Economic integration and macroeconomic shocks in Eurasia

Gharleghi, Behrooz

Dialogue of Civilizations Research Institute

1 August 2019

Economic integration and macroeconomic shocks in Eurasia [1]

Behrooz Gharleghi
DOC Research Institute, 10117, Berlin, Germany
Email: bgharleghi@doc-research.org

Abstract

The main objective of this research is to make an assessment of the symmetry/asymmetry of underlying macroeconomic shocks in the Eurasia region. A model is developed to distinguish structural global supply shocks, regional supply shocks, and domestic supply shocks using a reduced-form structural vector autoregressive model (SVAR). Empirical results reveal that the correlation between domestic and regional shocks, as well as between domestic and global shocks, are clearly divided into two groups of countries: (i) domestic (country-specific) supply shocks are more correlated with global shocks in the European part of the region (Armenia, Belarus, Georgia, and Ukraine; with the exception of Mongolia here); and (ii) domestic shocks are mostly correlated with regional shocks in the Central Asian part of the region (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, and Azerbaijan; with the exception of Moldova here). This has implications for the Chinese economy in the region.

Keywords: Eurasia, China, Economic shocks

1. Introduction

A global economic crises seems to be unavoidable, trade protectionism is proliferating – at least currently in some developed countries – and globalisation is slowing down (Jian, 2017). It is difficult to say that developed countries are opposing globalisation, but at the same time, the previous world economic order cannot meet their needs and new rules are necessary to deal with their interests. However, developed countries cannot determine the system, or how the system is regulated, alone. This is because globalisation in the current era requires a fair and equitable system of trade that provides an active role for developing countries. The development of regional and global partnerships such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and ASEAN Australia New Zealand Free Trade Area (AANZFTA) are examples of such cooperation between the developed and developing worlds. In this context, Russia's Greater Eurasian Partnership and China's Belt and Road Initiative are two instances of international cooperation that could respond to the changing international economic environment (Lukin, 2016).

The emergence of economic integration in a number of global regions has encouraged tighter economic cooperation in Eurasia. This region is receiving increasing attention as it is considered to be a bridge between East and West. It is necessary to identify how the economies of Eurasia respond to shocks from the region and from the world.

In this paper, the US economy represents the global economy and the regional economy is represented by the Chinese economy, due to their significant impact on other countries. It is important to realise whether Eurasian economies are more influenced by the global economy or the regional economy, in terms of macroeconomic shocks.

Regionalisation has emerged as a fundamental trend in the development of global order. Regionalisation also involves the establishing of new forms of interaction between states, especially when they comprise the world's macro regions. An increasing number of countries are attempting to form a stable system of cooperation with their neighbours. This is helpful in enhancing domestic potential and in facilitating solutions to regional problems. Regionalisation has taken various forms, including trade agreements, custom unions, alignment of regulatory systems, and monetary arrangements. In the Eurasia region, such arrangements have to some extent come about within the Eurasian Economic Union (EAEU), the Eurasian Economic Space, and the Shanghai Cooperation Organisation (Alimov, 2018).

China has recently developed its relations with neighbouring countries and is trying to increase its influence on these countries through the Belt and Road Initiative. The rise of the Chinese economy could potentially create a Yuan bloc in the region. The phrase 'Yuan bloc' implies a concentration of trade and investment relations in Eurasia rather than the role of the currency as part of a common monetary policy in the region. These two interpretations of 'Yuan bloc' are not necessarily in competition, as one may cause the other (Frankel, 1994).

Most of the countries in Eurasia are transitional economies that changed from central planning to free markets after the collapse of the Soviet Union in 1990. However, they are diverse in terms of culture, for example, some countries are closer to Europe and others, like the Central Asian countries, are closer to China. The region is prone to shocks from the global economy – as shown by US attempts to assert dominance over the Eastern European part of the region – and also from the regional economy – as shown by Chinese attempts to influence the region. Therefore, it is important to understand the reaction of these economies to supply shocks from the world and from the region.

This paper contributes to the literature by evaluating the economic security of the region and by assessing political analyses that have been recorded by Kuchins (2018), Karaganov (2018), and Li (2018).

2. Literature review

There is a large body of political analysis of Eurasian countries, but only a few authors pay respect to various aspects of economic integration. For example, Vinokurov (2017) examined the current state of the Eurasian Economic Union (EAEU) with in terms of economic integration, showing that the EAEU has not been a success story and also that the integration progress has slowed down, despite initially rapid advancement. However, there have been some achievements. The EAEU is widely viewed as a functioning customs union, although not as a general unit of regional economic integration.

Hartwell (2013) examined the challenges for deeper and broader integration in the Eurasia region and concluded that greater integration would only be useful for all economies if it is based on fostering the trade liberalisation in the region. In addition, the inclusion of Ukraine is not essential for the success of regional integration but Central Asian countries should be encouraged to follow a liberalised union. Just as the EU did in the post-war era, the Eurasian Economic Union could help the members to take liberalised steps that they are unable to take individually.

Vinokurov et. al (2017) examined monetary policy coordination among the five members of the EAEU and proposed three monetary regimes: (i) monetary policy reacts to inflation and, to a small extent, to the US Dollar; (ii) monetary policy reacts to the Russian Ruble; and (iii) monetary policy is based on a pegged exchange rate among the five members of the EAEU (Armenia, Belarus, Kazakhstan, Kyrgyzstan, and Russia). The result of the research revealed that in three of the four smaller EAEU countries, a pegged exchange rate would increase macroeconomic volatility. The second regime performs well (when monetary policy reacts to Russian Ruble, and to inflation) in Armenia, Kazakhstan, and Kyrgyzstan. Overall, the results indicate that the EAEU is not mature enough for a fully pegged exchange rate regime.

Atik (2014) argued that the regional economic integration of the EAEU is inefficient. He claimed that the causes of inefficiency are: (i) an inadequate convergence with the market economy; (ii) differences in macroeconomic structures, including income distributions, level of industrialisation, and balance-of-payments differences; (iii) a lack of common goals; and (iv) conflicts of interest across the region.

Beside the points above, the Eurasian Development Bank has reported different criteria for integration in the region, using trade, GDP, exchange rate, and budget balance variables to identify levels of integration for these economies (Eurasian Economic Integration report, 2017). However, none of these analyses have led to a concrete model that can determine the economic interaction of these economies with global and regional economies.

3. Data and methodology

Eurasia comprises thirteen countries according to the Organisation for Economic Cooperation and Development (OECD) classification: Afghanistan, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Mongolia, the Republic of Moldova, Tajikistan, Turkmenistan, Ukraine and Uzbekistan. Geographically, this group reaches from the borders of the European Union to the Far East.

GDP data for this study are drawn from the World Development Indicators of the World Bank and are expressed in logarithm form. GDP data for Afghanistan was not available prior to 2002 and hence it is excluded from the calculations.

In order to achieve the objective of the paper, I suggest that the model for regional economic integration should consist of three types of shocks: global output shocks; regional output shocks; and country-specific output shocks. Global output and regional output can be represented by US GDP and Chinese GDP respectively.

$$x_t = (y_t^g, y_t^r, y_t^d)$$

where *y* is the output and the superscripts *g, r,* and *d* refer to global, regional, and domestic shocks, respectively. The structural form of the above equation would be:

$$x_t = A(L)\varepsilon_{jt}^k$$

where *k= g, r, d* and *j* is the supply shocks. In this paper, *A* is a 3×3 matrix that defines the response of endogenous variables to global, regional, and domestic shocks. Therefore the VAR model is represented as below:

$$A(L) = \begin{bmatrix} A_{11}(L) & A_{12}(L) & A_{13}(L) \\ A_{21}(L) & A_{22}(L) & A_{23}(L) \\ A_{31}(L) & A_{32}(L) & A_{33}(L) \end{bmatrix}$$

However, there should be some restrictions imposed on this model in order to *identify* the matrix using the $[(n^2 - n)/2]$ formula, which results in three restrictions. These restrictions are defined below: (i) regional and country-specific shocks have no long-run impact on global output; and (ii) country-specific shocks have no long-run impact on regional output, therefore the matrix model would be written as:

$$\begin{bmatrix} \Delta y_t^g \\ \Delta y_t^r \\ \Delta y_t^d \end{bmatrix} = \begin{bmatrix} A_{11}(L) & 0 & 0 \\ A_{21}(L) & A_{22}(L) & 0 \\ A_{31}(L) & A_{32}(L) & A_{33}(L) \end{bmatrix} \times \begin{bmatrix} \varepsilon_t^g \\ \varepsilon_t^r \\ \varepsilon_t^d \end{bmatrix}$$

Where ε is the vector of the reduced form error term. In fact the above model is the structural vector autoregressive model developed by Blanchard and Quah (1989).

Regional shocks are important to an economy as it is assumed that neighbouring countries are trade partners and may have similar economic structures. External shocks have the potential to go beyond the regional boundaries. If global shocks can affect economies in the same way, a global arrangement could be a better option for dealing with global shocks than regional arrangements. In the case of Eurasia, if global shocks (US output) are relatively more important than regional shocks (Chinese output), then forming a US Dollar bloc would be a better policy and vice versa for a Yuan bloc (Frankel and Shang-Jin, 1994). Bayoumi and Eichengreen (1993) argued that supply shocks are more structural and less sensitive to varieties of exchange rate arrangement. If supply shocks are correlated across the region, then the region would be a candidate for common monetary arrangements. Frankel and Rose (1998) stated that with the rise in trade, countries are likely to face increasingly similar shocks. Therefore, supply shocks may become more correlated when economic integration progresses.

4. Empirical results

The stationary properties of the time series have been examined and are identified to be integrated of order one, i.e., $I(1)$ using the ADF and Phillips-Perron tests. Therefore the first-difference form of all variables is used for estimation. For the SVAR estimation, the lag length is uniformly chosen to be one based on the Schwarz Bayesian Criteria (SBC) as most of the equations show the lag length of one.

The structural VAR model is estimated and the degree of shock symmetry among the countries under consideration is calculated using a correlation of identified disturbances. For this reason, the correlation of three structural shocks is estimated via a structural VAR model for the twelve Eurasian economies from 1991 to 2017, the longest possible period. It is generally assumed that if the correlation of shocks is positive, the shocks are considered to be symmetric, and if the correlation is negative or if it is insignificant, they would be classified as asymmetric.

In order to find the correlation of structural shocks, structural vector autoregressive models are estimated and the residuals of the models are used to see the correlations. Literature (Sims, 1980) has suggested that if the correlation is positive, the shocks are considered to be symmetric. And if the correlation is negative or it is insignificant, then they are asymmetric. Table 1 reports the correlation between domestic supply shocks in these economies. High correlation between supply shocks suggests that the economies are subject to symmetric shocks and may have further economic arrangements such as monetary coordination (Chow and Kim, 2003). However, there are some asymmetries observed among different economies. This could be due to the fact that these countries are affected by different sources of variations, i.e., regional and global causes. In order to clarify this issue, the correlations between regional and domestic shocks and also between global and domestic shocks are reported in Table 2.

Table 1: Correlation of domestic supply shocks (China as regional economy) – 1991-2017

	ARM	AZE	BEL	GEO	KAZ	KGZ	MDA	MNG	TJK	TKM	UKR
AZE	0,252										
BEL	-0,280	-0,097									
GEO	**0,696***	0,291	-0,038								
KAZ	0,329	0,233	0,181	**0,476***							
KGZ	-0,030	-0,253	0,255	0,071	0,319						
MDA	**0,567***	0,036	-0,181	**0,442***	**0,433***	**0,388****					
MNG	**0,602***	-0.078	-0,008	**0,488***	**0,399****	**0,418***	**0,586***				
TJK	0,180	0,005	-0,077	0,176	0,217	0,354	0,173	0.253			
TKM	0,122	-0,095	0,261	-0,135	0,048	-0,028	-0,040	0.221	-0,542**		
UKR	**0,593***	-0,063	0,060	**0,497***	**0,636***	**0,392****	**0,526***	**0,625***	**0,492***	0,048	
UZB	-0,067	-0,137	0,233	0,122	0,109	**0,394****	0,116	0.183	0,351	-0,151	0,252

Note: *, **, *** denote significant at 1%, 5%, and 10% respectively. **Bold** figures are representing symmetry in shocks.

Table 2: Correlation of domestic supply shocks with the regional shocks and global shocks (China as regional economy)

	1991-2017		2000-2017	
	USA	CHN	USA	CHN
ARM	.672*	.328	0.777*	0.379
AZE	.248	.378***	0.275	0.693*
BEL	.404*	.117	0.662*	0.524**
GEO	.532*	.424*	0.698*	0.615*
KAZ	.172	.320	0.442***	.606*
KGZ	-.166	-.099	-0.284	-0.362
MDA	.152	.202	0.437***	0.075
MNG	.308	.112	0.522**	0.044
TJK	-.086	.016	0.460**	0.101
TKM	-.193	-.077	0.228	-0.203
UKR	.265	.203	0.579**	0.371
UZB	-.120	.115	0.280	0.222
Average	**.182**	**.170**	**0.423**	**0.255**

Note: *, **, *** denote significant at 1%, 5%, and 10% respectively.

Following Bayoumi and Eichengreen (1994), high correlation of domestic supply shocks and supply shocks to the anchor country suggests that the economies are subject to symmetric shocks, hence the economies are good candidates for monetary policy coordination with the anchor currency. Based on table above, in Eurasia, the correlation of supply shocks between these economies and the US is high, especially compared to correlation with Chinese supply shocks. Thus, according to Bayoumi and Eichengreen's (1994) propositions, a currency area anchored by US is likely to be more feasible than of one anchored by China.

From Table 2, it is evident that the Central Asian countries are more correlated with the Chinese economy and hence affected by shocks that originate from China. Although for Turkmenistan and Kyrgyzstan, the correlation is negative, the negative value is smaller when compared with the correlation for the US.

Countries in the European part of the region are more correlated with the US economy. This is an indication that generally, the region as a whole does not provide strong evidence that it is ready for monetary arrangements because the economies tend to be aligned with different economies. But there are suggestive indications that some arrangements could be made between the Central Asian countries with China, and between the European countries of Eurasia with the US.

5. Conclusion

A three variable structural vector autoregressive model was used to identify the impact of three types of shocks on the economies of Eurasia. The correlation of supply shocks within the region suggests some possibilities for further economic cooperation in monetary policies. In line with the objectives of the study to identify the impact of global shocks and regional shocks, two sub-regions were identified: (i) the sub-region of the Central Asian countries of Eurasia; and (ii) the sub-region of the European countries of Eurasia. Regional shocks are more important than global shocks for the Central Asian countries, and global shocks are more important than regional shocks in the European part of the region.
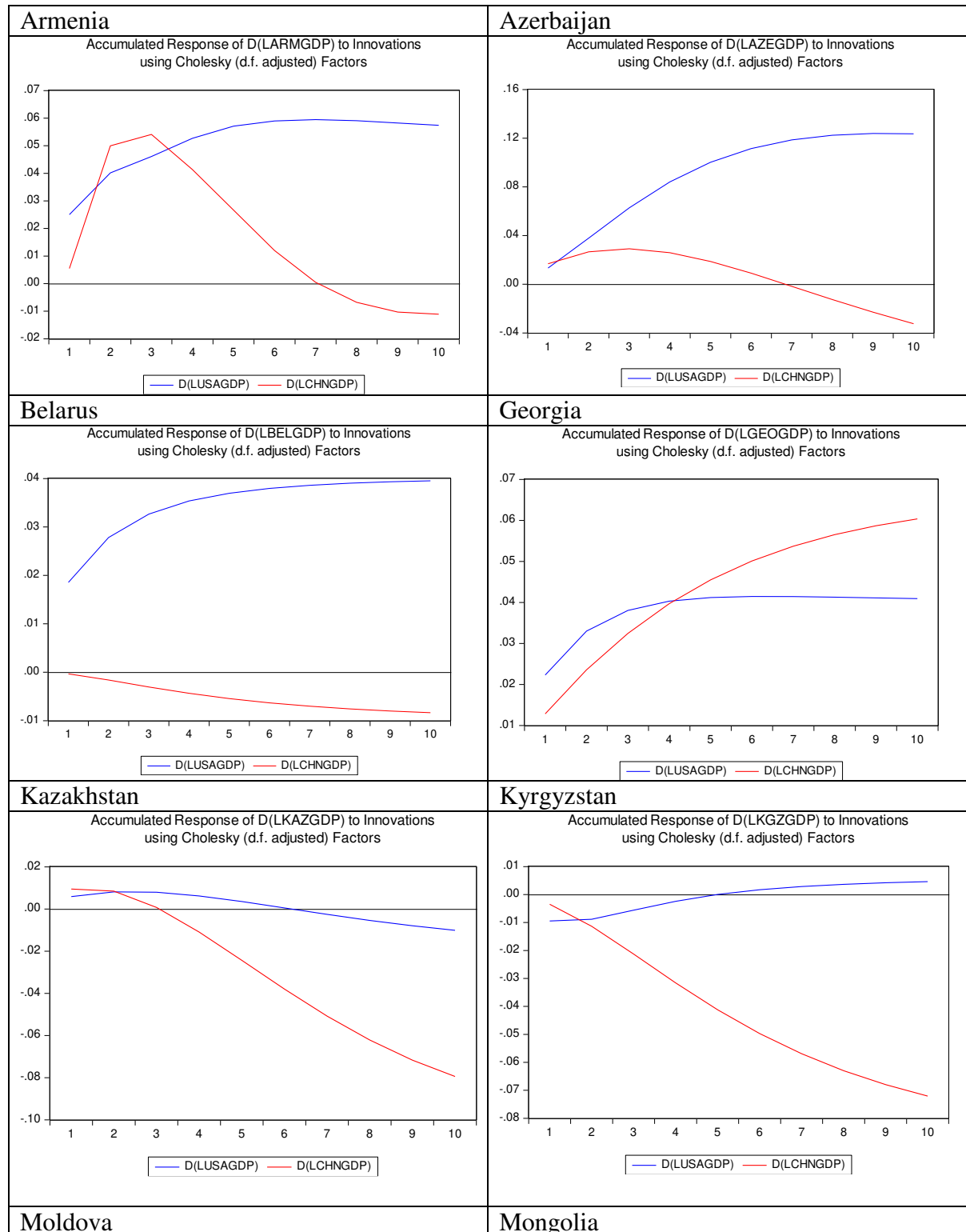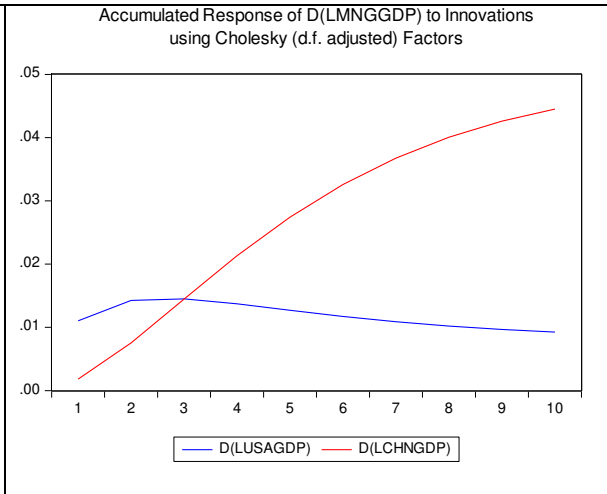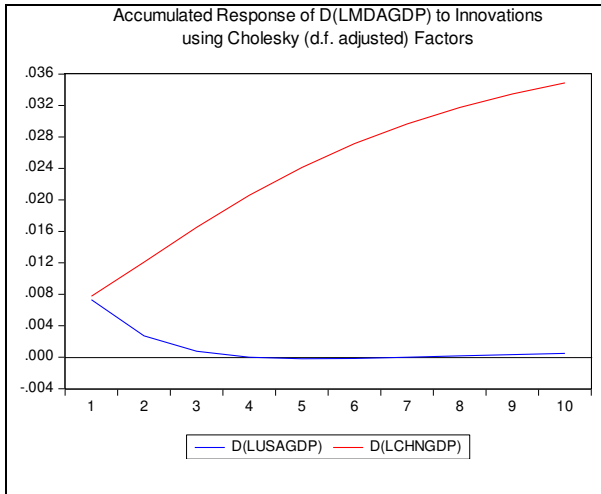
References

Alimov, R. (2018). The Shanghai Cooperation Organisation: Its role and place in the development of Eurasia. *Journal of Eurasian studies*, *9*(2), 114-124.

Atik, S. (2014). Regional economic integrations in the post-Soviet Eurasia: An analysis on causes of inefficiency. *Procedia-Social and Behavioral Sciences*, *109*, 1326-1335.

Bayoumi, T. A., Eichengreen, B. J. (1994). One money or many?: Analyzing the prospects for monetary unification in various parts of the world.

Eurasia Economic Integration, (2017), available at: https://eabr.org/upload/iblock/470/EDB-Centre_2017_Report-43_EEI_ENG.pdf

Frankel, J. A., & Wei, S. J. (1994). Yen bloc or dollar bloc? Exchange rate policies of the East Asian economies. In *Macroeconomic Linkage: Savings, Exchange Rates, and Capital Flows, NBER-EASE Volume 3* (pp. 295-333). University of Chicago Press.

Hartwell, C. A. (2013). A Eurasian (or a Soviet) Union? Consequences of further economic integration in the Commonwealth of Independent States. *Business Horizons*, *56*(4), 411-420.

Jian, X. (2017). Globalization in Reverse and Its Transformation. *China Int'l Stud.*, *65*, 5.

Karaganov, S. (2018). The new Cold War and the emerging Greater Eurasia. *Journal of Eurasian studies*, *9*(2), 85-93.

Kuchins, A. C. (2018). What is Eurasia to US (the US)?. *Journal of Eurasian studies*, *9*(2), 125-133.

Li, Y. (2018). The greater Eurasian partnership and the Belt and Road Initiative: Can the two be linked?. *Journal of Eurasian studies*, *9*(2), 94-99.

Lukin, A. (2016). Russia in a post-bipolar world. *Survival*, *58*(1), 91-112.

Vinokurov, E. (2017). Eurasian Economic Union: Current state and preliminary results. *Russian Journal of Economics*, *3*(1), 54-70.

Vinokurov, E., Demidenko, M., Korshunov, D., & Kovacs, M. (2017). Customs unions, currency crises, and monetary policy coordination: The case of the Eurasian Economic Union. *Russian Journal of Economics*, *3*(3), 280-295.
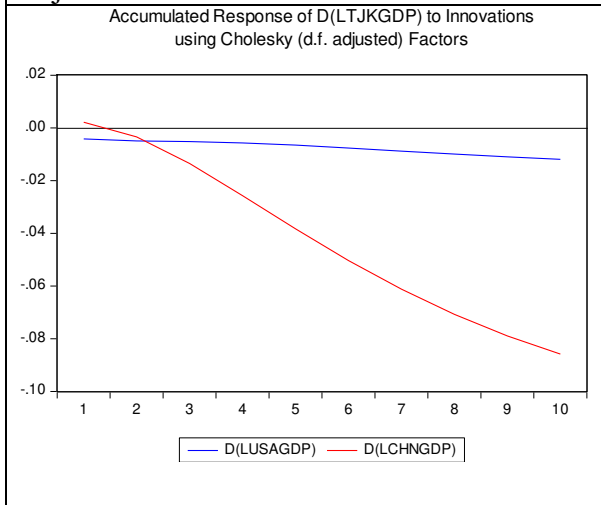
Appendix A: IRF from SVAR:

Below figures are depicting the response of domestic GDPs to a unit shock from the global economy and the regional economy **(1991-2017)**. The response of the shocks are inconclusive.
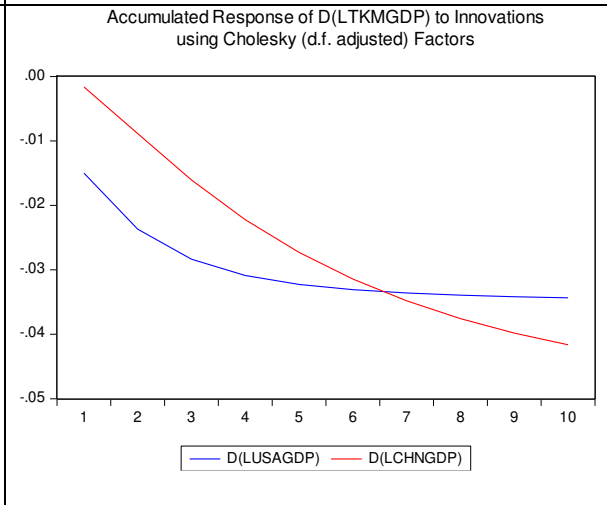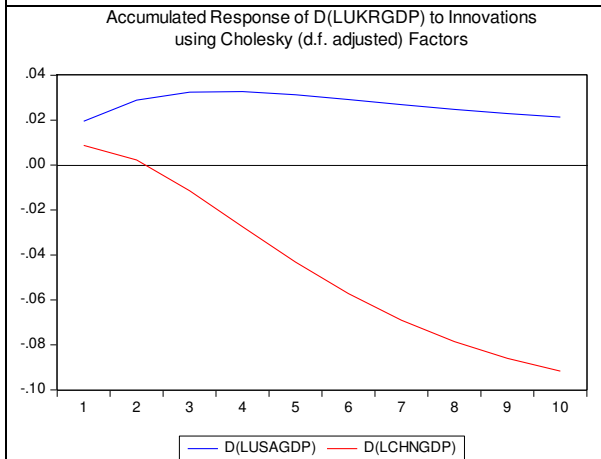
Armenia	Azerbaijan
Belarus	Georgia
Kazakhstan	Kyrgyzstan
Moldova	Mongolia

Accumulated Response of D(LMDAGDP) to Innovations using Cholesky (d.f. adjusted) Factors

Accumulated Response of D(LMNGGDP) to Innovations using Cholesky (d.f. adjusted) Factors

Tajikistan

Turkmenistan

Accumulated Response of D(LTJKGDP) to Innovations using Cholesky (d.f. adjusted) Factors

Accumulated Response of D(LTKMGDP) to Innovations using Cholesky (d.f. adjusted) Factors

Ukraine

Uzbekistan

Accumulated Response of D(LUKRGDP) to Innovations using Cholesky (d.f. adjusted) Factors

Accumulated Response of D(LUZBGDP) to Innovations using Cholesky (d.f. adjusted) Factors