

IMPORTED INFLATION OF
CONSUMER GOODS AND
ITS CONTRIBUTION TO THE
NATIONAL INFLATION

Lorena Skufi
Enian Çela

31 (70) 2017

WORKING PAPER



IMPORTED INFLATION OF
CONSUMER GOODS AND
ITS CONTRIBUTION TO
THE NATIONAL INFLATION

Lorena Skufi
Enian Çela

WORKING PAPER

31 (70) 2017

BANK OF ALBANIA



Lorena Skufi

Medium-term forecast Unit, Medium-term and Strategy Sector, Monetary Policy Department,
Bank of Albania, e-mail: lskufi@bankofalbania.org

Enian Çela

Analysis Unit, Economic Analysis Sector, Monetary Policy Department, Bank of Albania,
e-mail: ecela@bankofalbania.org

*Note: The views and opinions expressed in this article are those of the authors alone
and do not represent the position or policies of the Bank of Albania.*

C O N T E N T

ABSTRACT	6
1. INTRODUCTION	7
2. LITERATURE REVIEW	8
3. METHODOLOGY	11
3a. Selection of consumer goods' categories	11
3b. Calculation of price indices and inflation	13
3c. Inflation decomposition	15
3d. Overall inflation decomposition	17
4. CONCLUSIONS	18
5. DISCUSSION AND FUTURE RESEARCH OPPORTUNITIES	19
REFERENCES	21

ABSTRACT

As a small open economy, Albania is thought to be prone to foreign inflationist influences. The increasing degrees of trade openness and exchanges would support such claim with imported inflation producing an impact on overall inflation. This paper attempts to quantify imported inflation for a selected sample of consumer goods representing 60% of the CPI basket. Furthermore it attempts to decompose the overall inflation between domestic and foreign contributions on CPI basket by applying accounting techniques in the period 2008-2012¹. Results reveal marginal contributions associated with imported inflation.

Keywords: imported inflation, decomposition, CPI.

¹ Based on data availability at the moment the material was submitted for publication.

1. INTRODUCTION

Albania reflects a small open economy. Accordingly, the economic system and its indicators are sensitive to foreign factors which are perceived to exercise a substantial influence. In particular, consumer prices represent an important indicator affected by international developments. The presence of imported goods and services in the domestic market reflects this belief. Therefore, changes in import prices are deemed to affect the overall inflation of Albania.

This paper aims to quantify the imported inflation of a selected sample of consumer goods (representing 60% of the CPI basket) and separate its effect from the “domestically” generated inflation applying accounting techniques. In this aspect, the procedure reflects two steps. In the first step we measure the imported inflation associated with consumer goods (from the selected sample). In the second step we decompose the overall reported inflation into domestic and imported. We also show the contributions associated with the remaining 40% of the basket which is not decomposed.

The methodology also divides into two parts. In the first part we apply border unit prices to calculate monthly price indices for each of the selected categories of consumer goods (32 commodity groups) in the period 2008-2012. Individual commodity group indices are weighted to produce commodity category indices (8 categories) and inflation rates are calculated in the case of each category. In the end, commodity categories are unified to produce a single weighted figure representing imported inflation.

In the second step, accounting decomposition is conducted at category and overall level separating the domestic and foreign inflation contributions for the selected sample. In the case of commodity categories, the domestic contribution is represented as a residual of official inflation deducting imported contribution. In overall level, we also reveal the contributions associated with the other items that are included in the CPI basket but not in our decomposition analysis. These items are divided into dualistic, bearing both domestic and foreign contributions not decomposed; and purely domestic when no imported contribution is attributed to them.

In the analysis we employ import, CPI weighting, inflation rates and consumption data. Annual import, inflation and CPI weighting data are obtained from the Statistical Institute (INSTAT). Household consumption data for year 2008 is also obtained from INSTAT. However, consumption figures associated with 2009-2012 are based on estimations from the Macroeconomic Modeling Unit of the Research Department of the Bank of Albania giving the absence of official statistics.

At commodity level, results reveal the stronger contribution of domestic inflation in almost all categories and years including the cases when consumption of imported goods overtake consumption of domestically produced goods. The same applies when decomposition is carried out at overall inflation level.

These results do not rule out the possibility that overall price changes are immune to foreign influences. As a matter of fact, we only analyze the direct import influence on the CPI basket represented by imported goods being sold domestically. Indirect influences (e.g. cost push inflation through imported inputs and semi-finished goods) represent also a source of foreign pressure which we do not analyze at this moment. This represents an important challenge for future research.

2. LITERATURE REVIEW

The effects of imported prices on national CPI and inflation are closely related to the globalization process (Bowen and Mayhew, 2008). The closer the economies are integrated with one-another, the more bilateral export and import prices affect national inflation rates. In general terms, it is believed that the opening of developed economies to developing economies assists in the decline of inflationary pressures in the former (Taylor, 2000). That is related to the fact that both inputs and final demand commodities are obtained at cheaper prices (from the so-called low-cost economies). Bean (2006) reaches similar conclusions. However, related studies

reflect opposite results. We can mention here Pain et al. (2006), Spange and Young (2007) and McCooile (2008). In these cases, inflationary pressures in developed countries rise as a result of increased prices associated with increased global demand both for imported inputs and final demand commodities.

The methodology for the measurement of foreign influences on national inflation follows two streamlines (Bowen and Mayhew, 2008). The first one is known as the regression approach. In this case, elements of foreign pressure taking the form of import prices and import shares on domestic demand serve as explanatory variables for recorded domestic inflation. These variables are coupled with other factors affecting inflation e.g. unit labor cost, mark-ups, exchange rates etc. McCarthy (1999) applies this approach in identifying imported inflation effects in the case of industrialized economies. He finds mostly marginal effects. However, the foreign influence is stronger in the case of larger shares of imports on domestic demand.

Goldberg and Campa (2008) analyze the separate impacts of foreign prices and exchange rate fluctuations on domestic inflation in the case of 21 industrialized countries. The analysis includes inputs, non-tradable commodities and consumer goods. The approach measures the elasticities of domestic CPI to border prices. According to the results, the stronger effects are found in the case of imported inputs representing major exports for the partner countries.

Adetiloye (2010) applies Granger Causality approach in determining the impact of import prices and exchange rates on Nigeria's inflation. The results show that in those categories with higher import shares, domestic inflation increases with higher import prices.

In the case of Albania, the regressive approach is undertaken by Celiku (2003) in analyzing the effects of monthly imported inflation in the case of tradable and non-tradable goods. Imported inflation pressures are reported as significant for the category of tradable goods. Furthermore, they seem to maintain the influence until two periods forward. On the other hand, Tanku, Vika and

Gjermeni (2007) analyze the impact of exchange rate fluctuations on inflation. Once again, the effect is more profound in the case of tradable commodities.

The second streamline of methodology is known as the "accounting approach". Under this approach, the purpose is to identify the contribution (not influence) of imported inflation on overall inflation. The main components include the recorded inflation, the imported inflation and the shares of imported and domestically produced items on domestic demand. Nordhaus and Shoven (1977) introduced this approach with the decomposition of the Wholesale Price Index of the United States in period 1965-1974. Disaggregation is conducted for 90 individual categories gradually grouped until 5 large sectors: agriculture, fishing and forestry, mining and fuels, labor and imports. A residual is also incorporated consisting of not analyzed items and statistical discrepancy. The general formula of decomposition is the following:

$$\Delta WPI = \sum w_i \times \Delta p_i$$

with changes in the **WPI** explained as changes in component prices augmented for the component weight in the **WPI** index. Imported inflation contribution varies between 14-27%.

More recent studies have incorporated the element of partner changes and import substitutions adding imported inflation decomposition. Pain et al. (2005) calculated that increasing cheaper imports from emerging economies have caused a decrease by 0.1 pp in annual terms in the United States inflation during 1996-2005. For the Euro area the impact was larger in the period 2001-2005 with 0.3 pp drop annually. In the period 1996-2000, the impact on Euro area inflation was marginal.

Nickell (2005) analyzes the case of the UK switching to cheaper import partners for inputs in the period 2000-2004. He claims that this substitution has caused a 0.5 pp annual drop in UK export prices. MacCoille (2008) analyzes the impact of this substitution on UK import prices. The impact is a 0.7 pp drop in annual import

prices for manufactured goods. The ECB (2006) conducts a similar analysis for the Euro area in the period 1996-2005 reporting an average 2 pp decrease of import prices in annual terms.

The Bank of Albania produces an index of imported inflationary pressures based on the inflation figures for “Foodstuffs, beverages and Tobacco” of 18 trading partners and the inflation figures associated with commodities for Bulgaria, Germany, Greece, Italy and Turkey (Bank of Albania, 2013). These figures are augmented with the respective import values to obtain a single index. Furthermore, NEER is included in the equation to take account for exchange rate fluctuations. Imported inflation contribution is determined as the difference between the tradable CPI compound and the non-tradable CPI compound. The proxy for imported inflation bears certain shortcomings reflected in the fact that trade partner CPI composition and weighting does not necessarily reflect Albania’s CPI composition and weighting. Furthermore, partner CPI index do not necessarily represent the unit value index for exports towards Albania. Finally, inflation figures in trade partners also reflect their domestic policies (both fiscal and monetary).

3. METHODOLOGY

3A. SELECTION OF CONSUMER GOODS’ CATEGORIES

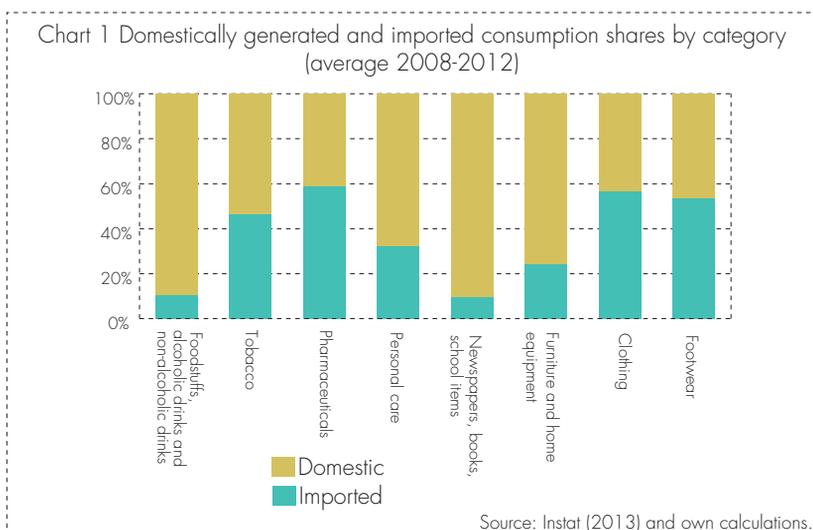
INSTAT most detailed import data includes 99 items, according to the NACE nomenclature. From these items, we have selected 32 of them featuring mostly consumer goods. Additionally, these 32 items have been further aggregated into 8 categories as featured in the CPI basket. These categories, representing almost 60% of the CPI basket (according to the structure applied by INSTAT), are shown in Table 1 with their respective shares:

Table 1 Consumer goods' categories and respective shares in the CPI basket

Category	Share in CPI
Foodstuffs, alcoholic drinks and non-alcoholic drinks (17 items)	41.1%
Tobacco (1 item)	1.8%
Pharmaceuticals (1 item)	2.5%
Personal care (2 items)	3.1%
Newspapers, books, school items (1 item)	1%
Furniture and home equipment (4 items)	5.1%
Clothing (5 items)	3.7%
Footwear (1 item)	1.5%
Total (32 items)	59.8%

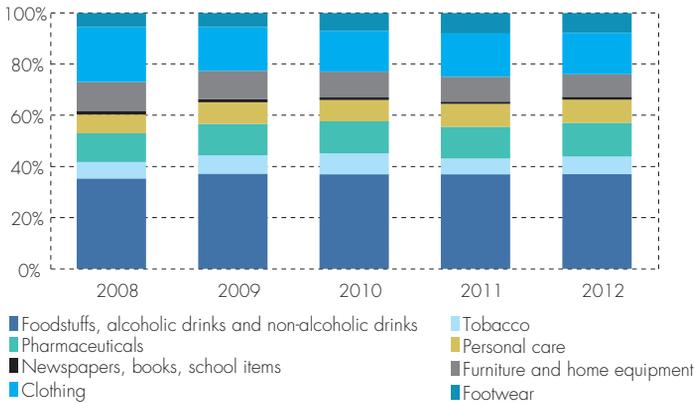
Source: Instat (2013)

The shares from table 1 are applied on annual household consumption figures to obtain domestic demand for each category. From these figure we deduct import value to separate the foreign component from the domestic one. The figures are shown in Chart 1 :



Imported consumption is dominant in the case of Pharmaceuticals, Clothing and Footwear. In the case of Tobacco the shares are almost equal, whilst in the other cases domestically generated consumption dominates. In the following chart, we show the import shares for each category to the overall sample imports.

Chart 2 Import structure for the selected categories (2008-2012)



Source: Instat (2013) and own calculations.

Foodstuffs and drinks represent the bulk of imported consumer goods followed by furniture and pharmaceuticals. The shares belonging to these categories remain roughly constant over the years, while in the other cases (featuring smaller shares) the shares are varying.

3B. CALCULATION OF PRICE INDICES AND INFLATION

Import data is reported monthly in terms of national currency (lek) for the values and net weight (in kg) for the quantities. Based on these data, unit prices are calculated in terms of price/kg. The monthly indices are then determined selecting December 2007 as base period taking in consideration that INSTAT applies the same approach in the national CPI index calculation. The following formula is applied:

$$I_t = \frac{P_t}{P_0}$$

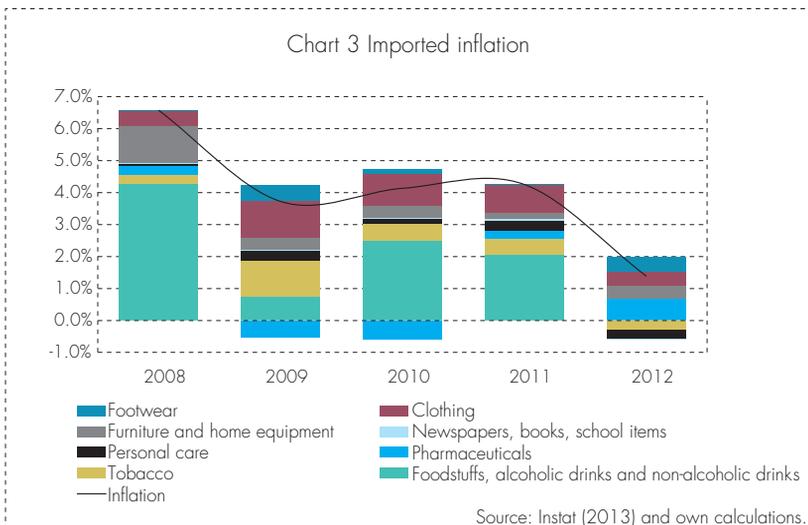
where I_t represents the index, P_0 represents the unit price in the base period (December 2007) and P_t reflects the unit price in the respective month. From individual indices we calculate the weighted indices for the 8 commodity categories via the following formula:

$$I_k = \sum_g w_g * I_g \quad \text{and} \quad \sum_g w_g = 1$$

where I_k represents the index for the respective category, w_g represents the import share belonging to item g as compared to overall import value of the category it belongs to. These monthly indices are employed to calculate commodity category related inflation rates. Ultimately, we calculate imported inflation using the formula:

$$i_m = \sum_k w_k * i_k \quad \text{and} \quad \sum w_k = 1$$

where i_m represents imported inflation, w_k represents the import share of the k category to overall import value (value associated with the selected sample); i_k represents the inflation rate belonging to the respective category. In Chart 3 are shown annual average imported inflation contributions by category as well as overall imported inflation. The major contributions arrive from the Foodstuffs and Beverages followed by Pharmaceuticals and Clothing. The contribution figures associated to the other categories are quiet marginal and varying across time.



3C. INFLATION DECOMPOSITION

The official reported inflation for the categories can be decomposed into the following:

- Domestic inflation contribution
- Imported inflation contribution

The respective contributions are associated both to the respective inflation values and also to the shares of domestic and imported component. Therefore, the reported inflation would be decomposed according to the following equation:

$$i_t = W_d * i_d + W_m * i_m$$

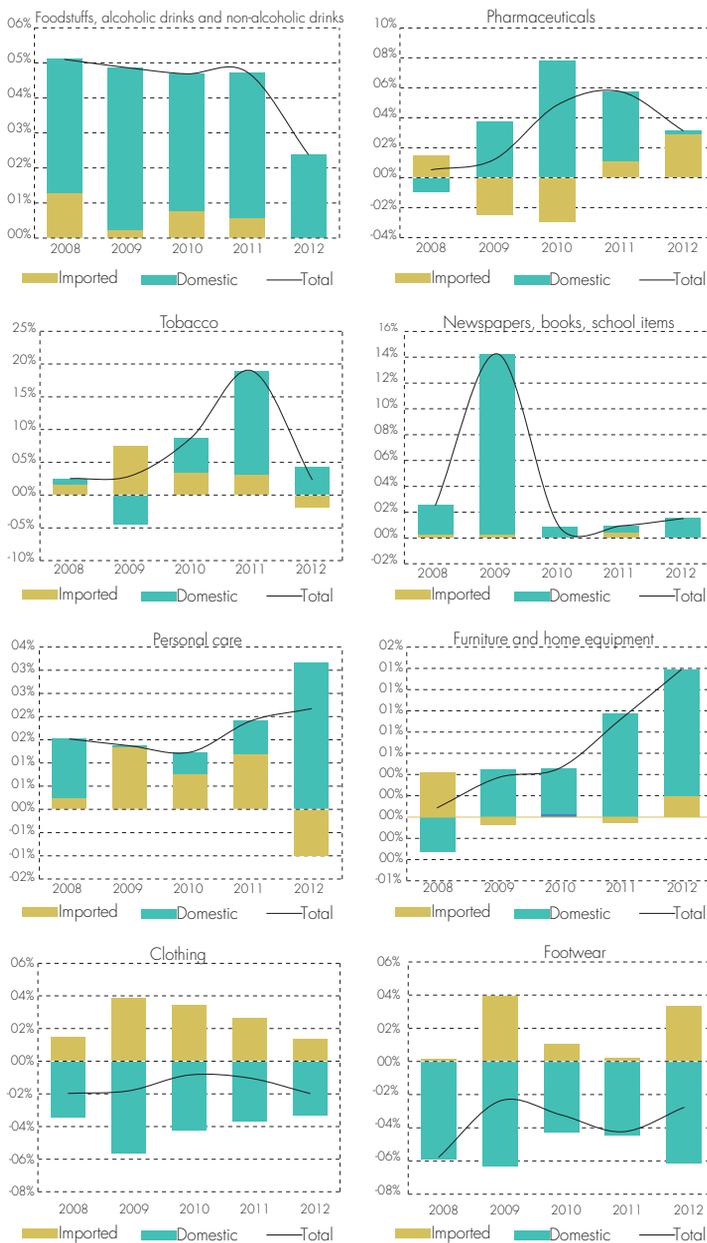
where, i_t represents the reported inflation, W_d represents the share of domestic output, i_d represents the inflation rate for the domestic output, W_m represents the share for imported output and i_m represent the rate for imported inflation.

Domestic inflation represents the only unknown and is derived as:

$$i_d = \frac{i_t - W_m * i_m}{W_d}$$

In the following step, the decomposition is carried out for each of the 8 categories. In Chart 4 are shown the respective contributions and the officially reported inflation rate. According to the graphs, almost in all cases the major contribution to the overall inflation derives from the domestic side. This applies also to those cases where imported consumption is dominant e.g. pharmaceuticals, clothing and footwear. In other words, domestic price variations are such that they overcome the dominant share that imports might have in certain categories.

Chart 4 Reported inflation, domestic and imported contributions by category



Source: Instat (2013) and own calculations.

3D. OVERALL INFLATION DECOMPOSITION

The overall reported inflation is decomposed into the following components:

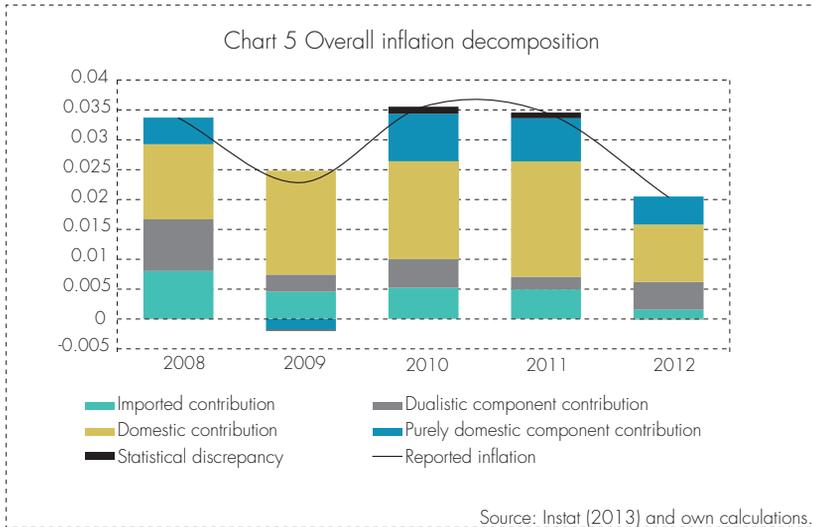
- Domestic contribution;
- Imported contribution;
- Dualistic component contribution;
- Purely domestic component contribution.

The first two elements represent the contributions associated with the 8 categories we mentioned in the previous section. In order to obtain their contributions on overall inflation, we augment the domestic and imported contributions (calculated in the previous section) with the weight of the respective category in overall CPI basket.

The dualistic components are associated with items in the CPI basket featuring both domestic and foreign influences which, at this point, we are unable to decompose. These items make up for 14% of the CPI basket and include the following:

- Fuel and electricity;
- Household appliances;
- Other furniture;
- Purchase of transport vehicles;
- Transport services;
- Other goods and services except for personal care.

Their contributions are calculated by augmenting the inflation rate with the respective weight in CPI basket. The remaining items (making up about 26% of the CPI basket) include purely domestic inflationary contributions include: rent, water supply, maintenance, medical and hospital services, equipment operation of personal transportation, communication, entertainment and cultural services, education services and hotels, coffee-house and restaurants. The contributions are calculated in the same manner as the case of dualistic components. The decomposition structure for overall inflation is shown in Chart 5:



According to the results, the domestic contribution associated with the 8 subject categories reveals contributions ranging between 28%-57.5% (44.75% on average). If coupled with from purely domestic items, the aggregate contribution ranges between 50.5%-78.4% (62% on average). The imported inflation contribution ranges between 8%-23% (17.5% on average). Ultimately, the contribution associated with the dualistic compound ranges between 6%-25.5% (16.15% on average). Domestic contributions are clearly dominant in all years under consideration.

4. CONCLUSIONS

This paper attempts to quantify the contribution of imported inflation in the case of 8 consumer goods' categories and overall reported inflation. The analysis commences with the selection of 32 consumer goods' items (as reported by INSTAT) and further aggregation into 8 categories according to the national CPI basket structure. The import data is applied for the individual price indices (in the case of items) and augmented indices calculations in the case of commodity categories. Then, inflation figures are calculated in the case of each category. Overall imported inflation is determined by augmenting the individual category based inflation figures.

In the next step, the inflation figure belonging to each category is decomposed into the domestic and imported contributions. The same approach is further applied to decompose the overall national inflation figure into domestic contribution, imported contribution, the contribution associated with dual items (bearing both domestic and imported influences but not decomposed) and the contributions from items featuring purely domestic influences. The period stretches between 2008 and 2012.

For the 8 categories under analysis, domestic influences are dominant in almost all categories and years. Domestic effects are more profound in the case of Foodstuffs and Beverages, Pharmaceuticals, Newspaper, Books and School items, Tobacco, Footwear and Clothing. Only for Personal Care and Furniture, imported influences tend to get the upper-hand in certain years.

In terms of overall inflation decomposition, the domestic contributions are once again dominant. Imported contributions become stronger (but not dominant) in 2008 with decreasing shares onwards. In particular in years 2009 and 2012, the imported contribution is negligible.

5. DISCUSSION AND FUTURE RESEARCH OPPORTUNITIES

The results shown in this paper seem to suggest the dominance of domestic inflationary pressures on the country's inflation. However, this approach focuses on the direct contributions related to the CPI basket. The analysis does not include influences exercised through indirect channels e.g. supply side inflation. The analysis of these influences would be an important challenge for future research. Also, it would be important to explain the reason why domestic influences dominate the direct effect. In any case, at this moment we cannot completely rule out the influences exercised by imported inflation.

Another issue regards the price indices. These indices (as mentioned) were calculated based on unit prices in terms of lek/kg. More detailed import data would enable the calculation of improved price indices taking in consideration quality changes. Therefore, the improvement of indices represents another important topic for future research.

Additionally, import data are reported in terms of local currency (lek) and so are unit prices. In this manner, exchange rate influences are accounted for. However, it would be more appropriate to separate these effects and obtain inflation pressures associated with import prices before conversion.

A further topic regards the shortness of the period under analysis. The addition of further years would enable to confirm whether the results are general (the domestic effect dominating in previous years as well) or constrained to the last years only. Import data availability and the fact that CPI weighting was different before 2008 remain as obstacles in achieving this endeavor.

REFERENCES

Adetiloye, KA (2010), 'Exchange Rates and the Consumer Price Index in Nigeria: A Causality Approach', *Journal of Emerging Trends in Economics and Management Sciences* 1 (2): 114-120.

Bean, C (2006), 'Globalisation and inflation', *Bank of England Quarterly Bulletin*, Vol. 46, No. 4, pages 468–75.

Bank of Albania, (2013), 'Raporti i Politikës Monetare për tremujorin e tretë të vitit 2013' URL: http://www.bankofalbania.org/web/Raporti_i_Politikes_Monetare_per_tremujorin_e_trete_te_vitit_2013_6854_1.php Retrieved on 22.11.2013.

Bowen, A and Mayhew, K (2008), 'Globalisation, import prices and inflation: how reliable are the 'tailwinds'?' *Bank of England Quarterly Bulletin*, Vol. 48, No. 3, pages 283-91.

Çeliku, E., (2003), "Kontributi i inflacioneve të mallrave të tregtueshëm dhe të patregtueshëm në inflacionin total: rasti i Shqipërisë" *Bank of Albania Discussion Material*, no. 1(12)03.

Goldberg, LS and Campa, JM (2008), 'The sensitivity of the CPI to exchange rates: distribution margins, imported inputs, and trade exposure', *Federal Reserve Bank of New York*.

Instat (2013), 'Foreign Trade Statistics', URL: http://www.instat.gov.al/en/figures/statistical-databases/select.aspx?rxid=eaafd2d1-9527-4123-b4a5-31e80539b1a4&px_tableid=FTM003 Retrieved on 01.04.2013.

MacCoille, C (2008), 'The impact of low-cost economies on UK import prices', *Bank of England Quarterly Bulletin*, Vol. 48, No. 1, pages 58–65.

McCarthy, J (1999), 'Pass-through of exchange rates and import prices to domestic inflation in some Industrialised economies', *BIS Working Paper*, 79.

Nordhaus, W., and Shoven J., (1977), *Analysis of Inflation 1965 – 1974*, 'A technique for Analyzing and Decomposing Inflation', ISBN

0-884-10477-X, pages 333 – 360.

Pain, N, Koske, I and Sollie, M (2006), 'Globalisation and inflation in the OECD economies', OECD Economics Department Working Paper, 524.

Spange, M and Young, C (2007), 'The macroeconomic impact of globalisation: theory and evidence', Bank of England Quarterly Bulletin, Vol. 47, No. 1, pages 40–47.

Tanku, A, Vika, L and Gjermeni, M (2007), *The Role of Exchange Rate in an IT Framework, What do we do?*, Discussion Paper, Bank of Albania, ISBN 978-99956-42-15-0.

Taylor, JB (2000), 'Low Inflation, pass-through, and the pricing power of firms', *European Economic Review*, 1389-1408.

CIP Katalogimi në botim BK Tiranë

Skufi, Lorena

Imported inflation of consumer goods and its contribution
to the national inflation / Lorena Skufi, Enian Çela. –

Tiranë : Banka e Shqipërisë, 2017

24 f. ; 15x21 cm. – (Working paper)

Bibliogr.

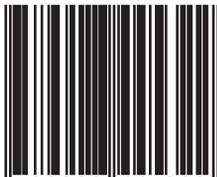
ISBN 978-9928-4453-2-2

I. Çela, Enian

1.Politika monetare 2.Inflacioni (financë)

336.748.12(496.5)

ISBN 978-9928-4453-2-2



9 789928 445322 >

www.bankofalbania.org

ISBN 978-9928-4453-2-2



9 789928 445322 >