse suddenly and in a synchronized manner, causing sharp currency depreciation and banking crises.

After integration into the world capital market, Ukraine has become highly vulnerable to external shocks both caused by international capital market imperfections and by domestic deficiencies within Ukraine (weakly supervised financial sectors and unstable export earnings, a large current account deficit and low currency reserves). High vulnerability of the Ukrainian economy can also be explained by unsustainable growth of external debt and inefficient allocation of a share of foreign capital. In the course of 2004 – 2008 the annual discrepancy between real exports and external debt growth rates averaged 15.9%, while the annual discrepancy between real GDP and external debt growth rates averaged 24.6%.

Net foreign capital inflows proved to be significant explanatory variables across various specifications of macroeconomic and financial indicators for Ukraine. The Granger Causality Test confirmed the two-way causation between real GDP and debt-creating flows. Combined with positive correlation among two time series, this finding suggests that foreign capital surges enhance the growth rates of Ukrainian GDP; while foreign capital drought deteriorates GDP dynamics.

I also revealed that foreign capital flow to the private sector has a statistically significant effect on fixed capital formation. Estimated coefficients show that foreign borrowing by Ukrainian corporations equivalent to 1% of GDP is associated with acceleration of fixed capital formation by around 1 percentage point. A model of interest rate dynamics suggests that inflows of

foreign bank loans or eurobond floatation equivalent to 1% of GDP is associated with domestic interest rate reduction by 0.17 of a percentage point.

I found that net inflow of foreign capital to the Ukrainian economy leads to hryvna appreciation, but net outflow of capital to hryvna depreciation. Estimated coefficients suggest that 100 mln USD of foreign capital inflows to private and public sector predicts an appreciation of the hryvna's REER of around 0.1 of a percentage point. Thus, for an emerging market economy debt-creating flows appear to have significant impact on the growth and decline of real GDP, fixed capital formation, domestic interest rates and REER of the national currency.

Alongside these effects I found that gross and net external debt liabilities of Ukrainian entities have exceeded the debt threshold for emerging markets, identified empirically. Thus, the Ukrainian foreign debt position requires a regulatory policy response. The regulatory framework should address the specific risks generated by capital flows, while leaving the door open for long-term and productive capital flows.

To smoothen the capital flows' swings and reduce the build-up of associated vulnerabilities, a spectrum of capital flow management tools may be employed by an emerging-market government: unremunerated reserve requirements or a 'Tobin tax' on short-term foreign borrowing by residents and portfolio debt inflows; tightening debt-to-income and loan-to-income ratios for borrowers from domestic banks and making these ratios conditional on the currency denomination of the debt; differential reserve requirements on banks' liabilities in local currency and in foreign currencies; tightening limits on net open currency positions of financial institutions; counter-cyclical/ time-variable capital requirements for banks.

## References

- Blanchard, O. (2007). Current Account Deficits in Rich Countries. *International Monetary Fund Staff Papers*, 54, N 2: 191-219.
- Calvo, G. (1998). "Capital Flows and Capital-Market Crises: The Simple Economics of Sudden Stops". *Journal of Applied Economics*, Vol. 1, N 1: 35-54.
- Catão, L. A., and G. M. Milesi-Ferretti. (2013). External Liabilities and Crises. *IMF Working Paper*, No. 13/113.
- Committee on International Economic Policy and Reform. (2012). Banks and Cross-Border Capital Flows: Policy Challenges and Regulatory Responses. -<http://www.brookings.edu/research/reports/2012/09/ciepr-banks-capital-flows>
- Cordella, T., L. Ricci, and M. Ruiz-Arranz. (2005). Debt Overhang or Debt Irrelevance? Revisiting the Debt-Growth Link. *IMF Working Paper*, N 05/23.
- International Monetary Fund. (2011). Recent Experiences in Managing Capital Inflows—Cross-Cutting Themes and Possible Policy Framework. - <http://www.imf.org/external/np/pp/eng/2011/021411a.pdf>
- International Monetary Fund. (2012). Liberalizing Capital Flows and Managing Outflows - Background Paper. - <http://www.imf.org/external/np/pp/eng/2012/031612.pdf>

- Jeanne, O., A. Subramanian, and J. Williamson. (2012). Who Needs to Open the Capital Account? - Washington: Peterson Institute for International Economics. – 132 p.
- Krugman, P. (1988). Financing versus Forgiving a Debt Overhang. *Journal of Development Economics*, No. 29: 253–68.
- P. Lane, P., G. Milesi-Ferretti. (2001). The External Wealth of Nations: Measures of Foreign Assets and Liabilities for Industrial and Developing Countries. *Journal of International Economics*, Vol. 55 (December): 263-294.
- Mohan, R. (2004). Challenges to Monetary Policy in a Globalising Context. In: *Monetary Policy in a Globalised World: A Practitioner's View*, ed. by R. Mohan. New Delhi: Oxford University Press.
- Reinhart, C., K. Rogoff, and M. Savastano. (2003). Debt Intolerance. *Brookings Papers on Economic Activity*, N1: 1-62.
- Reinhart, C., and K. Rogoff. (2004). Serial Default and the “Paradox” of Rich to Poor Capital Flows. *NBER Working Paper*, N10296.
- Reinhart, C., and K. Rogoff. (2009). “The Aftermath of Financial Crises.” *American Economic Review*, Vol. 99: 466–72.
- Rodrik, D., and A. Subramanian. (2009). Why Did Financial Globalization Disappoint? *International Monetary Fund Staff Papers* 56, N1: 112–138.
- Sachs, J. (1988). The Debt Overhang of Developing Countries. In: *Debt Stabilization and Development: Essays in Memory of Carlos Diaz-Alejandro*, ed. by G. Calvo, R. Findlay, P. Kouri, and J. Braga de Macedo. Oxford: Basil Blackwell.
- United Nations. (2009). Report of the Commission of Experts of the President of the United Nations General Assembly on Reforms of the International Monetary and Financial System. – New York, September 21, 140 p.
- Вахненко (Богдан), Т. П. (2008). “Кредитний бум в Україні у системі координат світових фінансів”. *Економіст*, N5: 34-38. (Vakhnenko (Bogdan), T. P. (2008). “Credit Boom in Ukraine in the Context of International Finance”. *Economist*, N5: 34-38).