INFLATION BY PRODUCER PRICE INDEX – PREDICTIVE FACTOR FOR INFLATION BY CONSUMER PRICE INDEX? THE CASE OF ROMANIA

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Abstract

Assessment of the Consumer Price Index in time is one of the most used methods for the analysis of inflation, which population have it and perceive with ease about the evolution of prices of goods and services from the consumption basket.

According to the theory of the production chain, part of the inflation through Production Price Indices could be transmitted to inflation through Consumer Price Indices, given that consumer prices are calculated based on the prices of production. This is the start hypothesis for the case study undertaken. The material explores the relationship between inflation through producer prices and inflation through consumer prices in our country. The analysis will be applied to monthly data series in the period 2007-2013 in Romania.

The aim of the research is to verify in what degree inflation by producer prices can be a predictive factor for inflation by consumer price in the analyzed period. After analyzing the relationship between Consumer Price inflation and Producer Price inflation through statistical and econometric methods (Johansen test, Engle-Granger test and Granger Causality) wasn't identified any long-term equilibrium relationship between time series analysed.

***Keywords**: Consumer Price inflation, Producer Price inflation, long-term equilibrium relationship, prices transmission*

***JEL Classification:** E31, C12, C19*

Introduction

Analysis, measurement and interpretation of the Consumer Price Index (CPI) is one of the most common ways of measuring inflation nationwide. Population, perceive the prices growth in a time interval through the purchase of goods and services in the consumption basket. Also, the National Institute of Statistics (NIS) of Romania analyzes also the Producer Price Index (PPI) to evaluate the growth of production factor prices, necessary for the production of final goods consumed by the population. The calculation of these two indices are the main measures of inflation in the assessment inflation of a country.

The theory of the production chain supports the transmission of production prices changes to consumer prices. Thus, the growth prices of finished goods, has repercussions on the growth prices of intermediate goods. Given the above theory, on the production and consumption of goods and services, in recent years a lot of studies were developt related to how inflation through production prices can be used as a predictive factor for inflation through consumption prices.

Undertaken analysis aims to verify to what degree inflation through Producer Price Indices can be a predictive factor for inflation through Consumer Price Indices. The research conducted analyzes data series in Romania, for the 2 indices mentioned above. The econometric and statistical methods applied verify the correlation and causal proportions of the two indicators.

Literature review

Nationwide, the main indices calculated by NIS are Consumer Price Index and Production Price Index. The formation and transmission mode of prices in market, always showed interest to economists in order to verify and validate economic theories.

The scientific literature shows over time, the points of view of economists regarding the formation and transmission of prices at the level of the market.

According to the theory of the production chain, price fluctuations in the industrial production can be transmitted after a certain time, to the consumer prices, being perceived by the population through the consumption basket. (National Bank of Romania, 2009).

On the other hand, the demand theory, supports the idea that consumers demand for finished goods determines the demand for intermediate goods. According to this, the prices transmission is realized from consumer prices to producer prices. (National Bank of Romania, 2009).

Theories of other economists, argue that pricing strategies are made according to manufacturers gains, while other opinions advocates for bidirectional causality between CPI and PPI. (Tiwari, Suresh, Arouri, Teulon, 2014)

As can be seen above, the scientific literature share to the readers, different views of economists on pricing formation in the market: some economists believe that the evolution of the consumer prices is determined by the evolution of producer prices, inflation of production prices is transferred to consumers through inflation of consumer prices; another part of economists sustaining the opposite or even bidirectional causality between the two prices analyzed. Why opinions are so divided? The explanations in this regard may be made of: different methodologies for calculating the Consumer Price Index and Producer Price Index from one country to another, the development of the country and the construction and evolution of prices in the market.

In case of production theory validation, inflation through Production Price Indices could be a predictive factor for inflation through Consumer Price Indices. Currently, a vast majority of countries measure and interpret Consumer Price Indices as the main method to analyse the inflation. Very few countries through Central Banks, mentions in the published analysis the Producer Price Index as a method for assessing the inflation (Tiwari, Suresh, Arouri, Teulon, 2014).

The present research paper, examines the relationship between inflation through producer prices and consumer prices in Romania for a period of 7 years (2007-2013) and the degree to which inflation through producer prices can be a predictive factor for consumer price inflation. According to the main economic theory related to market prices, consumer prices paid by the population for food goods, non-food goods and services are mainly established by economic agents, depending on producer prices, which in practice would mean that a part of inflation through producer prices is transmitted to, and is felt by the final customers through consumer price inflation.

If the hypothesis of this article, namely, inflation through the production prices is a method for forecasting consumer price inflation, turns out to be true, the Central Banks can use in the information sent to the population, also the methods of inflation targeting by producer prices.

Research methodology

The study of the relationship between consumer prices indices and the production price indices, will begin with a descriptive analysis of the calculation methodology of the 2 indices, which includes the conceptual

differences and will continue with a practical analysis, using the appropriate statistical and econometric methods.

Conceptual differences between PPI and CPI

Inflation, as a macroeconomic phenomenon, defines the evolution of prices from one period of time to another. National Institute of Statistics analyse, examines and evaluates inflation by two very important indicators: Consumer Price Index (CPI) and Production Price Index for Domestic Market (PPIDM). PPIDM assesses the evolution of industrial goods for the domestic market, while CPI assesses the evolution of prices of consumer goods for the population.

CPI takes into consideration households consumption in Romania, for the purchase and consumption of food goods, non-food goods and services to satisfy the needs of daily living. Through CPI does not take into account the institutions, only households, both rural and urban. Prices for goods (food and non-food) and services from the consumption basket of the population are registered through the Household Budget Survey, conducted on a monthly and annual by NIS.

CPI is currently the most common communication method of the inflation rate to the population, being a Laspeyres index that assesses the evolution of prices paid by consumers for a basket of food goods, non-food goods and services in period t, reported to the t-2 period.

To calculate CPI, it takes into consideration the items in the consumption basket of the population, excluding the calculation:

- Consumption of goods provided from own resources and those received as a gift;
- Financial resources alocated for investment and accumulation, such as: buying houses, making repairs to old houses etc.
- Financial resources allocated for household, such as: plowing, sowing, raising crops, medical treatment of animals etc.
- Financial resources to pay interests, insurance rates, fines, taxes, gambling etc.

(National Institute of Statistics, 2014)

Producer Price Index for Domestic Market includes the prices of all products manufactured and sold by economic agents, from all areas of mining and manufacturing industries, including the energy sector. PPIDM is also a Laspeyres index, like the CPI, being an aggregate index, which takes into account the evolution of prices of industrial goods, in various stages of production: raw materials, intermediate goods, finished goods and consumer goods. In order to calculate PPIDM are taken into account the transactions for the first stage of

marketing products, respectively the economic operator price. Given that some of the goods are produced for export, PPI is calculated both for the domestic market, as well as for the non-domestic market, the calculation mode being similar.

According to EC (European Conformity) Regulation no. 1165/98 and European Parliament and Council Regulation no. 1158/2005 concerning short-term statistics, the PPI does not include:

- Extraction of uranium and thorium;
- Processing of nuclear fuel;
- Manufacture of weapons and ammunition;
- Building of ships and boats;
- Manufacture of aircraft and spacecraft;
- Manufacture of military fighting vehicles;
- Collection and wastewater treatment;
- Collection, treatment and disposal activities; materials recovery activities;
- Activities and remediation services;
- Production manufactured and delivered within the same economic operator.

(National Institute of Statistics, 2014)

Considering the two definitions of indices, we start the research from the premise that a part of producer prices are forwarded (transferred) to the consumer prices, being paid by population through consumer basket. In order to verify the validity of the above hypothesis, we study the relationship between the two indices from both theoretical and practical point of view, through statistical and econometric methods.

First we will outline the main differences between the two indices in terms of the calculation methodology:

- Industrial production price index does not take into account the services, as against to CPI, which includes it;
- PPIDM include non-energy intermediate goods, while they are not part of the CPI;
- Unprocessed foods (vegetables, fruits, etc.) are included in the CPI calculation, but not delivered by the industrial sector;
- PPIDM captures only the prices of goods produced nationally, while household consumption takes into account both domestic products, and imported ones;
- Consumer prices paid by the population include VAT and other duties, while in PPIDM are not included. (National Bank of Romania, 2009).

Looking at the differences in calculation methodology, we can conclude

the necessity of a elaborate analysis of the correlation between CPI and PPIDM through statistics and econometric methods. Econometric methods used in this research, examines the validity of the existence of a long-run equilibrium relationship between production price indices and consumer price indices. Also, it will be check out the existence of a relationship of determination from producer prices to consumer prices.

Descriptive analysis of data

In view of analysis it will consider the monthly data series for CPI and PPIDM in the period 2007-2013. Given the methodology of calculation the two indices and implications of these products in the market, the analysis will use monthly series of CPI, CORE2, total PPIDM, Price Indices in the manufacturing industry, Price Indices in the food industry, Price Indices in durable goods industry, Price Indices in non-durable goods industry.

CORE2 is a measure of core inflation calculated nationwide by the National Bank of Romania by eliminating from consumption basket the influence of the administered prices, those with high volatility components (such as vegetables, fruits, eggs) and the price of fuel. The reason for using the above indices, obtained from the split of PPIDM is the use only those price indices that can have the greatest impact on consumer prices.

The data series used, as well as the names used in econometric processing are described in the table below.

Data series used in econometric tests

Table 1

CPI	Consumer Price Index
CORE2	Inflation obtained by removing: the influence of administered prices, volatility components such as vegetables, fruits, eggs and fuel price
PPIDM	Total Producer Price Index for Domestic Market
ind_prel	Production Price Indices for Domestic Market in the manufacturing industry
ind_alim	Production Price Indices for Domestic Market in the food industry
fol_indel	Production Price Indices for Domestic Market in durable goods industry
uz_curent	Production Price Indices for Domestic Market in non-durables goods industry

Source: National Institute of Statistics

From the economic point of view, two time series are in a long term equilibrium relationship if they are in a relationship of cointegration, which means (in theoretically) that there are important factors that affect their evolution on long term equally. In 1987 Engle and Granger showed that following linear combination of two non-stationary time series could result a stationary series.

According to econometrics, these two variables are cointegrated if the linear combination described above is resulted.

In order to achieve the econometric analysis will go through the following steps:

- Testing the integration degree of data series, will work with non-stationary time series in levels and stationary in first difference, integrated of order 1;
- Checking the existence of a relatively long-term equilibrium between production indices and consumer indices taken into account;
- Testing the Granger causality and meaning, between the series data analyzed.

Research results

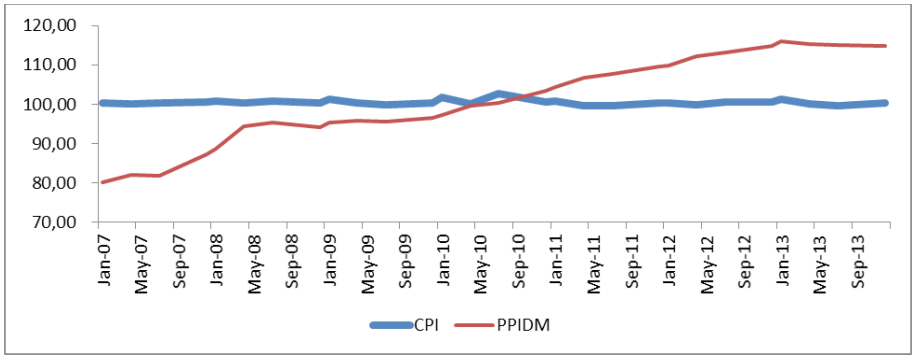
At this stage of the analysis will present the results obtained from research of the relationship between monthly data series of Consumer Price Indices, including CORE2 inflation, and monthly data series of Producer Price Indices overall and splitted on industries CAEN (Classification of Activities from the National Economy of Romania), namely: manufacturing, food, durables goods and non-durables goods industries. The period that will be analyzed the data series is 2007-2013. The steps of the research are represented by: presentation and analysis of the evolutions of data series analyzed, followed by presentation and analysis of the results of econometric tests used.

Evolution of data series analyzed in the period 2007-2013

In the period 2007-2013 the Consumer Prices Indices and Production Prices Indices used in analyse have evolved differently. Producer prices in manufacturing, food, durables goods and non-durables goods industries have recorded values below 100 percent, to about June 2010, after this date, the values of these indices rising to nearly 120 percent. Consumer Prices Indices recorded relatively constant developments over the analysis period, registering less over 100 percent, the maximum being of 102.58 percent in July 2010, and minimum in September 2013, of 99.43 percent. Main motivation of this evolution is linked by the measures taken by the National Bank of Romania to maintain the prices paid by the population for consumption basket and for stabilization of inflation rate. CORE2 inflation is obtained by removing from CPI calculation the products with administered prices and high price volatility, such as vegetables, fruits, eggs, fuels. During the analyzed period, CORE2 inflation followed the evolution of CPI, recording a maximum of 8.21 percent in July 2008 and a minimum of 0.66 percent in November 2013.

CPI and PPIDM evolution in the period 2007-2013

Figure 1

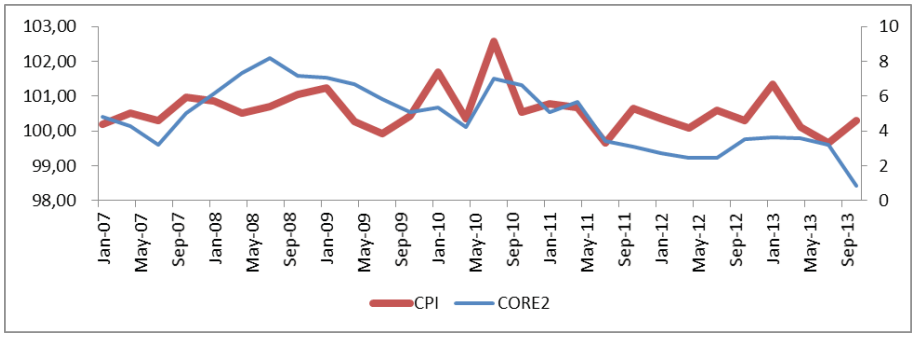


Source: National Institute of Statistics

The above graphic shows the evolution of the CPI and PPIDM in our country in the period 2007-2013. As can be seen, CPI recorded small oscillations from one month to another, due to anti-inflationary measures and careful monitoring of the National Bank, instead the PPIDM have registered an upward trend in the 2007-2013 period, the minimum being introduced in January 2007, by 80.13 percent and the maximum by 116.46 percent being introduced in February 2013. In the period January 2007 - July 2010 Consumer Price Index stood above the Production Price Index for Domestic Market, and since August 2010 the PPIDM exceeded the level of CPI, reaching 114.75 percent in December 2013. A few years after the appearance of the global economic crisis, its effect was felt in rising of production prices necessary to produce final goods.

CPI and CORE2 evolution in the period 2007-2013

Figure 2

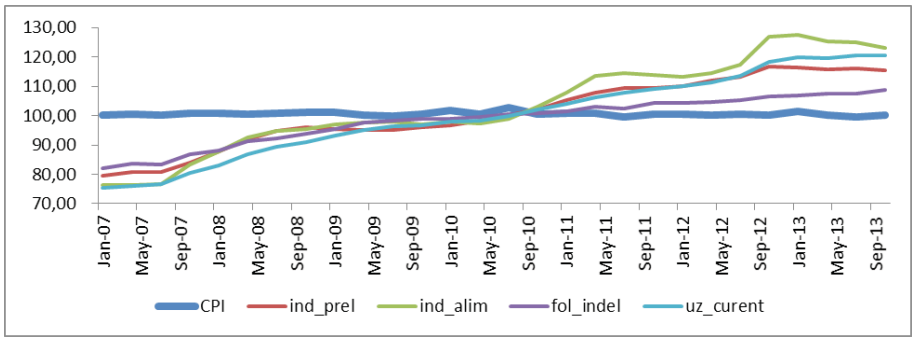


Source: National Institute of Statistics

The graphic above shows the evolution of the monthly CPI data series and CORE2 in the period 2007-2013. During this period the CPI remained at relatively constant levels compared to the Consumer Price Index, inflation rate CORE2 has recorded oscillations on the entire reference period studied, ranging from 0.85 percent in October 2013 to 8.21 percent in July 2008, with an average of 4.77 percent during this period.

CPI, ind_prel, ind_alim, fol_indel and uz_curent evolution in the period 2007-2013

Figure 3



Source: National Institute of Statistics

You can view from the above chart the evolution of CPI versus Production Indices of manufacturing, food, durables goods and non-durables goods industries. Until about July 2010 producer prices for analyzed indices have recorded prices below Consumer Price Index, below 100 percent. After this date, all indices of prices in industries analyzed surpassed evolution of Consumer Price Index, the most values being recorded by the food industry, recording values from 76.41 percent in January 2007 to 127.44 percent in January 2013.

Econometric analysis of data

In econometric tests undertaken it was started from general to particular, first analyzing the relationship between indices with large scope of coverage, then analyzing the production price indices with lower coverage. For data processing and application of econometric tests in the analysis was used the Eviews software.

The first step is to test the stationarity of time series used. In this regard, will use Dickey Fuller test. As can be seen from the table below all

time series are integrated of order 1 (except CPI series), which means they are non-stationary.

Determination the order of cointegration

Table 2

Variable	Period	Dickey Fuller test		Integration order
		Specification	Test value	
l_cpi	2007m01-2013m12	c, t	-8.22	Stationary series
l_ppidm	2007m01-2013m12	c, t	4.43	I(1)
dl_ppidm	2007m01-2013m12	c, t	-10.20	I(1)
l_core2	2007m01-2013m12	c, t	0.47	I(1)
dl_core2	2007m01-2013m12	c, t	-7.84	I(1)
l_ind_prel	2007m01-2013m12	c, t	-2.61	I(1)
dl_ind_prel	2007m01-2013m12	c, t	-9.16	I(1)
l_ind_alim	2007m01-2013m12	c, t	-2.05	I(1)
dl_ind_alim	2007m01-2013m12	c, t	-11.34	I(1)
l_fol_indel	2007m01-2013m12	c, t	-1.24	I(1)
dl_fol_indel	2007m01-2013m12	c, t	-17.04	I(1)
l_uz_curent	2007m01-2013m12	c, t	-2.05	I(1)
dl_uz_curent	2007m01-2013m12	c, t	-13.54	I(1)

Source: National Institute of Statistics and author's calculation through Eviews

All econometric tests were performed using logarithmic data series. After identifying the order of integration of data series, will be tested the cointegration between series indices: total PPIDM, Price Indices in the manufacturing industry, Price Indices in the food industry, Price Indices in durable goods industry, Price Indices in non-durable goods industry and CORE2 series. The testing of cointegration will be done through Eviews software by Johansen function. After testing, the results are specified in the table below.

Johansen test results

Table 3

Data series	Johansen test	Lag identified
l_CORE2; l_ppidm	Null hypothesis of absence of cointegration can not be rejected	1
l_CORE2; l_ind_prel	Null hypothesis of absence of cointegration can not be rejected	2
l_CORE2; l_ind_alim	Null hypothesis of absence of cointegration can not be rejected	2
l_CORE2; l_fol_indel	Null hypothesis of absence of cointegration can not be rejected	1
l_CORE2; l_uz_curent	Null hypothesis of absence of cointegration can not be rejected	2

Source: National Institute of Statistics and author's calculation through Eviews

The lag was identified according to the LR criteria (sequential modified LR test statistic), FPE (Final Prediction Error), AIC (Akaike information criterion), SC (Schwarz information criterion) and KQ (Hannan-Quinn information criterion), and full results are specified in Appendix (1).

From the above table it can be seen that after Johansen test was applied to the logarithmic series of industrial production indices for the domestic market, overall and splitted by branch of activity, no cointegrating relationship was found.

Although no cointegration relationship between time series analyzed was found, in continuation of the research will be applied Granger causality, in the event of identifying a spurious causality.

Granger causality tests

Table 4

Lag(s)	1		2		3	
Null Hypothesis	F-Stat.	Prob.	F-Stat.	Prob.	F-Stat.	Prob
L_PPIDM does not Granger Cause L_CORE2	2.94917	**0.0898**	2.41810	0.0958	2.15042	0.1011
L_CORE2 does not Granger Cause L_PPIDM	0.16689	0.6840	2.08568	0.1312	1.34015	0.2679
L_IND_PREL does not Granger Cause L_CORE2	3.53472	**0.0637**	2.57344	**0.0828**	3.27485	**0.0257**
L_CORE2 does not Granger Cause L_IND_PREL	0.35289	0.5542	2.14094	0.1245	1.36456	0.2603
L_IND_ALIM does not Granger Cause L_CORE2	2.64991	0.1075	4.37577	**0.0159**	3.34268	**0.0237**
L_CORE2 does not Granger Cause L_IND_ALIM	0.05058	0.8226	2.60629	**0.0803**	2.05593	0.1134
L_FOL_INDEL does not Granger Cause L_CORE2	2.35073	0.1292	1.52205	0.2248	1.27571	0.2890
L_CORE2 does not Granger Cause L_FOL_INDEL	0.61914	0.4337	0.32589	0.7229	0.70323	0.5531
L_UZ_CURENT does not Granger Cause L_CORE2	3.05961	**0.0841**	3.49372	**0.0353**	2.80214	**0.0457**
L_CORE2 does not Granger Cause L_UZ_CURENT	0.59592	0.4424	3.11184	**0.0502**	2.22434	**0.0924**

Source: National Institute of Statistics and author's calculation through Eviews

From the Granger causality tests, the following conclusions results:

- For a significance level of 10% was identified the following unidirectional Granger causality: PPIDM is caused by CORE2 (lag 1 and lag 2), ind_prel is caused by CORE2 (lag 1, lag 2 and lag 3), ind_alim is caused by CORE2 (lag 3) and uz_curent is caused by CORE2 (lag 1);

- For a significance level of 10% was identified the following bidirectional Granger causality: ind_alim and CORE 2 (lag 2), use _curent and CORE2 (lag 2 and lag 3).

Since the Johansen cointegration tests did not lead positive results, and from the Granger tests were identified causality relationships, it will be called spurious causality.

Discussion and conclusions

This paper presents the analysis of the correlation between Consumer Price Indices and those of the Producer Prices and the degree to which inflation by Producer Price Indices can be used as a predictive factor for inflation by consumer price indices. In the research there are analyzed monthly series data of Consumer Price Indices and Production Price Indices splitted by branch of activity in our country, in the period 2007-2013.

In the analysis we worked with data series integrated of order 1, for this reason the data series were verifyed through Dickey-Fuller test for identifying the order of integration. The test results revealed data series integrated of order 1 for: CORE2 inflation, total PPIDM and for PPIDM splitted used in analysis (ind_prel, ind_alim, fol_indel and uz_curent).

After the Johansen cointegration tests were applied to monthly series of consumer price indices and production splitted by section, it wasn't found any cointegrating relationship, and most unidirectional and bidirectional causality relationships were identified for lag 2. According scientific literature, we can define such causality identified as spurious.

Thus, if the Johansen test confirmed the existence of cointegration relationships between CPI and PPI analyzed, the time period after which inflation by Producer Price Indices would have been felt by the Consumer Price Indices would be 2 months. In this case the inflation by Producer Price Indices can not be used for forecasting inflation by Consumer Price Indices.

The main conclusions that can be formulated after the econometric tests performed are:

- Differences in methodology of calculation for the two indices considered in the analysis, prevents providing relevant results: the services aren't included in the production index, there are goods entering the consumer basket, but are not provided by any of the industries (such as fruit, vegetables etc.);
- Development of foreign trade, enables quick replacement of the goods from the consumption basket locally produced with imported goods;

- The link between inflation by Producer Price Indices and inflation by Consumer Price Indices from Romania in the period 2007 - 2013 does not confirm the economic theory on price transmission from producer prices to consumer prices, there are situations in which the two indices shows similar movements, invalidating the theory of the production chain.

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Appendix A.

Choosing the number of lags

Data series: l_CORE2, l_PPIDM

VAR Lag Order Selection Criteria
Endogenous variables: CORE2
Exogenous variables: C
Date: 11/19/14 Time: 12:57
Sample: 2007M01 2013M12
Included observations: 76

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-156.5868	NA	3.703009	4.147021	4.177689	4.159277
1	**-73.70711**	**161.3973***	**0.429311**	**1.992292**	**2.053627***	**2.016805***
2	-72.28592	2.730172	0.424592*	1.981208*	2.073211	2.017977
3	-72.06491	0.418752	0.433410	2.001708	2.124378	2.050733
4	-71.90895	0.291401	0.443185	2.023920	2.177258	2.085201
5	-71.57290	0.619049	0.451060	2.041392	2.225397	2.114929
6	-71.54471	0.051177	0.462834	2.066966	2.281639	2.152760
7	-71.48499	0.106868	0.474552	2.091710	2.337051	2.189760
8	-71.33236	0.269106	0.485415	2.114010	2.390017	2.224316

* 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

Data series: l_CORE2, l_ind_prel

VAR Lag Order Selection Criteria
Endogenous variables: L_CORE2
Exogenous variables: C
Date: 11/19/14 Time: 15:47
Sample: 2007M01 2013M12
Included observations: 76

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-59.46004	NA	0.287417	1.591054	1.621721	1.603310
1	22.87115	160.3292*	0.033806	-0.549241	-0.487906*	-0.524728
2	**24.53920**	**3.204414**	**0.033218***	**-0.566821***	**-0.474818**	**-0.530052***
3	24.53997	0.001452	0.034105	-0.540525	-0.417855	-0.491501
4	24.54022	0.000469	0.035018	-0.514216	-0.360879	-0.452935
5	24.64321	0.189716	0.035859	-0.490611	-0.306605	-0.417073
6	24.64525	0.003712	0.036820	-0.464349	-0.249676	-0.378555
7	24.67083	0.045762	0.037787	-0.438706	-0.193366	-0.340656
8	24.69505	0.042717	0.038782	-0.413028	-0.137020	-0.302722

* 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

Data series: l_CORE2, l_ind_alim

VAR Lag Order Selection Criteria
Endogenous variables: L_CORE2 L_IND_ALIM
Exogenous variables: C
Date: 11/19/14 Time: 21:19
Sample: 2007M01 2013M12
Included observations: 76

Lag	LogL	LR	FPE	AIC	SC	HQ
0	14.27715	NA	0.002482	-0.323083	-0.261748	-0.298570
1	276.3754	503.5045	2.79e-06	-7.115142	-6.931136	-7.041604
2	**300.8006**	**45.63661***	**1.63e-06***	**-7.652648***	**-7.345972***	**-7.530085***
3	302.1481	2.446824	1.75e-06	-7.582846	-7.153500	-7.411258
4	303.2484	1.939862	1.89e-06	-7.506536	-6.954520	-7.285923
5	304.4343	2.028592	2.04e-06	-7.432482	-6.757796	-7.162844
6	306.7533	3.844709	2.13e-06	-7.388246	-6.590889	-7.069584
7	307.6850	1.495629	2.32e-06	-7.307501	-6.387475	-6.939814
8	310.0458	3.665332	2.44e-06	-7.264362	-6.221666	-6.847650

* 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

Data series: l_CORE2, l_fol_indel

VAR Lag Order Selection Criteria
Endogenous variables: L_CORE2 L_FOL_INDEL
Exogenous variables: C
Date: 11/19/14 Time: 22:47
Sample: 2007M01 2013M12
Included observations: 76

Lag	LogL	LR	FPE	AIC	SC	HQ
0	66.38452	NA	0.000630	-1.694329	-1.632994	-1.669817
1	**331.0510**	**508.4382***	**6.61e-07***	**-8.553973***	**-8.369968***	**-8.480436***
2	332.9734	3.591875	6.98e-07	-8.499300	-8.192624	-8.376738
3	334.2511	2.319978	7.51e-07	-8.427660	-7.998314	-8.256072
4	338.6973	7.839419	7.43e-07	-8.439403	-7.887387	-8.218791
5	341.7348	5.195664	7.63e-07	-8.414073	-7.739387	-8.144436
6	344.3420	4.322433	7.94e-07	-8.377420	-7.580064	-8.058758
7	346.2241	3.021423	8.42e-07	-8.321688	-7.401662	-7.954001
8	351.1092	7.584618	8.27e-07	-8.344978	-7.302281	-7.928266

* 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

Data series: l_CORE2, l_uz_curent

VAR Lag Order Selection Criteria
Endogenous variables: L_CORE2 L_UZ_CURENT
Exogenous variables: C
Date: 11/19/14 Time: 23:19
Sample: 2007M01 2013M12
Included observations: 76

Lag	LogL	LR	FPE	AIC	SC	HQ
0	20.57136	NA	0.002103	-0.488720	-0.427385	-0.464208
1	330.7305	595.8321	6.67e-07	-8.545541	-8.361535	-8.472003
2	**340.2555**	**17.79670***	**5.76e-07***	**-8.690935***	**-8.384260***	**-8.568373***
3	342.0057	3.177956	6.12e-07	-8.631730	-8.202384	-8.460142
4	342.5422	0.945906	6.71e-07	-8.540584	-7.988569	-8.319972
5	343.3322	1.351360	7.32e-07	-8.456111	-7.781425	-8.186474
6	344.6041	2.108703	7.88e-07	-8.384320	-7.586964	-8.065658
7	346.8228	3.561488	8.29e-07	-8.337442	-7.417415	-7.969755
8	349.3230	3.881907	8.67e-07	-8.297974	-7.255277	-7.881262

* 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