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C O N T E N T

CONSUMPTION INEQUALITY: AN ANALYZIS BASED ON THE DECOMPOSITION OF THE GINI COEFFICIENT OF EXPENDITURES IN ALBANIA

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ABSTRACT

This article analyzes the inequality of consumer's spending in Albania by calculating and decomposing the Gini coefficient for expenditures. The data is obtained from the 2012 Living Standard Measure Survey (LSMS), which provides data on household expenditures on multiple categories of commodities and services. The results suggest for an inequality of 0.371 for total consumption versus an inequality of 0.403 for total income. About 78% of all household expenses consist of food, utilities and household operations. Consequently, expenses on other consumption components are perceived as being a luxury with a high relative inequality (relative Gini) coefficient.

INTRODUCTION

Consumers' decisions are the main determinants of economic growth and business cycles. As part of Albania's Gross Domestic Product (GDP), private consumption has steadily increased, marking 80% of annual GDP in 2015 [INSTAT (2017)]. In a recession period, as a result of increased uncertainty, consumers' expenditures are likely not only to fall but also to affect the prospects for recovery [Bernanke (1993), Dow and Hillard, (1995) and (2000), Sordi and Vercelli (2010), Bartolucci et al. (2011)]. However, aggregate consumption is the result of consumer's behavior in diverse subpopulations, which cannot be taken into account in macroeconomic estimates. In particular, heterogeneity in the composition of the population, along with the concentration of income and wealth at the peak of the distribution, is likely to cause disparities in the spending and consumption behavior of the households.

The Gini coefficient of income is considered one of the best statistical measures of inequality and welfare [Gini (1936)]. Inequality of income has attracted much interest in academic literature [look at Levy and Murnane (1992); Burtless (1995); Gottschalk and Smeeding (1997)], while few studies analyze consumption inequality. Indeed, it is easy to argue that family welfare is more appropriately measured by consumption rather than income. Consumption can be a better metric of permanent household income (Meyer and Sullivan, 2006), the welfare of the poor (Meyer and Sullivan, 2003) and changes in income inequality have implications on welfare that depend on the structure of credit and insurance markets (Krueger and Perri, 2005).

On the other hand, many studies have found that Gini's income and consumption coefficient are two complementary indicators that exhibit different behaviors

at certain times. Many studies have found that despite the decline in income inequality during years of recession and crises, inequality in consumption has increased, leading to the deterioration of welfare [Daunfeldt, Folster and Hortlund (2007)]. Also, many studies suggest that the growth of one of these coefficients warns of an increase of the next coefficient in the future: a growth in consumption Gini warns and an increase in income Gini. Moreover, many studies suggest that the growth of one of the coefficients warns for an increase of the other in the future: a growth in consumption's Gini anticipates for and an increase in income's Gini [Cutler and Katz (1992)] and vice versa [Krueger and Perri (2005)].

This article uses household micro data from 2012 and calculates the inequality in the distribution of household expenditures, and decomposes multiple inequality indicators of total expenditure components based on Garner's (1991) methodology. Using this methodology allows for sketching the Engels' curves as the calculation of elasticities provides information on preferences on consumption components and consequently on the slope of the curve of each of these components. Simultaneously, this analysis provides complementary and necessary information on understanding of welfare and family expenditure models and therefore provides important details on the behavior of aggregate consumption, serving the knowledge and decision-making of monetary policy and financial stability.

In the following two sections one can find details on the data and methodology used for the calculations and decomposition of the Gini and further results and conclusions.

METHODOLOGY

The Gini coefficient represents an indicator of inequality in the distribution of household expenditures in the population. The formula is written in terms of the covariance of total expenditures (X), the cumulative distribution [F(X)] and the mean of total expenditures (m) according to the formula:

$$(1) \quad G = \frac{2\mathrm{cov}(X,F)}{m}$$

The coefficient takes a value in the range of $0 \leq G \leq 1$ where the closer to 1, the higher is the rate of inequality and the closer to 0 the lower the rate of inequality. A value of 0 indicates complete equality and 1 indicates complete inequality.

The methodology used to calculate the decomposition of the Gini is based on the methodology introduced by Lerman and Yitzhaki (1984) and later used by Garner (1993). This methodology is one of the few methods that measures the

Gini coefficient at the individual (household) level and not at a group level. For comparison, using the above formula we calculate as well the Gini coefficient of total household income.

Expenditures are decomposed in (x_k) components such that: $x = \sum_{k=1}^{K}(x_k)$. The components are: food, transportation, entertainment, alcohol and cigarettes, household operations, furnishing and equipment, apparel and services, fuel and utilities and other expenses[1]. F_k represents the cumulative distribution of x_k and m_k it's the mean. Therefore, the Gini coefficient of the "k-th" component is calculated as:

$$(2) \quad G_k = \frac{2\mathrm{cov}(x_k, F_k)}{m_k}$$

Likewise, the Gini coefficient of total expenditures can be calculated by using the formula below, which utilizes cumulative distributions and averages of the expenditure components:

$$(3) \quad G = \frac{2\sum_{k=1}^{K} cov(F, x_k)}{m}$$

Besides the decomposition of the Gini coefficient, in this article, decomposed budget components have also been calculated. Multiplying and dividing the two sides of equation (3) with cov (x_k, F_k) and m_k, the equation is transformed as follows:

$$(4) \quad G = \sum_{k=1}^{K}\left(\frac{cov\,(x_k,F)}{cov(x_k,F_k)} \cdot \frac{2cov(x_k,F_k)}{m_k} \cdot \frac{m_k}{m}\right) = \sum_{k=1}^{K} R_k G_k S_k = \sum_{k=1}^{K} C_k$$

Where, R_k represents the correlation between expenditures of the k-th component with total expenditures. G_k measures the Gini coefficient for each one of the expenditure components as described above and S_k is the contribution to total expenses of the k-th component. C_k represents the product of the three decomposed elements for the k-th component. Any change in the variables R_k, G_k, or S_k will be reflected in changes of C_k. The greater the value of one of these components, the more C_k increases, the more the expenditure inequality increases (as $G=\sum_{k=1}^{K} C_k$).

Furthermore, in this article, two measures of relative effects of inequality are calculated: the relative inequality of expenditures, which is calculated as the ratio between the share of inequality to the total expenditure attributed to each component ($I_k = C_k/G$) with the share on expenditures of the k-th component (S_k, formula 4), and the relative marginal effects, calculated as the difference of the above.

[1] *For a more detailed list of goods and services that are included in each category, refer to Table 2 in the appendix.*

Finally, for each component, we calculate the elasticity to determine whether the goods and services are consumed and perceived as luxury, necessary or inferior goods:

$$(5) \quad e = \frac{R_k G_k}{G}$$

The elasticity takes three values: if e >1, the good is consumed as a luxury good, if 0<e<1 the good is consumed as a necessity good and if e<0 the good is consumed as an inferior good. Using the elasticities of the expenditure components, the Engel's curves for each component are sketched.

DATA

The data used for the analysis was derived from the Living Standards Measure Survey (LSMS) for 2012. The LSMS is a survey conducted by INSTAT with a 4-year frequency and a sample of 6672 households, providing information on various topics including data on household expenditures on multiple categories of goods and services. Although the information dates to 2012, the database is still suitable for analysis since: 1) Consumer theories suggest that individual smooth consumption throughout life and particularly in unchanged economic and social conditions consumption does not change significantly 2) the analysis does not use absolute values of expenditures, but cumulative averages and cumulative distributions of the population. However, this analysis would be interesting to repeat and compare with the results of the current LSMS.

Although many consumption components are measured using household expenditures, there are significant differences between the two concepts. First, expenditures exclude consumption that is not based on market transactions. Given the importance of domestic production in developing countries, this can be a significant difference. Second, expenditures refer to the purchase of a certain good or service. However, some goods cannot be consumed immediately or may have permanent benefits. In this article, we will be using expenditure inequality as a proxy for consumption inequality as the database does not allow access to real household consumption data.

Data on in-home and out-of-home food expenses are collected in two separate 14-day periods in the form of a diary for all households. These expenditures are representative of the average monthly household expenditures and are therefore multiplied by '26' in order to obtain the value of annual food consumption. Other expenditure questions are grouped in the survey into three major categories: with a frequency of one-month, six-month and 12-month; providing information on a variety of products, which for the purpose of the analysis are grouped according to expenditure components and multiplied respectively with 12, 2 and 1 to give the relevant annual consumption values. Total annual expenditures are calculated as the sum of the amounts in each category. Expenditures on insurance and voluntary pension's schemes, as well as tax payments, are not included in the value of the total.

A limitation of the data is that, a large number of reported "zeros" would bring an increase in the Gini of expenditures, thus if households voluntarily not report or underreport would increase artificially the coefficient. In order to obtain more accurate and unbiased values from the sample, we have dropped households that did not answer any of the questions about spending; those who answered questions about food, but none of the questions about the 1, 6, and 12-month spending and households who did not answer questions about 1-month spending, whose products are indispensable for the household. Moreover, these exclusions are made to avoid a deflated value of total household expenditure. After dropping these observations the sample resulted to be a total of 4987 households, which are sufficient to provide significant results.

On the other hand, the 2012 LSMS does not provide data on total self-reported household consumption, which could serve as a reference over the outcome and calculations, and moreover data on shelter, which could be a valuable addition to the expenditure components list.

RESULTS

Table 1 shows the results of the analysis. The first column (C_k) is calculated by using the second column (R_k) the third (G_k) and the fourth (S_k). The fifth column (I_k), the sixth (I_k/S_k) and the seventh (I_k-S_k) present relative effects of the decomposition. The last column presents the elasticity for each component of expenditures.

First, the Gini coefficient of total expenditures is equal to 0.371, which is lower than the Gini coefficient of total income of 0.403 calculated from the same data. Despite inequality is more prominent in income, it is not reflected to the same extent on household expenditures, thus households, regardless of income, spend same amounts on certain goods.

Meanwhile, looking at the third column, we can see that the Ginis of the expenditure components take high values. The lower the value the higher the probability of expenditures being distributed equally comparing to other expenditures and the higher the value the lower the probability of expenditures being distributed equally comparing to other expenditures. Entertainment, furnishing and equipment reach a value almost equal to 1, which implies that the probability that these expenses are being equally distributed is extremely low. The lowest coefficient comes from fuel and utilities, followed by household operation and food, which are commodities and services which generally a household cannot live without.

Meanwhile, as seen in column 1, the components that have a lower Gini are those that have contributed more to the calculation of Gini's total value versus components with a higher Gini, which implies a biased reduction of Gini's of the total. Food, household operations and fuel and utilities have the lowest coefficient and at the same time are the main contributors to the value of total

inequality (see column 5, Ik). On the other hand, furnishing and equipment, transportation and entertainment have the highest Gini component, but also give the lowest contribution to total inequality.

Indeed, the majority of total expenditures consist of food, fuel, utilities and household operations, which account for 76% of total household expenditure. Besides, the other components have a small share on household expenditures, for example, entertainment constitutes only 3% of the total expenditures of the average household, suggesting that basic consumption (and as such are reflected in the last column of elasticities) comprise the vast majority of household expenditures and this explains the calculated Gini's values and respective contributions.

So in this context, regardless of Gini's low total value, the Gini coefficients of the expenditure components should not be overlooked as they are a better indicator of inclusive inequality.

Table 1. Results: Gini of expenditures decomposition

Expenditure Component	Contribution to total inequality (Ck)	Correlation with rank of total expenditures (Rk)	Gini of Component (Gk)	Expenditure Share (Sk)	Share Expenditure Inequality (Ik)	Relative Expenditure Inequality (Ik/Sk)	Relative Marginal Effect (Ik-Sk)	Elasticity (Rk*Gk)/G
Food	0.090	0.636	0.484	0.292	0.243	0.832	-0.049	0.830
Transportation	0.012	0.449	0.888	0.030	0.032	1.067	0.002	1.074
Entertainement	0.027	0.788	0.906	0.038	0.072	1.894	0.034	1.924
Alcoohol and Cigarettes	0.033	0.555	0.799	0.074	0.089	1.203	0.015	1.195
Household Operations	0.083	0.756	0.477	0.230	0.224	0.974	-0.006	0.972
Apparel and Services	0.019	0.611	0.596	0.054	0.051	0.944	-0.003	0.982
Furnishing and Equipment	0.011	0.670	0.923	0.017	0.030	1.765	0.013	1.667
Fuel and Utilities	0.083	0.742	0.469	0.238	0.224	0.941	-0.014	0.938
Other	0.013	0.536	0.818	0.029	0.035	1.207	0.006	1.182
Total	0.371	1.000	0.371	1.000	1.000	1.000	0.000	

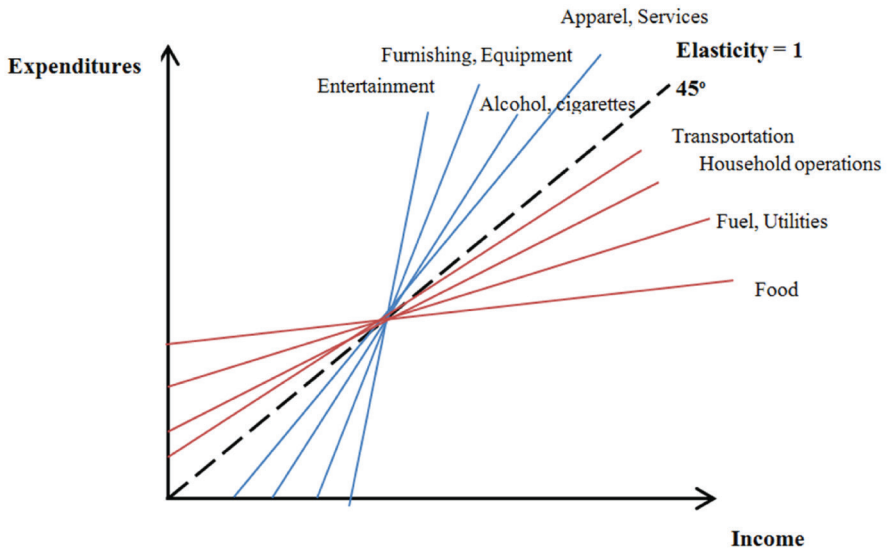
Source: The author's calculations (LSMS 2012 used)

Second, by analyzing the elasticities in the last column, we can see that entertainment, which as mentioned is only 3% of total expenditure, has a significantly higher elasticity coefficient, indicating that this commodity is considered a luxury good. The same applies to furnishing and equipment, transportation, alcohol and tobacco. Based on this grouping of goods and services, no component displays inferior goods tendencies, as these categories are quite broad and diverse and the aggregate effect can fade the effects on a couple of commodities that are perceived as such.

The value of the elasticity is significantly influenced by the correlation with the rank of total expenditure (R_k) and the Gini of the component (G_k). A high correlation and a high Gini result in goods and services displaying a high elasticity. As an example: food, household operations, fuel and utilities, are relatively inelastic, while entertainment, furnishing and equipment are relatively elastic.

Below we present a rough outline of the Engel's curves of the components of total expenditure, based on the values of elasticities. For comparison purposes, all curves are built on the same graph. These curves present a relationship between income and expenses and have a positive slope. Measuring elasticities avoids the need to include data on household income in the analysis.

Graph 1. Engels' curves for expenditure components



Engels' curves for luxury goods (E> 1) start on the horizontal axis, which means that up to a certain level of household income these goods are not consumed. While for necessity goods (E <1), Engel's curves start at the vertical axis, which means that even when household income is zero, these goods are consumed in positive quantities and the 45o curve representing E = 1 starts from the origin. Cross cutting does not necessarily mean that these curves will intersect at this point on the 45o line, but is rather used to facilitate the visualization.

Finally, the relative marginal effects presented in column (7) point to the possibility that an increase in expenditures for a particular component can lead to a decrease in inequality. To achieve this $I_k > S_k$ so the coefficient should have a negative value. A positive coefficient implies that an increase in expenditures for this component will result in an increase in inequality. **In our case, an increase in expenditures on food, household operations, apparel and services and fuel and utilities will bring a decrease in inequality.** An increase in expenditures for these components may come from tax cuts on basic products and services or other facilitating or incentivizing policies. Also, further taxation or constraining policies on luxury commodities, which have positive relative marginal effects will help achieving the same result, namely a reduction in the inequality of total expenditures.

CONCLUSIONS

The article finds a Gini income coefficient of 0.403% and a Gini expenditure coefficient of 0.371%, two values which suggest that the spending behavior of households is influenced by income but the inequality in the distribution of expenditures is lower than that in the income distribution. However, inequality deepens when calculating decomposed with Gini coefficients for components of total expenditure. In Albania, 78% of total expenditures refer to basic household goods and services, which have an impact on lowering artificially the Gini's coefficient. Certain components of expenditure as entertainment, transportation, furnishing and equipment constitute a very small proportion of average household expenditure and therefore have a probability almost one to be distributed unevenly among the population. In this context, the decomposition of the coefficient by categories of goods and services provides more information on inequality, purchasing power and consumption.

Indeed, only basic goods and services are consumed as a necessity, and any other expense, including entertainment, transportation, apparel, etc., are considered luxury expenses and as such their share to total expenditures is low in a large number of households. Since this analysis does not take into account household income, prices, or household characteristics, it is not possible to reason behind the optimization of household expenditures and consumption. These findings suggest for heterogeneity in the income and expenditures of households and the significant impact that sustainable and facilitating policies can have, which should be taken into account in the analysis and decision-making process of monetary policy and financial stability in the long run. In developing countries such as Albania, where spending is geared towards indispensable goods and services, market fluctuations have a major impact on consumption, welfare, and household debt levels [Cirera, Masset (2010)].

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APPENDIX

Table 2 Goods and services included in the expenditure components

Component	Goods and Services
Food	Food at home Food outside home
Transportation	Road transport (bus, taxi etc.)and rail Sea, water transport Air transport
Entertainment	Recreation (cinema, theatre, opera, concerts, circus, music, sport) Holidays in the country and abroad Excursions Books, journals, magazines Sport and hobby equipment
Alcohol and cigarettes	Alcohol and cigarettes
Household operations	Communication Internet, Wi-Fi Items of personal care Home cleaning items Domestic services (child and elderly care, cleaning etc.) Dry cleaning Postal services Food and services for pets Courses
Apparel and services	Men apparel, clothing and shoes Kids apparel, clothing and shoes Women apparel, clothing and shoes Fashion accessories Tailor services Cloth and sewing/knitting kits Banking, notary services etc. Personal care services
Furnishing and equipment	Renovation and maintenance of the house Furniture Small electric and nonelectric appliances Large electric and nonelectric appliances Kitchen utensils Linens, covers etc.
Fuel and Utilities	Fuel Electricity Water supply
Other expenses	Gifts Transfers outside the family Charity Gamble losses Expenses on family parties Other expenses in the past 1-month, 6-months, 12-months

SOURCES OF LABOR PRODUCTIVITY IN ALBANIA: EVIDENCE FROM ENTERPRISE DATA 2006-2015

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ABSTRACT

This article analyzes the main sources of labor productivity in Albania based on the decomposition of the total value by the: (i) within-sector effect, (ii) structural effect and (iii) interactive effect. Results based on the shift-share analysis implemented on the data of the Enterprise Structural Survey in Albania during the period 2006-2015 show that the main source of total labor productivity increase is the growth trend within the sectors. Meanwhile, the reallocation of the labor factor and the interactive and structural effects have played a secondary role in increasing the total labor productivity of enterprises in Albania.

INTRODUCTION

Economic literature defines the rate of productivity growth as an important indicator of a country's economic well-being. Consequently, analyzing its main sources is of particular interest to economists to understand and explain the dynamics of changes in other indicators of the economy. Low or high productivity indirectly reflects the performance of economic aggregates, and in particular the response of aggregate demand to the economy (Maddison, 1987), the increase or decrease of production, investments and consequently of economic growth (Ferber (1967), Dornbuch (2001) etc.).

Total productivity growth may come as a result of the productivity growth trend within the sectors of the economy, excluding labor effects (within-sector effect), shifting labor from less productive to more productive sectors (structural effect), or both (interactive effect).

Literature supports these effects as important sources of total productivity growth. On one hand, structural changes may bring about an efficient reallocation of labor that will increase production and consequently bring aggregate growth to the economy (Maddison, 1987). This redistribution may be encouraged by people moving to more productive sectors in search of higher salaries, but may also be due to changing demand for products in different sectors. In this sense, structural changes can bring and shift work towards less productive sectors which will show the opposite effect of falling sectorial and total productivity. This phenomenon is known as the "structural burden" of Baumol (1967). On the other hand, the literature supports the theory that the within-sector effect or productivity growth within the sector is a more accurate and consistent indicator of aggregate labor productivity and economic growth (Bartelsmann

et al. (2004), Brown and Earle (2008), Van Biesebroeck(2005), etc.) and especially growth in industries and services (ILO(2013)).

Thereby, analyzing the structural changes of labor and non-labor factors is important in understanding the fluctuations of the business cycle, as well as to observe the extent and the direction of the contribution to total productivity, especially the redistribution scale and its contribution, which is important for policy-makers. In a period of recession, the effect of redistribution can bring economic growth if people who lose jobs find new jobs in more productive sectors, but the situation may worsen if the contrary happens. The same reasoning is also used for expansion periods.

Based on the structural enterprise survey data for the period 2006-2015, this article aims to present a picture of aggregate productivity in Albania, based on the shift-share analysis introduced by EC (2003), where the decomposition of aggregate change of labor productivity results from within-sector changes, structural changes and interactive changes.

The results of the analysis show that during 2006-2015 the productivity growth rate in Albania has been positive, mainly due to the upward trend of the productivity of the sectors themselves, and less as a consequence of the shift of the labor factor from less productive sectors to more productive ones. As this time period comprises a period of decrease in the economic activity, estimates show that over the years, the growth of total productivity has been curbed. After 2010 this effect was particularly present in construction, manufacturing and transportation sector. Meanwhile the analysis shows that starting from this year, the mining and quarrying; trade and other services have had a significant increase of the rate of productivity growth of the sector, which has contributed to the growth of total labor productivity.

The article is organized as follows: the first section presents the data used in the analysis and afterwards examines the sectorial changes in employment, production and productivity over the period 2006-2015. The next section presents a brief description of the productivity decomposition methodology based on the shift-share analysis and the results, i.e. the sources of labor productivity changes for the period under review. At the same time, the change in aggregate productivity for the period was analyzed by intertwining business cycle fluctuations with shifting to productivity trends for the economy sectors. The last section summarizes the conclusions.

DATA

To estimate the main contributors to total labor productivity we used the data obtained from the Enterprise Structural Survey of Albania (INSTAT) for the 2006-2015 period. The survey constitutes a better source of information than aggregate data, as it provides more detailed and complete information on the disaggregated sectors of the economy. The data includes economic information on active enterprises in Albania, excluding banking and non-banking financial

institutions as well as enterprises involved in agriculture, farming and fishing. From a descriptive look at the data (Table 5, Annex 1), service providers represent the dominant market group in Albania with regard to the number of enterprises and workers employed. On average, 85% of enterprises and 58% of employees are mobilized in this market, while the remaining in the market of commodities. Whereas in terms of production, intermediate consumption and value added, the producers of goods contribute on average about 47-58% of the total, indicating also higher productivity of this market versus that of services.

At the sector level (tables 5,6,7, Appendix 1), data show that, on average, the trade sector and the manufacturing employ on average 26% and 22% of the total (Table 5, Appendix 1). While in production terms, the manufacturing and construction on average produce 21 and 22% of the total output, meanwhile there is a noticeable decrease in the production of the construction sector and increased production of the mining and quarrying sector (Table 6, Appendix 1). Meanwhile, production in other sectors has maintained nearly the same trajectory over the years with small fluctuations.

The data show that in terms of productivity (Table 7, Annex 1), calculated as output ratio to the number of employees, the most productive sectors in 2006 were transport and construction, and in 2015 were mining and quarrying and construction. The market of commodity producers has higher productivity than the average/total, meanwhile the market of service producers, despite the upward potential of trade and other services, continue to have a lower productivity than the average/total. Furthermore, we note that mining and quarrying productivity has increased significantly over the entire period and has also contributed to the productivity growth in terms of the total. This came as a result of a significant higher growth in output versus the employment growth.

The transport and communications sector (including accommodation and food service) has experienced a significant decline in productivity. This has come from the decline in output after 2010, but also by the significant employment growth in this sector. Otherwise, the trend has been increasing overall.

Regarding employment and structural changes of production obtained in the analysis, the article estimates the SCI index (structural change indicator) based on Havlík (2013). This index shows the movements in the ratio of employment or production of each sector of the economy to total employment and production year after year based on the formula below:

$$(1) \quad SCI_t = \sqrt{\sum_i (\Delta s_{i,t})^2 \left({}^{s_{i,t-1}}/_{100}\right)}$$

The term si, t is the percentage of employment (or output) of the sector to the total employed (or output), while operator Δ represents the percentage change

in the ratio of employees (or output) from year to year. This index takes values from 0 to 100, where a high value of this index implies a greater change in the ratio of the sector's employment rate or the shift of the work factor. Structural employment and production indexes are presented as follows (Table 1.2):
The highest values, the SCI employment index for the other services sector, trade, transport and construction are recorded in 2010, which coincides with the year after the 2009 crisis and with the year of changing the methodology of the survey. The SCI index for employment gets the highest value for the mining and quarrying and manufacturing, respectively during 2007 and 2012. The structural employment index developments are in line with the business cycle of the economy in Albania, where a significant reallocation of employment is noticed during the economic boom periods. While a more moderate employment reallocation is observed during the periods with the lowest level of economic growth.

Similar trends are also noted for the indicator of the structural change of production. Thus, the index has received its highest value during the periods with the highest growth level, respectively during 2008, 2010, and 2014. Meanwhile, in periods with the lowest growth level (i.e. 2009 and 2013) the value of this index is above the minimum value and below the value of the median for the services, trade and construction, indicating a low output reallocation. Whereas for the transport, mining and quarrying and manufacturing industries, the SCI index is above/at the median level, indicating a moderate reallocation of output.

Table 1 Indicator of structural employment changes

	Other services	Trade	Transport	Mining and quarrying	Manufacturing	Construction
2007	0.053	0.704	0.007	0.273	0.296	0.391
2008	0.221	0.268	0.043	0.063	0.696	0.537
2009	0.694	0.008	0.052	0.060	0.717	0.073
2010	2.840	0.769	3.122	0.017	0.052	0.742
2011	0.385	0.231	0.121	0.031	0.170	0.246
2012	1.205	0.315	0.261	0.091	0.808	0.480
2013	0.573	0.262	0.275	0.058	0.122	0.276
2014	1.039	0.635	0.301	0.050	0.003	0.116
2015	0.652	0.446	0.193	0.212	0.312	0.139
Median	0.652	0.315	0.193	0.060	0.296	0.276
Max	2.840	0.769	3.122	0.273	0.808	0.742
Min	0.053	0.008	0.007	0.017	0.003	0.073

Source: INSTAT / Enterprise Structural Survey 2006-2015 / authors' calculations

Table 2 Indicator of structural production changes

	Other services	Trade	Transport	Mining and quarrying	Manufacturing	Construction
2007	0.110	0.168	0.021	0.198	0.346	0.119
2008	0.290	0.341	0.763	0.998	1.477	0.804
2009	0.162	0.582	0.323	0.655	0.412	2.225
2010	0.575	0.410	1.306	1.566	0.394	4.359
2011	0.082	0.033	0.257	0.281	0.221	0.172
2012	0.654	0.596	0.058	0.335	0.615	1.600
2013	0.258	0.160	0.573	1.036	0.678	0.046
2014	0.673	0.762	0.821	0.185	0.216	0.827
2015	0.507	0.374	0.027	0.508	0.449	0.663
Median	0.290	0.374	0.323	0.508	0.412	0.804
Max	0.673	0.762	1.306	1.566	1.477	4.359
Min	0.082	0.033	0.021	0.185	0.216	0.046

Source: INSTAT / Enterprise Structural Survey 2006-2015 / authors' calculations

To comprehend more about the total productivity in the market of goods and services, the next section presents more evidence on the main effects that have affected total productivity during 2006-2015.

DECOMPOSITION OF TOTAL LABOR PRODUCTIVITY

To assess the main sources of labor productivity in Albania, the article is based on the shift-share analysis, which decomposes the rate of total productivity change (total of goods and services) into three main effects: the within-sector effect, the structural effect and interactive effect. Thus, based on EC (2003) methodology, the decomposition of aggregate labor productivity is presented as follows.

For each sector of the economy, in the period t, productivity is presented as the production ratio of each sector to the total number of employees (L). Respectively LP_{it} and LP_{t} represent sector productivity i and total (aggregate) labor productivity in period t.

$$(2) \qquad LP_{it} = \frac{Y_{it}}{L_{it}}$$

$$(3) \qquad LP_t = \frac{Y_t}{L_t} = \frac{\sum_i Y_{it}}{\sum_i L_{it}}$$

Another way of presenting total productivity is by expressing it as the sum of the productivity of each sector, as follows:

$$(4) \qquad LP_t = \sum_i LP_{it} \frac{L_{it}}{L_t}$$

Where the productivity growth rate is expressed according to the formula[1]:

$$(5) \qquad \frac{\Delta LP_t}{LP_{t-1}} = \underbrace{\sum_i \frac{\Delta LP_{it}}{LP_{it-1}} \frac{Y_{it-1}}{Y_{t-1}}}_{1} + \underbrace{\sum_i \frac{LP_{it-1}}{LP_{t-1}} \left(\frac{L_{it}}{L_t} - \frac{L_{it-1}}{L_{t-1}}\right)}_{2} + \underbrace{\sum_i \frac{1}{LP_{t-1}} (\Delta LP_{it}) \Delta \left(\frac{L_{it}}{L_t}\right)}_{3}$$

The first term represents the within-sector effect; the second term represents the structural effect; and the third term the interactive effect.

The within-sector effect of productivity change measures the contribution of individual productivity growth of each sector to the total productivity level, thus assuming that there are no structural changes in the economy, hereupon that the employment rate in each sector is unchanged. In this sense, a positive

[1] *Equation 5 results from getting the difference of equation 4, presented as:*

$$\Delta LP_t = \sum_i \Delta(LP_{it}) \frac{L_{it-1}}{L_{t-1}} + \sum_i LP_{it-1} \Delta \left(\frac{L_{it}}{Lt}\right) + \sum_i \Delta(LP_{it}) \Delta \left(\frac{L_{it}}{L_t}\right)$$

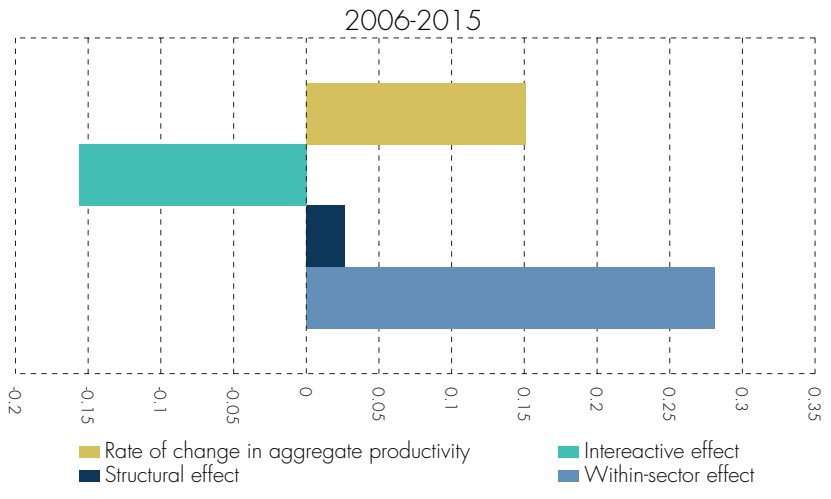
and by dividing it with LP_{t-1}.

within-sector effect implies that developments within the sector (not related to changes in employment) have led to productivity growth.
The structural effect measures the total productivity changes that come from the labor factor movements from less productive sectors to more productive sectors. If this structural effect is positive and growing in time, it signals a healthy process of restructuring of the economy, which also affects the increase of the professionalism of the work force. A redistribution of working hours to industries with higher levels of productivity occurs because firms in these industries can afford to pay higher salaries and therefore attract more skilled workers.

The interactive effect is a residual term that provides information on the dynamic element of structural changes. Through this effect, one can measure the difference in total productivity resulting from changes in productivity and employment simultaneously, as well as the effect of redistribution of labor between sectors with different productivity rates. The effect is positive if sectors with higher average productivity have also increased employment; the effect is negative if the sectors that have increased the number of employees have an increase of productivity below average. Overall, the interactive effect reflects the "ability of a country to redistribute its resources to fast-growing productivity industries" (Fagerberg, 2000, p402). A positive interactive effect supports the structural hypothesis that states: "a positive relationship between structural changes and economic growth is based on the assumption that during the economic development processes, sectors have shifted from industries with low to high contribution of the value added per input unit of work" (Peneder, 2003, p 2).

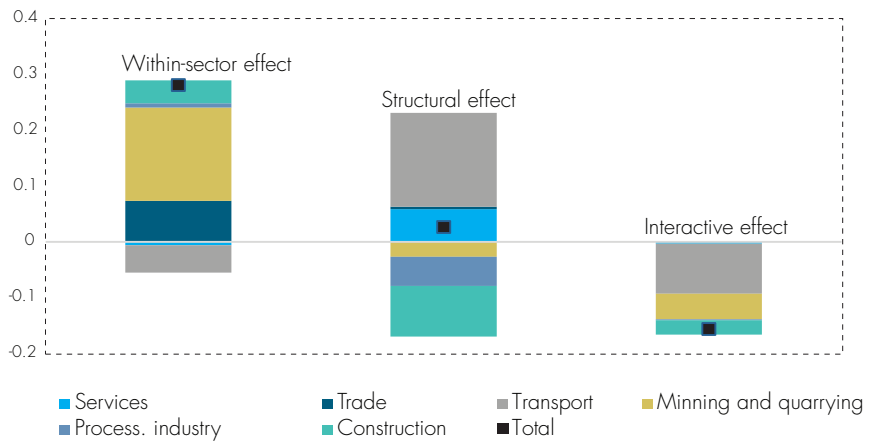
Based on the above methodology, below one can see how total productivity has changed over the period 2006-2015, (Figure 1A, 1B).

Figure 1A. Decomposition of the change of total labor productivity rate:



Source: INSTAT / Enterprise Structural Survey 2006-2015 / authors' calculations.

Figure 1B. Decomposition of the change of sectorial labor productivity rate: 2006-2015



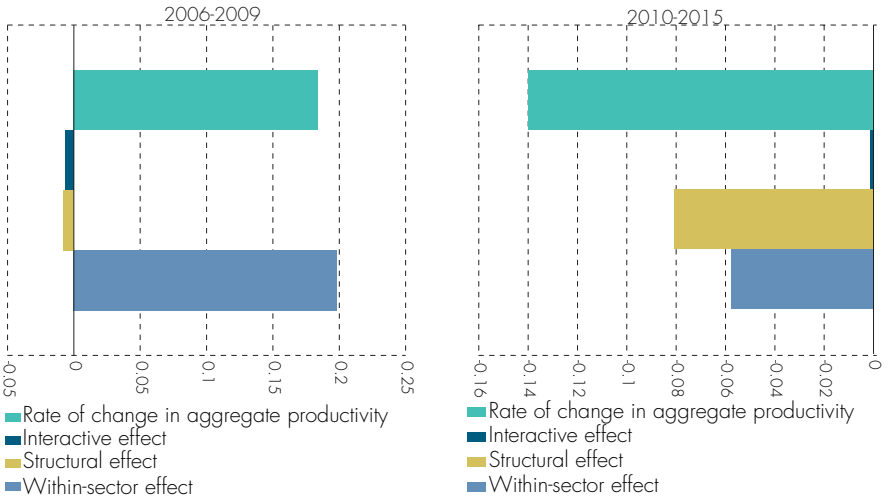
Source: INSTAT / Enterprise Structural Survey 2006-2015 / authors' calculations.

Results show that there is a total productivity growth of approximately 15%, which largely responds to productivity growth within sectors and industries (within-sector effect). This implies that changes in labor productivity within the sector are the main cause of fluctuations in total labor productivity versus the reallocation effect between sectors. The structural effect is positive, which implies that labor force movements have positively impacted productivity growth. While the interactive effect is negative, in this case the most productive sectors have not attracted a larger number of employees.

From the above chart we can see that the total within-sector effect in all sectors excluding transport has a positive value, especially in the mining and quarrying and trade. What has not allowed productivity to grow to these values has been the structural effect, which has recorded negative values in the commodity market. As so, despite the positive trend of the sector itself to develop voluntarily, movements of the workforce to less productive sectors have curbed productivity growth in sectors that could potentially be developed. Meanwhile, the service market has undergone positive structural changes that have allowed productivity growth. This is particularly apparent in the transport and communications sector, whose structural changes have allowed productivity growth against the downward trend of the productivity within the sector. In this sector, an adverse interactive effect means that the sector's contraction has brought about an increase in productivity. The source of total productivity growth is the shift of work among the most productive sectors, as opposed to the increase in value in particular sectors. This implies that even if a sector has low productivity it contributes to increasing total productivity by shifting labor force to more productive sectors. [Uyarer, Volkan (2016)].
In construction, manufacturing and mining and quarrying, the within-sector effect holds negative value despite the fact that the structural effect is positive which results in total productivity not reaching full potential. This implies that increasing labor productivity within the sector cannot compensate for lowering labor productivity resulting from inefficient workforce division.

As the period considered has been accompanied by methodological changes, as well as with a period of economic slowdown in Albania, the productivity decomposition during the period 2006-2009 and the period 2010-2015 has been analyzes separately. Figure 2 shows the photographic changes in total productivity over the two periods. The two-period break-down speaks more about the dynamics of productivity change and the different effects that have contributed to the change in the productivity rate in the relevant period. As we can see from the graph below, the periods 2006-2009 and 2010-2015 present different productivity trends.

Figure 2. Decomposition of the change of total labor productivity rate: 2006-2009 and 2010-2015



Source: INSTAT / Enterprise Structural Survey 2006-2015 / authors' calculations.

Evidence shows that the period 2006-2009 has been accompanied by a rise in total productivity, which is driven by increased productivity within the sector. Meanwhile the structural and interactive effects have adversely affected productivity. The negative value of the interactive effect shows that the within-sector and structural effects did not follow the same line but showed opposing trends which had an impact on total productivity growth. Meanwhile, as can be seen, before 2010, the total productivity growth was enabled by the within-sector effect.

The 2010-2015 period is characterized by a decline in total productivity, driven by structural changes and within-sector changes. This period is accompanied by shrinkage in the number of employees and their displacement to less productive sectors, which has led to negative growth rates of productivity. The interactive term has also received negative values in this period.

In order to get a more complete picture of changes in the trajectory of total productivity we've presented these changes for all the individual sectors in the table below.

Table 3 Sources of total labor productivity by sectors

	Period I			Period II		
	2006-2009			2010-2015		
	Within-sector effect	Structural effect	Interactive effect	Within- sector effect	Structural effect	Interactive effect
I. Other services	0.97	0.58	0.03	-0.63	5.86	-0.32
II. Trade	2.93	1.08	0.13	0.16	0.20	0.00
III. Transport	0.11	0.67	0.01	-4.31	-2.04	0.45
IV. Mining and quarrying	4.92	-1.36	-0.68	2.31	-2.71	-0.65
V. Manufacturing	3.90	-2.18	-0.35	-3.50	-2.94	0.46
VI. Construction	6.98	0.42	0.20	0.21	-6.45	-0.11
Total (I+II+III+IV+V+VI)	19.81	-0.78	-0.65	-5.76	-8.08	-0.16

Source: INSTAT / Enterprise Structural Survey 2006-2015 / authors' calculations

In the 2006-2009 period, it seems that all sectors in the economy have had a positive within-sector effect, especially construction, manufacturing and mining and quarrying, meaning that these sectors have had a high potential for productivity growth. On the other hand, industry has undergone a structural effect and negative interactive effect which suggests the shrinking of the sector has led to increased productivity. Construction, meanwhile, has had a small positive structural effect, meaning that this sector in this period has had an increase in productivity and growth.

The 2010-2015 period shows other trends in aggregate productivity, where construction and manufacturing seem to be no longer in the same positions as in the previous period. So these two sectors no longer have the same premise to increase productivity and consequently develop as in the previous period. Meanwhile, as we mentioned, the mining and quarrying remains dominant.

We also see that trade and the other services have experienced a rise in productivity during this period and on the contrary, the recession has enabled the growth and enlargement of the sectors. Based on the literature, this event signals potential for economic development in aggregate terms ILO(2013).

CONCLUSIONS

Economic literature has shown that sectorial and structural changes are an important source of economic growth and improved productivity as a whole (Maddison, 1987), thus analyzing the trajectory of productivity - and the sources that affect it - is important in understanding the performance of sectors in Albania.

To give a more comprehensive view of productivity and its development, some assessments are made based on the shift-share analysis, where the increase in productivity results from the within-sector effect, the structural effect and the interactive effect.

Data analysis show that aggregate productivity during the period 2006-2015 has increased. The greatest contribution came from the within-sector changes and less from structural changes. Meanwhile, the interactive effect has been

negative, indicating that within-sector and structural effects have acted as substitutes, moving in the opposite direction. During this period we see that the mining and quarrying and trade have had the largest positive within-sector effect. While the total structural effect is influenced by positive changes in transport and negative changes in construction and manufacturing.

Since the period we are considering coincides with both methodological changes and an economic slowdown, we have analyzed how total and sectorial productivity fluctuated during this period.

The decomposition of productivity shows that over the 2006-2009 period, aggregate labor productivity has increased reflecting productivity growth in all sectors of the economy, mainly as a result of the within-sector effect. It is precisely construction and industry (mining and quarrying and manufacturing) that have positively contributed to the increase of the within-sector effect. While the structural effect has been negative and had a lower contribution.

The 2010-2015 period is accompanied by a decline in total productivity resulting from negative structural, within-sector and interactive effects. Thus, there is a decline in productivity within the sectors, coupled with the shift of the work factor to less productive sectors, has resulted in total productivity decline after 2010. The decline in productivity has been felt particularly in the construction and manufacturing industries, two sectors that experienced higher productivity growth prior to this year. Following 2010 we inspect that the services and trade have a higher potential to grow.

APPENDIX 1

Table 4 Facts on commodity and service providers

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Total number of enterprises	55,650	61,369	69,045	73,701	76,953	79,968	83,591	84,790	85,206	104,534
Percentage of enterprises in the service industry to total enterprises	83.4%	85.0%	83.8%	84.0%	84.6%	83.7%	85.5%	85.3%	86.3%	87.3%
Percentage of enterprises in the commodity industry to total enterprises	16.6%	15.0%	16.2%	16.0%	15.4%	16.3%	14.5%	14.7%	13.7%	12.7%
Total number of employees (end of year)	202,191	216,646	240,391	252,227	280,443	288,776	316,133	342,074	387,201	434,479
Percentage of employees in the service industry to total employees	50.9%	54.2%	52.7%	54.6%	57.0%	57.4%	61.0%	62.6%	62.9%	64.7%
Percentage of employees in commodity industry to total employees	49.1%	45.8%	47.3%	45.4%	43.0%	42.6%	39.0%	37.4%	37.1%	35.3%
Total production	468,147	544,586	673,206	717,308	792,764	844,486	973,549	982,167	1,035,860	1,110,428
Percentage of service industry's production to total production*	42.1%	42.2%	40.4%	38.6%	41.1%	40.3%	44.2%	43.3%	45.4%	45.9%
Percentage of commodity industry's production to total production **	57.9%	57.8%	59.6%	61.4%	58.9%	59.7%	55.8%	56.7%	54.6%	54.1%
Intermediate consumption*** of service producers to total production	33.2%	32.9%	34.6%	27.8%	37.0%	33.0%	34.4%	37.2%	42.3%	39.9%
Intermediate consumption of commodity producers to total production	66.8%	67.1%	65.4%	72.2%	63.0%	67.0%	65.6%	62.8%	57.7%	60.1%
Value added**** of service producers to total value added	55.2%	55.2%	48.8%	56.9%	46.3%	51.8%	56.7%	51.7%	49.7%	54.4%
Value added of commodity producers to total value added	44.8%	44.8%	51.2%	43.1%	53.7%	48.2%	43.3%	48.3%	50.3%	45.6%

Source: INSTAT / Enterprise Structural Survey 2006-2015 / authors' calculations

** The manufacture or production value is based on revenues from sales of products and services generated by the enterprise itself, using labor, capital and raw materials, and is calculated as: (+/-) Changes in the state of cash and products process (+/-) Changes in the state of goods and services purchased for resale in the same condition, (-) Purchases of goods and services for resale in the same conditions (+) output of the fixed assets of the company (+) Subsidies*

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**** Intermediate consumption represents the value of products or services transformed or fully consumed during the production process. The use of fixed assets set at work is not included in the intermediate consumption value.*

*****Value added at basic prices is calculated as the difference between the production value and intermediate consumption. Value added is the basic concept for determining the classification of a unit based on economic activity. Value added is an additional measure of the contribution of each entity to the Gross Domestic Product (GDP).*

Table 5 Sector employment rate to total employed

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Other services	17.2%	17.1%	16.5%	18.2%	11.6%	12.7%	16.1%	17.5%	20.0%	21.5%
Trade	24.9%	26.3%	26.8%	26.8%	25.3%	24.9%	25.5%	26.0%	24.8%	25.7%
Transport	9.2%	9.2%	9.3%	9.5%	19.6%	19.9%	19.3%	18.7%	18.0%	17.5%
Mining and quarrying	9.9%	9.0%	8.8%	8.6%	8.6%	8.7%	8.4%	8.2%	8.1%	7.3%
Manufacturing	24.5%	25.1%	23.7%	22.3%	22.1%	21.8%	20.1%	19.8%	19.8%	19.1%
Construction	14.4%	13.3%	14.8%	14.6%	12.7%	12.0%	10.6%	9.7%	9.4%	8.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: INSTAT / Enterprise Structural Survey 2006-2015 / authors' calculations

Table 6 Production of the sector expressed in proportion to total production

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Other services	9.6%	9.2%	8.2%	8.8%	6.9%	6.6%	9.1%	10.0%	12.1%	13.6%
Trade	14.1%	14.5%	15.4%	13.9%	15.0%	15.1%	16.7%	16.3%	18.2%	17.3%
Transport	18.4%	18.5%	16.7%	15.9%	19.2%	18.6%	18.4%	17.1%	15.1%	15.1%
Mining and quarrying	10.4%	9.8%	13.0%	11.2%	15.9%	16.6%	17.4%	19.9%	20.3%	19.2%
Manufacturing	23.6%	24.3%	21.3%	20.4%	21.3%	21.7%	20.4%	18.9%	18.4%	17.4%
Construction	24.0%	23.7%	25.4%	29.8%	21.8%	21.4%	18.0%	17.9%	15.9%	17.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: INSTAT / Enterprise Structural Survey 2006-2015 / authors' calculations

Table 7 Production of the sector, measured as a ratio of output to employees in each sector

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Other services	1.30	1.32	1.40	1.38	1.70	1.51	1.74	1.62	1.69	1.61
Trade	1.32	1.35	1.61	1.48	1.70	1.78	2.01	1.78	2.05	1.72
Transport	4.71	4.92	5.02	4.77	2.80	2.73	2.94	2.61	2.35	2.19
Mining and quarrying	2.48	2.67	4.16	3.72	5.28	5.55	6.36	6.89	7.04	6.69
Manufacturing	2.25	2.36	2.52	2.61	2.76	2.92	3.14	2.73	2.60	2.32
Construction	3.91	4.35	4.82	5.81	4.94	5.24	5.23	5.23	4.74	5.02
Total	2.34	2.45	2.81	2.85	2.87	2.93	3.08	2.85	2.79	2.55

Source: INSTAT / Enterprise Structural Survey 2006-2015 / authors' calculations

Table 8 Economic activities observed by the Enterprise Structural Survey

	NVE Rev 1.1		NVE Rev 2	Observed economic activities
A	Agriculture, hunting and farming	A	Agriculture, forestry and fishing	NA
B	Fishing			
C	Mining and quarrying	B	Mining and quarrying	Mining and quarrying
D	Manufacturing	C	Manufacturing	Manufacturing
E	Production and distribution of electricity, gas, steam and cold water	D	Electricity, gas, steam and air conditioning supply	Electricity, water and waste management
		E	Water supply, waste management and waste management activities	
F	Construction	F	Construction	Construction
G	Wholesale and retail trade, repair of motorcycles, personal belongings and household appliances	G	Wholesale and retail trade, repair of automobiles and motorcycles	Trade
I	Hotels and restaurants	I	Accommodation and food service	Accommodation and food service
H	Transport, storage and communication	H	Transport and storage	Transport, information and communication
		J	Information and communication	
J	Monetary and financial mediation	K	Financial and insurance activities	NA
K	Real estate, leasing, informatics, scientific research work, other professional activities	L	Real estate	Other services
		M	Professional, scientific and technical activities	
		N	Administrative and support services	
L	Public and defense administration; Compulsory social security	O	Public and defense administration; Compulsory social security	NA
M	Education	P	Education	Other services
N	Health and social work activities	Q	Health and social work activities	
O	Other collective, social and individual service activities	R	Arts, entertainment and recreation	
		S	Other service activities	Other services (excluding S94)
P	Home services	T	Home services	Other Services
Q	Activities of international organizations	U	Activities of international organizations	NA

Source: INSTAT (2017)

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DOES BANK COMPETITION AFFECT STABILITY IN THE BANKING SECTOR AFTER THE GLOBAL FINANCIAL CRISIS?

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ABSTRACT

This paper analyses the inter-temporal competition – stability nexus after the global financial crises based on a Generalised Method of Moments with quarterly data for the period 2008 – 2015. Empirical results strongly support the "competition – stability" view after the global financial crises - that higher degree of competition boosts further bank stability conditions. Results further indicate that greater concentration has also a negative impact on bank stability. Finally, we do not find a non-linear relationship between competition and stability.

JEL Codes: C26, E32, E43, G21, H63.

Keywords: Bank stability, Competition, Boone indicator, Panel Data, GMM.

1. INTRODUCTION

The effect of banking competition on financial stability within a country has been an issue of active debate in academic and policy circles. This debate intensified in the collapse of Lehman Brothers in the US in 2008 and the need for bailouts for a number of European banks as a consequence, while many banks failed and others lost their profitability and required additional capitalisation [Beck, et al., (2013)]. There are a number of studies which have attempted to answer the question on whether bank competition has an impact on financial stability. However, the results are far from being conclusive since they depend heavily on the data, as well on the period and countries analysed [Kasman and Carvallo, (2014), Bushman, et al., (2016)].

Two stylised facts motivate our focus on this question. First, problems of banks being "too-big-too-fail has already emerged as the 6 largest banks hold nearly 80% of the market share. Second, at a ratio of nearly 16.2% for the whole market and 22.2% for the large banks, the Herfindahl–Hirschman index (HHI) suggests that the Albanian banking sector is "moderately concentrated". Similarly, evidences (See also Graph 1 in Appendix A) show that there is a relatively close relationship between the degree of market power and the extent to which banks are exposed to greater instability, which suggests that competition foreheads bank fragility over time. Therefore, the effect of the

[1] *Note: The views expressed herein are of the author and do not necessarily reflect the views of the Bank of Albania.*

regulatory framework on competition and banks' risk-taking incentives and ultimately bank stability make it a particularly interesting environment in which to study the competition-stability nexus.

From an empirical point of view only a few papers are loosely related to the research question we address in the case of Albania. For example, the most relevant work is by Dushku (2016)[2] who investigates the link between competition (measured by Lerner Index) and bank risk-taking (measured by Z-Score) for 15 banks operating in Albanian banking system during the period 2004 – 2014. However, while the Z-score can be interpreted as the number of standard deviations by which a bank is removed from insolvency, the NPL ratio focuses only on credit risk, but leaves out concerns with regards to liquidity and capital risk, or other sort of risks that is linked to the market in which banks operate. Hence, neither of them is a perfect substitute indicator to account for actual bank distress or the probability of default, which are without doubt the most appropriate concepts to define bank risk [Fu, et al., (2014), Kick and Prieto (2015)]. Another concern, as Beck, et al., (2013) reveal, is that Z-Score and Lerner both include profitability in the numerator and any positive relationship between the two might thus be mechanical rather than economically meaningful.

Against this background, the existing literature provides a fairly comprehensive review on competition-stability nexus, but of these cases still one question needs to be answered empirically as there is no evidence on the nature of this relationship in the case of a small-opened emerging economy, namely Albania, and in particular after the GFC. The main question, thus, addressed in this paper focuses on how competition affects bank stability after the GFC. The paper makes use of a sample with quarterly data for 16 banks operating in the Albanian financial sector over the period 2008 – 2015. The empirical estimation approach follows a five-step procedure. First, we constructed a new composite individual bank stability indicator as explained by Shijaku (2016). Second, we estimate a competition indicator as suggested by Boone (2008), and calculated in the case of Albania by Shijaku (2017). Then, our specified model is estimated based on the Generalised Method of Moments (GMM) approach. In addition, we deepen our empirical analysis by checking for a possible non-linear relationship between competition and stability in the case of Albanian banking sector. Finally, we use also other alternative structural and non-structural measure of competition, such as the Lerner index and the efficiency-adjusted Lerner index, as well as the profit elasticity and the HHI.

The empirical findings provide strong evidence supporting the "competition-stability" view that greater degree of competition improves further bank stability conditions. This implies that there is no trade-off between competition and bank stability in the banking sector in Albania. A number of robustness checks confirm also our main findings that support the "completion-stability" view. Results further indicate that greater concentration has also a negative impact

[2] *Note (2006) applies the Panzar-Rosse methodology to measure the competition degree in the Albanian banking system during the period 1999 - 2006. The author finds that Albanian banks operate in monopolistic competition conditions.*

on bank stability. By contrast, we find no evidence of a non-linear relationship in the competition-stability nexus. Finally, with regards to the control variables, we find that macroeconomic conditions are relatively important for bank stability. Similarly, bank stability is also conditional to improving operation efficiency and capital structure of the banks.

The rest of the paper is structured as follows. Section 2 summarises the literature review. Section 3 presents the methodology with regards to model specification and data. The main results are presented in Section 4. The material concludes in section 5.

2. METHODOLOGY APPROACH

2.1. THE EMPIRICAL APPROACH

The empirical specified model draws on the extensive review of previous studies related to bank fragility by Betz, et al., (2014) and Black, et al. (2016), and in particular by Shijaku (2016). However, this study departs from them, as it deepens further the empirical analyses by including also a proxy of competition instead of market size. Therefore, the model is specified as follows:

$$(1) \qquad CAELS_{i,t} = \alpha + B_1 * GDP'_{j,t} + \beta_2 * PSRISK'_{j,t} + \beta_3 * BOONE'_{j,t} + \beta_4 * EFFICIENCY'_{i,t} + \beta_5 * LEVERAGE'_{i,t} + \varepsilon_{i,t}$$

Where, is our stability indicator of bank i at time t, with i = 1, …, N and t = 1, …, T, expressed as a function of a set of explanatory variables that includes a set of macroeconomic variables that account for state of economy, such as output (*GDP*) and primary sovereignty risk (*PSRISK*); market-specific variable that accounts for the degree of competition (*BOONE*); and bank-specific explanatory variables, namely operational efficiency (*EFFICIENCY*) and capital structure of the bank (*LEVERAGE*); α is a constant term. β is a vector of coefficients to be estimated. is an error terms that is assumed to be identically and independently distributed with mean of 0 and variance $\sigma_u^2 A = \pi r^2$.

One potential problem with Equation [1] is the over-identification problems. To correct for this issue, the estimation approach is based on the GMM approach as proposed by Arellano and Bond (1991) and Arellano and Bover, (1995)[3]. This approach is also virtuous to deal with potential endogeneity problems [Anderson and Hsiao (1981)]. The instrument variable is based on the past information of , and to limit the number of instruments, we restrict at 4 the lag range used in generating the instruments as suggested by Roodman (2006). First, AR(1) and AR(2) are the Arellano-Bond tests for first and second order

[3] *Han and Phillips (2010) suggest GMM is constructed to be able to achieve partial identification of the stochastic evolution and to be robust to the remaining un-modelled components.*

autocorrelation of the residuals. One should reject the null hypothesis of no first order serial correlation and not reject the null hypothesis of no second order serial correlation of the residuals. Then, the Sergan and Hensen test is used for over-identifying restrictions based on the sample analogy of the moment conditions adapted in the estimation process, thereby as to determine the validity of the instrument variables (i.e. tests of the lack of serial correlation and consistency of instruments variables).

2.2. DATA

The sample data for this study consists in quarterly data gathered and complied by the Bank of Albania, which is taken from balance sheet and income statement items of 16 banks operating in Albania. The strength of the dataset is its sample coverage and reliability of information. It covers all banks operating in Albania in the last two decade. The sample consists of 960 quarterly data for 16 banks operating in Albania, since 2001 Q1.

The empirical study focuses on the period 2008 Q2 – 2015 Q3, as the second half of 2008 marks the beginning of pass-through effects of GFC in the Albanian economy[4]. That includes a panel with 448 observations and 28 periods. The variables used for empirical analysis are approximated as follows. The bank stability indicator, bank-specific and market-specific variables are estimated individually for each bank. CAELS represents the bank stability condition estimated as explained by Shijaku (2016). It is transformed into an index, taking as the base year the average performance during the year 2010. EFFICIENCY is proxy as gross expenditure to gross income ratio. LEVERAGE presents the total equity to total asset ratio of individual banks. BOONE is a non-structural competition index variable as explained Shijaku (2017). It is transformed also into an index, taking as the base year the average performance during the year 2010 and enters the model as log-transformed. The macroeconomic variables are aggregated indicators that represent the state of the economy. GDP represents the real gross domestic production deflating with the Consumer Price Index (CPI). PSRISK represents the spread between domestic 12 month T-Bills and the German 12 month T-Bills. Both interest rates are transformed in real terms by subtracting the respective domestic and German annual inflation rate. All the data are of end-period values. They are log-transformed, besides PSRISK. Further, the dataset developed for this paper has several sources. Data on GDP are taken from the Albanian Institute of Statistics. Data on the domestic T-Bills rate are taken from the Ministry of Finance. Data on German 12 months T-Bills rate and German CPI are taken from Bloomberg. The rest of the data are taken from Bank of Albania.

Finally, prior to the empirical estimation, all the data have been subject to a unit root test procedure on the argument to understand their properties, and

[4] *The Albanian economy was not affected directly by the GFC, but the spill-over effects through financial and trade linkages were immediately transmitted from 2008 Q04, which at the same time provides a justification why we choose to the empirical estimation from this period.*

also to be sure that their order of integration fulfils the criteria for our empirical estimation approach. The latter is a pre-required condition in order to receive consistent and unbiased results. Therefore, the unit root test approach includes the Augmented Dickey-Fuller (ADF) and the Phillips-Peron (PP) Fisher Chi-square tests. The reason is twofold. First, these tests are built on the same null hypothesis that the panel variables are stationary. Second, they are mostly used for unbalanced panel model, as it is our sample.

3. EMPIRICAL RESULTS

3.1. MAIN RESULTS

This section reports the main results of our empirical approach as specified in Equation [1]. First, as reported in Table 3 in Appendix, the results of the unit root test suggest that EFFICIENCY and LEVERAGE are integrated of order zero I(0) and thus enter the model specification in level. The other variables are found to pose non-stationary properties and are integrated of order one, I(1). Therefore, they enter the model in their first difference, since this approach transforms them into a stationary stance[5]. Second, as reported in Table 6 in Appendix, we estimate 2 regressions. In each regression we use the same measure of competition, but to some methodological changes. First, column [1] reports the results of a linear relationship between competition and stability. Second, column [2] presents the results with regards to a possible non-linearity relationship, which is yet again estimated based on the GMM approach as explained previously. The model makes uses of 'White Cross-Section' standard errors and covariance (d.f. corrected). At the bottom of the table, we report the diagnostic test results for the GMM estimation. They suggest that in our case the requirements are met as suggested by the p-values of the AR(1) and AR(2) tests. In addition, the Sergan and Hensen test suggests that the instruments used in all the specifications are appropriate. This means that our model is properly specified and that the empirical analyses are robust and consistent with the GMM estimation criterion.

A glance at the results confirms that stability conditions of banks react relatively to the responses of other explanatory variables according to the predictions obtained from the theory[6]. They accomplish also previous findings as analysed in chapter one. For example, the coefficients of the variables linked to the

[5] *These results are robustness also to other unit root test approaches, including the Im, Pesaran and Shin W-stat test and Fisher test. Data can be provided upon request.*

[6] *However, as instrumenting is technically difficult in the Arellano-Bond model, we also apply a standard a panel Ordinary Least Square (OLS) approach with random effect and with fixed effect, including the lagged dependent variable as an additional regressor. The former included also some fixed effect factors that distinguish for two important components, namely small versus large banks and foreign-owned versus domestic-owned. Results came out to be relatively similar to our findings through the difference GMM approach, while findings through means of fixed effects were more consistent and robust to the estimation through random effects. Results are also relatively robust and similar to findings when CAELS is estimated based on the simple average approach rather the PCA approach and the model is estimated with panel first difference GMM with the second step difference approach. Finally, they are also robust to the estimation of the two-step GMM estimation approach.*

macroeconomic patterns bear relatively the same level of significance on bank stability as previously. The coefficient of GDP is positive in all regressions, suggesting that an increase in economic growth boosts bank stability. The coefficient of primary sovereignty risk, presented by PSRISK, is yet again statistically significant and negative in both regressions. However, at the given magnitude of the coefficients, these results indorse yet again that the interest rate pass-through effect on bank stability is negative, but relatively low. Second, bank-specific factors are also found to impact bank stability as previously reported. In addition, the coefficients of both EFFICIENCY and LEVERAGE are statistically significant. The magnitude of the coefficients indicates yet again that there is a trade-off between operational efficiency and capital in terms of bank stability. This is another confirmation that bank stability increases through improving operational efficiency and a better capital structure.

Table 6 summarises also the effects of competition through the Boone indicator. As mentioned by Shijaku (2017), it emphasizes the effect of an increase in marginal cost on the decrease in market shares. The results indicate that the coefficient of Boone indicator is significantly positive suggesting that competition improves bank stability conditions, given that higher value of the Boone indicator signifies a higher degree of competition. At the same time, since Boone indicator is significant, changes of marginal cost have more effects on profits, which means that market share is subject to more competition. Similarly, as competition in the banking sector increases it is likely to boost the franchise value and encourage banks to lower their overall risk exposure, thus confirming the competition-stability view in the case of Albania. These findings are consistent with the "competition-stability view" of other recent studies [Berger and Bouwman (2013), Fiordelisi and Mare (2014), Schaeck and Cihak (2014)] that greater bank competition is associated with higher bank stability. However, this finding is different to those of Dushku (2016), thus revealing that the stability – competition nexus has changed after the GFC.

Finally, following Jiménez, et al., (2013, Liu, et al., (2013), Fu, et al., (2014), Kasman and Kasman (2015), we use also a quadratic term of the measures of competition to capture a possible non-linear relationship between competition and bank stability. Results, as reported in Table 6, column [2] in Appendix, reveal an important consideration that we did not find evidence of non-linearity relationship between competition and stability in the case of Albanian banking system, thus rejecting Martinez-Miera and Reputto (2010) model. However, one important consideration is that as our measures for competition mainly focus on the lending market, it should be kept in mind that these conclusions are quite subject to loan markets.

3.2. ROBUSTNESS CHECKS

In an attempt to further enrich our analysis and as a complementary proof we run a number of robustness checks on our main model, as specified in Equation (1), but this time we use five different alternative measures as proxy for bank competition, which are then used also as explanatory variables to get

more robust results. For example, column [3] in Table 6 in Appendix shows the impact of competition, as measured by an alternative Boone indicator that includes also bank capital (Equity) in the estimation of the TCF model, on bank stability [See also Equation (B.1 and B.2)][7]. The results are relatively similar to those as in the previous sections re-confirming that greater degree of bank competition due to increasing operational efficiency would improve bank stability conditions.

On the other hand, as a robustness check, we also use the estimates of marginal cost from Equation (8) to calculate the Lerner index [LERNER][8] and the efficiency-adjusted Lerner index [LERNER*][9], as well as to estimate the profit elasticity [PROFITELASTICITY]10, the results of which are respectively reported in column [4], [5] and [6]. These results show that the LERNER and LERNER* are negatively related to CAELS. The impact is also significant. As mention previously, since the Lerner index is inversely proportional to CAELS, it appears that the negative sign for both these competition measures show that increases in the degree of bank pricing power are positively related to individual bank stability in Albanian banking sector. By contrast, the coefficient of PROFITELASTICITY exhibits a positive sign, suggesting that lower elasticity of profit would boost bank stability. These results provide yet again another strong supportive evidence for the competition-stability view, re-confirming as previously that greater degree of bank competition improves bank stability conditions.

Finally, we also examine the impact of bank concentration on the stability of Albanian banks using the HHI[11]. The results are reported in Table 6, Column (7) in Appendix A. The negative coefficient for the HHI indicator supports a negative link between market power and bank stability. This suggests that lower bank concentration ratio leads to a decrease in bank insolvency risk, and therefore a higher degree of bank stability. That is that the less concentrated the banking system is the more stable banks are. By contrast, based on the size of the respectively coefficients, we find that the impact of bank concentration is relatively higher that the extent to which competition effects bank stability. On the one hand, it is very clear that the results remain as those analysed in the previous sections, as in all the regressions, we find that bank market power is negatively related to bank stability, meaning that there is a positive relationship between higher degree of competition and stability. These results support both theories of competition-stability view and concentration-fragility view in the case of Albania showing that banks under less degree of market power are, on average, more stable. On the other hand, the usage of the alternative competitiveness proxy should be treated as a robustness check of the results which further strengths our conclusions in terms of competitions.

[7] *See also Shijaku (2017).*

[8] *Following Fiordelisi and Mare (2014) we calculated the Lerner index as* $LERNER_{it} = \frac{P_{i,t} - MC_{i,t}}{P_{i,t}}$. *The index is a linear straight forward indicator that takes the value between 0 and 1, with lower value indicating greater degree of competition.*

[9] *[See also Equations (B.3) in Appendix B for the approach used to estimate this index].*

[10] *[See also Equations (B.4) in Appendix B for the approach used to estimate this index].*

[11] *It is calculated using bank total asset as inputs* ($HHIA = \sum_{i=1}^{n} s_i^2$, *where s represents the market share of each bank in total assets in the market). It can range from 0 to 1.0, moving from a huge number of very small firms to a single monopolistic producer. Increases of the index generally indicate a decrease in competition and an increase of market power, and vice versa.*

4. CONCLUSIONS AND POLICY IMPLICATIONS

The developments in the banking market leading to the financial crisis in 2008 heightened new great challenges for bank stability and systemic risk and competition policies. Therefore, this paper fills in the information gap of analysing whether competition improves or reduces banking stability for banks operating in the Albanian banking system during the period 2008 – 2015. Although there have been several articles we improve on the existing literature along three crucial dimensions. First, in contrast to other bank-level studies, we use the most direct measure of bank stability available, which is generated from the unique supervisory dataset collected by the Bank of Albania to which we analyse the bank competition-stability nexus. Then, we use a set of alternative proxy of competition indicators, namely the Boone indicator, the Lerner index; and the efficient-adjusted Lerner index, profit elasticity and the Herfindahl index.

The main results provide strong supportive evidence that banks' behaviour towards greater competition has been crucial for boosting bank stability in the aftermath of GFC, thus bolstering the "competition – stability" view. From a policy point of view, findings suggest that bank competition and soundness go hand in hand with each other and that higher pricing power during instability periods could simultaneously lead to higher bank stability. Results appear to hold for a wide array of other alternative model specifications, estimation approaches and variable construction. In addition, we find also that during this period bank concentration is inversely correlated to bank stability, thus supporting the view that a more concentrated banking system that easies market power is more vulnerable to systemic instability. For policymakers analysing bank competition, these results are crucial not only for the stability of the financial sector, but also for the whole economy. Therefore, if one is to boost bank stability during crises period than it is fundamentally essential to increase profit margins (franchise value) as results imply that intense competition in the banking sector is associated lower riskier loan portfolios.

Contrary to the above mentioned results, we provide evidence that do not support a non-linear relationship between competition and stability in the aftermath of GFC in the case of Albania banking system. This is different to the findings of Dushku (2016), thus confirming that the GFC has changed the competition – stability nexus to a linear interaction. Therefore, we suggest that perfect competition is the desirable market structure in order to promote great stability in the banking sector in the case of Albania. In addition, as for other control variables, our results confirm that supervisors and policy-makers should carefully monitor macroeconomic risks since lower economic growth and higher sovereignty risks are associated with greater bank instability. Our results further indicate a negative linkage between operational efficiency and bank stability implying that lower efficiency banks are more destine to bank instability. Finally, our results show that supervisors should be also aware of capital structure of banks as higher capital ratio significantly boosts the state of bank stability conditions.

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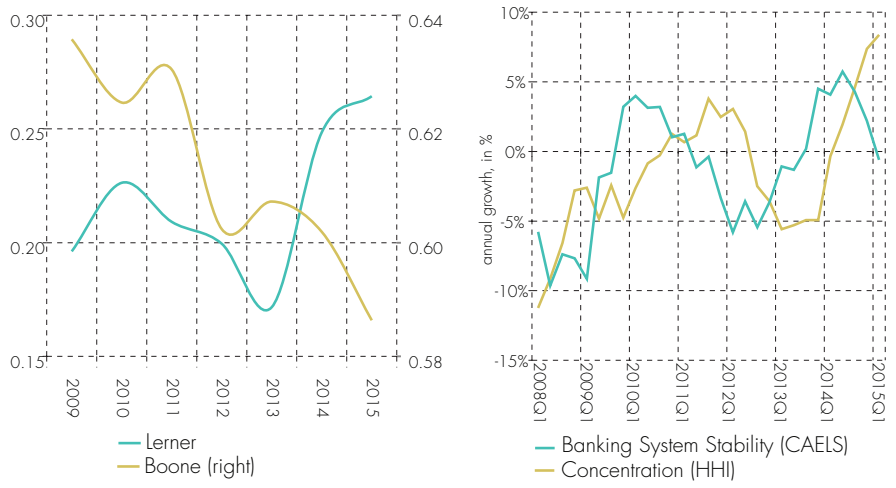
APPENDIX A

Graph 1 Bank competition and bank stability, 2008 -2015



Source: Bank of Albania, Author's calculations.

Table 1 Panel Unit Root Test

Variable	ADF - Fisher Chi-square			PP - Fisher Chi-square		
	Intercept	Intercept and Trend	None	Intercept	Intercept and Trend	None
ΔCAELS	[0.0000]	[0.0000]	[0.0000]	[0.0018]	[0.0000]	[0.0000]
ΔGDP	[0.0000]	[0.0000]	[0.0000]	[1.0000]	[0.0000]	[0.0000]
ΔPSRISK	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[1.0000]	[0.0000]
ΔBOONE	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[1.0000]	[0.0000]
EFFICIENCY	[0.0000]	[0.0000]	[0.9649]	[0.0000]	[0.0000]	[0.8965]
LEVERAGE	[0.0000[	[0.0007]	[0.0001]	[0.0000]	[0.0006]	[0.0010]

Note: Δ is a first difference operator. Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Source: Author's calculations

Table 6 Empirical Results based on GMM approach

Model Estimation	Banking System						
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
ΔGDP	0.7827*	0.9494**	0.8169*	0.5475*	0.7000*	0.7092*	0.9319*
ΔPSRISK	-0.053*	-0.0549**	-0.0534*	-0.0301*	-0.0312*	-0.0543*	-0.0279*
ΔBOONE	0.171*	0.1996					
ΔBOONE^2		-0.0313					
ΔBOONE*			0.0581*				
LERNER				-0.2042**			
LERNER*					-0.0312***		
PROFITELASTICITY						0.0304	
HHI							-0.9244*
EFFICIENCY	-0.304*	-0.4118***	-0.2962***	-0.1351	-0.3839*	-0.2946**	-0.2252***
LEVERAGE	0.328**	0.5674**	0.3114***	0.2042***	0.4864*	0.0522	0.4215*
Cross-sections	16	16	16	16	16	16	16
Instrument rank	20	20	20	20	20	20	20
No. of observations:	448	448	448	493	434	480	480
J-statistic	11.9	8.6	17.6	18.4	15.8	12.0	18.5
Probability of J-statistic	0.37	0.57	0.28	0.19	0.33	0.29	0.19
AR(1)	0.02	0.03	0.07	0.00	0.00	0.00	0.59
AR(2)	0.26	0.49	0.45	0.11	0.14	0.21	0.53

Table shows bank-level GMM regressions statistics on the empirical results of the estimations. Haussmann tests (J-Statistics and the Probability of J-Statistics) investigates the validity of the instruments used, and rejection of the null-hypothesis implies that instruments are valid as they are not correlated with the error term. The Arellano and Bond test results also require significant AR(1) serial correlation and lack of AR(2) serial correlation (See also Kasman and Kasman, 2015). The Probability appears in parentheses [ ] below estimated coefficients.

Source: Author's Calculations

APPENDIX B

As a robustness test, we estimate an alternative measure of the marginal cost in the Boone indictor formula[12] following Leon (2014) and re-specify Equation (7) to include also additional control variable, namely bank capital. The specified model is expressed as follows:

$$B1 \quad lnTC_{it} = \alpha_0 + \alpha_1 lnQ_{it} + 0.5\alpha_2 (lnQ_{it})^2 + \sum_{j=1}^{3} \beta_j lnP_{it_j} + \sum_{j=1}^{3}\sum_{k=1}^{3} \delta_{jk} lnP_{it_j} * lnP_{it_k} + \sum_{j=1}^{3} \gamma_j lnQ_{it} * lnP_{it_j} + \tau_1 Trend + 0.5\tau_2 (Trend)^2 + \tau_3 Trend * lnQ + \omega_1 lnE_{it} + 0.5\omega_2 (lnE_{it})^2 + \omega_3 lnE_{it} * lnQ + CRISIS + \varepsilon_{it}$$

Where, E_{it} is total equity of bank *i* at time *t*. This model is estimated based on the OLS approach. Then, assuming that inputs' prices are still homogeneous, Equation (4) is re-expressed as follows:

$$B2 \quad MC_{it} = \frac{TC_{i,t}}{Q_{i,t}} \left[\hat{\alpha}_1 + \hat{\alpha}_2 lnQ_{it} + \sum_{j=1}^{3} \hat{\gamma}_j lnP_{it_j} + \omega_3 lnE_{it} + \tau_3 Trend \right]$$

The most important finding, as reported in Shijaku (2017), is that marginal costs, which are calculated based on different approach, have a relatively high level of correlation, which is also statistically significant. This means that changing methodology and augmenting the TCF model does not change the results and that banking sector in Albania exhibits competitive patterns. Following Clerides, et al., (2015) and Kasman and Kasman (2015) we estimated the efficiency adjusted Lerner index at the bank level, as follows:

$$B3 \quad Efficiency - Adjusted\ LERNER_{it} = \frac{\pi_{i,t} + TC_{i,t} - MC_{i,t} * Q_{i,t}}{\pi_{i,t} + TC_{i,t}}$$

Where, $\pi_{i,t}$ is the profit of bank *i* at time *t*, and other are as previously defined. Similar to the conventional Lerner index, the Adjusted Lerner index also ranges from 0 to 1, with larger values implying greater market power. Then, Clerides, et al., (2015) measure the profit elasticity by deriving from the efficiency adjusted Lerner index by solving for in equation (B.3) and differentiating with respect to , as follows:

$$B4 \quad Profit\ Elasticity_{it} = \frac{Q_{i,t} * MC_{i,t}}{Q_{i,t} * MC_{i,t} - TC_{i,t} * (1 - Adjusted\ LERNER_{it})}$$

Hence, the efficiency adjusted Lerner index and the profit elasticity are two closely related concepts.

[12] *The results are provided upon request.*