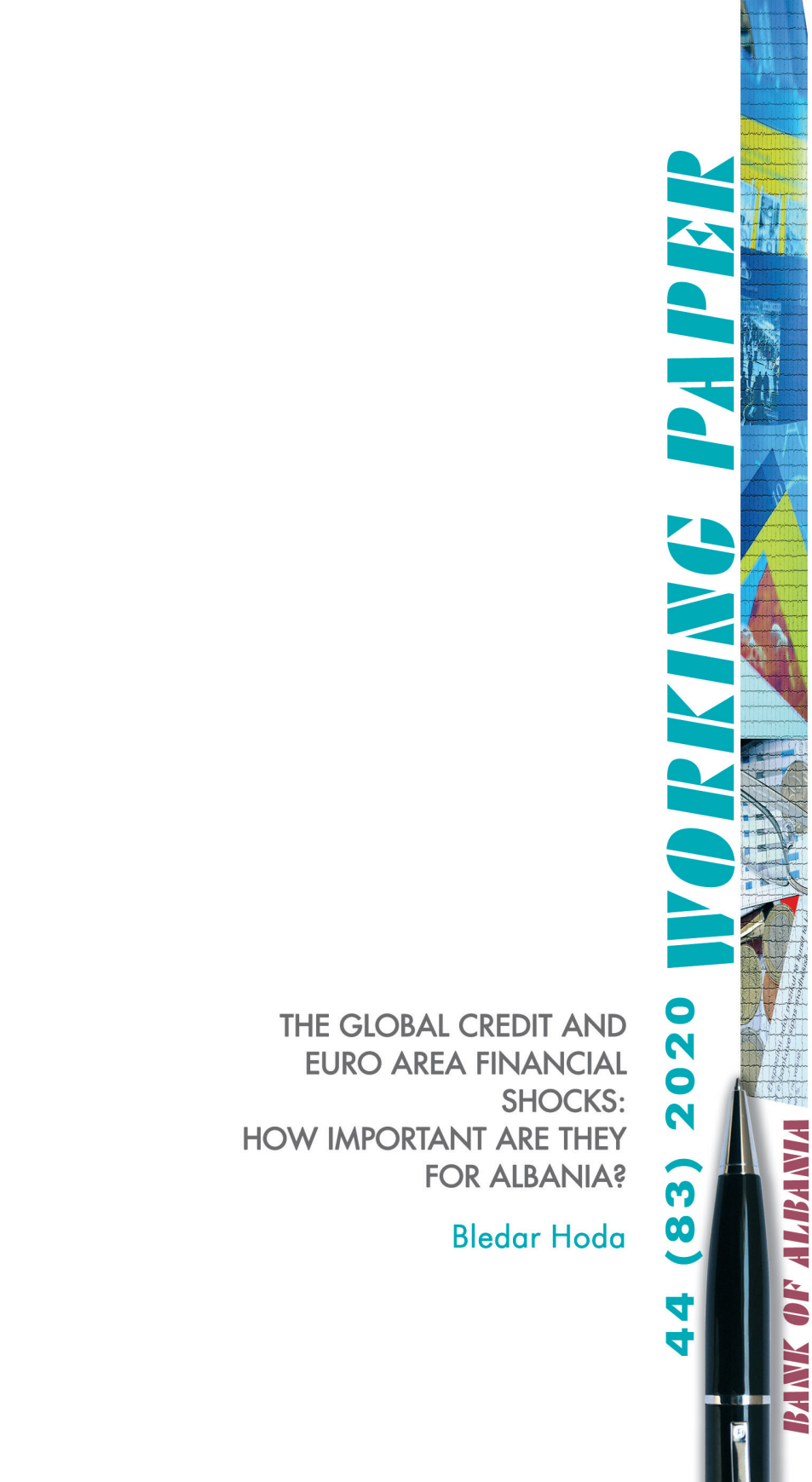

THE GLOBAL CREDIT AND EURO AREA FINANCIAL SHOCKS: HOW IMPORTANT ARE THEY FOR ALBANIA?

Bledar Hoda

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CONTENTS

ABSTRACT

Economies with open financial and capital account, high euroization and high foreign bank ownership are favorably exposed to global liquidity and foreign macro-financial shocks. In this study I assess how these forces have played out for Albania during the recent two decades. The set-up is a small open economy Bayesian VAR with global liquidity and Euro area variables accounting for non-domestic shocks. I find a strong impact of non-domestic shocks on key macro and financial variables of Albanian economy. Results indicate non-domestic shocks account for around 60-80% of variations observed in typical business and financial cycle indicators of Albania. Global liquidity shock is of the greatest importance explaining slightly less than ½ of fluctuations in aggregate demand and more than a 33% of variations in credit to GDP ratio of Albania. Shocks to Euro area financial variables are also critical drivers, though at a smaller scale. In the absence of a global liquidity shock, it is these Euro area financial shocks (bank credit and house prices) that account for more than ½ of variations in typical domestic macro and financial cycle variables.

Keywords: Global liquidity, financial cycle, Business cycle, Bayesian VAR, small open economy.

JEL Codes: E52, F42, C11, C32, G15

1 INTRODUCTION

The overlook of financial factors has been at the root of the recent crisis and of the following low growth rates in many advanced and emerging economies. The research expanding in the last decade has increasingly stressed the faster growth of financial variables as the underlying factor behind a potential crisis. Similarly, policymakers and academics are increasingly emphasizing the concept of financial cycle (FC) as a new critical measure for the macro-financial risks that build up prior to a crisis.

The increasing coherence of the financial cycle among advanced economies as shown by Jordà et al (2017) and the large share of these economies on the world GDP has led to the concept of Global Financial Cycle (GFCy)[1]. The GFCy is broadly defined as the monetary and financial conditions in largest advanced economies, typically identified with US that has a global currency and to a lesser degree in Euro area. To explore the main drivers of GFCy several studies identify it with global liquidity, which in turn is measured by cross-border credit (Avdjiev et al. (2017), Eickmeier et al. (2013), Cerutti et al. (2017)). The common finding of these studies suggests that factors like uncertainty (global risk), global monetary policy driven by MP of large economies like US as well as global credit supply and demand are key factors behind global liquidity.

The presence of a financial cycle at global level identified with cross border credit has implied that there are externalities arising from the financial or monetary cycles and policy actions in major advanced economies for smaller ones. It is those externalities that to an extent shape the financial and economic performance of small open and emerging economies. There are ground reason for externalities to exist, particularly due to increasing integration of small and emerging economies to the global economy and global financial markets.

Over the course of recent three decades, Albania has seen

[1] *The most comprehensive study is the one by Jordà et al (2017) with data from 17 advanced economies going back 140 years.*

drastic transformations of its economy, in terms of trade and finance with advanced major economies as well as in terms of its financial system modernization. Following this process of transformation, a few characteristics of the Albanian economy have come to stand out as candidates that potentially alleviate the transmission of foreign shocks into the domestic economy.

1. First, Albania has an ***open financial and capital account*** and in order to finance its large investment needs relies largely on financial and capital flows from abroad. At the peak of the global financial crisis, in 2009, these flows together peaked at around 19 % of GDP before returning to the historical average of 10% of GDP.

The large share of capital and financial inflows to GDP, indicates that the economy is potentially exposed to both business and financial cycle shocks from large advanced economies[2]. A surge in financial/capital inflows may trigger a crowding in effect by fuelling further demand for credit in Albania. The 'crowding in' effect in credit to economy only amplifies the direct impact that financial and capital inflows usually have on aggregate demand and business cycles in an economy. As a significant share of financial and capital flows comes from Euro area economies, it is the Euro area financial cycle that has a great potential to influence the dynamics of the domestic economy.

2. Second critical feature is ***high euroization*** in the balance sheet of the financial system in Albania. About 50% of total banking system deposits and 50% of outstanding credit is denominated in foreign currency[3].

Although the assets of the Albanian financial system are almost fully funded by domestic liabilities, denominated in both domestic and foreign currency, euroization is critical for the transmission

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[2] *Alternatively, fluctuations might as well be due to country-specific factors.*

[3] *Early in the 2000s, the degree of euroization in Albanian banking system was different. Bank deposits in foreign currency accounted for about 20-25% of total deposits while outstanding credit in foreign currency made up for about 70% of total credit, in 2000-2004. As banks' credit portfolio started to go up, deposit euroization increased while credit euroization declined, both towards 50% of the total outstanding amount.*

of foreign shocks, particularly financial shocks. Easy global financial conditions allow low interest rates abroad to influence the opportunity cost of funds at home (i) directly for credit to economy in foreign currency and (ii) indirectly, through uncovered interest rate parity, for credit to economy in domestic currency. The severity of these two effects should grow in proportion to the high degree of financial euroization.

3. Third, Albanian financial system has had ***foreign bank ownership*** in the range of 70-80% since the early 2000s until recently. It is only in the last couple of years that banking system ownership has gone through some changes in terms of ownership. In times of crisis, there are at least two channels through which such high foreign ownership of banking system can become relevant for the transmission of shocks from the advanced economies to smaller emerging ones, the ***liquidity channel*** and the ***equity channel***.

(a) The liquidity channel.

While the banking system balance sheet expansion in Albania prior to 2009 has been almost fully funded by bank deposits of domestic households, high foreign ownership allows for the internal capital market channel to be active. High foreign bank ownership of the banking system allows for the liquidity to flow both ways:

(i) from the parent to the affiliate (parent-to-affiliate), in case the latter finances credit with cross-border inflow from parent bank, or
(ii) from the affiliate to the parent bank (affiliate -to- parent) if the parent bank cannot get liquidity from third parties, but rather sacrifices the intermediation in the host country of the affiliate to fulfill the liquidity requirements of the parent bank.

The first case may happen during an expansion phase. When local affiliates finance expansion with cross-border inflows, then cutting down on cross border flows (parent-to-affiliate) may transmit a foreign financial shock into an emerging economy. Albanian banks could have only temporarily be exposed to such a scenario at

a particular point in 2009, when net foreign assets of the banking system fell close to zero only for a short period of time before picking up again. The stock of net foreign assets of the banking system had been critical for the financing of credit expansion up to that point.

The second case is rather straight forward and difficult to trace. A potential scenario is possible right in the aftermath of the crisis. Such a scenario happens when parent banks in home countries (i.e Euro area) calls for liquidity support by affiliates and dries up liquidity in smaller economies where these affiliates are located.

(b) The equity channel

In times of crisis, capital becomes quite expensive for banks. Any increase in balance sheet leverage of affiliate banks operating in the host country requires additional capital, which can take the form of either retained earnings or new equity supplied by the parent bank. The local affiliates of parent banks operating in Euro area may limit further leveraging in smaller economies as the parent bank cannot support this leveraging by injecting additional capital or it may call for the (retained) earnings of its affiliates to be repatriated as dividends.

The above channels could account for the transmission effects in addition to the trade and remittances channels that make small and emerging economies subject to international business cycle shocks originating in advanced economies.

The focus of this work is to shed light on the sensitivity of the Albanian economy to foreign financial cycle dynamics over the recent two decades. The findings would be helpful in projecting the potential of the latter to influence macro and financial developments in the future.

The objective is to assess "how critical the impact of Euro area financial cycle, and potentially of global liquidity, for the macro-financial dynamics in Albania is"[4]. The study addresses the question

[4] *BIS narrowly defines global liquidity as the outstanding amount of cross-border bank flows to banking and non-banking sectors.*

by assessing the magnitude of the impact of foreign shocks identified with business and financial cycles abroad on a few similar financial and macroeconomic indicators of the Albanian economy. Results may emphasize the role of foreign financial shocks and contribute to the existing knowledge available to policymaking in minimizing the adverse effects of the foreign financial cycle on domestic economy. Next, the study proceeds by summarizing key trends in literature, discussing the data and methodology and presenting the results. The paper ends with some concluding remarks.

2 LITERATURE REVIEW

In broad terms, financial cycles identify with imbalances in credit and financial markets in a particular economy (Borio, 2014). There is a growing emphasis on these imbalances as they are closely associated with and precede systemic banking crisis (Drehman et al (2012), Schüler et al (2017)) and as these imbalances play a critical role in the modern business cycles (Jordà, Schularick, & Taylor, 2011).

Empirical evidence is suggestive that the excesses in these markets are not isolated episodes without any correlation among economies. Empirical evidence by Jordà et al (2018) are conclusive that in a sample of more than 100 years, the synchronization of credit, house prices and equity prices in developed economies has trended upwards to new historical highs in the last three decades.

The financial cycle is not observable, but a few most common statistical approaches are employed to get a reasonable measure from the credit and asset price variables. Identification of the cycle relies on the extracted cyclical component of typical financial variables closely linked to asset prices or ones that capture the leverage of the financial intermediaries, like credit to economy. The general trend is to employ statistical approaches like turning point analysis or frequency-based filters to generate statistical measures of the financial cycle[5]. Claessens et al (2011), Claessens et al (2012), Drehmann et al (2012), Stremmel (2015), Schüler et al (2015), Mandler & Scharnag (2019) document some of the statistical methods employed to measure the financial cycle. A frequency-based band-pass filter is used to extract the financial cycle from credit, asset price and banking system balance sheet data in Albania (Kota & Goxhaj, 2019).

Having obtained a statistical proxy, many studies usually proceed by measuring the synchronization of financial cycle across economies. A high correlation or concordance index of the extracted cycles among economies is seen as a sign of potential

[5] *The turning point analysis sets cyclical peaks and troughs in a time series using an algorithm while frequency-based filter analysis relies on filtering techniques to isolate fluctuations with a particular frequency.*

synchronization of financial cycle across these economies. The depth and broad coverage across world economies of the financial crisis of 2007-2008 had already signaled a high correlation of financial cycles.

In a closely related stream of literature, a quickly growing literature makes use of global liquidity as a synthetic indicator of the financial cycle at global level. In general, by 'liquidity' is usually meant the amount of cash or equivalents available to buy services, goods or assets. In macroeconomics, 'liquidity' is measured by one of the monetary aggregates, more often a narrower definition (Rueffer and Stracca (2006), D'Agostino and Surico (2009)).

More recently, a commonly used measure of global liquidity that comes up often in literature is based on credit (Domanski et al. (2011), Bruno and Shin (2015))[6]. Unlike monetary aggregates relying on a particular set of bank liability, credit is the last link of the chain that represent financial intermediation. The advantage of credit variable to monetary aggregates is that, unlike the latter, credit accounts for the various types of liabilities employed to fund it that might not necessarily be included in monetary aggregates. As a major share of credit in largest economies is accounted for by cross-border credit (Borio, McCauley, & McGuire, 2011), the latter has become an easily available global liquidity proxy to capture financial cycle. Domanski et al. (2011) concludes that "… growth in international bank credit exhibits boom-bust cycles that appear to correspond closely to episodes of financial distress".

A rich list of research is focusing on the impact of global financial cycle in national macroeconomic and financial indicators, motivated by the exogeneity of a global factor to country-specific indicators. A review of literature shows that the international cross-border credit is quite a common indicator used in recent literature to capture the dynamics of global financial cycle. There are at least three different streams of growing literature that rely on cross-border credit as a proxy indicator for global financial cycle and global liquidity. The first is the literature on international capital flows. The second is

[6] *Domanski et al. (2011) conclude that '…co-movement of cross-border credit and risk appetite proxies appears consistent with the notion of a global liquidity cycle'.*

on bank leverage and credit supply at national level, particularly through securities and loan supply. The third strand of literature is on monetary policy and to a lesser degree on macro-prudential policy.

In the first strand, recent research has been focusing on the global liquidity and global factors ('push' factors) as key drivers of capital flows (Rey (2013), Passari & Rey (2015), Forbes & Warnock (2012), Cerutti et al. (2015)). These studies conclude that global liquidity as a proxy of global financial cycle explains a significant portion of capital flows to advanced and emerging economies. In many emerging markets capital flows co-movements hide significant heterogeneity across countries (Cerutti, Claessens, & Puy, 2015) and that borrowing economies can limit their exposure to volatile capital flows by adjusting their macro frameworks and other regulatory tools (Cerutti, Claessens, & Ratnovski, 2015). This viewpoint is further justified by the findings that global factors cannot account for more than a ¼ of variations of capital flows in most countries after the 1990s (Cerutti, Claessens, & Rose, 2019).

To some degree these different conclusions may mirror the different characteristics of emerging markets versus advanced economies. Cesa-Bianchi et al. (2015) support the view that global financial cycle has a stronger effect in emerging economies rather than in advanced economies. A more flexible story is proposed by Ghosh et al. (2014) who conclude that global factors may determine the timing of capital flow surges, while country-specific variables determine their magnitudes.

The second stream of literature addresses the significance of global liquidity and global financial cycle for the credit markets and bank leverages in local financial systems (Bruno and Shin (2014), Cetorelli & Goldberg (2011), Schnabl (2011), Miranda-Agrippino & Rey (2015)). The transmission of global financial cycle takes place through bank leverage (Bruno & Shin, 2014), cross border bank lending (Cetorelli & Goldberg (2011), Cesa-Bianchi et al. (2017) or returns of risky assets (Miranda-Agrippino & Rey, 2015).

Another stream of papers highlights the importance of global financial cycle and global liquidity for the transmission mechanism

of monetary policy (Ma & Zhang (2016), Bruno and Shin (2015), Obstfeld (2014), Han & Wei (2016)). The general view is that the global liquidity matters for the transmission of monetary policy through bank leverages, capital flows and eventually national business cycles. In particular, the bank leverage cycle is a critical determinant of the transmission of global financial conditions across borders through banking sector capital flows (Bruno and Shin (2014)). It may be difficult to maintain monetary policy autonomy even in countries with flexible exchange rate regimes (Han & Wei, 2016). A stronger response by monetary policy is advised to smooth shocks to economy coming from these flows (Ma & Zhang (2016), Obstfeld (2014)).

Across this literature there are a few cases that are relevant to this study in analyzing the impact of an international financial cycle on a few domestic variables that characterize the business cycle and the financial cycle of a local economy.

Cesa-Bianchi et al (2015) employ global liquidity as a proxy for international financial cycle to assess its impact on local variables of emerging and advanced economies, like consumption, current account, house prices and exchange rate. Their findings suggest **global liquidity shock has a stronger effect on house prices and consumption of emerging economies than it had in advanced ones.**

In a similar paper, Cesa-Bianchi et al (2017) document that it is a positive shock to the leverage of US Broker-Dealers that leads to the increase in country-specific cross-border flows, house prices, real exchange rate, consumption and in current account deterioration. A corollary of their analysis is that **the effect is stronger, the higher the dollarization and the higher the maximum (limit) loan-to-value are in a particular economy.**

Another relevant study is the one by Jordà et al. (2018), in which the authors assess the impact of key US variables, commonly identified as drivers of the global financial cycle, on consumption, house prices, exchange rate, current account (as a ratio to GDP) and cross-border credit for 17 advanced economies. The data in their paper span more than 140 years. The paper supports evidence to

the hypothesis of **very high synchronization of financial cycles in the last 2-3 decades relative to earlier periods.**

In Cetorelli and Goldberg (2011) examine cross border lending data from balance sheet of banks operating internationally across different countries. They investigate how transmission of global liquidity shocks takes place via the operations of these international or global banks onto foreign bank affiliates and local banks operating in an emerging economy. They conclude that transmission may take place through both (i) cross-border lending and (ii) internal capital markets. In simple terms, **the former implies a parent bank facing liquidity shock may not lend to affiliates in emerging country. Transmission through internal capital market implies the affiliate in emerging country transferring liquidity to parent bank facing a liquidity shock.**

In taking stock of these working papers there are a few results that stand out. The global financial cycle

(i) has a stronger impact on emerging economies' business cycle (consumption) and financial cycle (house prices) compared to advanced countries,
(ii) has a stronger effect on dollarized economies and on the ones with high loan-to-value ratio,
(iii) has been increasingly synchronized over the last 2 decades, and
(iv) can take place via two type of operations, cross-border lending and internal capital markets.

The findings from the literature are quite relevant to Albanian economy as well. Albania is a small open economy with a macroeconomic structure similar to that of many emerging economies. The Albanian economy shares those features mentioned in (i – iv). In particular Albania has liberalized the capital and financial account, and

- is a dollarized economy with around 50% of the outstanding total bank loans and deposits of banking system denominated in foreign currency, mainly in euros;

- has been through a similar credit expansion phase during 2004- 2009 as in many Euro area economies as bank credit to GDP in percentage points went up from a single digits towards 25-30% of GDP;
- has a high foreign bank ownership reaching up to 70-80% of banking system at least until a couple of years ago.

The similarities of Albanian economy with other emerging economies that are subject of the recent studies raises the prospects of potential effects of global financial cycle in Albania. To what extent these similarities have led to measurable implications of the global and foreign financial cycles on the business cycle and financial cycle of Albanian economy? In this paper I address this question. I provide evidence on the scale of the potential impact, rather than attempt to assess the transmission channels.

3 METHODOLOGY AND DATA

To analyze the impact of international financial shock in Albanian economy I employ a VAR methodology. I estimate three different representations to emphasize the role of foreign financial cycle for the Albanian economy, and compare their results.

(a) The first set up is a simple VAR of domestic variables that aim to represent the dynamics of the business cycle and financial cycle. The set of data I include in this single block of home variables mimics the block of macro and financial data that are used in similar studies.

(b) This VAR framework is a small open economy VAR with two block of variables, a home block and a foreign block consisting of variables of the same nature.

(c) The third one is my baseline VAR. I employ an exogenous global variable in addition to the two sets of variables, foreign (Euro area) and home (Albanian) variables used in the previous VAR. This is still a small open economy VAR representation with block exogeneity, whereby foreign (Euro area) variables are allowed to have an impact on local ones but not vice versa, neither contemporaneously nor with time lags. In addition the global liquidity variables is exogenous to both the foreign block and the domestic block of variables and captures the global financial cycle. It can have an impact on both Euro area and on the home (Albanian) variables, but not vice versa. Indeed the global variable follows an AR(p) process, where 'p' is the lag order of VAR.

I will shortly summarize the structure of the three VARs estimated in this study: the baseline VAR (c), the small open economy VAR (b) and simple VAR with only a block of domestic variables. For the sake of reference I will be using the terms global, foreign and home to imply the following:

- 'global' is used to mean a shock or variable at global level,
- 'foreign' is used to mean a shock or variable of Euro area,

- 'non-domestic' will refer to both global and foreign shocks or variables, and
- 'home' or 'domestic' will refer to variables of economy in Albania or shocks to them.

3.1 The Block Exogeneity in VAR

For any vector $n\ x\ 1$ of domestic and non-domestic variables $Y_t=(Y_{1,t},...Y_{n,t})$, the structural representation is written as a VAR(p) model

$$A_0\ Y_t=A_1\ Y_{t-1}+\cdots+A_p\ Y_{t-p}+\epsilon_t \quad (1)$$

ϵ_t is the set of i.i.d orthogonal shocks and $A_0...A_p$ are the matrices of impacts at lags $0....p$, with lag zero implying the contemporaneous effect. The reduced form VAR is

$$Y_t=B_1\ Y_{t-1}+\cdots+B_p\ Y_{t-p}+u_t \quad (2)$$

where, B_s is a $(n\ x\ n)$ dimensional matrix of coefficients such that $B_s=A_0^{-1}\ A_s$, for $\forall s=1...p$ and $u_t=A_0^{-1}\ \epsilon_t$ is the vector of reduced form innovations with $u_t\sim WN(0,\Sigma)$, that is $E[u_t,u_t']=\Sigma$.

The estimation of a VAR with only the home block is straightforward as in equation (1), where Y_t would consist of only home variables, $Y_t=Y_t^H$.

$$A_0\ Y_t^H=A_1\ Y_{t-1}^H+\cdots+A_p\ Y_{t-p}^H+\epsilon_t \quad (3a)$$

Estimation of a small open economy VAR framework assumes exogeneity of foreign block. The block exogenity implies that domestic variables do not have an impact on non-domestic variables neither contemporaneously nor by a lag. Assuming the vector of variables is made of only home (H) and foreign (F) variables, $Y_t=[Y_t^F,Y_t^H]'$, whereby the home variables cannot have an impact on foreign ones, then the structural VAR representation would be as following.

$$\begin{bmatrix}\tilde{A}_{11} & 0\\ \tilde{A}_{21} & A_{22}\end{bmatrix}\begin{bmatrix}Y_t^F\\ Y_t^{\mathrm{H}}\end{bmatrix}=\begin{bmatrix}A_{11} & 0\\ A_{21} & A_{22}\end{bmatrix}\begin{bmatrix}X_t^F\\ X_t^{\mathrm{H}}\end{bmatrix}+\begin{bmatrix}\epsilon_t^F\\ \epsilon_t^{\mathrm{H}}\end{bmatrix} \quad (3b)$$

Here I have used the following definitions: $\tilde{A}_{11}$ is the component matrix in the *i*-th row and *j*-th column of the contemporaneous matrix A_0 from equation (1), the matrix A_{11} is the component of the matrix of lagged coefficients A of eq. (1), $X_t^i=[I,Y_{t-1}^i,\ldots Y_{t-p}^i]'$ *for* $i=[EA,AL]$ for is the matrix of lagged data, and is the vector of foreign and domestic (home) exogenous innovations, respectively.

I go one step further, by adding a global block of variables to the above system. The global block is exogenous to the former two blocks, the foreign and the domestic block. In this particular case the exogenous block is made only of a global liquidity variable. The innovations to this global indicator represent the global financial cycle and competes with innovations to foreign financial shocks in Euro area in explaining the fluctuations in foreign and home block. The representation of structural VAR is an extension of equation (1), with $Y_t=[Y_t^G,Y_t^F,Y_t^H]'$. Each vector of variables Y_t^i, *for* $\forall i=G,F,H$, for is block exogenous to the following block of vector(s).

$$\begin{bmatrix} \tilde{A}_{11} & 0 & 0 \\ \tilde{A}_{21} & \tilde{A}_{22} & 0 \\ \tilde{A}_{31} & \tilde{A}_{32} & \tilde{A}_{33} \end{bmatrix} \begin{bmatrix} Y_t^G \\ Y_t^F \\ Y_t^H \end{bmatrix} = \begin{bmatrix} A_{11} & 0 & 0 \\ A_{21} & A_{22} & 0 \\ A_{31} & A_{32} & A_{33} \end{bmatrix} \begin{bmatrix} Y_t^G \\ Y_t^F \\ Y_t^H \end{bmatrix} + \begin{bmatrix} \epsilon_t^G \\ \epsilon_t^F \\ \epsilon_t^H \end{bmatrix} \qquad (3c)$$

Having only one variable in the vector of global variables Y_t^G, assumes the global liquidity variable follows an exogenous AR process.

3.2 Data

I employ variables that are broadly associated with the business cycle properties and that typically represent the financial cycle in an economy. In selecting the variables I follow standard literature that use similar VAR methodology and focus on the dynamics of financial cycle[7]. The vector of Euro area variables is:

$$Y_t^F=\{ea.\ CIr_t,\ ea.\ CAY_t,\ DJr_t,\ eaCPSy_t,\ ea.\ HPr_t\} \qquad (4)$$

[7] *For a list of relevant papers see Lodge & Manu (2019) Cesa-Bianchi et al (2015), Cesa-Bianchi et al (2017), Jordà et al (2018), Cetorelli & Goldberg (2011).*

$\{ea.\ CIr_t\}$ is the (annual growth of) sum of real consumption plus real investment, $\{ea.\ CAY_t\}$ is the (annual change of) the ratio of current account to GDP, $\{ea.\ DJr_t\}$ is the (annual growth of) deflated Dow Jones index for Euro area, $\{eaCPSy_t\}$ is (the annual change of) credit to private sector to GDP ratio, and $\{ea.\ HPr_t\}$ is the deflated house price index.

The set of variables is common across the lists of various studies I referred to in the previous section (2. Literature Review). It is standard across these studies to use a couple of variables that are associated with fluctuations in business cycles and another two or three variables that capture financial cycle dynamics. For the latter the use of house prices and credit to GDP ratio is quite standard in literature. Employing the Dow Jones index in euro area enables one to distinguish between the dynamics due to financial market stress those due to the financial cycle effects.

One key difference is that most authors employ consumption or GDP as a variable to identify fluctuations of business cycles. Unlike these studies, I prefer the sum of consumption and investment. The use of such variable is to keep the consistency with the set of domestic variables used in the home block. The GDP series in Albania shows little fluctuation compared to the business cycles of the sum of consumption and investment. Using only consumption might also be problematic due to issues with the statistics. To be consistent in the use of a business cycle variable, in both blocks I employ the sum of the two, consumption and investment in real terms, as a best compromise rather than the GDP.

The home block is similar to the foreign one, with the following vector of variables

$$Y_t^H = \{ al.CIr_t,\ al.CAYxm_t,\ NEER_t,\ alCPSy_t,\ al.HPr_t \} \quad (5)$$

As the notations are the same, the only variable that is different from the foreign block is the nominal effective exchange rate ($NEER_t$) which has replaced a stock market index in the foreign block. Since there is no such index in Albania, I have used the exchange rate. All data are available for the period 2001-2018 on quarterly basis.

One key difference in the treatment of data is that I have used the absolute value of the current account deficit in Albania, while in euro area the current account balance is in surplus. Therefore an upward response of $\{al.CAYxm_t\}$ implies a higher current account deficit in Albania, while a positive response of $\{ea.\ CAY_t\}$ implies an higher current account surplus in Euro area.

3.2.1Order of the Variables

The ordering of the variables in equations (4) and (5) is not random. It is particularly helpful to make use of the Cholesky identification scheme. The block of financial variables $\{NEER_t, alCPSy_t, al.HPr_t\}$ and $\{DJr_t^*, eaCPSy_t^*, ea.HPr_t^*\}$ is ordered last to allow shocks in the first two to have a contemporaneous impact. The motivation is that financial variables have a higher frequency that can be observed and agents can take decision with respect to factors affecting these financial variables at a similar frequency.

In principle, the financial cycle variables $\{alCPSy_t, al.HPr_t\}$ are ordered last within both, the foreign and the domestic blocks, to allow the shocks of the within-block variables compete equally with global shocks in driving the financial cycle component of these two variables. Motivated by the same argument, within the group of financial variables, the ordering of house prices is assumed to allow shocks to the 'credit to economy' $\{alCPSy_t\}$ within the block to compete at an equal foot with the foreign shocks to 'credit to economy' $\{eaCPSy_t^*\}$ in euro area and with the global liquidity shock. By construction, the latter two have a contemporaneous effect on $\{al.HPr_t\}$.

In an euroized economy, where house prices are commonly expressed in foreign currency and half of credit to economy is denominated in foreign currency, letting exchange rate shocks have a contemporaneous effect allows the same advantage to the global liquidity variable. Based on that reasoning, is ordered before $\{eaCPSy_t\}$ and $\{ea.HPr_t\}$ to allow the former have an impact on both.

Finally, an aggregate demand shock, typically identified with the

sum of consumption and investment, $\{al.CIr_t\}$ is allowed to have a contemporaneous effect on current account $\{al.CAYxm_t\}$. The latter should be driven by both, the aggregate demand and the terms of trade shocks. The former is captured by the $\{al.CIr_t\}$ and is allowed to affect both variables. But a terms of trade shock that usually affects current account should not have a contemporaneous effect on aggregate demand. The argument motivates the ordering of the first two variables within the foreign and domestic block of variables in equations (4) and (5).

3.3 Bayesian Estimation (BVAR)

There is a total of 11 variables in the basic structural VAR of equation (3b). For a set of quarterly data in a sample of 18 years, the number of coefficients to be estimated is still large even when this number is reduced due to block exogeneity imposed on foreign variables. Bayesian estimation is useful in at least two aspects. The approach allows the introduction of priors on the coefficients of lagged variables B of the reduced form VAR and on the variance-covariance matrix Σ. On theoretical and empirical grounds, the estimation improves VAR forecast performance (Litterman, 1986). From a practical perspective, it also helps in setting the block exogeneity restriction in a convenient way for econometric estimation.

In this study I perform the estimation using the BEAR toolbox (Dieppe, van Roye, & Legrand, 2016). The toolbox allows Bayesian estimation of VAR coefficients for different prior distributions and for different values of hyper-parameters. The toolbox is sufficiently flexible to accommodate VAR estimation with time series and panel data via the Bayesian technique. It has very good documentation to support performing BVAR estimation. For a broader discussion of Block Exogeneity and Bayesian VAR in the case of Albania see an earlier paper (Hoda, 2018).

4 RESULTS

4.1 Impulse responses

I first estimate the impulse responses (hereby IR) of the VAR model in equation (3c) with and assess how domestic variables respond to the Euro area (EA) and the global shocks. In Figure 1 to Figure 3 of Appendix I report the responses of home and domestic variables to the global and foreign (Euro area) shocks. Some of the impulse responses in these figures are squared in dashed lines. These are the IRs of variables whose fluctuations are explained by the respective shock above a 10% arbitrary threshold, based on the forecast error variance decompositions (FEVD).

- **Euro area IR**

To get an indication of the validity of the results it is useful to check how foreign (Euro area) variables respond to the shocks. IRs are shown on the left panel of each page from Figure 1 to Figure 3. An eyeball view of IRs suggest they are mainly in line with expectations.

- The 'global liquidity' shock stimulates expansion of aggregate demand, leads to a shrinking of current account surplus in Euro area, and raises the credit to economy as a share of GDP and pushes the (real) house prices up. Aside from the weak impact on aggregate demand and in Dow Jones index, global shock explains 20-30% of the volatility of the two financial variables and of current account to GDP (squared in dashed lines).
- An aggregate demand shock does not have a considerable effect on neither financial variables nor current account or Dow Jones index of Euro area based on FEVDs. The positive demand shock reduces the current account surplus of Euro area, and leads to a slight decline in the credit to GDP ratio.
- Following a shock to current account (surplus) over GDP ratio, euro area aggregate demand and Dow Jones index go up. As the economy expands, while the outstanding credit stock does not change, the credit to GDP ratio declines although house prices increase in real terms. The current account shock,

which can potentially be a terms of trade shock, accounts for around 15-25% of the volatility of each Euro area variables.

- A positive shock to credit-to-GDP ratio drives up aggregate demand, reduces the trade surplus, boosts stocks markets and pushes house prices up. A positive shocks can explain around 10% of volatility in aggregate demand, in stock market fluctuations and in house prices.
- Finally an exogenous shock to house prices drives up both macro and financial variables in Euro area, but the shock accounts for only 20% and 10% of volatility in aggregate demand and in credit to GDP ratio, respectively.

- **Home IR**

The 'global liquidity' shock has a significant impact on all home (Albanian) macro and financial variables and explains a sizeable fraction of each of these variables (upper-right panel of Figure 1.).

- The global shock triggers an increase in domestic aggregate demand.
- It first triggers appreciation of domestic currency and contraction of current account deficit.
- The positive global shock supports the growth of credit to economy and the increase in house prices in Albania with a lag. As these two financial variables respond with a lag, a year after the shock takes place, exchange rate depreciates and current account deficit expands, probably in response to the credit growth.

<< Figure 1 to Figure 3 here >>

The 'shocks to foreign macro and financial variables' (Euro area ones) explain a share of only some of the domestic (Albanian) variables. The impulse responses are shown on the right side of Figure 1 and Figure 2. I summarize the effect of global and foreign shocks only in case that particular shock explains more than 10% (arbitrary) of fluctuations of a variable based on FEVD (Chart 1)[8].

[8] *Empty cells indicates the shock does not explain much of fluctuations of that variable (based on FEVD). The picture is quite similar even when I choose an arbitrary threshold between 6 and 10 percent.*

- A shock to foreign consumption and investment (EA) drives upward the two domestic (Albania) financial variables, credit to economy and house prices.
- A shock to the foreign current account surplus (EA) has a negative effect on the home current account (declining deficit), on exchange rate (appreciating) and on credit to economy (decline).
- Shocks to the foreign financial variables have a positive impact on the domestic financial variables.

Chart 1. IR signs of some of the Euro area and Albanian variables following foreign (EA) and global shocks.

	$GLI.x_t$	CI_t^*	CAy_t^*	DJr_t^*	$CPSy_t^*$	HP_t^*	CI_t	CAy_t	$NEER_t^*$	$CPSy_t$	HP_t
Global Liq.$\{GLI.x_t\}$ shock	x		–		+	+	+	–	–	+	+
EA Demand shock $\{CI_t^*\}$		x								+	+
EA CA/GDP shock $\{CAy_t^*\}$		+	x	+	–	+		–	–	–	
EA Dow Jones $\{DJr_t^*\}$ shock		+		x		–					
EA Credit/GDP $\{CPS_t^*\}$ shock		+		+	x	+			+	+	+
EA House Price $\{HPr_t^*\}$ shock		+			+	x		–	+	-/+	+

The impulse responses of domestic variables to foreign shocks (Euro area) are very similar to the ones that come out from estimation of the VAR model in equation (3b) without an exogenous global block, hence without a global liquidity variable ($Y_t=[Y_t^F, Y_t^H]'$).

4.2 Forecast Error Variance Decompositions

The impulse responses showed that the domestic variables associated with business cycle and financial cycle in Albania respond positively to a global financial (global liquidity) shock. These responses are consistent with theoretical expectations. The IRs so far support the hypothesis that improved financial conditions at global level and at Euro area level have a positive impact on Albanian economy. This result begs the question how strong their impact is.

4.2.1 What drives HOME variables?

The forecast error variance decompositions (FEVD) from the estimation of VAR equation (3c) with the vector of variables

$Y_t=[Y_t^G, Y_t^F, Y_t^H]'$ are shown in Chart 4 of Appendix. The few results that stand out when looking at that chart are summarized below.

The FEVD results indicate that the global financial shock is a major factor in driving the dynamics of domestic macro and financial variables. The shock can account for:

- up to 45% of fluctuations in domestic demand (consumption plus investment) at its peak 6 quarters after the shock,
- up to 36% of fluctuations in domestic credit-to-GDP ratio at 12 quarters after the shock, and
- up to 15% of variations in domestic real house prices at 12 quarters after the shock.

Of the five different foreign (Euro area) shocks, three of them have a particularly strong impact in driving some of the domestic variables.

- Foreign aggregate demand (sum of consumption and investment) shock and foreign credit-to-GDP shock have a particularly strong impact on the dynamics of domestic credit-to-GDP and of domestic house prices. Each shock can drive up 20-25% of fluctuations of those two domestic financial variables.
- Foreign current account shock (as a ratio to GDP) drives a critical share (up to 25%) of exchange rate fluctuations. This is probably a due to a terms of trade shock. As there is no exchange rate variable in the Euro area block, the foreign current account shock captures both the real exchange rate effect and the relative price effect.

Other non-domestic shocks are also critical in driving the Albanian economy. Since the number of shocks is relatively large, 11 of them, counting on them one by one may dilute the overall impact of foreign shocks on domestic ones. I classify the shocks into groups of similar nature in the foreign and domestic blocks and construct indices of the sum of the median FEVD of shocks in each group. A graphical representation of these indices will help to get a better picture of the impact of foreign and global shocks on the dynamics of the Albanian macro and financial variables.

I arrange the foreign and domestic shocks into two categories, Business Cycle & Terms-of-trade shocks (BC-ToT) or Financial Cycle (FC) shocks. In the case of domestic block, the BC shocks include aggregate demand, current account to GDP and exchange rate shocks. These are some of the standard macro shocks that drive the business cycle of an economy. The domestic FC category includes the credit-to-GDP shocks and house price shocks. These two shocks are typically the financial shocks commonly associated with the recent financial crisis that took off in 2007-2008. The BC-ToT and FC shocks in foreign block are slightly different due to the presence of a stock market (Dow Jones) shock instead of an exchange rate shock present in the home block. The Dow Jones shock is classified in the foreign FC group. Finally, a global financial shock is already identified with the global liquidity shock, the only shock in the global block. A summary of this stylized classification is shown in Chart 2.

Chart 2. Classification of shocks.

	Global FC	Foreign Business Cycle shocks	Foreign Financial Cycle shocks	Home Business Cycle & Terms-of-Trade shocks	Home Financial Cycle shocks
shocks	Global Liquidity	Sum of Consumption & Investment	Credit to economy /GDP	Sum of Consumption & Investment	Credit to economy /GDP
		Current Account / GDP	House Prices	Current Account / GDP	House Prices
			Dow Jones Index	Nominal Effective Exchange rate	

<< Chart 2 here >>

Having done this arrangement, I construct an index made of the median FEVDs of the respective shocks on the basis of the classification shown in Chart 2. The FEVDs of home and foreign variables based on these indices are shown in Figure 8 and Figure 9 of Appendix, respectively.

<< Figure 8 and Figure 9 here >>

Associating the shocks on these foreign and home variables with either business cycle or financial cycle, provides a clearer picture of results.

As a cross-check, the global financial shock (red pattern) is important for the financial cycle of the Euro area economy (Figure 9 of Appendix). It does explain around 20-35% of variations of financial variables (credit/GDP and home prices) and of variations in current account to GDP ratio the area[9]. This result is consistent with a substantial evidence across the literature on the role of global liquidity shocks.

In the domestic economy both the global shock (red pattern) and the foreign shocks (dark and light brown) account for a significant part of variations of domestic variables. The total variation explained by these non-domestic shocks is shown by a line graph, while bars show individual contributions of global shocks, of foreign financial shocks (dark brown) and of foreign macro shocks (light brown). Several clear patterns emerge from such representation (Figure 8).

- At 6 to 16 quarters horizon, the non-domestic global shock (in red pattern) and foreign shocks (in light and dark brown color) explain around 60-80% of fluctuations of domestic variables.

- In particular, the global shock and the foreign Financial Cycle shocks (dark brown) are key drivers of the home economy at medium to long horizon (at 6 to 16 quarters horizon).
  Digging further into the details, the following two observations stand out.

- The impact of global shock is stronger in driving the dynamics of domestic aggregate demand (sum of consumption and investment) and of credit-to-GDP ratio at home, explaining around 35-45% of their FEVDs.
- The impact of foreign FC shocks are greater in driving the fluctuations of the two domestic FC variables (credit-to-GDP ratio and real house prices) and of domestic current account to GDP ratio, accounting for around 30% of their respective FEVDs.

[9] *It is not very important for aggregate demand (sum of consumption and investment) and for the stock exchange in Euro area.*

- Foreign Business Cycle shocks (in light brown) account for a small fraction of fluctuations in domestic variables, on average around 10-20% at any horizon.
- At the shorter horizon of 1-6 quarters, the macro or financial domestic shocks (in blue and purple color) explain a greater part of fluctuations of domestic variables than the foreign shocks[10].

The results make a strong case for the role of non-domestic factors in driving the Albanian economy during the past two decades.

Still, a useful exercise is to shut down the global or foreign (Euro area) shocks and assess what drives the domestic variables absent these shocks. Is the impact of the global shock or of the foreign financial cycle shock captured by home business cycle shocks or domestic financial shocks absent the former two? I take this question to the next section.

4.3 Comparative Analysis

To see how the absence of a global financial shock or of Euro area shocks maters for the power of the framework to explain the dynamics of financial and business cycles in Albania I estimate two more VARs.

- One is a model without the global block, but has the same foreign (Euro area) block and the same home block of variables ($Y_t=[Y_t^F, Y_t^H]'$). The model is described in equation (3b) of section 3.1, while the variables in each block and the ordering inside each block are the same as in previous section.

$$\begin{bmatrix} \widetilde{A}_{11} & 0 \\ \widetilde{A}_{21} & A_{22} \end{bmatrix} \begin{bmatrix} Y_t^F \\ Y_t^{\mathrm{H}} \end{bmatrix} = \begin{bmatrix} A_{11} & 0 \\ A_{21} & A_{22} \end{bmatrix} \begin{bmatrix} X_t^F \\ X_t^{\mathrm{H}} \end{bmatrix} + \begin{bmatrix} \epsilon_t^F \\ \epsilon_t^{\mathrm{H}} \end{bmatrix} \quad (3b)$$

[10] *As I have removed the FE variation explained by own shocks, a great part of variation explained by domestic shocks (either in blue or purple colored bars) is not shown in these graphs.*

- The second model is a model with only a home block of variables, with the set of variables only from the domestic economy. This is the framework described in equation (3a) of section 3.1.

$$A_0 Y_t^H = A_1 Y_{t-1}^H + \cdots + A_p Y_{t-p}^H + \epsilon_t \quad (3a)$$

4.3.1 Do domestic shocks make up for the absence of global financial shock?

The impulse responses from estimation of equations (3b) and (3a) are shown in Figure 4 to Figure 6 and in Figure 7, respectively.

<< Figure 4 to Figure 6 and Figure 7 here >>

- The IRs from estimation of equation (3b), without a global shock are similar to those in the base VAR equation (3.c) that includes both global and foreign shocks.
- Comparing the impulse responses from estimation of VAR with only home block (eq. 3a) it is clear that some of impulse responses of domestic variables subject to domestic shocks are different.
- In particular the responses of financial variables and exchange rate to current account shock are very different from the IRs in the previous two frameworks due to the absence of non-domestic shocks.
- The IRS of all home variables subject to exchange rate shock in the VAR with only home variables are also very different from those IRs obtained in the other two VAR estimations (equations 3b and 3c).
- The system with less than half of the number of shocks compared to baseline VAR (eq. 3c) now assumes a greater burden on each shock to explain the variations in domestic economy.

In the previous section results showed a high percentage of variation in domestic variables explained by global and foreign shocks. It is helpful to check how the FEVDs in the absence of these

shocks look like. Note that the line graph in Figure 10 is the sum of FE variations explained by global and foreign shocks based on the results in the baseline VAR (eq. 3c) in Figure 8 of Appendix.

<< Figure 10 here >>

FEVDs for domestic variables from baseline VAR equation (3b) with $Y_t=[Y_t^F,Y_t^H]$ (no global shocks) in Figure 10 (total sum of the bars) are compared to the FEVDS from VAR equation (3c) where $Y_t=[Y_t^G,Y_t^F,Y_t^H]$ (the line from the baseline VAR in Figure 8 of Appendix). Note than FE variation due to OWN shocks is not included in those graphs[11]. The main observation is the following.

In the absence of a global financial shock the FE variance of domestic variables that was previously explained by this shock in the baseline VAR model (3c) is now accounted for by:

- either the foreign financial cycle shocks as in the case of domestic aggregate demand, house prices, and partially in the case of exchange rate,
- or the own shock of each domestic variable (not shown), as is the case of current account and credit to economy (as % of GDP).

What is common across all the domestic variables is that none of the other domestic (non-own) shocks can account for the FE variance that was due to the global financial shock in the baseline VAR with three blocks. The impact of an omitted global variable (shock) is either captured by foreign financial cycle shock or is captured by own exogenous shock. That is there is no change in blue or purple bars relative to the previous baseline VAR. As own exogenous shocks in a VAR usually capture the impact of omitted variables, presence of global shock is critical to explain the variations in domestic credit to economy and in current account.

A similar simplified analysis is less useful for the FEVD of Euro area macro and financial variables (shown in Figure 11). The

[11] *Therefore the gap between the line and the sum of bars is the share of FE variance explained by OWN shocks.*

line graph here shows FE variance explained by both global and foreign shocks imported from baseline VAR with 3 blocks. The bar graphs show FE variance explained by Euro area shocks in the VAR without global shocks[12].

<< Figure 11 here >>

In the absence of global shock, variations in Euro are current account and house prices are partially captured by own shocks (gap between bars and line graph). Variations in aggregate demand, credit-to-GDP and Dow Jones that were previously explained by global shock are now explained by non-own foreign shocks. But these two conclusions are not really helpful, so do not elaborate any further.

4.3.2 How important are non-domestic shocks for the Home business cycle?

One important questions is whether the global financial shock and foreign (financial) shocks are indeed accounting for the variations in domestic variables that would otherwise be explained by the domestic financial shocks, like the ratio of credit to GDP and real house prices. Can these domestic financial shocks account for the variations in business cycles when non-domestic shocks are absent?

The graphs in Figure 12 show the FEVDs from VAR estimated with only home variables ($Y_t=Y_t^H$ in eq. 3a). Again, bar graphs are the FE variations explained by domestic financial or macro shocks from the VAR with $Y_t=Y_t^H$. The line graph is the simple sum of FE variations explained by the global and foreign shocks imported from the baseline VAR with 3 blocks ($Y_t=[Y_t^G,Y_t^F,Y_t^H]'$).

<< Figure 12 here >>

The difference between the line graph and the sum of the bars is the percentage of FE explained by global and foreign shocks in baseline VAR which could not be explained by other domestic

[12] *By construction, domestic shocks do not affect foreign variables in a VAR with.*

shocks in VAR with a home block only. The difference is rather explained by own shocks (removed from the graph).

- In the case of domestic current account to GDP ratio and real house prices, when global and foreign shocks are absent, of the 60-70% of FE variation explained by these shocks (line graph from baseline VAR) none of it is explained by domestic shocks (other than own shock). All of variation is now explained by exogenous own shock of each respective variable.

- In the case of FEVD of aggregate demand (sum of consumption and investment), credit-to-GDP ratio and NEER, only about half of the 60-80% of FE variation explained by global and foreign shocks (line graph from baseline VAR) is now explained by domestic shocks. The other half is explained by exogenous own shock of each respective variable.

The exercise simply rules out the alternative explanation that global financial shock and foreign shocks (financial or macro) explain the share of variations in the domestic business cycle and in current account that would otherwise be explained by the financial cycle in Albania.

It is less certain to state such a conclusion with regard to variations in domestic financial variables like house prices or credit-to-GDP, since exogenous domestic financial cycle shocks are indeed own shocks of credit-to-GDP ratio or of house prices.

Yet, the absence of global financial shock and foreign shocks leaves a large share of variations in domestic business cycle and financial cycle variables unexplained and therefore only captured by the exogenous own shocks.

5 CONCLUSIONS

Global financial cycle is increasingly cited as an important component of the set of factors driving the emerging economies. High dollarization, high foreign bank ownership and dependence on financial and capital flows expose emerging economies to non-domestic shocks. A growing literature supports the view that the global liquidity and global financial cycle, influences these emerging economies through the capital flows, bank leverage and credit supply as well as through monetary policy spillovers. The global risk, global credit supply and US monetary policy have been identified as key drivers of global liquidity.

The impact of global liquidity, as a proxy of global financial cycle, and of foreign Euro area shocks on a set of macro and macro-financial variables of Albanian economy is analyzed in this study. The macroeconomics variables associated with the business cycle in Albania are aggregate demand (sum of consumption and investment), current account to GDP ratio and nominal effective exchange rate. The macro financial variables associated with the financial cycle in Albania are bank credit to GDP ratio and real house prices.

On average, I find that around 60-80% of variations in domestic variables are explained by global liquidity and foreign shocks.

The global liquidity shock drives slightly less than half of fluctuations of domestic aggregate demand and around 36% and 15% of credit to GDP ratio and of house prices, respectively.

Exogenous shocks to (foreign) aggregate demand and credit-to-GDP ratio of Euro area also explain up to ¼ of fluctuations of domestic financial variables (credit and house prices). The scale of fluctuations of domestic variables accounted for by other foreign shocks is in the range of 10-25%, in case of each domestic variable.

I further ask whether domestic shocks, other than exogenous own shocks of each domestic variable, can account for the variation of domestic variables in the absence of these global and foreign

shocks. I find that of the 60-80% of variations of domestic aggregate demand, credit to GDP and nominal exchange rate explained by global and foreign shocks, only half (30-40%) of these fluctuations can be captured by other (non-own) domestic shocks when the former are shut down.

In the case of domestic current account and house prices, shutting down global and foreign shocks leaves the 60-70% of variations explained by these shocks captured by exogenous autoregressive shocks.

The results suggest that the presence of global and foreign macro and financial shocks are critical for the dynamics of Albanian macro and financial variables. The presence of these non-domestic shocks is essential to improve on the modelling of domestic business cycle and financial cycle variables.

The set of domestic variables included in this analysis is quite comprehensive. The set-up includes indicators of aggregate demand, of terms-of trade and external balance and of financial cycle in the domestic economy. Most typical fundamental shocks like the monetary shocks, productivity shocks, terms of trade shocks and financial shocks can be accounted by own shocks in the variables included in this set up. Having exogenous own shocks on domestic variables compete with non-domestic shocks allows both non-domestic and domestic fundamental shocks compete in a very parsimonious set up.

Finally, the above results do not shed light on the channels through which these non-domestic shocks are transmitted to the Albanian economy.

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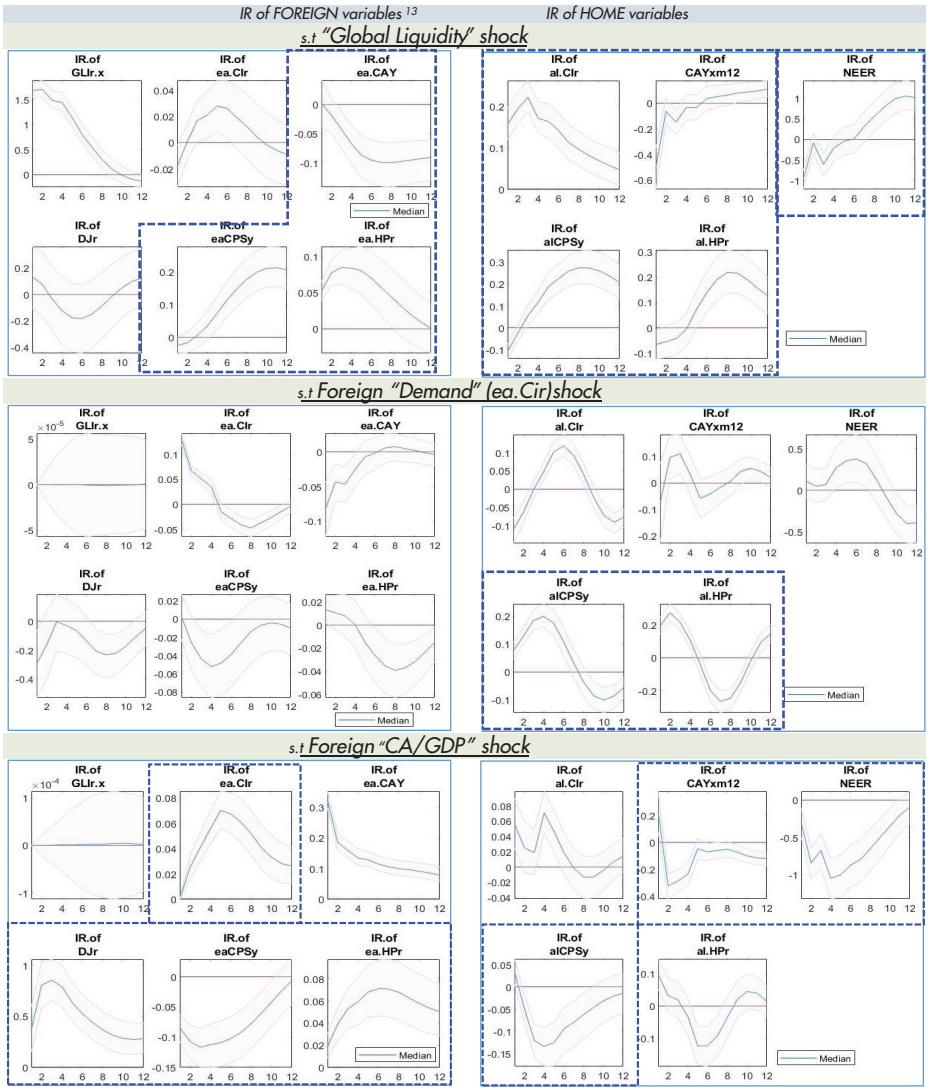
APPENDIX

Chart 3. Lag order test.

VAR Lag Order Selection Criteria						
Endogenous variables: *GLIR_X ea_CIr ea_CAY DJR eaCPSy ea_HPr al_CIr CAYXM12 NEER alCPSy al_HPr*						
Exogenous variables: C						
Date: 11/14/19 Time: 15:37						
Sample: 2001Q1 2018Q4						
Included observations: 72						
*Note: selection calculation does not impose restricted VAR coefficient restrictions						
Lag	LogL**	LR	FPE	AIC	SC	HQ
0	-1661.671	NA	4182621.	46.46308	46.81090	46.60155
1	-1095.768	943.1718	18.58839	34.10466	38.27854*	35.76629
2	-941.0552	210.5809	9.082926	33.16820	41.16815	36.35300
3	-754.5083	196.9105	2.790720	31.34745	43.17347	36.05543
4	-485.7138	201.5959*	0.202931*	27.24205*	42.89413	33.47319*
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

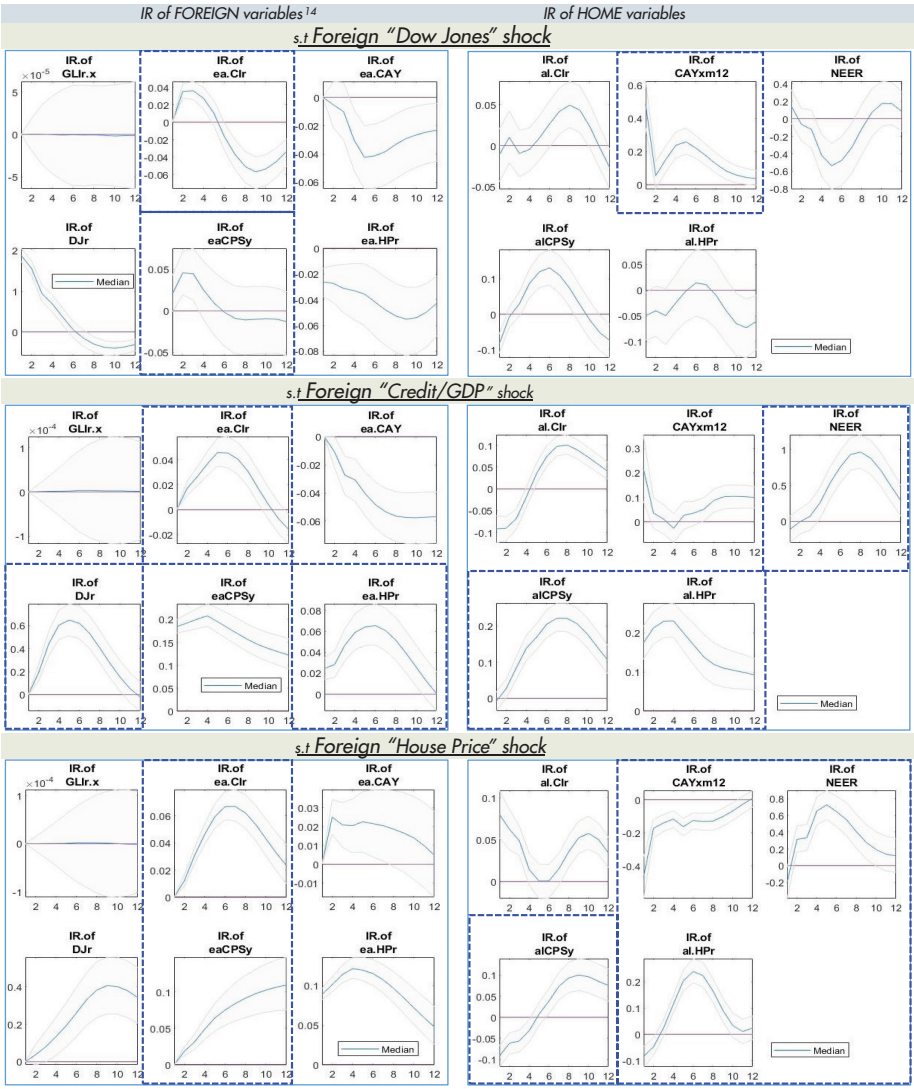
5.1 Impulse Responses

Figure 1. IRFs from VAR in eq. (3c), section 3.1 with three blocks GLOBAL, FOREIGN and HOME $Y_t=[Y_t^G, Y_t^F, Y_t^H]$.



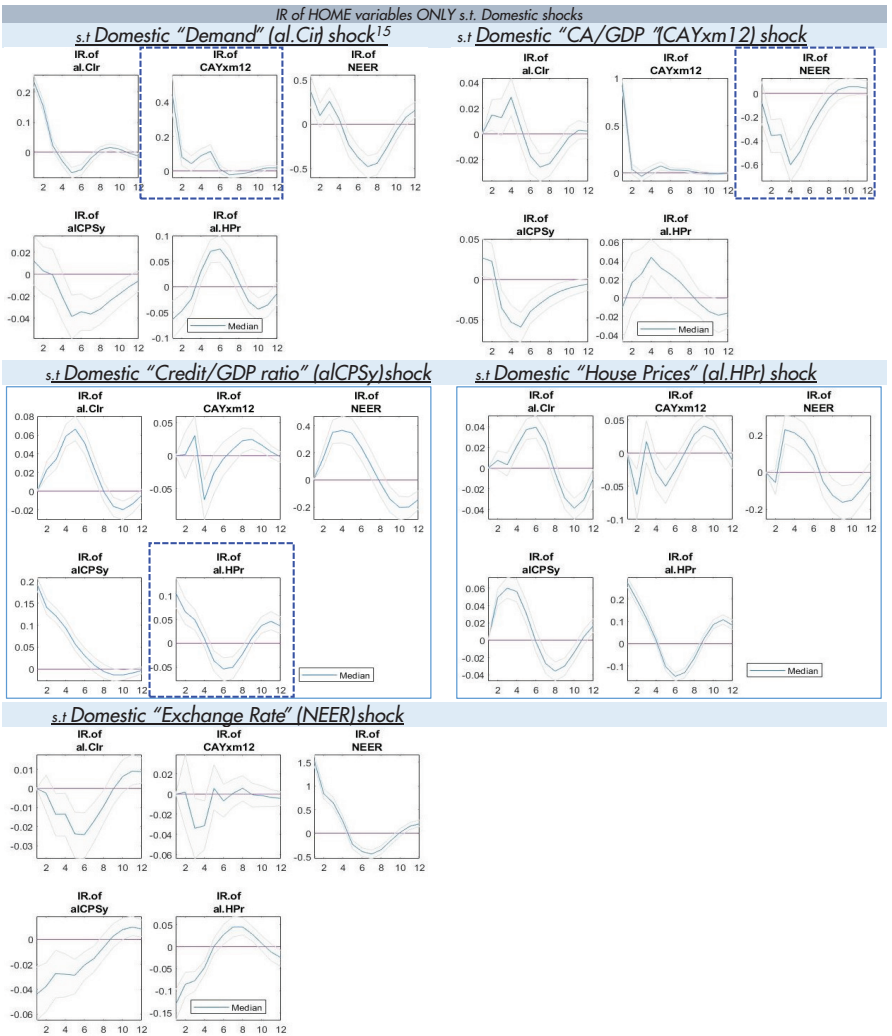
[13] *GLlr.x = real Global Liquidity; ea.Clr = real Consumption plus investment; ea.CAY=Current Acount to GDP; DJr= Dow Jones eurostoxx (deflated); ea.CPSy=Credit to GDP; ea.HPr=real House Prices. The squared dashed line indicates that more than 10 % of the fluctuations of the variable whose IRF is shown is explained by the respective shock. Impact of j-th shock on the j-variable is not shown in dashed square.*

Figure 2. IRFs from VAR in eq. (3c), section 3.1 with three blocks GLOBAL, FOREIGN and HOME.



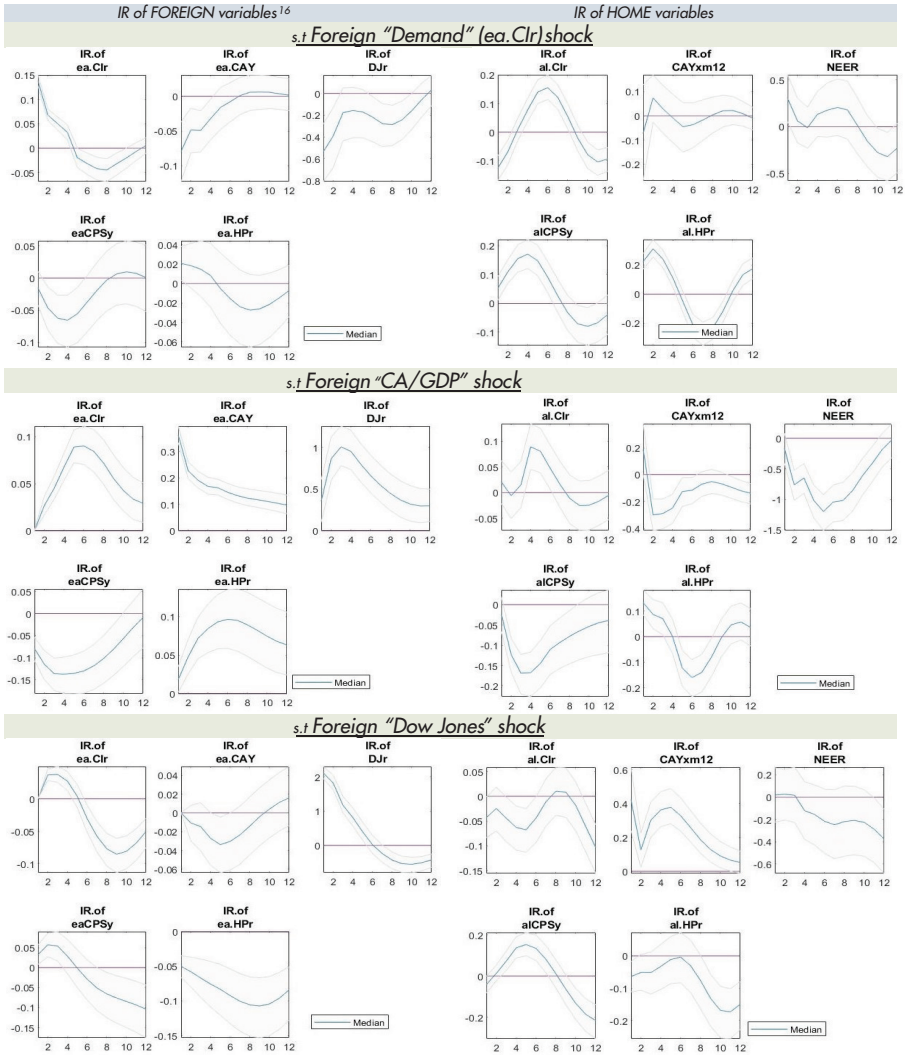
[14] *GLlr.x = real Global Liquidity; ea.Clr = real Consumption plus investment; ea.CAY=Current Acount to GDP; DJr= Dow Jones eurostoxx (deflated); ea.CPSy=Credit to GDP; ea.HPr=real House Prices. The squared dashed line indicates that more than 10 % of the fluctuations of the variable whose IRF is shown is explained by the respective shock. Impact of j-th shock on the j-variable is not shown in dashed square.*

Figure 3. IRFs from VAR in eq. (3c), section 3.1, with three blocks GLOBAL, FOREIGN and HOME.



[15] *Domestic Variables: al.Clr = real Consumption plus investment; al.CAYxm12=Current Acount to GDP; NEER=Nominal Effective Exchange Rate; alCPSy=Credit to GDP; al.HPr=real House Prices.*
The squared dashed line indicates that more than 10 % of the fluctuations of the variable whose IRF is shown is explained by the respective shock. Impact of j-th shock on the j-variable is not shown in dashed square.

Figure 4. IRFs from VAR in eq. (3b), section 3.1, with only a FOREIGN and a HOME block.



[16] *GlIr.x = real Global Liquidity; ea.Clr = real Consumption plus investment; ea.CAY=Current Acount to GDP; DJr= Dow Jones eurostoxx (deflated); ea.CPSy=Credit to GDP; ea.HPr=real House Prices. The squared dashed line indicates that more than 10 % of the fluctuations of the variable whose IRF is shown is explained by the respective shock. Impact of j-th shock on the j-variable is not shown in dashed square.*

Figure 5. IRFs from VAR in eq. (3b), section 3.1, with only a FOREIGN and a HOME block.

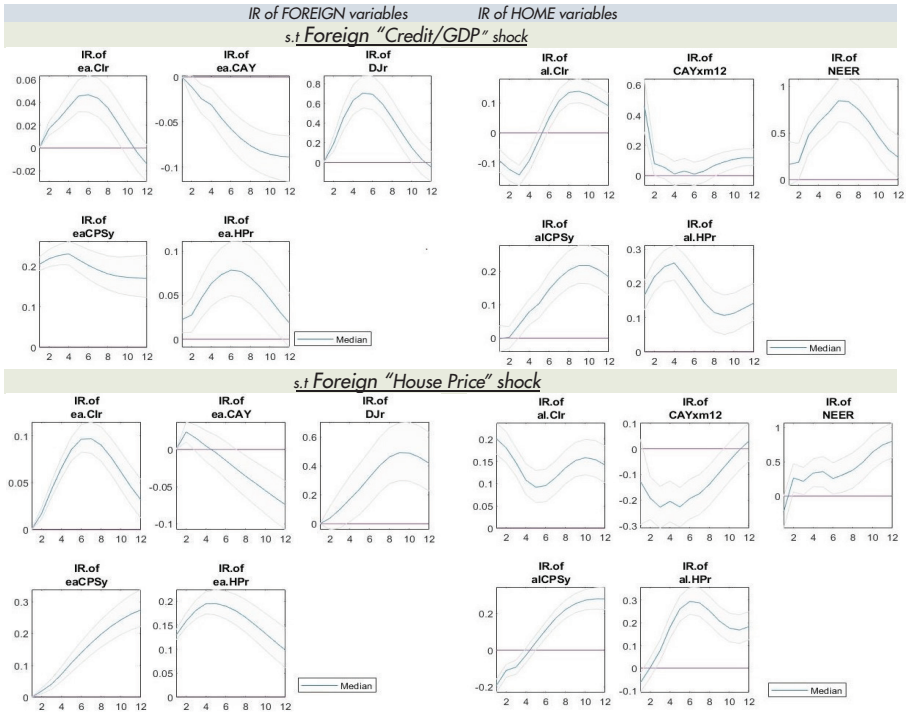
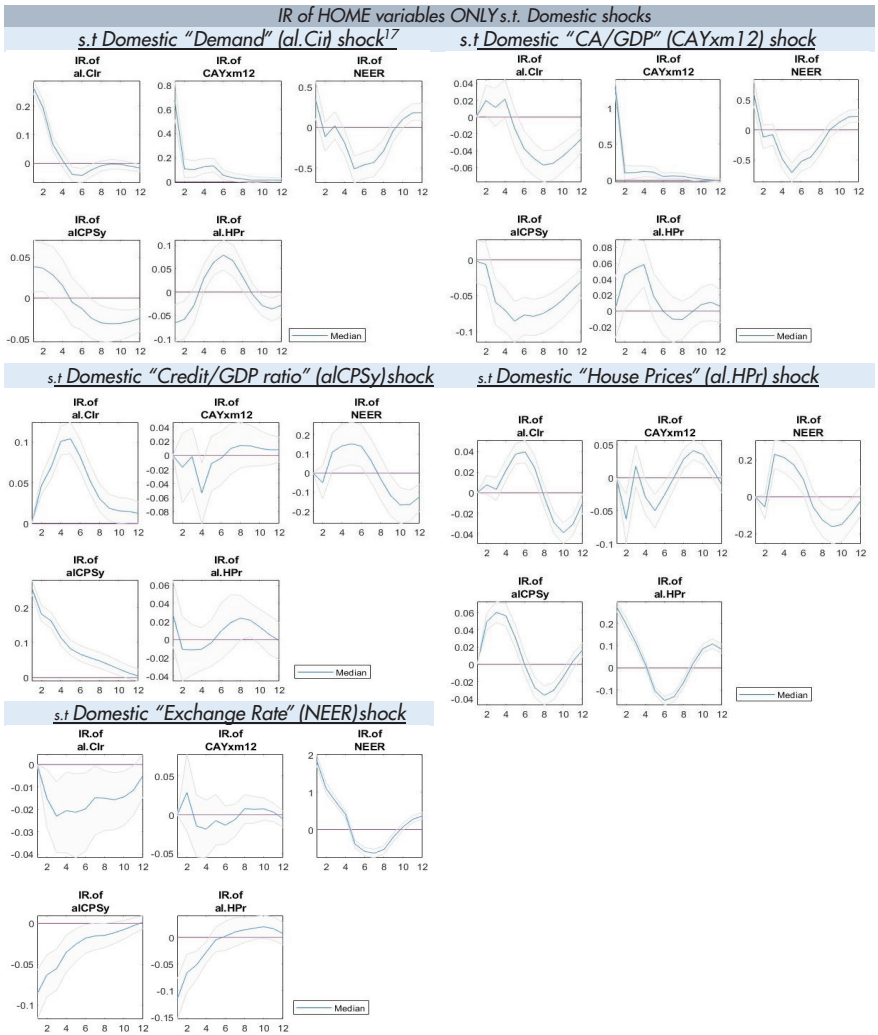
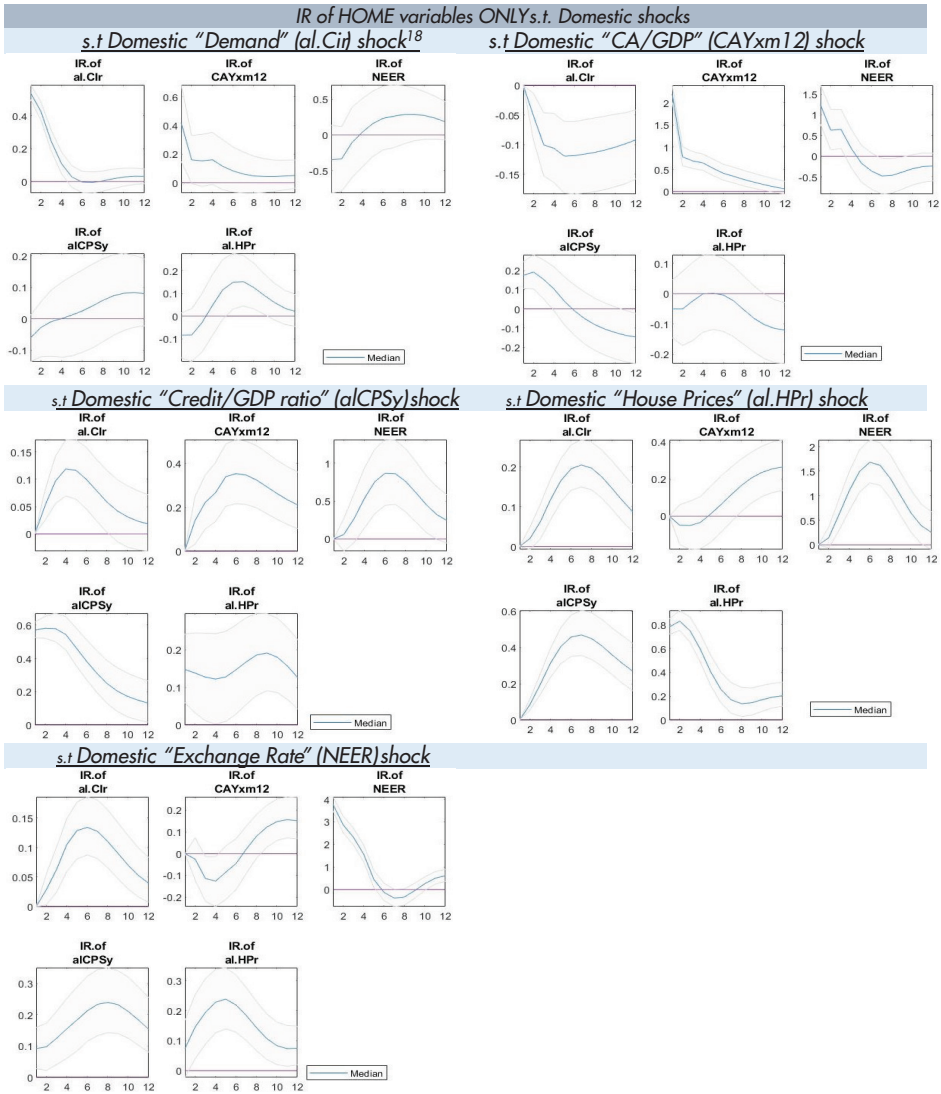


Figure 6. IRFs from VAR in eq. (3b), section 3.1, with only a FOREIGN and a HOME block.



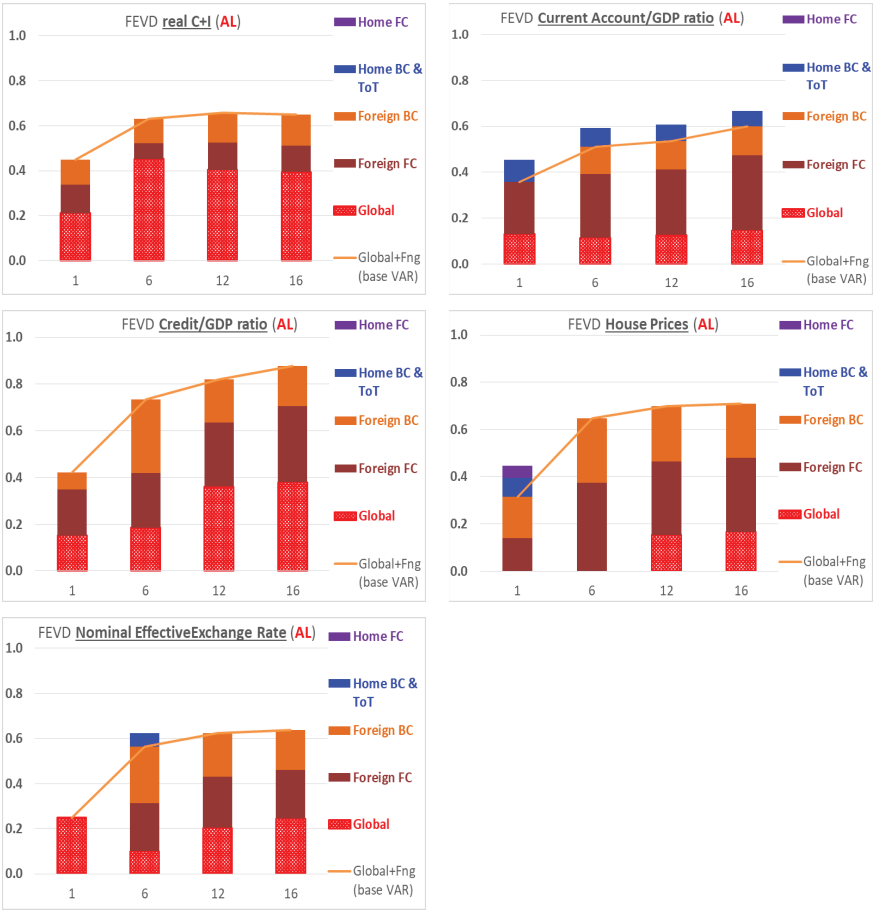
[17] *Domestic Variables: al.Clr = real Consumption plus investment; al.CAYxm12=Current Acount to GDP; NEER=Nominal Effective Exchange Rate; alCPSy=Credit to GDP; al.HPr=real House Prices. The squared dashed line indicates that more than 10 % of the fluctuations of the variable whose IRF is shown is explained by the respective shock. Impact of j-th shock on the j-variable is not shown in dashed square.*

Figure 7. IRFs from VAR in equation (3a), section 3.1, with only a HOME block.



[18] *Domestic Variables: al.Clr = real Consumption plus investment; al.CAYxm12=Current Acount to GDP; NEER=Nominal Effective Exchange Rate; alCPSy=Credit to GDP; al.HPr=real House Prices. The squared dashed line indicates that more than 10 % of the fluctuations of the variable whose IRF is shown is explained by the respective shock. Impact of j-th shock on the j-variable is not shown in dashed square.*

Figure 8. FEVDs of Home variables from VAR in eq. (3c), section 3.1 with three blocks GLOBAL, FOREIGN and HOME. FE variance explained by OWN shocks NOT included(*) (†).



(*) Note: The graphs do NOT include the FE variance explained by OWN shock. As an example, when HOME variable Ht is classified in the 'Financial' (or Business) cycle category (based on Chart 2) then the respective OWN shock (Ht shock) would show up as HOME Financial (or Business) cycle shocks, corresponding to the bar in purple (blue). "Own shock" accounts (largely) for the difference 100% less the sum of the bars shown in each graph.
(†) The line graph shows FE variance explained by both global and foreign shocks imported from baseline VAR with 3 blocks.

Figure 9. FEVDs of Euro area variables from VAR in eq. (3c), section 3.1 with three blocks GLOBAL, FOREIGN and HOME (). FE variance explained by OWN shocks NOT included(*) (†).

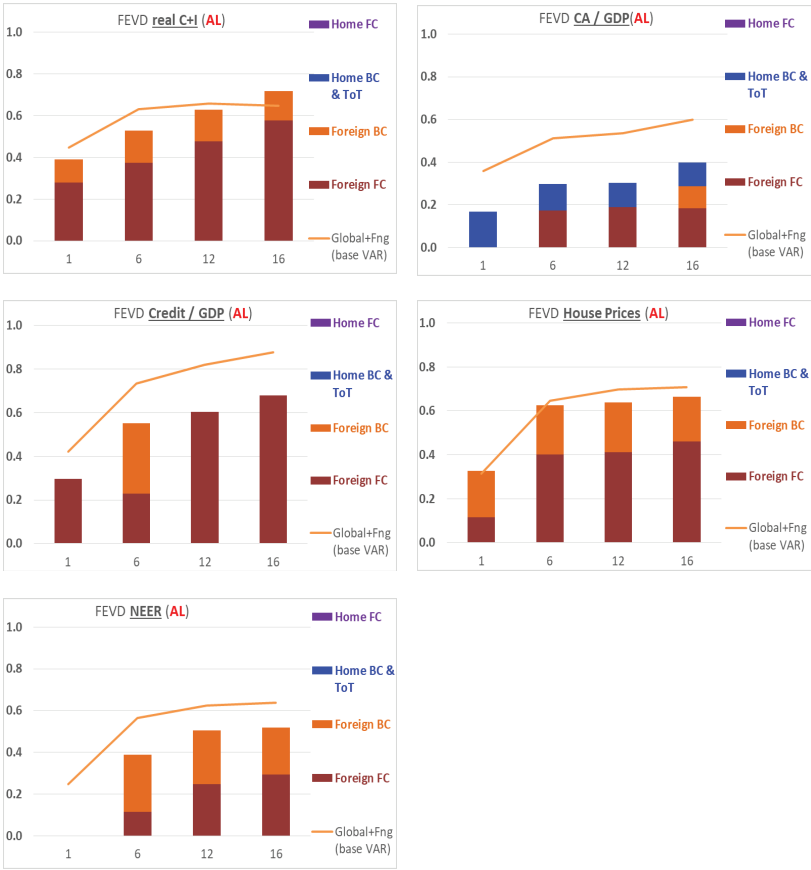
(*) Note: The graphs do NOT include the FE variance explained by OWN shock. As an example, when FOREIGN variable Ft is classified in the 'Financial' (or Business) cycle category (based on Chart 2) then the respective OWN shock (Ft shock) would show up as FOREIGN Financial (or Business) cycle shocks, corresponding to the bar in dark brown (or light brown). "Own shock" accounts (largely) for the difference 100% less the sum of the bars shown in each graph.

(†) The line graph shows FE variance explained by both global and foreign shocks imported from baseline VAR with 3 blocks.

Chart 2 Classification of shocks.

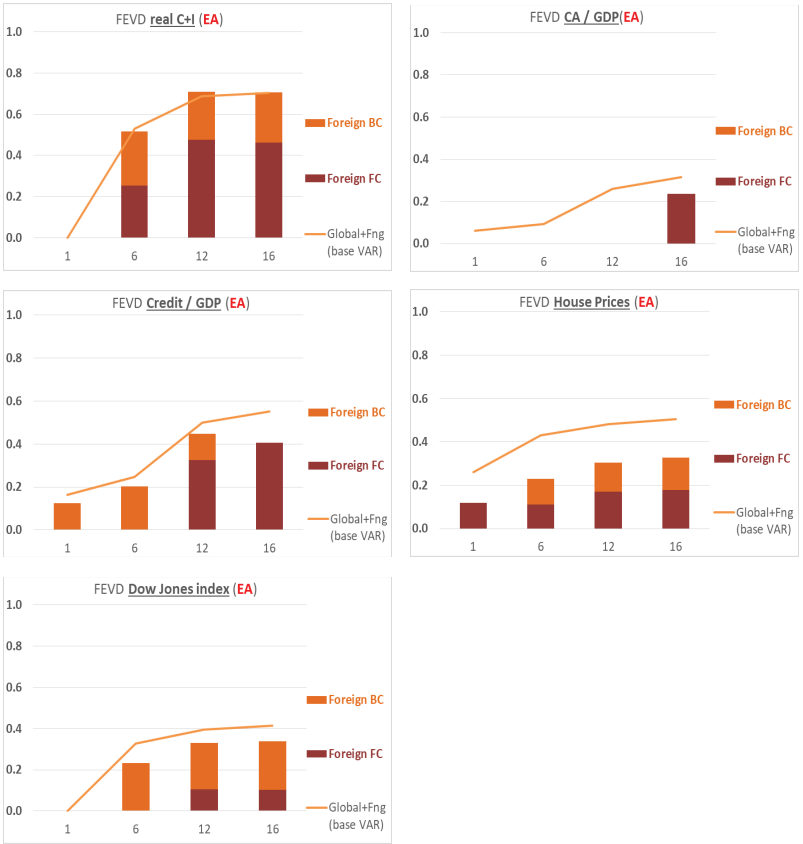
	Global FC	Foreign Business Cycle	Foreign Financial Cycle	Home Business Cycle & Terms-of-Trade	Home Financial Cycle
shocks	Global Liquidity	Sum of Consumption & Investment	Credit to economy /GDP	Sum of Consumption & Investment	Credit to economy /GDP
		Current Account / GDP	House Prices	Current Account / GDP	House Prices
			Dow Jones Index	Nominal Effective Exchange rate	

Figure 10. FEVDs of Home variables from VAR in eq. (3b), section 3.1 with TWO blocks FOREIGN and HOME. FE variance explained by OWN shocks NOT included(*) (†).



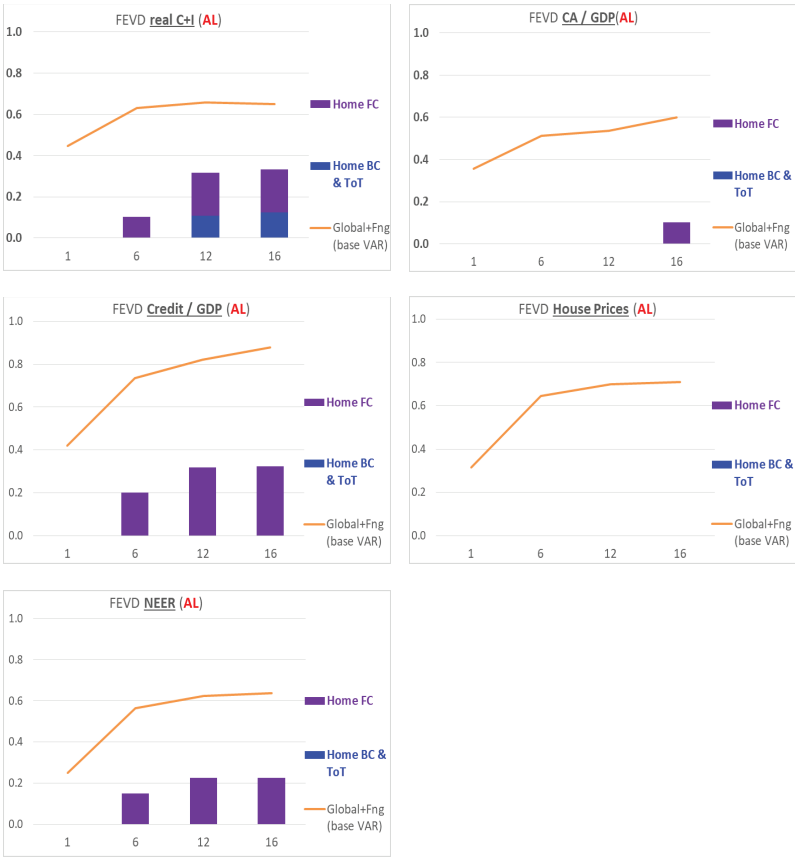
(*) Note: The graphs do NOT include the FE variance explained by OWN shock. As an example, when HOME variable Ht is classified in the 'Financial' (or Business) cycle category (based on Chart 2) then the respective OWN shock (Ht shock) would show up as HOME Financial (or Business) cycle shocks, corresponding to the bar in purple (blue). "Own shock" accounts (largely) for the difference 100% less the sum of the bars shown in each graph.
(†) The line graph shows FE variance explained by both global and foreign shocks imported from baseline VAR with 3 blocks.

Figure 11. FEVDs of Euro area variables from VAR in eq. (3b), section 3.1 with TWO blocks FOREIGN and HOME (). FE variance explained by OWN shocks NOT included (*) (†).



(*) Note: The graphs do NOT include the FE variance explained by OWN shock. As an example, when FOREIGN variable Ft is classified in the 'Financial' (or Business) cycle category (based on Chart 2) then the respective OWN shock (Ft shock) would show up as FOREIGN Financial (or Business) cycle shocks, corresponding to the bar in dark brown (or light brown). "Own shock" accounts (largely) for the difference 100% less the sum of the bars shown in each graph.
(†) The line graph shows FE variance explained by both global and foreign shocks imported from baseline VAR with 3 blocks.

Figure 12. FEVDs of Home variables from VAR in eq. (3a), section 3.1 with ONLY HOME block (). FE variance explained by OWN shocks NOT included(*) (†).



(*) Note: The graphs do NOT include the FE variance explained by OWN shock. As an example, when HOME variable Ht is classified in the 'Financial' (or Business) cycle category (based on Chart 2) then the respective OWN shock (Ht shock) would show up as HOME Financial (or Business) cycle shocks, corresponding to the bar in purple (blue). "Own shock" accounts (largely) for the difference 100% less the sum of the bars shown in each graph.
(†) The line graph shows FE variance explained by both global and foreign shocks imported from baseline VAR with 3 blocks.

Chart 4. Forecast Error Variance Decomposition from VAR in eq. (3c), section 3.1 with.

	Global	Foreign (Euro area) shocks					Domestic (Albania) shocks				
Q	GUr.x shock	ea.CIr shock	ea.CAY shock	DJr shock	eaCPSy shock	ea.HPr shock	al.CIr shock	CAYxm12 shock	NEER shock	alCPSy shock	al.HPr shock
	part of ea.CIr fluctuation due to each shock										
1		0.98									
6	0.05	0.39	0.22	0.06	0.09	0.16					
12	0.05	0.27	0.21	0.14	0.08	0.20					
16	0.06	0.25	0.22	0.14	0.09	0.19					
	part of ea.CAY fluctuation due to each shock										
1		0.06	0.92								
6	0.09	0.05	0.78								
12	0.20	0.03	0.63		0.06						
16	0.24	0.03	0.57		0.08						
	part of DJr fluctuation due to each shocks										
1			0.03	0.91							
6			0.22	0.58	0.11						
12	0.04	0.03	0.22	0.50	0.12	0.06					
16	0.05	0.03	0.23	0.47	0.11	0.07					
	part of eaCPSy fluctuation due to each shocks										
1			0.16		0.78						
6	0.06		0.19		0.62	0.04					
12	0.30		0.11		0.42	0.09					
16	0.35		0.09		0.36	0.11					
	part of ea.HPr fluctuation due to each shocks										
1	0.21			0.05	0.05	0.61					
6	0.22		0.11	0.04	0.10	0.46					
12	0.16	0.03	0.15	0.08	0.09	0.41					
16	0.16	0.03	0.17	0.09	0.09	0.39					
	part of al.CIr fluctuation due to each shock										
1	0.21	0.11			0.07	0.06	0.48				
6	0.45	0.11	0.03		0.07	0.03	0.21				
12	0.4	0.13	0.03		0.12	0.05	0.15				
16	0.39	0.14	0.03	0.04	0.12	0.05	0.15				
	part of CAYxm12 fluctuation due to each shock										
1	0.13			0.12		0.11	0.10	0.43			
6	0.11		0.12	0.16		0.12	0.08	0.31			
12	0.13		0.12	0.16	0.04	0.12	0.07	0.27			
16	0.15		0.13	0.16	0.05	0.12	0.07	0.25			
	part of NEER fluctuation due to each shock										
1	0.25						0.04		0.6		
6	0.10	0.03	0.25	0.05	0.06	0.10		0.06	0.22		
12	0.20	0.04	0.19	0.04	0.15	0.08	0.03	0.03	0.13		
16	0.24	0.05	0.18	0.05	0.14	0.08	0.03	0.03	0.12		
	part of alCPSy fluctuation due to each shock										
1	0.15	0.07		0.09		0.11				0.46	
6	0.19	0.22	0.10	0.08	0.15	0.03				0.13	
12	0.36	0.13	0.06	0.06	0.21	0.05				0.06	
16	0.38	0.11	0.06	0.07	0.20	0.06				0.05	
	part of al.HPr fluctuation due to each shock										
1		0.17	0.04		0.14	0.03			0.08	0.05	0.35
6	0.05	0.22	0.05		0.25	0.12			0.03		0.16
12	0.15	0.24	0.05		0.19	0.12					0.12
16	0.17	0.23	0.04		0.18	0.13					0.11

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