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## AN ALTERNATIVE TO MEASURING THE CLARITY OF THE MONETARY POLICY COMMUNICATION AT THE BANK OF ALBANIA: 2005-2016

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*"[...] by studying the ECB's statements about its assessment and outlook of economic conditions, we can obtain a better understanding about its conduct of monetary policy than is possible by solely estimating empirical reaction functions.*

*Stefan Gerlach (2007)*

*"[...] communication clarity should be relevant for policymakers as the quality of inflation outlook affects the inflation expectations [...]"*

*Alain S. Blinder (2009)*

### ABSTRACT

The aim of the article is to study the clarity of Bank of Albania's communication regarding inflation and monetary policy decision-making during 2005-2016, through the Flesch-Kincaid (FK) grade level indicator. As a standard measurement of simplicity with which written texts can be assimilated, it is also used in assessing the communication of the main central banks under the inflation targeting regime. The involvement of the FK in assessing the clarity of monetary policy communication has emerged as a need versus the increasing demand for quantitative, qualitative and clear communication through the main documents of the monetary policy decision-making, press releases and inflation reports. In the case of Albania, the FK is measured for press releases in both Albanian and English languages. The results indicate for a downward trend of FK, suggesting a clearer monetary policy communication over the years. Despite this trend, the level of difficulty for being clearly understood by the general public remains still large. In approximately 70% of cases, the clarity level of the monetary policy communication for explaining inflation deviations from the target has increased. In certain periods, the clarity of communication is deteriorated not only as a result of increased uncertainty in the early stages of the crisis (2009), but also as a result of an uncertain environment for forecasting inflation and economic growth (2013). This phenomenon is not an isolated case for Albania. Even in developed countries, the financial crisis compromised, to a certain extent, the clarity of central banks communication.

*Keywords: monetary policy, communication, clarity, inflation*

*JEL Classification: E52, E58, E31*

<sup>1</sup> I thank my colleagues, E. Maci and D. Lama who collaborated in the database for calculating indicators.

## I. CLARITY OF THE MONETARY POLICY COMMUNICATION

The early 1990s marked the beginning of a modern phase for major central banks around the world, such as the Federal Reserve in the US (1994). They modified their conservative profile, relatively closed and quite "faithful" to the information secrecy regarding the decisions of the monetary policy. Gradually and well aware of their mission, central banks transformed the communication and transparency into inseparable concepts for monetary policy, creating an added value in terms of its decisions' effectiveness.

Rich empirical evidence has shown that high transparency and qualitative and clear communication strengthen the monetary policy and market efficiency. Advanced transparency has been enabled by the implementation of two fundamental concepts. One is related to the fact that higher central bank independence requests a greater democratic accountability. In other words, the independent central banks are obliged to explain their decisions and the reasons behind them. The other concept relates to previous studies by Blinder (1998) and Woodford (2001) concluding that central bank communication should be clear, as such communication would enhance the effectiveness of monetary policy.

Initially, banks paid particular attention to measuring the communication from a quantitative point of view. The assessments on the degree of the openness of the monetary policy communication were initially focused on the way how central banks announced their decisions regarding the policy rates. Then the openness was assessed based on the volume of materials communicated and how they were published. This quantitative view of assessing the openness in communication continues to be considered, because it is an aspect that cannot be neglected. As noted above, central banks have always paid attention to the quantitative aspects of a transparent monetary policy communication. The literature on central bank communication refers to indicators such as: voting results in decision-making; the volume of information being published; the time of its processing, submission and publishing; time-lags in publishing the decisions and minutes of the board meetings; time-lags in the publication of monetary policy reports; number of meetings on monetary policy issues with groups of interest; the number of public appearances of the governor, board members, managers and technical staff of the central bank; number of published pages; number of searches and visits on the central bank website; number of materials and educational activities and other such measurable direct indicators.

Despite the progress in the communication issues, the language has remained difficult, quite technical and, therefore, less clear to the general public. According to *Bulir et. al.*, (2008), faster steps have been made regarding the amount of communicated materials than regarding the clarity of monetary policy communication as a process. The best practices in terms of clarity communication can be found at the central banks of New Zealand, Norway, Sweden, Canada, England, etc.

A clear communication increases the level of understanding the monetary policy messages by the general public. By increasing clarity in the monetary policy communication, central banks create an added value of the communication quality. A clear communication by the central bank provides the markets with the relevant information regarding the target and main drivers of the monetary policy.

A clear communication increases the efficiency of decisions, because it helps the formation of expectations for achieving the primary monetary policy objective. As a result of the clarity in communicating monetary policy decisions, market responses become more predictable. According to Blinder (1998) and other researchers, this enables a more efficient central bank job to better manage the conditions of the economy.

Central banks should clearly communicate some of the most important monetary policy aspects such as the regime it has decided to pursue and the underlying reasons; overall objectives and medium-term strategy; motivations behind a certain decision; economic prospects and projections; quantitative or qualitative assessments regarding the monetary policy stance and the future trend of the policy rate.

*Bulir et. al* (2008) state that "...a clear communication requires that the various communication tools send signals that are mutually consistent and well coordinated." In the situation that the modalities and communication tools are various and the information flow is higher, more readily available for users and the general public, special attention should be paid to filtering it. Communicating unfiltered, inconsistent and uncoordinated information in terms of economic relations is likely to cause noises. An unclear reading and, in the worst case, an incorrect understanding of the monetary policy decision making by the public would harm the efficiency and credibility of the monetary policy to achieve the objective.

Blinder, as one of the distinguished researchers on the central bank communication issues, underlines the indispensable role of transparency and clarity in their communication, especially for central banks under the inflation targeting regime. According to Blinder (2009) the role of clarity and transparency in communication is similar to that of inflation expectations in anchoring the public expectations to the central bank's target. The transmission scheme of the monetary policy decision-making passes through a technical process that requires a clear and transparent explanation. This process is developed to the point where technical details do not compromise the understanding of monetary policy decision-making by the market agents and the general public.

In order to explore the clarity of monetary policy decision-making communication, this article is organized as follows. The succeeding section addresses the importance of communication clarity in times of crisis when uncertainties increase. The third section explains the database and the methodological issues related to the measurement of the degree of clarity, based on non-

parametric methods focusing on the standard Flesch - Kincaid grade level readability (FK) indicator. The results for Albania are presented in the last part of this section, through an analysis of the FK's performance and inflation gap during the period 2005-2016. Based on the results and the analysis, the fourth section provides the main conclusions and recommendations.

## II. CLARITY IN COMMUNICATION VERSUS UNCERTAINTY

Clear communication is a sensitive process playing a critical role, especially in times economic uncertainties and crisis. According to *Tang and Yu (2011)*, a clear communication could lead to less volatile inflation and interest rate dynamics, implying lower volatility of prices in financial markets.

According to *Draghi (2015)*, monetary policy-making in turbulent times is more difficult. However, the central banks are accountable, because they are much more likely to meet their mandates if they are able to inform the public and markets about their strategies, assessments and decision making in an open, clear and timely way.

*Bulír et. al. (2014)*, verified a negative correlation between clarity and market volatility prior to and during the early stage of the global financial crisis for the euro area. As the crisis unfolded, there is no longer robust evidence of a negative correlation. The authors conclude that reducing "noise" or uncertainties by publishing clear reports is possible, but not without challenges.

In times of crisis, the implementation of the monetary policy is very likely to change. Often, central banks are obliged to find unconventional measures to fulfil their mandates for two main reasons: firstly, in order to realize the transmission of monetary policy; secondly, to operate under the standard monetary policy instruments, policy rates increasingly closer to the zero-lower bound. Against this backdrop, the understanding of the decision-making process becomes more difficult. This phenomenon has been encountered in most of the central banks during the recent global and debt crisis in the euro area countries.

The common monetary policy rules lose their strength and usefulness, to some extent, for explaining their policy and signals. On the other hand, the use of unconventional monetary policy measures implies a wider range of monetary policy response to a given shock. In order to anchor expectations related to the future policy, the central banks need to be clearer about how the new economic environment is understood in times of crisis. Why are they taking a certain decision, what do they expect from this decision, and when do they expect the results? Communicating the risks surrounding a monetary policy decision is another important point. In times of crisis, projections based on a single baseline scenario are more vulnerable, because the latter is surrounded by high uncertainties. Therefore, in times of crisis and increased uncertainties, the central banks are the first promoters of a clear, open and consistent communication over time. This communication assures the public



that maintaining price stability in the medium-term close to the target remains the primary monetary policy commitment. Meanwhile, explaining the reliable assessments regarding expected dynamics on the economic and financial situation is another crucial point of the communication.

On the other hand, in communication's literature it is argued that technical explanations might cause additional difficulties for creating a clear picture of the economy, in times of crises and uncertainty. As such, the details might carry the risk of different perceptions from the market agents and the general public. Details are important to be explained at a certain point and without damaging the understanding of monetary policy key messages. In such cases, it is better not to communicate "less important, confusing, uncertain and inconsistent" details. *Morris and Shin* (2002) suggest that greater transparency on public policy under the lack of information is not necessarily welfare enhancing. In any case, an optimal level of transparency in decision-making should not be affected. *Van der Cruysen, Eijffinger and Hoogduin* (2010) have investigated for finding an optimal intermediate degree of transparency. The latter corresponds to that level for which the minimization of inflation persistence is achieved. Reducing the persistence, in other words, means decreasing the adaption component to the past values of inflation or decreasing the inertia of inflation. The results show that while some banks still have room to benefit from increased transparency, some others have already reached this level. If the latter attempt to have even higher transparency, they can weaken the inflation expectations channel. Such a situation mainly occurs when uncertainties increase and the technical details instead of helping to anchor the expectations, strengthen the adaptive behaviour of expectations to current and past inflation rates.

### III. MEASURING CLARITY AND MONETARY POLICY DECISION-MAKING: THE CASE OF ALBANIA

How clear is the communication language of the main monetary policy documents? This section presents a version of a quantitative measurement of communication's clarity in the most frequent documents of the monetary policy decision-making.

One of the documents addressed to the general public and widely discussed in the media is the Press Release of the Supervisory Council of the Bank of Albania on monetary policy decision-making. This document is directly related to the statement of the Governor of the Bank of Albania to the press conference on the monetary policy decision, after the Monetary Policy Report is approved in the Supervisory Council meeting. These documents are the most important explanatory ones for the public and the media on the monetary policy decision.

**BOX 1: MONETARY POLICY COMMUNICATION THROUGH WRITTEN DOCUMENTS\***

*In the case of Albania, the monetary policy framework, its decisions and implementation process are communicated to the public through the following documents:*

**Monetary Policy Document** –describes the main principles of the monetary policy, implemented for a certain period of time. It is not a periodic publication. If the monetary policy framework changes, the change should be reflected and made clear to the public re-publishing the Document;

**Quarterly Monetary Policy Report** –is the main communication instrument of monetary policy to the public. It provides a comprehensive overview of the economic, monetary and financial developments during the previous quarter in order to assess the actual and expected inflationary pressures.

*In this report, mid-term projections for inflation and other macroeconomic indicators are not published yet, although, since 2015, the Bank of Albania has been implementing an explicit inflation targeting regime. Since 2011, inflation expectations have been given as a range of values for a one-year ahead forecasting horizon, with a 90% probability of occurrence. Meanwhile, since the second half of 2015, medium-term assessments have been provided for the closing of the output and inflation gaps, and other assessments on the expectations for the future trend of the monetary policy stance.*

**Periodic Analyses** - are intended to complement the macroeconomic developments presented in the quarterly Monetary Policy Report. These quarterly analyses provide detailed information on the fiscal and external debt sustainability, financial intermediation and international markets developments.

**Confidence Survey Analyses** – are intended to measure the businesses and consumers sentiment regarding the general economic activity and its specific aspects during the recent, current and expected periods from a short-term perspective. The survey results help market agents, decision-makers and the public to assess the economic situation through indirect qualitative indicators, although official statistics are not yet published;

**Decision of the Supervisory Council of the Bank of Albania on the interest rates** – published within 48 hours;

**Press Conferences of the Governor** - after each monetary policy decision by the Supervisory Council, the Governor explains the decision and the underlying reasons to the public;

**Presentation of the Quarterly Monetary Policy Report to Economics Journalists** - this presentation is organized to clarify main economic and financial developments, to provide key analysis and decision-making messages for avoiding any inaccurate interpretation from the public and market agents. Thus, this communication has an added value. It takes place a few hours before the Quarterly Monetary Policy Report is published on the Bank of Albania website;

**Publication of regulations and legal acts** - they relate to the instruments used for the implementation of the monetary policy;

**Publication of research studies** – they are studies on monetary policy, macroeconomic and financial analysis, provide forecasting as well. They are published on the Bank's website as articles, discussion and working papers. They are important to complete the framework of monetary policy communication as an art and science. They target those segments of the public that are more interested in scientific analyses.

*\*The information in this box is downloaded from the Bank of Albania's website.*

### III.1. DATABASE

Press Releases and Governor's Statements as available over 2005-2016 have been used as main documents for measuring the communication clarity of the monetary policy decision-making. Two to three paragraphs have been randomly chosen in the introduction, middle and conclusion part of these documents to perform a quantitative assessment of communication clarity.

The assessments are conducted for written and published documents both in Albanian and English, in order to see whether there is a systematic deviation of indicators between the two languages. This assessment may suggest that, if the deviation persists and is significant, an external correction of the quantitative indicator is needed in the case of documents in Albanian. The following section explains some "interventions" that have been made to soften linguistic features. These interventions, in essence, do not reduce the clarity of sentences, but can simply lead to the measurement of a quantitative indicator less influenced by the artificial growth of the number of words and syllables.

### III.2. METHODOLOGICAL ISSUES – “FLESCH - KINCAID GRADE LEVEL READABILITY”

To quantitatively measure the degree of comprehension of the texts, a standard indicator labelled after its authors' names, Flesch - Kincaid grade level Readability (1975) (FK), has been used. This indicator is reported for the written texts in English. It is a non-parametric statistic, widely used to measure the absorption degree of the texts in various fields.

It provides quantitative information about the simplicity of the readability and clarity of the written reports and their messages transmitted to the readers and the public. How simple and clear is the monetary policy communicated, based on the results of this indicator? This is a simple indicator reported by Microsoft Word. For this reason, it has been chosen in studies of such nature as an indicator of clarity of readability.

Another reason is that the FK indicator has unlimited use for texts regardless of the fields. It is widely used in studies of readability, repeatability of sentences and words, in different texts. It also has a significant advantage, because it can be used for readability comparative purposes for the documents of the same nature - in our case the degree of clarity of press releases on the monetary policy decision-making. The FK indicator has presented a very high correlation, about 0.9, vis-à-vis alternative measures of text readability. For this reason, focusing on this indicator is only the first step to measure the clarity of the related document. The result of this statistic is interpreted as the number of years of education needed on average to sufficiently understand a text communicated through press releases on monetary policy decision-making. The result of this indicator can be interpreted as the number of years of education needed to sufficiently comprehend a text communicated through

press releases on monetary policy decision-making. For a given selected text it is calculated according to formula (1):

$$0.39 * (\# \text{ words} / \# \text{ sentences}) + 11.8 * (\# \text{ syllables} / \# \text{ words}) - 15.59 \quad (1),$$

where:

<b># words</b>	– number of words
<b># sentences</b>	– number of sentences in a paragraph
<b># syllables</b>	– number of syllables
<b># words</b>	– number of words

0.39; 11.8; 15.59 - are values derived from the non-parametric estimates of the test, indicating to some extent the weight of each element (word per sentence and syllables per word, in average terms).

It is based on the average number of words per sentence and the average number of syllables per word.

The intuition of someone writing a text is that if there are very long sentences (many words per sentence or many syllables per word) the readability might be decreased, the text might become more difficult to understand for the readers and the audience. The main message might fall through the cracks. Also, if the sentences are encumbered with long words (more syllables per word), they become even less understandable.

The FK fluctuates in a wide range of values, when discussing the clarity of communication of monetary policy decisions based on press releases. *Bulir et.al. (2012)* have shown that by observing this document in various central banks under inflation targeting monetary policy regime, the FK grade level ranges from 10-19 years of schooling. The large width of the interval depends on: the country's specifics in the implementation of the inflation targeting regime; experience in written reports; periods corresponding to the reports - before, during and after the crisis; how developed the central banks are; the development of the national statistics. This also depends on whether the English language is an official language or not. Even the translation process might cause losses in terms of FK indicator size, it might be increased, due to the modifications from a certain language to the English one.

According to *Bulir et.al. (2012)*, the most readable documents are those of the central banks of England and Sweden. They, in average terms, require about 12 years of schooling to be sufficiently understandable. They are followed by the Czech National Bank reports (14 years), meanwhile the reports of the ECB, central banks of Poland and Chile require around of 16 years of education. More than 17 years of schooling are required for the documents of Thailand's central bank.

Jansen (2011a) underlines that measurements of readability based on such indicators should be interpreted with caution. Referring to formula (1), this indicator is highly sensitive to the number of words in the sentence, the length

of words and the number of sentences in the paragraph.

The language in which the reports were originally written, the translation issues, and the features of the language itself, greatly affect the size of this indicator. The Albanian language has a lot of articles preceding nouns and adjectives and verb parts that increase the number of words in a sentence. Also, there are plenty of prefixes/suffixes, composite and related words that increase the number of syllables in the words. This is not so obvious in English, which is a more compact and expressive language, and less overloaded with such components.

For this reason, in the randomly selected paragraphs in Albanian, some "cleaning" have been done on these specific components, without damaging the context of sentences. As explained above, they increased the number of words in a sentence, while we are dealing with a single word.

The measurement of clarity according to the FK indicator also depends on the period of time analysed by the documents, whether they are normal periods or with certain volatility in the markets, due to specific developments.

The researchers conclude that the developments in transparency's communication has certainly led to better understanding the reports, press releases and governors' conference statements, because of a plain language. In particular, the "inflation targeting" implementation regime requires a high degree of transparency and accountability. The latter have evolved through increased clarity of communication for the monetary policy and decision-making.

### III.3. RESULTS OF READABILITY ASSESSMENT: 2005-2016

The Press Releases or the Governor's Statements as part of the monetary policy reports, published on the Bank of Albania's website in Albanian and in English during the period 2005-2016, have been analysed based on the FK's results<sup>2</sup>.

Table 1 represents the FK grade level readability calculations over the years according to the two languages. Based on these estimates, years of education to clearly understand the Albanian language documents on the communication of monetary policy decision, range from 24 years to 18 years of schooling, following a downward trend over the years. Obviously, the language plays a role in the indicator's size. Due to the Albanian language specifics only, and without pretending to evaluate the translation issues, this indicator increases from English to Albanian by almost 5 years of education on average terms. For cross-country comparison purposes, the FK's average result for documents in Albanian should be corrected, reducing it by 5 years, or the FK's indicator should be directly taken from documents translated into English.

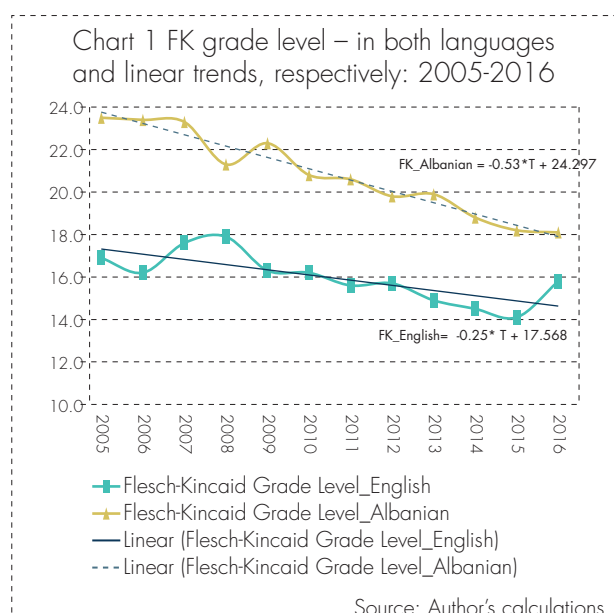
<sup>2</sup> For the period 2005-2008, several evaluations of Governor's statements in Albanian and English have been calculated.

Table 1. FK grade level – according both languages for the period 2005-2016 and the difference

Years	Flesch-Kincaid Grade Level_English (in education years)	Flesch-Kincaid Grade Level_Albanian (in education years)	Difference Albanian - English (in years )
2005	16.9	23.5	6.6
2006	16.2	23.4	7.2
2007	17.6	23.3	5.7
2008	17.9	21.3	3.4
2009	16.3	22.3	6
2010	16.2	20.8	4.6
2011	15.6	20.6	5.0
2012	15.7	19.8	4.1
2013	14.9	19.9	5.0
2014	14.5	18.8	4.3
2015	14.1	18.2	4.1
2016	15.8	18.1	2.3
Average	16.0	21.0	4.9

Source: Author's calculations.

Chart 1 illustrates a downward linear trend of the FK indicator for both languages, but more pronounced for the Albanian language. These trends suggest an increasing degree of clarity of monetary policy communication over the period under review. Monetary policy is becoming increasingly understandable because it requires less years of schooling to be absorbed through such written communication documents. The trend lines show that, over time, the appropriate years of education to clearly understand the press releases of monetary policy decision making, are falling by almost 0.5 and 0.3 years, in average terms, for Albanian and English documents respectively.



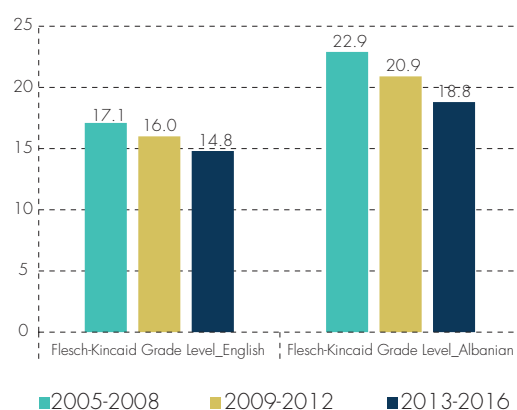
On one hand, the FK indicator points to an increasing communication clarity through main documents on the monetary policy decision; on the other hand, it suggests that the education's level to understand them remains still high. It needs, on average, 21 and 16 years of education, for documents in Albanian and English, respectively. This is not a surprise, as long as the countries that have adopted inflation targeting for many years will need over 15 years of education, according to 2012 assessments, to clearly understand press releases on monetary policy decisions. This assessment covers also the crisis period, implying higher uncertainties on projections and communication.

By interpreting the above results, we may find that clear communication is well and quickly absorbed if the public possesses an appropriate level of economic and financial literacy. By contrast, more years of schooling are required to make decision-making through written documents readable. The

fact that the FK results in the Albanian version are still high is also in line with the conclusions drawn by Atkinson and Messy (2012), studying the level of financial literacy in our public. According to a survey organized by the OECD (2011), compared to the average score for the financial literacy at the 4.3 level for all countries grouped, Albania is positioned in the group of countries with a rating below the average level, in a 1-7 scale, even close to the lower levels, in the interval of 2-3, specifically. Based on the same sample survey, Ceca et.al. (2013) conclude that there are weaknesses in financial literacy, and emphasize the need for continuing education of the public with economic and financial knowledge. In a more general context of education, according to OECD (2016), and the assessment under "PISA" program, Albanian students of 15 years of age in 2015 continued to be ranked in the lower positions for general knowledge. Albania is far from the OECD average, for knowledge in science, reading and mathematics<sup>3</sup>.

In the case of Bank of Albania's communication of the monetary policy decision-making, it seems that during the sub-periods: before, during and after the crisis, respectively, the clarity of communication has increased, in average terms.

Chart 2 FK grade level – in both languages, by sub-period



Source: Author's calculations.

Press releases of monetary policy decision-making during the period 2005-2016 result more clear in explaining the inflationary pressures fluctuations, over or below target. This means that by increasing clarity in communication, monetary policy aims to explain the current inflation deviations from the target. Ultimately, clarity in communication should enable the explanation of the inflation gap and the monetary policy decision, which aims to turn it to the medium-term target.

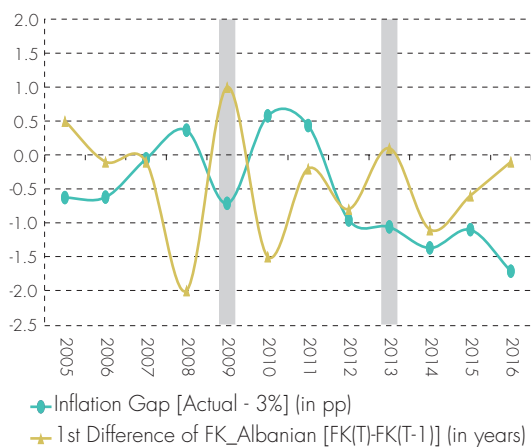
Empirical results suggest that although for the entire period clarity increases in average terms versus the explanation of the inflation gaps, in two specific years, the communication becomes less clear. Particularly in 2009 and 2013, although inflation gaps are significantly negative, i.e. actual inflation rate lower than target, the first differences of the FK indicator mark a significant increase. During 2009, the economy felt the first implications from the global financial and debt crises in several EU countries, reflecting higher uncertainty in communication. Meanwhile, in 2013 in addition to the significant negative output gap, a considerable amount of arrears versus businesses for public works was verified, increasing, therefore, economic uncertainties.

This situation with increased uncertainty may have contributed to the fall of explanation clarity of current and expected inflationary pressures. In these

<sup>3</sup> OECD, 2016, "PISA 2015 – Results in Focus". – The assessment is conducted in every 3 years under the "PISA" program. The assessment refers to the measurements of 2015.



Chart 3 Inflation gaps and 1st differences of FK: 2005-2017



Source: Author's calculations.

years, there is an increase of the 1st difference of the FK indicator, mainly due to the very long sentences. The linear correlation between these two indicators is almost -0.80 for the period from 2005 to 2011, suggesting that the inflation gaps (positive/ negative) are associated with increased clarity in communication. For the period 2011-2016, after "the outburst" of the crisis, the correlation between 1st differences of the FK and inflation gaps is negative (-0.16), but insignificant, albeit this estimation period has few observations only.

The Albanian case explained above is not an isolated one. *Bulir et.al(2014)*, in order to investigate whether the clarity of inflation reports affects the fluctuation of financial markets, have measured the clarity of the reports in cases of central banks of

the Czech Republic, England, Sweden and the ECB, using the FK indicator as a standard readability measure. They conclude that, especially for the euro area, a negative correlation between clarity and market volatility before and during the early stages of the global financial crisis is verified. Once the crisis "was installed", there was no strong evidence of the significance of this negative correlation. Another important conclusion of this study is that the noise reduction using clear reports is possible, but not without challenges, especially in times of crisis.

## CONCLUSIONS

The assessment presented in this study is a first attempt to quantify clarity in communication through monetary policy documents on decision making. At the same time, the study assesses the performance of clarity over the years. The indicator used is a standard measure of communication clarity, FK, expressed in years of schooling to understand written materials.

In the case of press releases on monetary policy decision, both Albanian and English versions have been evaluated. For a more correct use of the FK indicator, for documents in the Albanian version, some preliminary adjustments have been applied in the texts.

The results show that although the readability indicator remains at high levels, its downward trend suggests that the clarity of the main communication documents on the monetary policy decision has been increased over time. The considerable level of the indicator, 16 years, is not an isolated and unexplained case by other factors. Other countries, long-time Inflation Targeting implementers, have also high values of this indicator, over 15 years of schooling. Meanwhile, crisis-related uncertainties have increased this indicator, a present phenomenon in Albanian as well in 2009, the early



stage of crises, and in 2013, when the negative output gap was significantly expanded and when the economic agents' uncertainties were higher.

A determinant factor influencing in the high values of this indicator is the level of education in general and that of financial literacy in particular. According to the studies referred in this article, the Albanian public is characterized by low levels of financial literacy, at least until 2011 and is ranked far below the average OECD countries for the general education of the students 15 years old (almost with 9 years of schooling).

In this context, it is recommended that clarity in communication should be further enhanced, in addition to continuing education programs for the general public. An assimilated communication in the right way contributes to anchoring the public expectations and to transmitting the monetary policy decision-making.

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## BUILDING DIVISIA MONETARY AGGREGATES. WHAT ARE DIVISIA AGGREGATES AND HOW DO THEY COMPARE TO THE TRADITIONAL MONETARY AGGREGATES?

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The standard monetary aggregates (M1, M2, and M3) that are broadly published and used by central banks for monetary policy analyses are built according to the linear aggregation method, taking the simple arithmetical sum of each composing financial asset. More specifically, the components of monetary aggregates, like currency outside banks and time and demand deposits in all currencies, have the same weight in the calculation of these aggregates, according to the IMF methodology<sup>1</sup>. They are treated as perfect substitutes of each other, assuming that they carry the same risks and profitability (Gebregiorgis and Handa 2005). Measuring them in this way has sparked debates recently, for several reasons. Some are related with the aggregation bias, the insufficient capture of the changes in the monetary services flows or the incomplete reflection of the many changes occurring in the financial sector. Other critics of traditional aggregates highlight that the simple arithmetical sum of broad money components is not a good representative of the theory of money and the money stock in the economy. This is more apparent in the case of the broad money indicators, which, among others, include indicators kept for saving reasons. As such, these are not perfect substitutes to be used in transactions and are not consistent with microeconomic theories.

Divisia is an alternative method of measuring the stock of money in the economy. The building of the Divisia monetary aggregates is based on a new methodology, whose purpose is measuring the total flow of monetary services, by weighting each composing financial asset of the money stock with different weights, based on the contribution of each component in the aggregate flow of the monetary services. Thus, building them this way takes into account the usefulness of each composing monetary asset of the respective aggregate in facilitating transactions or the flow of monetary services it offers, hence being closer to the concept of money, and a better representative of the money stock in the economy. Of the three main functions of the money as medium of exchange, store of value and unit of account, the building of Divisia aggregates tries to separate the function of money as medium of exchange from the other functions. Instead of simply measuring the stock of money in the economy, the Divisia aggregates assess the consumer benefits from holding various financial assets. In this context, money is assessed as a stable consumption good, which offers financial services (Wesche, 1996). On the contrary, the traditional money aggregate may not be considered as a viable economic product, for which a stable demand function exists, since it is not able to measure the economic concept of money (Barnet 1980).

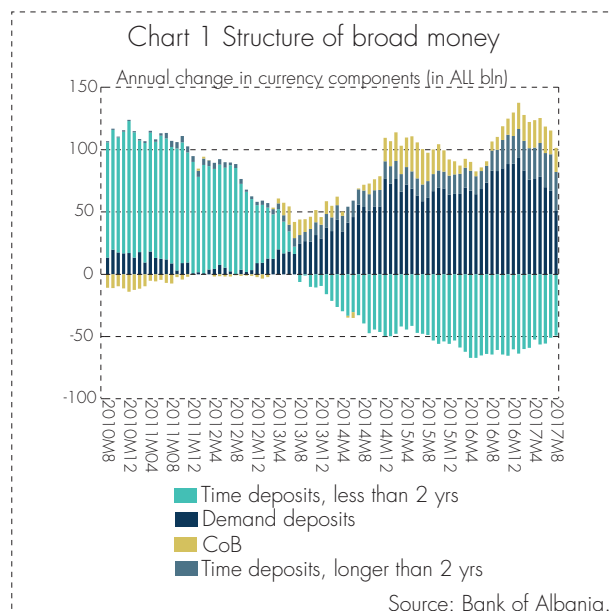
<sup>1</sup> The method of monetary and financial statistics based on the "Monetary and Financial Statistics Manual" of the International Monetary Fund, 2000 ed. [https://www.bankofalbania.org/web/pub/Metodika\\_e\\_SMF\\_Banka\\_e\\_Shqiperise\\_Korrik\\_2003\\_902\\_1.pdf](https://www.bankofalbania.org/web/pub/Metodika_e_SMF_Banka_e_Shqiperise_Korrik_2003_902_1.pdf)

In this context, a series of studies exist, assessing the stability of money demand and its determinants depending on the monetary aggregate chosen to measure such demand. In a study of the euro area countries, Foresti and Napolitano (2014) show that the monetary aggregate chosen to measure the money demand matters. They find that the use of the M2 aggregate, as opposed to the broad money aggregate, M3, contributes to the increase of the degree of the stability of money demand and improves the performance of the monetary policy of the European Central Bank. Studies by Beyer et al. (2007) and Fischer et al. (2007) are widely cited for the evidence they bring regarding the instability of money demand after the introduction of the euro in 1999. However, it has been often argued that the degree of the stability of the money demand function is affected by the monetary aggregate chosen to measure such demand (Foresti, Napolitano 2014). Hence, it is clear that selecting a monetary indicator as the best estimator for measuring the demand for money is important for a better assessment of such money demand.

### WHY IS IT IMPORTANT TO BUILD DIVISIA AGGREGATES?

The usefulness of monetary indicators for policy-making purposes must be assessed in the context of the foreseeable relationship they show with macroeconomic indicators, like the economic activity, the expenditure indicators or inflation (Jansen, 1996). More specifically, the components of the liquid aggregate, M1, currency outside banks and demand deposits in the domestic currency, do not capture entirely the services offered by money.

On the other hand, the indicators of broad money, M3, which includes time deposits in all currencies, serve mainly as saving instruments, hence weakening the relationship with consumption indicators in the economy. Building monetary aggregates using the Divisia method, by giving specific weights to the components of broad money, helps to better assess the flow of monetary services offered by these instruments. More specifically, interest-bearing time deposits are held mainly for saving purposes, and as such they have a lower weight in Divisia money, whereas currency outside banks is generally used for payment purposes and has a relatively higher weight. Hence, measuring the performance of the monetary indicators using the Divisia method might be more useful and quicker in providing information regarding the expenditures of the economic agents, compared to the traditional aggregates<sup>2</sup>.



<sup>2</sup> Time deposit with over two years of maturity, which have grown in the last years, are not part of the broad money aggregate, M3, according to the methodology defined by IMF. For the purposes of this analysis, only changes that impact the component and structure of broad money will be taken into account, in this case M3.

Assigning different weights to the components of the monetary aggregates using the Divisia method, instead of calculating them by giving the same weights, is more efficient in capturing the changes in the money stock. The aggregation technique of these indicators takes into account the presence of substitution effects as a result of the relative price changes among different financial assets. The prices of these monetary assets may change as a result of monetary policy changes and, consequently, of interest rates and the amount of currency in circulation. Various economic and financial reforms may also impact the composition of monetary aggregates and, consequently, the relative importance of each aggregate as medium of exchange in the economy (Barnett 1980).

## HOW ARE THE DIVISIA AGGREGATES BUILT?

The methodology of building the Divisia aggregates is based on the statistical index-number theory<sup>3</sup> (Barnett, 1980; Anderson, Jones and Nesmith, 1997a). Their technique is based on the assessment of the user costs of financial assets and the calculation of the expenditure share, which helps to better understand the changes in the importance of the monetary assets as a result of changes in the economic conditions. The Divisia Monetary Index (DMI) is built according to a quantitative Tornqvist-Theil chained index, based on the methodology of Anderson, Jones and Nesmith (1997b).

$$DMI_t = DMI_{t-1} \prod_{i=0}^n \left( \frac{M_{it}}{M_{it-1}} \right)^{0.5(W_{it}+W_{it-1})} \quad (1)$$

where  $W_{it}$  represents the expenditure share from the investment of a monetary asset  $i$  at time  $t$ , and  $M_{it}$  represents the nominal stock of the monetary asset  $m$  at time  $t$ . The expenditure share may also be defined as a measurement of the usefulness of money for transactions, where the relevant monetary asset is multiplied by an interest rate that reflects the opportunity cost of holding money in a particular financial instrument as compared to the instrument with the highest interest rate in the market. In this context, the higher the interest rate of the latter, the higher the opportunity cost of holding the monetary asset in an alternative instrument and the higher the share, and consequently its "usefulness" in transactions.

The expenditure share is calculated as follows:

$$W_{it} = \frac{\pi_{it} M_{it}}{\sum_{j=1}^n \pi_{it} M_{it}} \quad (2)$$

The denominator in equation (2),  $\sum_{j=1}^n \pi_{it} M_{it}$  represents the total expenditure on monetary assets, and  $\pi_{it}$  the user-cost of the monetary asset  $i$  at time  $t$ .

<sup>3</sup> Statistical index number.

The total expenditures can be calculated either as the sum of the products of the nominal user-costs,  $\pi_{it}^n$ , with the real stock of monetary assets,  $RM_{jt}$ , or as the sum of the products of the real user-costs,  $\pi_{it}^r$ , with the nominal stock of monetary assets,  $NM_{jt}$  as follows:

$$\sum_{j=1}^n \pi_{it} M_{jt} = \sum_{j=1}^n \pi_{it}^n RM_{jt} = \sum_{j=1}^n \pi_{it}^r NM_{jt} \quad (3)$$

In the above equation,  $\pi_{it}^n = P_t * \pi_{it}^r$ , where  $P$  represents the cost of living at time  $t$ .

The nominal user-cost of money refers to the price of the transaction service for each monetary asset according to the definition below:

$$\pi_{it}^n = \frac{P_t(R_t - r_{it})}{(1 + R_t)} \quad (4)$$

where  $R_t$  represents a benchmark market rate at time  $t$ ,  $r_{it}$  the rate of return of the monetary asset  $i$  at time  $t$ , and  $P_t$  is a price index. The benchmark rate represents the highest return rate of several monetary assets in the market. In this case, the return rates of a number of assets that serve as alternative investments in financial instruments outside the banking system, like the yields of 3-, 6-, 12-months Treasury bills as well as longer maturity bonds, are used.

## THE PERFORMANCE OF DIVISIA MONETARY AGGREGATES AND THEIR POTENTIAL USEFULNESS

The performance dynamics of traditional monetary aggregates compared to those calculated with the Divisia method might be similar in normal periods. However, as noted in other cases in literature, changes are observed during periods characterised by turning points, related to stages of business cycles, changes of the monetary policy, periods of very low or high inflation etc.

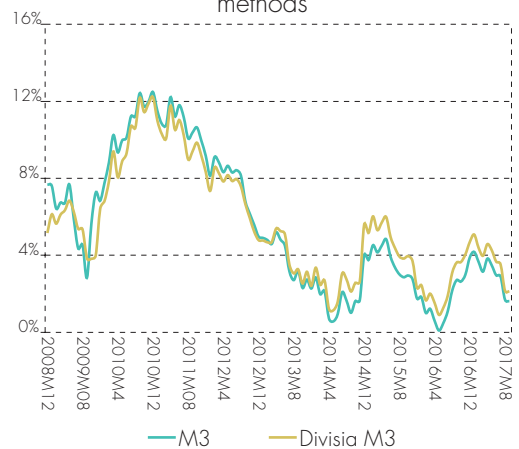
In the last four-five years, the broad money indicator in Albania, Divisia-M3, shows higher annual growth rates compared to the traditional M3 aggregate. This performance is related to the accommodative monetary policy implemented during this period, which has affected the overall decrease of interest rates and, consequently, the increase of the stock of liquid components of the M3 aggregate. At the same time, liquid monetary assets are weighted more heavily, reflecting the higher difference between a representative market rate<sup>4</sup> and the low or zero rate of liquid instruments (the opportunity cost of holding money in an instruments with a lower rate), compared to the rates of

<sup>4</sup> As representative rate is taken the highest rate registered in the market for financial instruments, in this case deposits and securities with up to two years maturity.

other interest-bearing instruments, like time deposits. Despite the reduction of the spread between the opportunity costs of these two groups of instruments, as a result of the decrease of the interest rates in the markets, the increase of the volume of liquid instruments seems to have offset the lower weights in the calculation of the M3 aggregate using the Divisia method.

Building aggregates using the Divisia method may be useful for several reasons. It may be used to improve the quality of the analyses of the financial sector and macroeconomic indicators like inflation, aggregate consumption, GDP, as well as to improve the forecast of these indicators. Theoretical assumptions are also supported by the conducted research, which confirms that Divisia indicators perform better than traditional indicators. Considering the forecast performance, Serletis and King (1993) find in a study about Canada that using the Divisia aggregates produces better forecasts of nominal GDP. Wesche (1996) analyses the importance of monetary aggregates in the euro area and concludes that the money demand functions based on Divisia monetary aggregates perform relatively well in five countries, while Hans-Eggert (2002) in a study also on the euro area concludes that the Divisia aggregates perform better in forecasting the changes of the harmonised consumer prices index (HCPI). Kok Shyong et al. (2007) find that Divisia M1 produces better results in forecasting changes in inflation compared to the traditional M1 aggregate. Celik and Uzun (2009) in a panel study of money demand for the period 1980-1993 in the euro area, USA, UK and Japan find that the Divisia monetary aggregates show a strong correlation with GDP and interest rates. Schunk (2001) analyzes the forecast performance of the Divisia aggregates compared to the traditional aggregates, using data for the period 1960-1997 in the US and concludes that Divisia aggregates produce more precise forecasts. Also, Puah and Hiew (2010) compare the usefulness of the two types of aggregates on drafting the monetary policy in Indonesia for the period 1981-2005 and conclude that Divisia aggregates perform better, especially in terms of stability. A later study in India by Ramachandran et al. (2010), reports that the Divisia monetary aggregates produce more precise forecasts of inflation compared to the traditional aggregates.

Chart 2 Annual change of the M3 monetary aggregate with the traditional and the Divisia methods



Source: Bank of Albania.

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## THE INFLUENCE OF MONETARY POLICY ON NET INTEREST MARGINS: EVIDENCE FOR ALBANIA

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### INTRODUCTION

Understanding the link between interest rates and bank profitability is essential in evaluating the effects of monetary policy on the soundness of the financial sector. Monetary policy is not, of course, the only influence on bank interest rates, but it has a major impact on them: the central bank sets the short-term rate and influences longer-term rates through direct purchases of securities and by guiding market participants' expectations about the short-term rate. The issue takes a greater importance in the context of the significantly eased monetary conditions by the Bank of Albania through the continuous decrease of the policy rate during the recent years, to push inflation up towards the target and enhance lending to the real economy (in a low growth environment).

Surprisingly, the link between monetary policy and bank profitability in Albania is an under-researched area. There are two previous studies that include the policy rate among the determinants of net interest margin (NIM) in the Albanian banking sector (Papavangjeli and Leka, 2016; Kalluci, 2010), but they do not focus specifically on the impact of monetary policy on banks profitability. In this article, we try to investigate further the relation between monetary policy rate and banks NIM, as the main component of banks profitability, by allowing also for non-linearities in this relation. Furthermore, we use the latest available banks' data and we split the analysis into three bank groups according to their share in the total assets of the banking sector.

### METHODOLOGY AND DATA

Interest rates affect banks' net interest income through the following mechanisms. Liabilities are likely to be more interest rate sensitive than assets due to the difference between maturities of assets and liabilities, often referred to as "maturity mismatch." Banks typically "lend long and borrow short". When market interest rates fall, banks' funding costs usually fall more quickly than their interest income, and net interest income (difference between interest income and interest expenses) rises. With the decrease of the interest rate, the demand for loans increases and the supply of deposits decreases, which can lead to larger lending volumes and lower deposit volumes, and thus improve interest income. As interest rates have become extraordinarily low, a decrease of interest rates will decrease loan interest more than the decrease on deposit rates, because

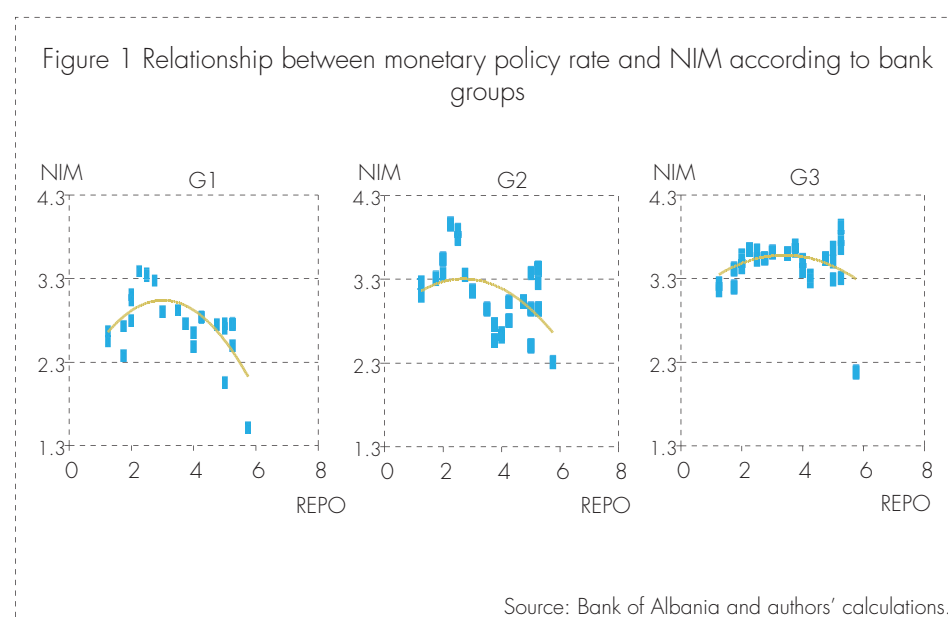
<sup>1</sup> E-mail: [mpapavangjeli@bankofalbania.org](mailto:mpapavangjeli@bankofalbania.org); [abode@bankofalbania.org](mailto:abode@bankofalbania.org); [bvorpsi@bankofalbania.org](mailto:bvorpsi@bankofalbania.org)

the deposit rate cannot fall below zero, causing a decrease on net interest income (Borio et al., 2015). These effects indicate a non-linear relationship between net interest margin and policy rate, that's why in this article we test the existence of a possible quadratic relation between the two variables.

We split the analysis into three bank groups according to bank size<sup>2</sup>: The banks whose share in their total assets to the overall banking sector assets is below 2% are considered small banks (G1); those whose share is larger than 2% and lower than 7% are considered medium-sized banks (G2); and those whose share is larger than 7% are considered large banks (G3). This helps us to provide a deeper analysis of monetary policy rate on banks profitability, as large banks may be less sensitive towards an interest decrease compared to smaller ones. Large banks (G3) make up more than 60% of total private and public sector credit in the country, and about 70% of customers' deposits (individuals and businesses) (Bank of Albania, 2017). The spread between the interest rate on credit and deposits for these banks is reported to be at high and stable levels, expanding even more in the recent years, while for small (G1) and medium-sized banks (G2) this spread seems to be smaller and has narrowed over time.

Figure 1 shows a graphical representation of the relation between the NIM and monetary policy rate (repo) for each bank groups and its quadratic approximation, in order to create a prior idea on the existence of a possible quadratic relation between the two variables, before proceeding with a more rigorous analysis than the econometric one. Graphically, the concave relationship is more evident for small banks compared to the two other groups.

The estimation of a quadratic relationship between the repo rate and NIM can also be useful to find a threshold level for the monetary policy rate, under which its impact on NIM will be positive and above which the NIM will increase with the decrease of interest.



<sup>2</sup> This is a conventional categorization used by the Bank of Albania.

In line with *Borio et al. (2015)*, we carry out the econometric analysis using the following benchmark model, indexing individual banks with  $i$  and periods with  $t$ :

$$\text{NIM}_{i,t} = \alpha_0 + \alpha_1 \text{NIM}_{i,t-1} + \alpha_2 \text{REPO}_{i,t-4} + \alpha_3 \text{REPO}_{i,t-4}^2 + \alpha_4 \text{LR}_{i,t} + \alpha_5 \text{NPL}_{i,t} + \alpha_6 \text{GROWTH}_{i,t} + \varepsilon_{i,t} \quad (1)$$

where  $\text{NIM}_{i,t}$  is the net interest income as a ratio of total assets. The monetary policy indicator is the policy rate, the so-called REPO rate, which is included in the model in linear and quadratic form. In addition, we use two bank-specific factors such as liquidity ratio (LR) and credit risk measured by non-performing loans ratio (NPL) that capture supply-side effects. We also include in the model the real economic growth rate (in annual terms) as one of the most important variables to describe the macroeconomic conditions of the country.

Because of the persistency of bank profitability (Carbó and Rodríguez, 2007), we include the first lag of the net income component in the right-hand side of the equation. Banks that have been profitable in the previous period tend to be profitable even in the current period. The REPO rate is taken with 4 lags because monetary policy needs some time to transmit its effects in the market interest rates.

Information on bank-specific variables is obtained from banks' balance sheets; meanwhile, macroeconomic variables are taken from Institute of Statistics (INSTAT). The data are quarterly for the period 2004Q1-2017Q2 (54 periods) and the estimations are performed separately for each of the three bank categories: small (5 banks), medium-sized (7 banks) and large ones (4 banks). The total number of observations is 170, 265 and 164 for each of the groups, respectively.

In our analysis, we do not need to use fixed effects estimators, because we already identify the individual effects of the banks by splitting the econometric analysis into three bank groups, according to their share in the total assets of the banking sector. As for each of the sub-samples of our database (according to the three bank categories) the number of banks (cross-sections) is lower than the number of time periods, the model is estimated by using an OLS-based PCSE procedure, which improves parameters efficiency and generates more accurate t-statistics, by correcting residual correlation between equations and cross-sectional heteroskedasticity (Beck and Katz, 1995). We test for autocorrelation presence in each of the three models using a LM-test, because this procedure is based on the assumption that the errors have low or no serial correlation. Test results suggest that the level of autocorrelation in each of the three estimated models is low, so we can proceed with this method.

## MODEL RESULTS AND THEIR INTERPRETATION

This session discusses the main findings concerning the impact of monetary policy rate on NIM for each of the three bank categories.

Table 1 Estimated coefficients for the three bank groups  
(Dependent variable: banks' NIM).

	Small banks G1	Medium-sized banks G2	Large banks G3
NIM(-1)	0.8166***	0.7974***	0.7472***
REPO(-4)	0.3494**	0.1475	0.1996
REPO(-4) <sup>2</sup>	-0.0503**	-0.0216	-0.0253
LR	0.0008*	0.0014	0.0006
NPL	-0.0099***	-0.0058*	0.0011*
GROWTH	0.0087**	0.0159*	0.0077*
C	0.1623	0.5236	0.4569
Adjusted R-squared	0.7819	0.7163	0.5924
Prob. (stat.-F)	0.0000	0.0000	0.0000
N	213	334	196

Note: \*significance at 10%, \*\*significance at 5%, \*\*\*significance at 1%.

The adjusted R<sup>2</sup> is above 59% for all the three equations, which means that more than 59% of the variance of NIM is explained by the variance of explanatory variables included in the equation.

In line with the analytical discussion, NIM (the difference between interest received on lending and that paid on funding, divided by total assets) is positively correlated with the monetary policy rate for all the three bank categories. The quadratic term is negative, indicating that the functional relationship is concave in all the cases, but this relation is statistically significant only for small banks.

The estimated partial derivative of net interest margin on monetary policy rate for small banks is given by the formula below:

$$\frac{\partial NIM}{\partial REPO(-4)} = a_2 - 2 * a_3 * REPO(-4) = 0.3494 - 2 * (-0.0503) * REPO(-4)$$

Equating the above expression with 0, we find the threshold monetary policy rate which is 3.5%. The estimated partial derivative of NIM with respect to REPO rate is positive for REPO values lower than 3.5% and decreasing in REPO. This means, in particular, that changes in the REPO rate have a larger impact on interest income ratio when it is close to zero. For interest rate levels greater than 3.5%, the partial derivative is negative. This implies that an expansionary monetary policy (a decrease on REPO rate) has positive effects on net interest income, which means that the decrease on interest income caused by the decrease in the policy rate is lower than the decrease on interest expenses.

The results of the above econometric analysis suggest that only small banks are affected adversely and at a larger extent by monetary policy; meanwhile,

the two other groups of banks are more indifferent in their behavior towards monetary policy changes (the quadratic relation is statistically insignificant).<sup>3</sup> As regards other explanatory variables, liquidity ratio results to have a positive significant effect only for small banks. This may be explained by the fact that small banks have a higher share of short-term loans compared to the two other bank-groups, which means that liquid assets have a significant contribution to their interest profits.

NPLs result to have a significant negative effect on NIM for small and medium-sized banks, which indicates that this is a strategy of these banks to increase their market share, by not increasing their interest margins, regardless the increased costs due to higher non-performing loans. Similar results are found by Brock and Rojas Suárez (2000) for the Latin American banking systems. The effect for large banks results positive, which implies that these banks have increased their interest margins to offset the increased costs of NPLs. Real economic growth has a positive significant effect for the three bank peer groups, implying that the periods of economic boom have been associated with a higher lending activity and with higher interest profits for the banks.

## CONCLUDING REMARKS

In this article, we use a bank-level panel dataset to investigate the effects of monetary policy rate on NIM in the Albanian banking sector for the period 2004Q1-2017Q2.

Despite the expansion of the monetary policy after the global financial crisis, all bank groups have sometimes experienced the downfall of the NIM rate. The impact was higher on the small banks and their recover was slower, while larger banks recovered more quickly.

We find significant nonlinearities in the relation between the policy rate and NIM only for small banks, which confirms our prior belief that small banks are more sensitive towards monetary policy changes. If this scenario persists for much longer, it may have an adverse effect on the NIM and therefore on banks profitability, primarily due to the floor in interest rates on deposits.

These findings have implications for the possible unintended side effects of accommodative monetary policy, designed to keep repo rate low for very long periods. Of course, the overall effect of monetary policy on bank profits will also depend on the impact of monetary policy on macroeconomic conditions as economic growth result to be an important determinant of NIMs of the banks. In particular, it will crucially hinge on the efficacy of monetary policy in boosting aggregate demand at the low levels of policy rate.

<sup>3</sup> In this article, the threshold monetary policy rate for medium and large banks has not been calculated, but more detailed information about them can be found in the full paper of the same title, which will be published soon on the official site of the Bank of Albania.

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## PRICING TO MARKET EFFECTS IN ALBANIA: HOW COMPETITIVE IS THE EXTERNAL SECTOR?

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December 2017

### ABSTRACT

It is often presumed that small open economies do not have market power and therefore take prices as given in international markets. This study tries to test this hypothesis by assessing the degree of pricing-to-market of exporters and importers in Albania. It analyzes the price-setting behavior in the external sector in conjunction with the international environment and domestic costs. Econometric results suggest that pricing-to-market effects are considerable in the price-setting behavior. It is estimated that international price movements and exchange rate changes influence only half of developments in the export prices of goods that are produced in Albania. Their pass-through to import prices is somehow higher, where a 1 percent increase in foreign prices and/or exchange rate depreciation might lead to 0.7 percent increase in imported goods' prices. The impact is similar in both, long run and the short run. These findings have important implications for the monetary policy objective of price stabilization and the specification of transmission channels in macroeconomic models for the Albanian economy.

### INTRODUCTION

Prices of exported and imported goods are influenced by developments in the international markets and exchange rate movements. In this respect, small open economies have been widely assumed in the literature as having no market power in the price-setting process of their traded goods. In that case, trade prices are expected to be determined purely by international price and exchange rate performance, hence bear a full pass-through. Empirical findings have, however, revealed incomplete pass-through in advanced as well as developing economies. This is taken as an evidence of the so-called "pricing-to-market" effects, which are assumed to reflect the market power of a country's exporters and importers. Stimulated by imperfect competition/sticky prices framework, many authors have put their views forward that even products from low income exporters can compete against international products, and their prices are concurrently determined by both, domestic and external factors.

According to Krugman (1986), pricing-to-market (PTM) is a phenomenon that occurs due to product differentiation or imperfect competition, where exporting firms attempt to maintain the same price level despite the depreciation in the importers' currency. Otherwise stated, PTM means that producers tend to absorb exchange rate fluctuations through the applied markup, and this being

reflected in a relatively stable final export price in order to keep market share in compliance with competition in destination markets. Firms producing similar goods also face peer to peer competition when entering foreign markets. But, at the same time they have to differentiate their products in terms of price and quality compared to domestic producers. Thus, the pricing-to-market strategy is not an easy process. It depends on domestic factors that evolve in the respective destination markets. Another important factor in the pricing-to-market strategy of producing firms is the degree of elasticity of demand in importing countries and their willingness to trade off short-run costs for long-run market share objectives.

Assessing the degree of pricing-to-market in external trade is important for policymakers. The sensitivity of import and export prices to exchange rate developments provides insights on the role of exchange rate in the adjustment of foreign trade deficits to sustainable levels. Given a substantial response of trade volumes to relative prices, a high exchange rate elasticity of prices would lead to significant improvements in trade balance through the expenditure switching effect. Furthermore, a precise estimate of the exchange rate and foreign price pass-through to domestic prices is crucial from the monetary policy perspective with the objective of price stability. Their effects are transmitted to domestic prices through external trade deflators, especially import prices. Designing an optimal monetary policy would thus take into account the effects of PTM, i.e. the degree of local currency price stability.

Our research analysis tries to find out whether exporting and importing firms in Albania with trivial shares in international trade can still deliver pricing to market. The findings contribute to the empirical literature on PTM in developing countries. In addition, they help to better understand the channels in the transmission mechanism in order to improve the external sector specification in macroeconomic models for the Albanian economy. To preview the results, foreign prices and exchange rate movements influence only half of developments in the prices of Albanian exported goods. Their pass-through to import prices is somehow higher, where a 1 percent increase in foreign prices and/or exchange rate depreciation might lead to 0.7 percent increase in imported goods' prices.

In what follows, we will shortly elaborate the concept of pricing to market and show some empirical findings in the literature on advanced and developing countries. Next section displays some stylized facts on the performance of exported and imported goods sectors in Albania. Then we introduce the model specifications for export and import prices followed by their respective results for the long-run and short-run elasticities to domestic and external factors.



## LITERATURE REVIEW

The law of one price (LOOP) in international economics assumes that prices should be equal in every country, once it is expressed in a single currency. A vast empirical literature has, however, documented that LOOP might hold only in the long run, and the speed adjustment to equilibrium might take even decades. One possible explanation to the LOOP failure is the theory of pricing-to-market (PTM), which dwells on the role of imperfect competition in trade. Various studies have shown the degree of competition to be mainly determined by the exporter's share in the destination market and the level of product differentiation. A higher market share would reduce the incentive of the exporter to absorb nominal shocks in its own currency prices, therefore raising the likelihood of passing exchange rate movements to her buyers. PTM is found particularly high for importers in the euro area (Warmedinger, 2004) and the US (Vigfusson, Sheets and Gagnon, 2009), which could be due to the smaller shares of exporters in these huge markets. Also, greater product differentiation gives rise to elements of monopoly or market segmentation, which allow a firm to exercise some control over market prices by charging a destination-specific mark-up on the marginal cost. The mark-up is related to the price elasticity of demand for their traded goods. Thus, the lower the price elasticity the higher the firms' ability to profitably raise market prices above marginal costs.

Numerous empirical studies have explored the PTM phenomenon and tried to contribute to the understanding of export pricing strategies in foreign markets. The pricing to market concept was first elaborated by Krugman (1986), who identified this pricing phenomenon as an effective tool for producers to align export prices according to their growth strategies in foreign markets. However, the author argues that PTM takes place only in an environment of imperfect competition where price discrimination comes as a result of market segmentation in spite of factors affecting production such as geography, information asymmetry, costs of transport and bilateral trade relations. Similarly, Froot and Klemperer (1989) conceptualize a dynamic model based on the assumption that market shares are important to determine long-term profits for exporting firms and given the exchange rate volatility they have to make tradeoffs between profits and the market share. From a theoretical point of view, Brauer (1999) utilizes the market oligopolistic framework to explain that pass through of prices might come as a dual reaction to exchange rate or production cost differences, considering price elasticity of demand and product substitutability in the destination market as fundamental export price determinants. Bacchetta and van Wincoop (2005) present a model where the invoicing choice of exporting firms depends on the market share in the importing country and on the extent to which products of domestic firms are substitutes for those of competing foreign firms.

The literature offers ample evidence for the existence of PTM in advanced as well as developing economies. Knetter (1989), Marston (1990), Knetter (1993), Swamy and Thurman (1994), Gagnon and Knetter (1995) bring empirical evidences that PTM of exporters from major global economies is delivered

by making a mark-up adjustment that is specific for each destination market stabilizing final export price in order to effectively face local competition and keep the market share. In this regard, exchange rate is the main determinant behind price adjustment processes while changes in income between countries are seen not of the same level of importance. Jaeger et al. (2001) find empirical evidences that low inflation regimes tend to minimize exchange rate pass-through effects and as result exporters applying higher markup adjustments to keep stable export prices toward these economies. In a panel analysis of 11 industrialized countries Bailliu and Fujii (2004) argue that the decline of exchange rate pass-through to domestic prices is attributed to a low-inflation environment. Yang (2007) investigating for possible asymmetries in the pass-through to US import prices concludes that exchange rate pass-through effect during periods of dollar appreciation differs from one industry to another.

Studying the determinants of pricing-to-market at the firm level in 12 developing and emerging economies, Asprilla et. al. (2015) find that exporters absorb 10 to 15 percent of currency fluctuations and pass through the difference, and pricing-to-market effects increase with the firm size. Bussiere, Delle Chiaie, and Peltonen (2014) estimate export and import price equations for 40 countries of which 22 emerging market economies aiming to understand heterogeneity across countries in the degree of exchange rate pass-through to import and to export prices. The results indicate that export price elasticities are higher in emerging market economies than in advanced economies, and among others trade elasticities are primarily influenced by macroeconomic factors.

In an empirical analysis on low-middle income countries (including Albania), Rollo (2014) rejects the assumption that small open economies are pure price takers, and thus able to conduct pricing to market. Her conclusion stems from the findings that exporters from these countries apply different prices for the same goods in different markets. Similarly, Penkova and Sinclair (2010) test for potential PTM behavior of Bulgarian exporters in textiles and machinery industries over the period 1998-2008. The empirical results found by the authors offer new evidence on the optimal response of a firm's export price to changes in currency values depending on a number of factors that are transmitted through two main channels: exchange rate impact on marginal cost and mark-up of price over marginal cost.

## SOME STYLIZED FACTS

The euro area is the main trading partner for Albanian exporters, while the rest of the world amounts to one fourth of the total exported goods. Data from the Institute of Statistics shows that the top five euro area markets for Albanian exports consist of Greece, Germany, Malta, Spain and Italy, with the latter accounting for more than half of Albanian exports. Eighty percent of the exported products during the period 2005-16 consisted of minerals (27%), base metals (16%), textiles (20%) and footwear (18%). The EA19 has been the destination for about all exports of textiles and footwear, and for more than half of minerals and metals (the rest going to the non-EU countries).

The imported goods appear somehow less concentrated than exports. More than fifty-five percent of imports come from Euro area (or about 60% from the EU28). Italy, Greece, Germany, Spain and France appear to be the most important countries for imports originating from the Euro area. About two-thirds of imported goods during 2005-16 consisted of minerals (15.4%), machineries (14.3%), base metals (11.3%), textiles (8.6%), chemical products (8.3%) and prepared foods, alcoholic drinks and tobacco (7.9%).

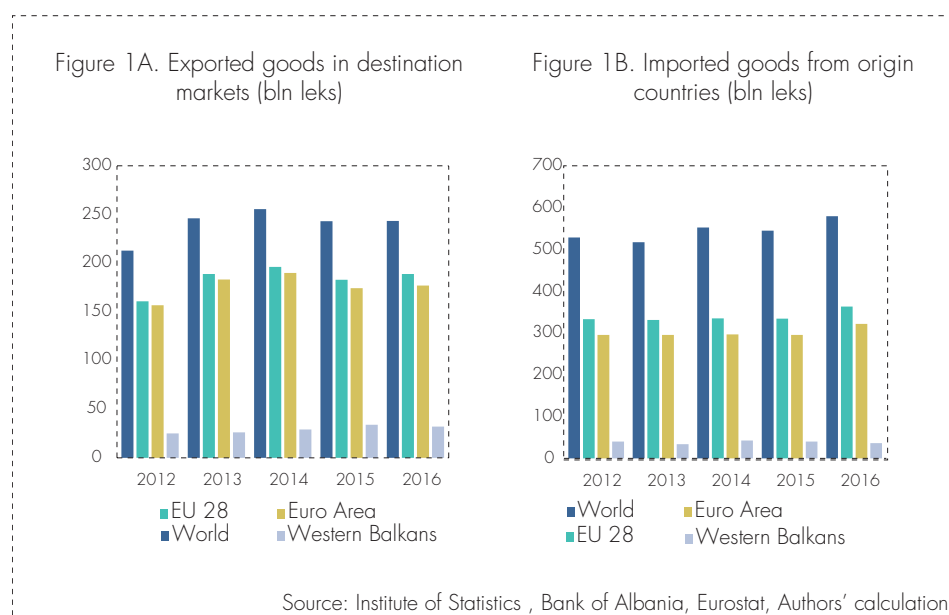
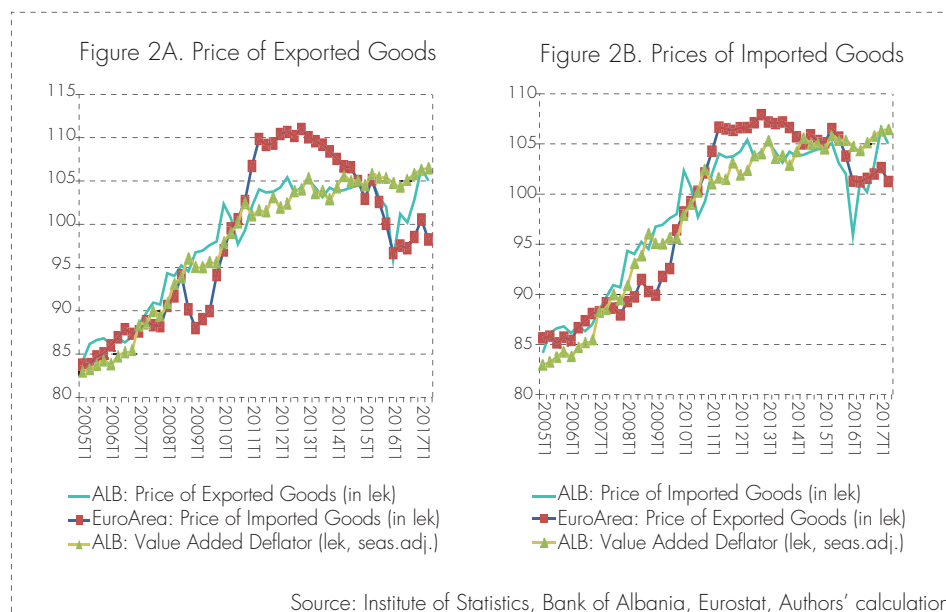


Figure 2 displays the performance of traded goods prices in comparison to domestic and international prices. Both export and import prices of Albania have apparently followed the pace of domestic prices, for most of the period since 2005. The trajectory of trade prices has managed to withstand quite well the international trade disorders caused by the global financial crisis of 2007-10. In terms of GDP, the emerging economies in Europe experienced the most adverse effects in the world (Shelburne, 2010). Yet, Albanian trade prices did not bend down in the midst of global crisis around 2009, nor did they speed up afterward during a faster-than-expected recover of international trade. Export and import prices seem rather predictable until mid-2015, except for the recent years when they have rather attuned to competitors' prices in the Euro area. Indeed, one might expect a rather high co-movement of trade prices between Albanian firms and their competitors, given the trivial stake of Albanian traders in the Euro area's exports and imports. According to the Eurostat's data, the ratio of Albania in the Euro area's external trade has remained at merely 0.1 percent for the past decade, which is pretty much comparable with its relative economic size. This suggests us that the price-setting behavior of Albanian firms could be influenced by factors other than the market share, such as product differentiation that allows them to create specific competitive advantages.



## METHODOLOGY AND STATISTICAL DATA

In the general theoretical framework of price discrimination exporting firms apply different pricing strategies depending on the destination market and the exchange rate. Let's suppose an exporter that sells goods in  $n$  separate destination markets, indexed by  $i$ . The profits of the exporting producer are given as:

$$\Pi(p_1, \dots, p_n) = \sum_{i=1}^n p_i q_i(e_i p_i) - C\left(\sum_{i=1}^n q_i(e_i p_i), w\right) \quad (1)$$

In the above equation,  $p$  is the export price expressed in producers' domestic currency;  $e$  denotes the foreign exchange rate per unit of producer's currency deflated by the price level in destination market;  $q$  is the quantity of goods demanded in the destination market (a function of relative prices); and  $w$  represents the index of input prices expressed in own currency, as part of the total cost function  $C$ .

Following a standard first order conditions (FOC) for profit maximization it is necessary that the firm's marginal revenue from sales in each market should be equal to marginal cost of production. Thus, the optimal export price to each destination market is the product of the common marginal cost ( $mc$ ) and a destination-specific mark-up:

$$p_i = \left( \frac{\varepsilon_i(e_i p_i)}{\varepsilon_i(e_i p_i) - 1} \right) mc$$

where  $i = 1, \dots, n$ , and  $\epsilon_{it}$  represents the relative price elasticity of demand in the foreign market for a specific good. As possible to understand from the second equation the producer's optimal export price to each destination depends on two determining factors: the common marginal cost and the mark-up of export price over marginal cost.

The theoretical approach is very similar in the literature, yet the econometric models take various forms in terms of specification and control variables. Our estimation method follows a standard framework as in Campa and Goldberg (2005), Gagnon and Ihrig (2004), Bussiere et al (2008) and other authors. In modeling the export and import prices of Albania we have assumed that markets operate in monopolistic competition with differentiated products and the mark-up on production costs is fixed in the long run. Trade prices are explained by international prices (including the exchange rate pass-through) as well as the prevailing domestic prices. The long-run models of export and import prices are estimated separately in natural logarithms as follows:

$$\ln(PT) = b_{pd}\ln(PD) + b_{pc}\ln(PC)$$

where  $PT$  is the deflator for imported and exported goods expressed in Albanian lek, estimated separately;  $PD$  stands for domestic prices, proxied by GDP deflator at factor costs; and  $PC$  represents foreign competitors' prices, constructed as international prices in euro currency multiplied by the exchange rate of leks per unit of euro. The international price in the Albanian export (import) price equation is proxied by the Euro area import (export) deflator. Albania's external trade prices are proxied by the deflators of exported and imported goods. Both data series are only published from the first quarter of 2009, therefore previous periods needed to be extrapolated to increase the sample size of our regression analysis. Because imported goods account for majority of imports, the growth of aggregated import deflator was used to extrapolate the series before 2009. On the other hand, the ratio of exported goods in total exports has gradually shrunk in the past decade. Moreover, its deflator did not commove with the total deflator but showed similar patterns with producer prices. Therefore, the latter was hired to extrapolate observations in the preceding years. All the deflators, for the domestic and international data, and the exchange rate were indexed with 2010 as the base year, and the seasonal components were removed from the original data by using the Tramo/Seats method.

The primary objective is to assess if there are competitive advantages that Albanian traders can use to tackle market competition. This can be measured by  $b_{pd}$  coefficient in front of domestic prices. The higher it is the less competitive and stickier should be Albania's export and import prices. And the more it falls to zero the closer to full pass-through is  $b_{pc}$  coefficient, suggesting that Albanian firms are price takers. Please note that exchange rate and international prices in our model are restricted to have the same effects on trade prices. Lek depreciation and rising foreign prices are expected to lead to higher trade

prices, thus  $b_{pc}$  should be positive. This restriction comes from the assumption of fixed mark-up in markets with monopolistic competition. Yet it could only be plausible in the long run and may not hold in the short run, where the reaction to exchange rate and international price developments might be different. Many studies have imposed the homogeneity restriction such that the sum of estimated coefficients  $b_{pd}$  and  $b_{pc}$  is equal to one.

The results should help us improve on model specifications of external trade for Albania. Economic models have often relied on trade price equations as solely a function of foreign prices and exchange rates on the assumption that small open economies are pure price takers. A positive bpd and substantially above zero would reject that hypothesis and push for an augmentation of the function of external trade prices with domestic cost indicators.

## EMPIRICAL RESULTS

This section presents the empirical results on the importance of factors that can influence Albanian firms' pricing strategy with regard to domestic production costs and international developments. The sample period of the regressions runs from the first quarter of 2005 to second quarter of 2017. Table 1 displays the unit root test. Price variables are generally found to be non-stationary in levels, and become stationary in first difference. Because variables are of the order  $I(1)$ , the dynamic ordinary least squares (DOLS) method was used to estimate the long-run PTM effects. The DOLS method is a cointegration approach that helps to take care of endogeneity and serial correlation problems in the models. We assume there is a single cointegrating relationship in the model, with causality running from costs and foreign price developments to export and import prices.

Table 2 displays the sensitivity of external trade prices. It seems that movements in competitors' prices (which combine foreign prices with the exchange rate) are passed only half to export prices, and about two-thirds onto import prices. This implies that PTM effects are considerable in Albania, as measured by the impact of domestic costs on export (0.46) and import (0.33) prices. The incomplete pass-through of external factors and the substantial response to domestic costs should force us to change the perception that small open economies have limited power to negotiate their prices. Consequently, it is necessary for equations of export and import deflators to include indicators on domestic costs in order to improve the long-term projections of the external trade bloc in a macromodel.

The literature reveals that higher than expected PTM and resulting incomplete pass-through might stem from "macro" structural factors, such as an environment of low inflation, low exchange rate volatility, and relatively low economic openness (see for e.g. Campa and Goldberg, 2002). A number of papers have evidenced a reduction in the exchange rate pass-through in low inflation countries. Hence, they exhibit higher pricing to market effects. Similar findings have been documented for Albania, where annual inflation averaged 2.8

percent during the 2000-10 period and only 2 percent in the subsequent seven years. In such an environment with expectations of low future prices it could be harder for cost increases to be passed on to prices, as argued by Jaeger et al (2001). Similarly, low exchange rate volatility is another factor that may influence more pricing-to-market behavior from exporters (Bussière et al, 2008). Indeed, certain studies have considered the Albanian currency to perform as in a fixed exchange rate regime, due to its low exchange rate volatility against euro. A comparison of floating currencies in the CESEE countries reveals that from 2010 to 2017 the coefficient of variation of lek has been 1.6 percent, against 2.9 to 23.5 percent in the others. Consequently, there might be more favorable circumstances for incomplete pass-through and higher pricing to market behavior from Albanian traders. Finally, the difference between the estimated pass-through to import and export prices might be explained by the relative economic openness. A rather high pass-through to import prices is consistent with the considerable imported good penetration in economy (nearly 32% of gross domestic production). On the other hand, the lower-than-expected export price sensitivity is in line with the much lower export ratio to GDP (averaging just above 8% in the last seven years).

Table 1. Phillips-Perron Unit Root Tests, 2005 Q1-2016 Q4 period

Null Hypothesis: Unit root	Levels (prob.\$)	1st difference (prob.\$)
	With constant	
AL: Price of Imported Goods	0.1724	0.0000
AL: Price of Exported Goods	0.3195	0.0000
AL: Price of Gross Value Added	0.1559	0.0035
ALL/EUR Exchange Rate	0.6834	0.0000
EA: Price of Imported Goods	0.2497	0.0011
EA: Price of Exported Goods	0.3464	0.0013
	With constant and trend	
AL: Price of Imported Goods	0.0161	0.0000
AL: Price of Exported Goods	0.6832	0.0000
AL: Price of Gross Value Added	0.0035	0.0001
ALL/EUR Exchange Rate	0.9679	0.0002
EA: Price of Imported Goods	0.6717	0.0048
EA: Price of Exported Goods	0.6086	0.0071
	Without constant and trend	
AL: Price of Imported Goods	0.7150	0.0000
AL: Price of Exported Goods	0.9867	0.0000
AL: Price of Gross Value Added	0.9954	0.0000
ALL/EUR Exchange Rate	0.7628	0.0000
EA: Price of Imported Goods	0.8100	0.0000
EA: Price of Exported Goods	0.9239	0.0001

\$Newey-West bandwidth automatic selection using Bartlett kernel

Table 2. Long-run relationship of Traded Goods Prices with Costs and Competitors

Method: Dynamic Least Squares (DOLS), HAC st. errors & cov.; no cointegrating equation deterministics		
Dependent variable:	Price of Exported Goods	Price of Imported Goods
Sample: 2005 Q1 2017 Q2, no. of obs. after adjustment	46	48
Automatic leads and lags specif. based on HQC crit.	4 leads, 6 lags	2 leads, 5 lags
Explanatory variables	Coefficient	Coefficient
Domestic Prices	0.4570***	0.3308**
Competitors' Prices	0.5369***	0.6736***
Adjusted R-squared	0.9548	0.9718
S.E. of regression	0.0155	0.0187
Normality test, JB prob.	0.3027	0.7195
Unit root with Break test on residuals	<0.01	<0.01

Note: \*\*\*, \*\*, and \* denote 1, 5, and 10 percent level of significance, respectively.

In addition to long-run estimates, we estimated another short-run dynamic model to find out the short-run relationship among our variables. That could also help to achieve a better fit of the models and as well as to assess whether the same impact restriction of exchange rate (*ER*) and international prices (*PF*) above holds in the short run. The dynamic model is specified in first difference, it allows up to four time lags *t*, and includes the error correction term (*ECT*) derived as a residual from the above equations. The short-term equations are written in the following form:

$$\Delta \ln(P_T) = c_{ect}ECT_{-1} + \sum_{t=-1 \text{ to } -4} \Delta c_{pt} \ln(P_T)_t + \sum_{t=0 \text{ to } -4} \Delta c_{pd} \ln(PD_t) + \dots$$

$$+ \sum_{t=0 \text{ to } -4} \Delta c_{pf} \ln(PF_t) + \sum_{t=0 \text{ to } -4} \Delta c_{er} \ln(ER_t)$$

Table 3 displays the response of external trade prices in the short run. A parsimonious estimation of the short-run model helped to improve model fitness in both equations, as suggested by significantly lower standard errors than previous regressions. The results maintain the earlier conclusions of considerable PTM effects in the price setting behavior of both, exported and imported goods in Albania. Disentangling the impact of competitors' prices reveals that the reaction to international prices is similar to that of exchange rate movements in the export price equation; whereas in the import price equation that response is three times higher. Finally, the error correction term is found negative and statistically significant; its size around 0.4 suggests us a rather fast speed of adjustment of prices towards their long-run equilibrium.



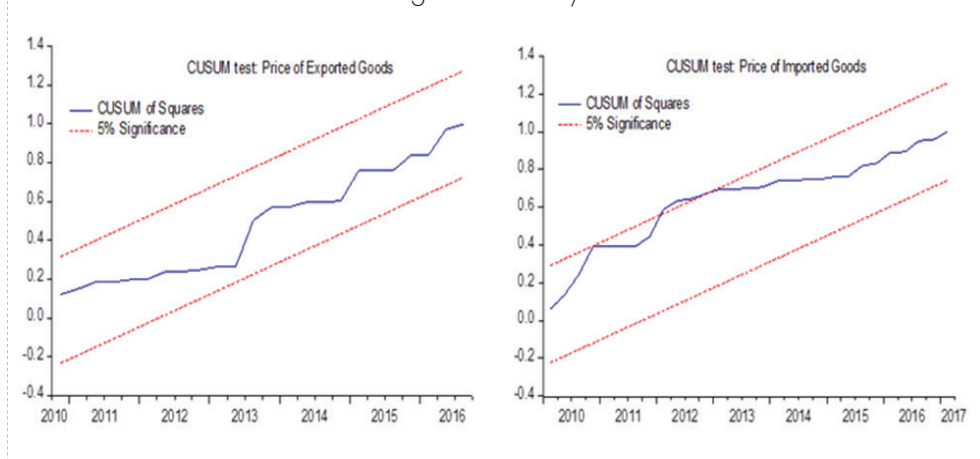
Table 3. Short-run evidence for pricing-to-market effects

Method: Least Squares, HAC standard errors & covariance		
	Price of Exported Goods	Price of Imported Goods
Explanatory variables	Coefficient	Coefficient
Error Correction Term-1	-0.4208**	-0.3634**
Lagged Trade Prices	-0.3469***	
Domestic Prices	0.4851***	0.4535***
International Prices	0.5036***	0.6672**
ALL/EUR Exchange Rate	0.3946**	0.2212*
Dummy = 1 (Exp. 2009Q1; Imp 2008Q1)	0.0459***	-0.0623***
Dummy = 1 (Exp. 2016Q1; Imp 2009Q4)	-0.0460***	0.0999***
Sample period 2005Q1:2017Q2, no. of obs. after adjustment	45	48
Adjusted R-squared	0.7187	0.7962
S.E. of regression	0.0099	0.0107
Normality test, JB prob.	0.5975	0.6026
Autocorrelation: LM test prob. F(4)	0.8319	0.1781
Heteroskedasticity: BPG test prob. F(6)	0.8176	0.2995

Note: \*\*\*, \*\*, and \* denote 1, 5, and 10 percent level of significance, respectively.

Ramsey test signals that specification errors are likely in both models, suggesting omission of relevant variables or nonlinearity problems. Nevertheless, CUSUM of squares tests on S-R regressions suggest no significant anomaly in each model's performance since 2010. Moreover, in-sample forecast evaluation shows satisfactory performance (TICs turn out very modest), where bias appears less often to be a major contributor to forecast errors. When fitted values with a power of 2 to 3 enter as explanatory variables the F-tests are statistically significant at 10% in the export price equation and 5% in the import price equation. Our DOLS method used in the long-run estimation takes account of endogeneity and serially correlated disturbances. Therefore, model misspecifications might come from omission of relevant variables or nonlinearity issues.

Figure 3 Stability test results



## CONCLUDING REMARKS

Pricing-to-market effects analyzed in past three decades mostly in advanced economies assume that PTM derives from the market power. Recent studies have, however, evidenced that even when exporters have relatively small market shares they can deliver pricing-to-market. Our analysis finds evidence for PTM effects on Albania's external trade prices, which suggests that domestic firms might not be complete price takers as generally perceived. The long-term influence of PTM is found considerable on both export (0.46) and import (0.33) prices. Consequently, there is an incomplete pass-through from exchange rate and international prices to Albanian trade prices. Tests of stability show models' performance to be satisfactory. However, other relevant variables could help to improve model explanation, as suggested by Ramsey test.

Further research could be undertaken from a microeconomic perspective with the scope of shedding light whether PTM effects are confined to differentiated goods or apply to homogeneous goods as well. Depending on data availability, research analysis could be enriched by studying the link between PTM and trade policies, especially after free-trade-agreements that took place in the second half of 2000s.

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