

***Financial and Banking Services Market***

Tetiana BOGDAN

**DEBT-CREATING CAPITAL FLOWS
AND SHOCK SPILLOVERS
IN AN EMERGING ECONOMY
(UKRAINE'S EXAMPLE)****Abstract**

This paper investigates the financial channels of shocks transmission and crises diffusion in an emerging market economy and highlights the role of debt-creating capital flows. Analysing the determinants of capital flows, author decomposes them into the contribution of global «push» factors and country-specific «pull» factors and estimates their significance on Ukraine's example. Author argues, that «push» factors play a major role in driving capital flows as long as a business cycle in emerging economy is synchronized with a global business cycle; however, being affected by local or regional crisis, emerging economy is getting decoupled from the global developments and «pull» factors are gaining the dominant role. Author also considers the macroeconomic implications of debt-creating capital flows and external debt in emerging market economies and provides empirical estimates of economic growth effect in Ukraine.

© Tetiana Bogdan, 2020.

Bogdan Tetiana, Doctor of Economic Sciences, Chief of Department for Public Finance at NGO «Growford Institute», Ukraine. ORCID: <https://orcid.org/0000-0002-6133-5336> Email: tetiana.bogdan@gmail.com.

Key words:

Emerging markets, financial spillovers, capital flows, «push» and «pull» factors, Ukraine's crisis, external sustainability.

JEL: F34, F62, F37.

Introduction

Many emerging market economies and Ukraine's economy, in particular, are highly sensitive to the impact of global factors. Global shocks transmit to these economies, predominantly, through the foreign trade and capital flows' channels. Practical experiences and empirical studies suggest that rising global risk aversion on the capital markets and declining world prices for commodities are the main drivers of external shocks' transmission to emerging economies.

In case of Ukraine, these factors proved to be the main drivers of global trends transmission to the economy of Ukraine up to 2014. However, since that time, Ukraine suffered from a deep economic recession and financial turmoil as a result of Russian military aggression. Besides, Ukraine's fiscal sector, external and financial sectors were highly vulnerable that magnified the effects of above shocks. Under such conditions, starting from 2014, country-specific factors proved to play a major role in driving net inflows of capital flows and global «push» factors impact became insignificant.

The goal of this study is to investigate the main channels and mechanisms of financial shock spillovers in external sector, fiscal, financial and real sectors of the emerging market economy; to examine the role of debt-related factors in driving external vulnerability and elevating the risks of external crisis; to reveal the significance and contribution of global «push» factors and country-specific «pull» factors in driving capital flows to an emerging market economy; and to estimate the macroeconomic implications of debt-creating capital flows in Ukraine. For reaching the specified goals, analytical, historical and econometric **methods** of research are employed.

In what follows, I investigate the role of potential push (global) and pull (country-specific) factors in driving foreign capital flows to emerging economy, being conditional on its business cycle synchronization with a global cycle. Current research could help shaping the national policy response to global developments and domestically driven shocks, improving the resilience of an emerging market economy to the impact of adverse shocks.

The study is divided into four sections encompassing the various aspects of shocks transmission and debt-creating capital flows implications. Section 1 describes the main trends in global financial environment and their driving forces. Next, section 2 identifies the main areas and mechanisms of shock transmission and crises diffusion in emerging market economy and highlights a role of debt-creating capital flows. After that, section 3 reveals the global and country specific factors of foreign capital inflows to Ukraine with a specific emphasis on business cycle synchronization and decoupling episodes. It describes the econometric methodology as well. In view of economic growth and macro-financial stability concerns, associated with debt-creating capital flows, section 4 focuses on macroeconomic implications of external borrowings in Ukraine. Last section concludes and outlines policy recommendations.

1. Recent trends in capital flows and global debt dynamics

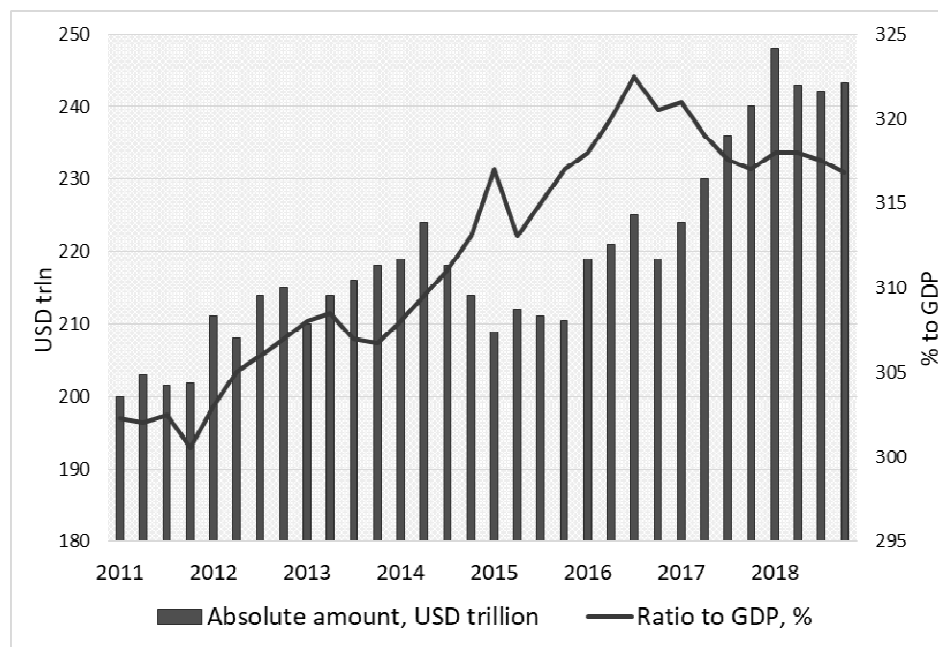
Over the last few years, unconventional monetary policy in several advanced countries has been a main determinant of bond and equity inflows to emerging market economies. Institute for International Finance predicts that in 2019 foreign capital inflows to the emerging markets will approach 1.26 trillion USD that imply 10.5% increase as compared to 2018. Over the last years monetary policy of «quantitative easing» in G-3 countries promoted capital inflows to emerging markets, which offered higher yields.

In 2018 the major recipients of foreign capital among emerging markets appeared to be India (60.7 billion USD), Argentina (38.7 billion), Indonesia (23.8 billion), Mexico (23.1 billion), Turkey (17.4 billion) and Brazil (17 billion). In such a way, inflow of foreign capital to emerging markets accelerated, sovereign borrowing yields went down, and their national currencies started appreciating vis-à-vis US dollar.

Global debt is at historic highs currently, reaching the peak of USD 243 trillion in 2018 that is equivalent to 317 % of global GDP (Fig. 1). The world is now 85% of GDP more indebted than in 2009. Some experts argue that in many countries, the future has been mortgaged by high public and private debts, which risk choking off growth (Andersen, 2018).

Fig. 1

Global debt in absolute and relative terms over 2011–2018



Source: Institute for International Finance.

According to the Institute for International Finance, at the end of 2018 advanced countries' debt accounts for 72.5% of total global debt, while developing countries and emerging markets debt 27.5%. In terms of GDP ratio, advanced countries' debt approached 380% roughly versus 212% in developing countries and emerging markets. Interestingly, if China is excluded from the latter sample, it decreases the debt ratio down to 100% of GDP.

Over the last years global debt continues growing and 21 trillion USD was added to the global debt mountain in 2017 and 3 trillion USD in 2018. Slow pace of debt accumulation in 2018 was explained by limiting public and private debts in the EU and China. In the course of 2018, global debt ratio remained steady approaching 317% of GDP.

According to the Institute for International Finance, at the end of 2018 global debt had the following composition: non-financial sector owed 72 trillion

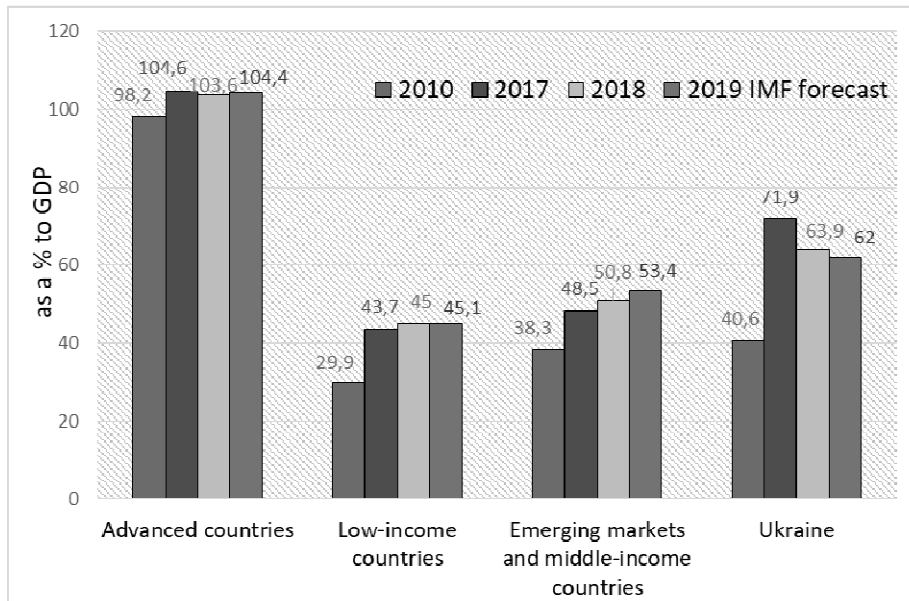
USD, government – 65.3 trillion, financial sector – 59.8 trillion and household – 46.2 trillion USD.

Public debt has played an important role in the surge of global debt. According to the IMF, public debt in advanced economies is equivalent to 103.6% of GDP on average – levels not observed since World War II. In emerging market and middle-income economies, debt is at 50.8% of GDP, i.e. levels not seen since 1980s debt crisis.

In advanced countries, public debt ratio went down through 2017–2018. Public debt of this country group reached a peak of 106.7% of GDP in 2012 and in 2016. Later on, it tailed off and stood at 103.6% of GDP in 2018 (fig. 2). Improving debt ratio was attributed to the growing primary balances in Eurozone and declining nominal interest rates throughout the advanced countries.

Fig. 2

General government debt across country groups and in Ukraine over 2010–2019



Source: compiled by the author on the basis of IMF's «Fiscal Monitor».

Public debt of emerging markets and developing countries crept up from 46.8% of GDP in 2016 to 50.8% in 2018. The IMF forecasts further growing of this ratio in subsequent years. Although a general indebtedness of emerging markets and developing countries is not high, currently 20% of these countries bear witness public debt ratio above 70%.

A significant share of the total debt of low- and middle-income countries as a group is accounted for by external debt, that indicate their high reliance on foreign debt-creating capital flows. According to the World Bank, total external debt outstanding of this group of countries amounted to 7.1 trillion USD in 2017. Throughout the past decades, an upward trajectory of external debt has been apparent. In 2017, the absolute amount of low- and middle-income countries' external debt was 1.8 times higher than in 2010.

The ratio of external debt to gross national income (GNI) stagnated over 2014–2017 and averaged 25–26%. Notwithstanding the moderate ratio on average, one quarter of low- and middle-income countries recorded an external debt-to-GNI ratio of over 60 %, including ten countries with the ratios above 100%. The ratio of external debt to exports breached 100% in 2016 and went up slightly in 2017. These ratios bore witness a reduction of external debt burden as compared to 1990 or 2000, although starting from 2010 an upward trend prevailed.

In emerging market economies overall debt ratios declined in the decade following the crises of the late 1990s. Currently the risks of contagion and systemic debt crisis in these countries are limited not least because the quality of macroeconomic policy has generally improved and FX reserve volumes have increased, allowing governments to better deal with external shocks. However, some countries with unsustainable fiscal policies and high external gaps continue to remain at risk. High foreign currency-denominated corporate debt poses elevated risks of currency and debt crises as well.

2. Main channels and mechanisms of shock transmissions and a role of debt-creating capital flows

Because of the integrated nature of the international economy, any country is tied to other countries and global markets by multiple financial and real economy linkages. International trade and financial linkages are the most important channels of shock spillovers for many countries. Emerging market economy reliance on foreign loans and portfolio investments, as well as significant amount of accumulated external debt liabilities constitute the financial channel for diffusion of the cross-border contagion effects and crises.

In the emerging markets, foreign capital can promote financial deepening and risk diversification. On the macroeconomic front, a potentially important benefit of foreign capital inflows is the relaxation of credit constraints, augmentation of investment resources, and, accordingly, the facilitation of economic growth. Igan, Kutan, and Mirzaei (2016) argue that foreign capital brings knowledge and discipline to the host countries; in addition, access to foreign funds can enhance capital allocation efficiency and productivity, and thus economic growth. Gruss, Nabar, and Poplawski-Ribeiro (2018) find that an increase in the ratio of capital flows to GDP within the region of 1 percentage point (p. p.) raises medium-term growth by 0.2 p. p. Moreover, authors reveal that external financial conditions accounts for one-third of the increase in average income per capita growth in the above economies between 1995 and 2014.

However, 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. The main worries from the financial fragility side are large foreign currency exposure, domestic credit booms and asset price bubbles. In unfavourable times, capital inflows tend to reverse suddenly and in a synchronized manner, causing sharp currency depreciation and financial crises.

In many cases, episodes of large capital inflows increase the probability of a sudden stop that hurt economic performance. ***Emerging market economies, which rely heavily on foreign capital inflows, build up vulnerabilities on their balances of payments, sovereign balances, corporate balances and increase their exposures to the external shocks.*** If sound macrofundamentals and proper system of risk management are lacking, ***such vulnerabilities could spur financial crisis in the case of a sudden stop.***

Major global shocks and contagion effects, which may be transmitted to emerging economy, encompass:

- a) a recession in trading partners;
- b) the world prices decline for commodities being exported,
- c) devaluations of the national currencies in the trading partners,
- d) contraction of global liquidity,
- e) a fall in «appetite for risks» by international investors (a rise in volatility index VIX), and, accordingly, a hike in financial spreads for emerging markets.

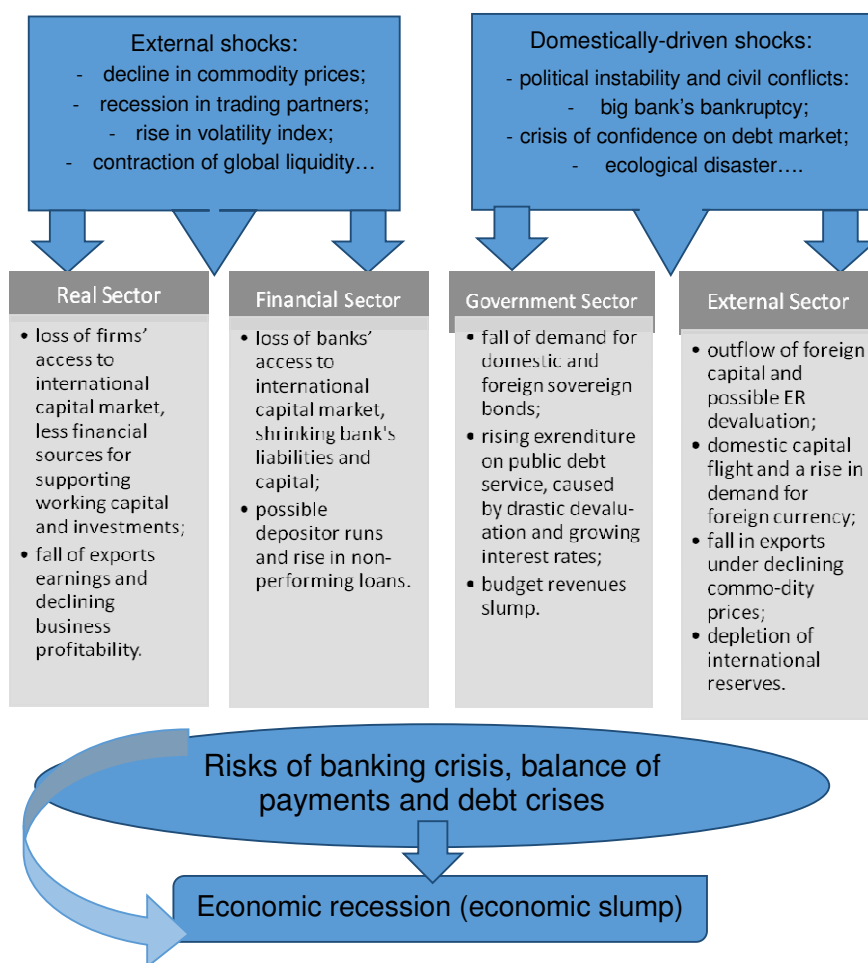
Domestically-driven shocks encompass:

- a) political turmoil and civil conflicts,

- b) big bank's bankruptcy and systemic risk realization,
- c) crisis of confidence at domestic debt market, related to a lack of fiscal reforms,
- d) ecological disaster and destruction of essential infrastructure, etc.

Fig. 3

Areas and Mechanisms of Shocks Spillovers in an Emerging Market Economy



Source: created by the author.

In 2008–2009, Ukraine was hit by global crisis that affected Ukraine's economy heavily. It was attributed to Ukraine's openness to international trade and capital flows, as well as build-up of high-risk exposures in different sectors of national economy prior to crisis.

In 2014–2015, Ukraine experienced the effects of geopolitical crisis and domestically driven shocks that turned domestic vulnerabilities into full-fledged economic and financial crisis. «Revolution of dignity» in Kyiv, annexation of Crimea by Russia and armed conflict in Donbas led to the economic deterioration, loss of confidence and risk aversion. Ukraine's real sector underwent a destruction of the production facilities in the East, a closure of the Russian market for national exports and a loss of confidence related to the armed conflict.

Through 2014–2015, Ukraine faced large foreign capital outflow. However, contrary to the previous episodes of capital flow reversal, that one was not explained by global financial shocks spillovers to national economy.

Thus, Ukraine experienced a triple financial crisis (currency crisis, debt and banking crises), that went hand-in-hand with a deep economic recession. Meanwhile, reciprocal two-way connections among different sectors of the economy appeared: financial crisis deepened economic recession as GDP and export declines triggered the severity and the scale of financial crisis. Drastic cut in Ukraine's GDP and exports have been magnified by a «trade war», initiated by Russia, and physical destructions of infrastructure and production facilities in Lugansk and Donetsk oblasts (where significant part of Ukrainian «hard» industry was concentrated).

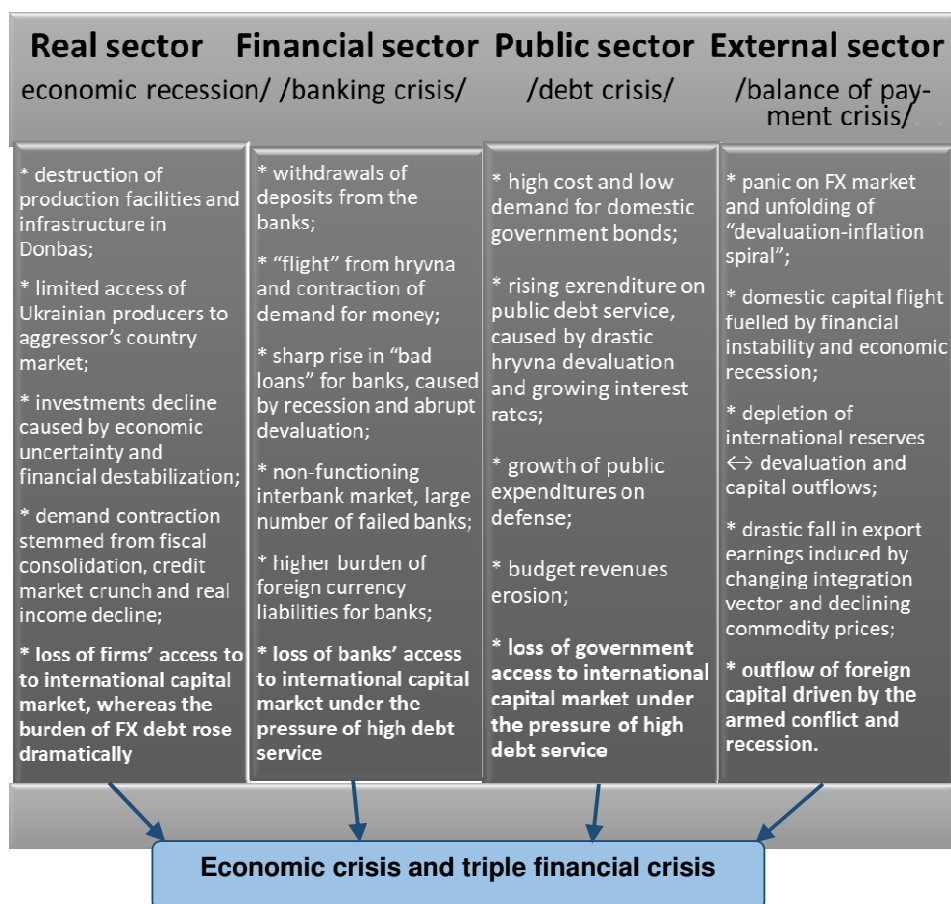
The mechanisms of the triple financial crisis' origin and channels of crisis transmission in Ukraine through 2014–2015 are depicted in Chart 4. Debt-creating capital flows played a prominent role in shock spillovers and crisis diffusion. Ukraine had a combination of currency, banking and debt crises, which were partially associated with a realization of debt refinancing risk and a significant rise in a burden of debt service after the severe exchange rate devaluation. Sovereign and corporate borrowers were cut off the international capital market that brought about currency and banking crises and affected the severity of recession in the real sector.

External debt crisis in Ukraine evolved in two dimensions, i.e. as a sovereign debt crisis and a corporate debt crisis. In November 2015, Ukrainian government concluded public debt restructuring agreement with the private investors in foreign bonds. As a component of this agreement, the government issued the GDP-warrants, which came into force through 2021-2040 whenever real GDP growth rates in Ukraine would be higher than 3%.

As opposed to 2008–2009 crisis, recent Ukraine's crisis was not driven by worldwide economic or financial factors; Ukraine since that time was decoupled from global economic and financial factors impact.

Fig. 4

Various transmission channels and debt-related factors of multiple crises in Ukraine (2014–2015)



Source: created by author.

Thus, taking into account the theoretical predictions and actual Ukrainian experience over the last decade, we could infer the main **areas and mechanisms of shocks spillovers in an emerging market economy**. Globally and domestically driven shocks generate the following primary effects through national economy and financial system:

- on the balance of payments front, the *inflows of foreign capital* go down, whereas the outflows of interest payments go up (recorded in the current account) and *international reserves* are shrinking;
- under deteriorating risk aversion and increasing uncertainty on the international capital market, the *capital flights* shoot up, that again affects a balance of payments, as well as banks' financial position;
- on the foreign exchange market the supply of foreign currency plummets and central bank resorts to the foreign exchange interventions in order to calm down a market and to smoothen the exchange rate volatility;
- as regards to debt sustainability, interest rates hikes drive a rise in foreign debt service for the national borrowers, makes the refinancing of the accumulated debts problematic and increase the probability of debt distress;
- on the public finance front, budget expenditures on debt service creep up and budget revenues slump, while chances of budget deficit financing by foreign private creditors are glooming, and market demand for domestic government bonds are falling in.
- as regards to a real sector of economy, increased uncertainty results in shrinking financial sources for supporting a working capital and generating investments by corporations, including exporters, that affects negatively economic activity and exports prospects.

3. Global and country specific factors of foreign capital inflows to the emerging market economy and empirical estimates for Ukraine

Numerous studies find evidence of significant relationships between emerging market sovereign bond spreads and indicators of global financial market (push factors), as well as country-specific economic indicators (pull factors). Global push factors mostly explain the common dynamics of capital inflows to emerging markets. Models, including indicators of external financing conditions and country-specific fundamentals, are widely used by the researchers for estimation of bond spreads and capital inflows.

For instance, González-Rosada and Levy Yeyati (2008) regress bond spreads over a set of country-specific and global factors for 33 emerging economies. They find that global factors are largely responsible for most of the variance of emerging market bond spreads. Comelli (2012) estimated the baseline

regression for 28 emerging markets covering 1998–2011, and shown that both the country-specific and global explanatory variables were statistically significant and explained variations in emerging market bond spreads.

A consensus has emerged on the **role of U.S. monetary policy, the supply of global liquidity and the global risk appetite** in helping to explain the high synchronicity of capital flows to emerging markets (for instance, Milesi-Ferretti and Cédric 2011). Hartelius et al. (2008) find that a higher/ lower global risk aversion and an increase/ a decline in either the level or the volatility of the U. S. Federal fund futures rates are associated with the higher (lower) country risk premium.

Some empirical research suggest that global factors account for 50–80% of variances in foreign bonds spreads for emerging markets (Gonzalez-Rosada and Levy-Yeyati, 2008). Cerutti, Claessens, and Puy (2015) conducted a systematic analysis of the sensitivity of 34 countries to global push factors. They found that various global push variables play a major role, which are the VIX, changes in the expected U. S. policy rate, the slope of the U. S. yield curve, etc. In particular, push factors account for about 65 % of the overall R2s in the case of other investments, about 60 % of portfolio bonds, and 75 % of portfolio equity flows.

A strand of literature uses the expected 3-month interest rates in the U.S., the Federal funds rate, and expected 10-year U. S. bond yield, as measures of global liquidity, while the investors' risk appetite on the international markets has been proxied by a VIX indicator. Risk appetite depends on both the degree to which investors dislike uncertainty (risk aversion) and the level of that uncertainty. Risk appetite is a part of the intrinsic make-up of investors. The Chicago Board Options Exchange Volatility Index (VIX) is a measure of the market's expectation of stock-market volatility over the next 30-day period. An increase in the VIX index raises the yields requested by investors to hold emerging market debt securities.

Some empirical studies employ a set of country-specific factors for explaining the sovereign bonds spreads, which include the real GDP growth rates, the domestic interest rate level, the inflation rates, international reserves related to the country's import or short-term debt, a ratio of public debt or total external debt, a budget deficit, and a current account balance. For instance, Ananchotikul and Zhang (2014) examined a set of push and pull variables for 17 emerging market economies; they concluded that solid macroeconomic fundamentals appeared to provide the important buffers to international contagion.

In what follows we will focus on the impact of global and country-specific factors on debt-creating capital inflows to a corporate sector of Ukraine. Presumably, global factors significance for capital inflows to Ukraine was different for the episode of 2004–2013 and of 2014–2018, since a latter period was associated with a regional armed conflict and domestic shock spillovers.

For a pre-crisis period, I investigated the role of potential push and pull factors in driving bond spreads. The empirical research is based on quarterly data spanning Quarter 4 of 2004 to Quarter 1 of 2014 that make up 38 observations of the whole dataset. In the framework of this research, independent variable was proxied by EMBIG-Ukraine spread, calculated by JP Morgan bank. The explanatory variables fall in two broad categories: (i) variables that identify the global push factors for debt-creating capital flows to emerging markets; and (ii) variables capturing fundamentals and market characteristics of the recipient economy (Ukraine's in our case).

To analyse the dependencies between EMBIG spread and global appetite for risks, I computed the correlation coefficient. Ukraine's sovereign bonds spreads proved to be strongly correlated with volatility of the global financial market (VIX index). Their correlation coefficient is 0.74. It suggests that a rise in the VIX, i.e. increased uncertainty, is usually associated with the higher interest rates on Ukraine's debts and with a reduction of cross-border capital flows.

While in theory the lower world interest rates are expected to bring about a higher demand for risky financial assets and the lower bond spreads in emerging economies, this study, alongside with Cline and Barnes (1997), Min (1998) and Comelli (2012), doesn't find any significant relationships between U.S. Treasury yields and emerging markets' bond spreads. What Comelli (2012) explains is the demand of international investors for emerging markets' bonds being more sensitive to country-specific variables rather than to US interest rates, starting from roughly 2003. Our correlation analysis suggest, US long-term and short-term rates are not significant in explaining the international markets' interest rates for the emerging market governments, and Ukraine in particular.

The next issue I'll expand on is Ukraine's economy exposure to price fluctuations on the global commodity markets. Given the structure of Ukraine's exports, national revenues from exports are related to the level of world commodity prices. Agricultural products and raw materials, minerals, ferrous and non-ferrous metals and their products make up $\frac{3}{4}$ of the total exports of goods.

I recalculated the UNCTAD monthly data on commodity price indices as quarterly based. UNCTAD runs free market commodity price indices for main commodity groups, in terms of current US dollars, relative to 2000. Correlation coefficient of EMBIG-Ukraine spread with the quarterly commodity price changes turned out to be quite high, i. e. -0.62 .

Pull or country-specific factors of bond spreads were captured by the quarterly real GDP growth rates, exports as percent of GDP, growth rates of Ukrainian exports, the level and the increase in public debt (as a % of GDP), the level of gross external debt (as a % of GDP), the level of foreign exchange reserves, the current account deficits and budget deficits (as a % of GDP), the inflation rates and real domestic interest rates. The correlations of explanatory variables with the «EMBIG-Ukraine» spread are presented in Table 1.

Table 1

Correlations among «EMBIG-Ukraine» Spread and Country-Specific Variables

No	Potential independent variables	Correlation with «EMBIG-Ukraine» spread
1.	Real GDP growth rate, as % to a corresponding period of the previous year	-0.77
2.	Foreign exchange reserves, as % of total external debt	-0.50
3.	Current account balance, as % of GDP	-0.28
4.	Consolidated budget balance, as % of GDP	-0.12
5.	Exports of goods and services, as percent of GDP	-0.42
6.	Exports' growth rates, as % to a corresponding period of the previous year	-0.53
7.	Inflation rates, as % relative to corresponding period of the previous year	0.11
8.	Real domestic interest rates, weighted average for banking loans with a maturity 1-5 years	-0.03
9.	Public debt level, as % of GDP	0.34
10.	Increase in public debt level, as % of GDP	0.56
11.	Gross external debt, as % of GDP	0.36

Source: author's estimates based on data of the IMF and Ukrainian authorities.

On the basis of correlation coefficients with bond spreads, I derived the independent variables for a multiple regression models. They are:

- VIX index, as a proxy for global risk appetite (VIX);
- quarterly changes of UNCTAD commodity price index, all commodity groups, lagged 1 quarter, as a % (PRICE_all (-1));
- real GDP growth rates, as a measure of country's economic prospects and creditworthiness (GDP_real);
- foreign exchange reserves, as a proxy for international liquidity of the borrowing nation and an indicator of the currency exchange risks for non-residents (RESERVES).
- quarterly increase of public debt level in Ukraine, as a % of GDP, lagged 1 quarter (INC_DEBT (-1)).

I estimate the following equation for the «EMBIG-Ukraine» spread:

$$\text{EMBI_UKR} = 37.7 \text{ VIX} - 28.0 \text{ GDP_REAL} - 19.4 \text{ RESERVES} + 549.3 \quad (1)$$

$$R^2 = 0.84; \text{ F-statist.} = 66.2; \text{ Q-statist. (20 lags)} = 17.1.$$

where EMBI_UKR denotes «EMBIG-Ukraine» spread, bps at the end of relevant quarter;

VIX – global volatility index or investors' appetite for risks, average % for a relevant quarter;

GDP_REAL – real GDP growth rates in Ukraine, as a % to a corresponding period of the previous year;

RESERVES – foreign exchange reserves of National bank of Ukraine, as a % of total external debt.

The actual regression results indicate that all coefficients are statistically significant and have the expected signs. 84% of the variation of «EMBIG-Ukraine» spread is explained by the variation of independent variables. Q-statistics signal quite low autocorrelations of the error term.

The estimation results suggest that across 2004–2013 the Ukraine's economy was highly sensitive to a global risk aversion and **Ukrainian government bonds spread increases by about 38 basis points in response to a 1 of a percentage point increase in VIX**. From the other hand, higher real GDP growth decreases the level and volatility of foreign-currency bond yields, as better growth prospects decrease credit risks for investors and the country's debt burden becomes easier to service. Increase in real GDP growth rates by 1 of a percentage point is associated with a decrease in EMBIG spread by 28 basis points. Equivalently, accumulation of foreign exchange reserves by 1% of total external debt leads to a reduction in EMBIG spread by 19 basis points.

Going ahead with empirical estimation, I modified the equation (1) by adding commodity price variable, and some country-specific variables as drivers of bond spreads. As a result, a multiple-regression model was specified, encompassing the effects of two push factors and two pull factors on the spread's level.

$$\text{EMBI_UKR} = 35.0 \text{ VIX} - 6.5 \text{ PRICE_all} (-1) - 25.2 \text{ GDP_REAL} + 40.9 \text{ INC_DEBT} (-1) \quad (2)$$

$$R^2 = 0,83; \text{ Q-statist. (20 lags)} = 26,0.$$

where PRICE_all(-1) denotes quarterly changes of UNCTAD commodity price index, all commodity groups, lagged 1 quarter, as a %;

INC_DEBT (-1) – quarterly increase of public debt level in Ukraine, as a % of GDP, lagged 1 quarter.

All estimated coefficients are statistically significant and 83% of the variation of dependent variable is accounted for by the variation of independent variables.

Models (1) and (2) suggest that among numerous factors, affecting foreign bond yields, ***the most significant are global risk appetite, changes of global commodity prices, real GDP growth in Ukraine, level of international reserves and Ukraine's public debt increase. The first two factors belong to the group of push factors and others to the group of pull factors.*** While commodity price growth, positive real GDP dynamics and accumulation of FX reserves pull down the spread, growth of volatility index and public debt accumulation raise the bond spreads for Ukrainian borrowers.

In such a way, global and country-specific drivers of the EMBIG-Ukraine spread have been identified and estimated for the period covering Q1 of 2004 – Q1 of 2014.

At a second stage of our empirical research, we'll investigate the role of global and country specific factors over the period 2014 – Q1 of 2019, when Ukraine experienced a military aggression of the neighbouring country and the local economic and financial crisis.

Independent variable for the regression model was defined as CAPITAL_LOAN_ml that captures quarterly inflows of portfolio investments and foreign loans to the corporate and financial sectors of Ukraine in million USD. Data on EMBIG-Ukraine spread for the whole sample were missing (JP Morgan suspended the relevant calculations).

To proxy the impact of global financial factors on capital inflows to Ukraine we used «VIX» variable as an indicator of investors' risk appetite. We found that ***a pair correlation coefficient between debt-creating capital inflows to Ukraine and VIX index equals to 0.26.*** It means that above relationship is rather weak and ***country specific factors gained more importance over 2014–2019 in explaining the dynamics of foreign capital flows to Ukraine.***

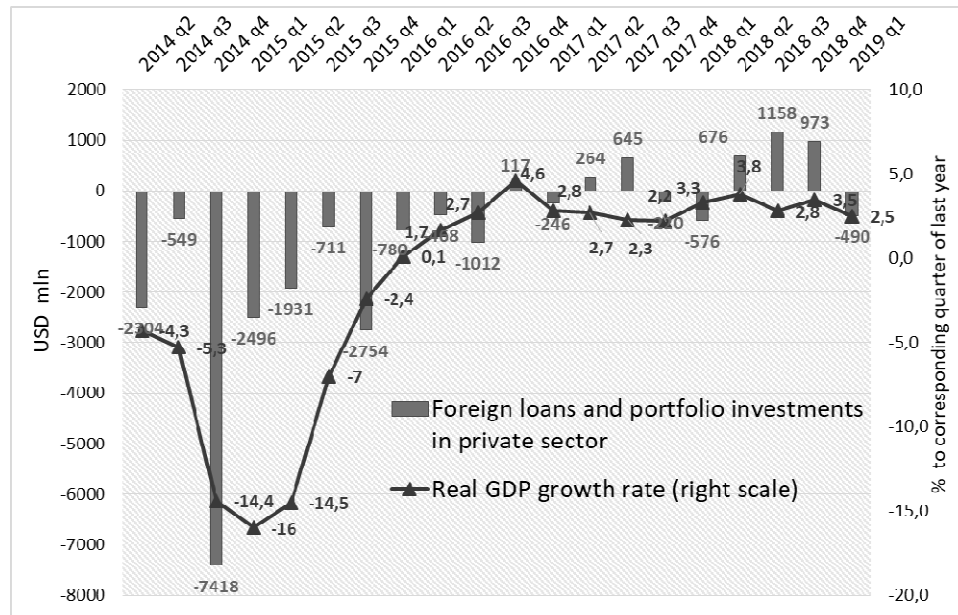
Going forward, I tested the relationships between dependent variable and various indicators of country risks. By applying a correlation analysis, I revealed the key role in attraction of foreign capital to Ukraine played by following independent variables:

- real GDP growth rates as an indicator of general economic environment attractiveness for foreign investors and creditors (GDP_RATE);
- value of international reserves as an indicator of international liquidity and foreign exchange risks borne by foreign investors and creditors (FX_RESERVE);
- level of Ukraine's total external debt as an indicator of credit risks and perceived solvency of a borrowing nation (EX_DEBT_ml) .

Higher GDP growth rates and favourable economic prospects of Ukraine push up its attractiveness for foreign creditors and strengthen debt sustainability. Figure 5 shows considerable relationships between economic growth rates and net inflow of debt-creating capital to Ukraine's private sector.

Fig. 5

Foreign capital inflows to corporate and banking sectors of Ukraine and real GDP growth rates in Ukraine



Source: compiled by author on the basis of National Bank of Ukraine and State Statistics Service data.

Other indicators of country risks turned out to have the minor correlations with a dependent variable, and namely: current account balance, growth in exports of goods and services, inflation rates, level and increase in public debt, State budget deficit, nominal and real interest rates on bank loans in Ukraine.

Pair correlation coefficients of independent variables with foreign loans and portfolio investments inflows constituted:

- real GDP growth rates (GDP_RATE) – 0.74;
- foreign exchange reserves volume (FX_RESERVE) – 0.74;
- external debt volume (EX_DEBT_ml) – –0.49.

Above-mentioned estimates and conclusions are identical to those derived by Comelli (2012). Author finds that among country-specific variables, changes in the degree of external vulnerability are estimated to provoke the largest changes in the cost of external financing for emerging markets. Improvements in the degree of external vulnerability are estimated to be twice more effective than improvements in the political risk rating in lowering the cost of external debt finance for emerging markets.

On the basis of above results, I specified the following regression model:

$$\text{CAPIT_LOAN_ml} = 98.1 \cdot \text{GDP_RATE} + 0.20 \cdot \text{FX_RESERVE} - 0.03 \cdot \text{EX_DEBT_ml} - 0.99 \cdot \text{MA}(1) \quad (3)$$

$$R^2 = 0.78; \text{Q-stat. (20 lags)} = 5.7.$$

where CAPIT_LOAN_ml denotes quarterly inflows of portfolio investments and foreign loans to the corporate and financial sectors of Ukraine in USD million;

GDP_RATE – real GDP growth rates in Ukraine, as % to a corresponding period of the previous year;

FX_RESERVE – foreign exchange reserves of the National bank of Ukraine at the end of corresponding quarter in million USD;

EX_DEBT_ml – gross external debt of Ukraine at the end of corresponding quarter in million USD;

MA (1) – moving average component.

R² indicates that 83% of the variation of dependent variable is accounted for by the variation of independent variables. All estimated coefficients are statistically significant. Low Q-statistics signal quite low autocorrelations of the error term.

Our empirical research suggests that real GDP behavior, international reserve adequacy and external indebtedness of Ukraine's residents are statistically significant factors explaining the dynamics of foreign capital inflows to corporate and banking sectors of Ukraine.

Estimated coefficients show that real GDP growth by 1 p. p. is associated with foreign loans and portfolio investments inflows to private sector in the region of 100 million USD per quarter. Accumulation of international reserves by the National bank stimulate foreign capital inflow to Ukraine in the ratio of 5 to 1. At the same time foreign loans and portfolio investments decline by 3 million USD in response to 100 million increase in total external debt of Ukraine.

Thus, I found that a rising global risk aversion and declining commodity prices were the main drivers of external shocks' transmission to Ukraine's economy up to 2014 when Ukraine's economic stance went hand-in-hand with a global one. However, in 2014 Ukraine's economy was decoupled from global developments, that was explained by Russian military aggression and domestically driven shocks. Through 2014 – Q1 of 2019 country-specific factors played a major role in driving interest rates and capital inflows to Ukraine. «Pull» factors of capital flows, i.e. real GDP growth rates, international reserves volume and total external debt level proved to be the major determinants of foreign capital outflow over 2014 – 1st half of 2016, and attracted the small amounts of foreign capital since the II half of 2016.

4. Impact of debt-creating capital flows on economic growth and external sustainability in Ukraine

In the framework of my previous study, I found that net foreign capital inflows had significant explanatory power across various specifications of macro-economic and financial variables in Ukraine (Bogdan, 2015). More specifically, I revealed that *capital flows have a statistically significant effect on fixed capital formation, domestic interest rates and real effective exchange rate (REER) of national currency.*

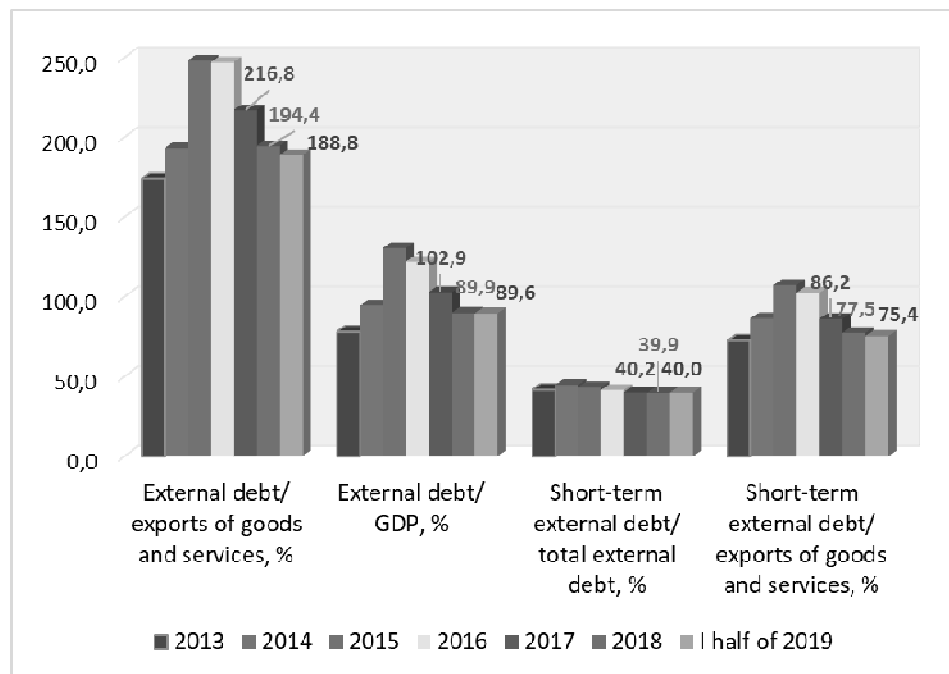
Notwithstanding these results, a question arises what effects the debt-creating flows and the accumulated external debt on the real GDP dynamics have. External debt is known to affect a country's external vulnerability through its impact on ability to discharge and service external obligations, as well as on country's access to international capital market.

Moreover, having a burden of external debt, national economy is getting sensitive to the impact of external shocks originated on the global markets. It's associated with the increased vulnerability of a recipient economy that may launch a chain reaction of crisis under the effect of capital flow reversals. Many emerging countries experienced this adverse scenario, as well as Ukraine in 2008–2009.

Currently, total external debt of Ukraine at 188.8% of exports is close to the threshold values and overruns the average indicators across the low- and middle-income economies. Figure 6 depicts Ukraine's external debt indicators over 2013–2019. Total external debt was on an upward path through 2014–2015 and started to decline gradually since 2016.

Fig. 6

Ukraine's external debt indicators in terms of ratios over 2013 – 1st half of 2019



Source: created by author on the basis of the National Bank of Ukraine data.

In particular, the following ratios raise concerns:

- total external debt approached 89,6% of GDP, whereas a threshold ratio is at 60%;
- short-term external debt amounted to 75,4% of exports, as a threshold ratio stands at 40%;
- short-term external debt reached 223,7% of international reserves, whereas a threshold ratio is known to be at 100% of reserves.

High level of external debt of Ukraine increases vulnerability of the different sectors of economy to external shocks, i. e., commodity price shock, economic growth shock in a partner country, a rise in global risk aversion, etc. Besides, excessive debt level exposes public and corporate finance to a higher debt

refinancing risk and interest rate risk that may drive financial crisis under deteriorating market conditions.

External sustainability analysis, carried out on Ukraine's data, suggests that an excessive external debt level, the volume of short-term external debt, the large amounts of debt service and repayments, as well as a low level of international reserves signal the high probabilities of debt distress and balance of payment crisis (see Bogdan, 2019).

Under significant external debt burden, a national economy records low and volatile growth rates. High levels of debt are detrimental to economic growth via economic uncertainty and low private investments channels. It also exposes a country to a higher debt refinancing risk on the capital market that may drive financial crisis. Overall, external debt increases vulnerability of the economy to shocks.

International experience suggest that debt crisis years are associated with a drop in GDP of between 2 and 5% per year, while bilateral trade flows fall up to 7% per year (International Monetary Fund, 2016). An extensive literature has established that excessive debt levels are associated with lower growth even in the absence of a crisis. Chudik, Mohaddes, Pesaran and Raissi (2015) provide a formal statistical analysis of debt-threshold effects on output, in a panel of 40 countries over 1965–2010. They showed that, regardless of debt thresholds, there is a significant negative long-run relationship between rising debt-to-GDP and 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. Krugman (1988) and Sachs (1988) suggest that heavy debt burdens act as implicit tax on the resources generated by a country.

With regard to public debt, the conventional view is that higher debt-to-GDP ratio can stimulate aggregate demand and output in the short run, but crowds out private investments and reduces output in the long run. In addition, there are likely non-linear effects in the debt-growth relationship, where the build-up of debt can impair economic growth, especially when the level of debt exceeds a certain threshold (see, for example, Reinhart and Rogoff, 2010, Kumar and Woo, 2010).

The relevant empirical research for Ukraine is based on quarterly data for Ukraine spanning Q1 of 2007 to Q1 of 2018, i. e., the used dataset consists of 45 observations. Time series were downloaded from the web sites of National bank and State Statistics Service of Ukraine. The primary purpose of this research is revealing and estimating the implications of accumulated external debt for the output trajectory.

In order to estimate the relationships between GDP growth and external debt ratio, the following regression was specified:

$$\text{GDP_GR} = 0.14 \times \text{OK_RAT}(-1) - 0.18 \times \text{GROSS_ED} + 15.4 + 0.78 \times \text{AR}(1) + 13.1 \times \text{SIGMASQ} \quad (4)$$

where: GDP_GR denotes real GDP growth rates, as a % to corresponding period of the previous year;

OK_RAT (-1) – capital investments growth rates, lagged 1 quarter, as a % to corresponding period of the previous year;

GROSS_ED – total external debt of Ukraine at the end of the year, as a % to annual GDP;

AR (1) – auto regression component.

Estimated coefficient of the dependent variable shows that external debt accumulation equivalent to 1% of GDP is associated with a real GDP decline by around 0.2 p. p. over the medium- and long-run.

The actual regression results (Table 2) indicate that all coefficients are statistically significant and have the expected signs. Seventy six percent of the variation of real GDP growth rates is explained by the variation in independent variables. Q-statistic signals quite low autocorrelations of the error term.

Table 2

Estimation output of the regression model

Dependent Variable: GDP_GR				
Method: ARMA Maximum Likelihood (OPG – BHHH)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FIX_CAP(-1)	0.13644	0.04804	2.84052	0.0071
EDEBT	-0.17961	0.06579	-2.73011	0.0094
C	15.3900	7.42993	2.07135	0.0448
AR(1)	0.77597	0.10912	7.11151	0.0000
R-squared	0.76394	Mean dependent var		-0.45111
Adjusted R-squared	0.74033	S.D. dependent var		7.52540
S.E. of regression	3.83475	Akaike info criterion		5.65101
F-statistic	32.3621	Durbin-Watson stat		1.47417
Prob(F-statistic)	0.00000			

Source: E-Views presentation.

Thus, key indicators of Ukraine's external sustainability reveals that attained macro-financial stabilization in Ukraine is rather fragile and may be destroyed any time under the impact of domestically- or externally driven shocks. It's attributed to high external debt burden, while basic criteria of the reserves adequacy are still not met and excessive debt service obligations are falling due in 2019–2020. I also found the significant negative long-run effects of external debt build-up on economic growth. Taking a future perspective, obtained results indicate that Ukraine's economy will grow faster if external imbalances are diminished and total external debt is placed on a downward trajectory.

Conclusions

Thus, vulnerabilities accumulated in a governmental sector, financial, external and real sectors under the impact of external and domestically driven shocks may unfold the chain of events that would drive financial crisis. The key mechanisms of shocks spillovers and crisis diffusion are related to foreign capital flows reversals, exchange rate devaluation, domestic capital flight, fiscal imbalance and modes of its financing, shrinking bank liabilities and capital, declining export proceeds, etc.

Excessive external debt and other vulnerability zones increase the exposure of emerging market economy to shocks and evolve a crisis scenario in the case of capital flows reversal. Rising world interest rates and declining world prices for commodities appeared to be the most powerful external shocks' transmitted to the economy of Ukraine up to 2014. The main areas and mechanisms of global shocks spillovers were evident on the balance of payments front, on the foreign exchange market, on the public finance front and debt sustainability area, as well as in the real sector of national economy. In 2014 – 2015, Ukraine had a combination of currency, banking, debt crises and economic recession that were brought about by Russian military aggression and were partially associated with accumulated domestic vulnerabilities.

Carrying out empirical research, I identified and estimated the global and country-specific drivers of the Ukrainian bonds spread. This study covers a period of 2004-2013, when Ukraine was in the vein of other emerging markets developments. Global risk sentiment, commodity price changes, real GDP growth in Ukraine, FX reserves and public debt accumulation proved to be the significant determinants of foreign capital inflows to Ukraine.

The analysis of the drivers of foreign bond spreads in Ukraine's economy clearly indicates that various global push variables played a significant role prior to crisis of 2014-2015. Since Ukraine, as many emerging economies, is a net exporter of commodities, higher commodity prices improved Ukraine's economic

perspectives and thus boosted cross-border flows. I also found that Ukrainian economy was highly sensitive to a global risk aversion and government bond spreads increased by about 38 basis points in response to a 1 of a p.p. increase in the VIX. The results imply that a degree of uncertainty at the global financial market typically significantly affect the cost of foreign financing for Ukraine's borrowers.

However, starting from 2014, Ukraine has been decoupled from global developments and above-mentioned relationships have vanished. Country-specific factors have gained the major importance since then. I found that real GDP growth by 1 p. p. is associated with foreign loans and portfolio investments inflows in the region of 100 million USD per quarter, while accumulation of international reserves by the National bank stimulate foreign capital inflow to Ukraine in the ratio of 5 to 1. Obtained results indicate that Ukraine's economy will grow faster if external imbalances are diminished and total external debt is placed on a downward trajectory.

Thus, «push» global factors of capital flows play a major role in driving capital flows as long as a business cycle in emerging economy is synchronized with a global business cycle; however, being affected by local or regional crisis an emerging economy is getting decoupled from the global developments. Consequently, country's economic perspectives and resumption of capital inflows is getting conditional, predominantly, on strengthening macroeconomic fundamentals and/ or solving geopolitical issues.

As to macroeconomic effects of debt-creating flows, our empirical research confirms that emerging market economy records low and volatile growth rates as well as a high exposure to external shocks under the significant external debt burden. Estimated coefficient shows that external debt accumulation equivalent to 1% of GDP is associated with a real GDP decline by around 0.2 p. p. over the medium- and long-run.

Our results suggest that policy makers in emerging economies should apply intensive efforts to withstand the potential disruptions that may be brought about by global shocks and domestically driven shocks. This empirical study (as many others) argues that active efforts of emerging market governments could improve the resilience of emerging markets to adverse shocks and make foreign capital more stable and accessible. In this vein, a spectrum of economic policy tools are recommended for Ukraine's and other emerging market governments in order to reduce a build-up of vulnerabilities and mitigate the risks, associated with capital flows. They encompass an efficient public debt management, implementing fiscal adjustment, strengthening macro-prudential regulation, attractions of foreign direct investments and accumulation of international reserves up to the adequate level.

References

1. Andersen C. (2018). The Problem with Debt. *Finance and Development*, 55 (1), p.2.
2. Ananchotikul N., Zhang L. (2014). Portfolio Flows, Global Risk Aversion and Asset Prices in Emerging Markets. *IMF Working Paper No WP/14/156*, International Monetary Fund, Washington.
3. Bogdan T. (2015). Debt-Creating Capital Flows and their Macroeconomic Implications in Ukraine. *Athens Journal of Business & Economics*, 1(2), pp. 135–152.
4. Bogdan T. (2016). Determinants of Capital Flows to Emerging Market Economy: A Case of Ukraine. *Transformations in Business & Economics*, 15 (37), pp. 127–146.
5. Bogdan T. (2019). External Financial Vulnerability and Gross External Debt of Ukraine: Current State and Risks as of 01.04.2019, Retrieved from: <http://optimacenter.org/research/zovnishnja-finansova-vrazlyvist-i-zovnishnjisukupnyj-borg-ukrajiny-potochnyj-stan-ta-ryzyky-stanom-na-01042019-r/>
6. Cerutti E., Claessens S., Puy D. (2015). Push Factors and Capital Flows to Emerging markets: Why Knowing Your Lender Matters More Than Fundamentals. *IMF Working Paper No WP/15/127*, International Monetary Fund, Washington.
7. Chudik A., Mohaddes K., Hashem Pesaran M., Raissi M. (2015). Is There a Debt-threshold Effect on Output Growth? *IMF Working Paper No WP/15/197*, International Monetary Fund, Washington.
8. Comelli F. (2012). Emerging Market Sovereign Bond Spreads: Estimation and Back-testing. *IMF Working Paper No WP/12/212*, International Monetary Fund, Washington.
9. Gruss B., Nabar M., Poplawski-Ribeiro M. (2018). Growth Accelerations and Reversals in Emerging Market and Developing Economies: The Role of External Conditions. *IMF Working Paper No WP/18/52*, International Monetary Fund, Washington.
10. Gonzalez-Rosada M., Levy-Yeyati E. (2008). Global Factors and Emerging Markets Spreads. *The Economic Journal*, 118, pp. 1917–36.
11. Hartelius K., Kashiwase K., Kodres L. (2008). Emerging Market Spread Compression: Is it Real or Is it Liquidity? *IMF Working Paper No WP/08/10*, International Monetary Fund, Washington.

12. Igan D., Kutan A., Mirzaei, A. (2016). Real Effects of Capital Inflows in Emerging Markets. *IMF Working Paper No WP/16/235*, International Monetary Fund, Washington.
13. Institute for International Finance. Global Debt Monitor. Slowdown in 2018 – Pause or Trend? (2018). Retrieved from: http://files.clickdimensions.com/iif-com-ai7nn/files/globaldebtmonitor_april_vf.pdf.
14. Institute for International Finance. (2019). *Capital Flows Tracker. Softer Flows to EM*, Retrieved on April 1, 2019 from: <http://files.clickdimensions.com>.
15. International Bank for Reconstruction and Development. (2019). *International Debt Statistics*, Retrieved from: <https://openknowledge.worldbank.org/handle/10986/30851>.
16. International Monetary Fund. Fiscal Monitor: Curbing Corruption. (2019). Retrieved from: <https://www.imf.org/en/Publications/FM/Issues/2019/03/18/fiscal-monitor-april-2019>.
17. International Monetary Fund. (2016). *Sovereign Debt Restructurings 1950–2010: Concepts, Literature Survey, and Stylized Facts*, Retrieved from: <https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Sovereign-Debt-Restructurings-1950-2010-Literature-Survey-Data-and-Stylized-Facts-26190>.
18. International Monetary Fund. (2016). Debt: Use It Wisely. *Fiscal Monitor*, Retrieved from: <https://www.imf.org/en/Publications/FM/Issues/2016/12/31/Debt-Use-it-Wisely>.
19. Krugman P. (1988). Financing versus Forgiving a Debt Overhang. *Journal of Development Economics*, 29, pp. 253–68.
20. Kumar M., Woo J. (2010). Public Debt and Growth. *IMF Working Paper No WP/10/174*, International Monetary Fund, Washington.
21. Milesi-Ferretti G. M., Cédric T. (2011). The Great Retrenchment: International Capital Flows during the Global Financial Crisis. *Economic Policy*, 26 (66), pp. 285–342.
22. Min H.G. (1998). Determinants of Emerging Market Bond Spreads: Do Economic Fundamentals Matter? *Policy Research Paper No 1899*, Washington, World Bank.
23. Reinhart C., Rogoff K. (2010). Growth in a Time of Debt. *American Economic Review: Papers & Proceedings*, 100 (2), pp. 573–78.
24. 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.