Firms behavior around tax thresholds in Albania during the 2015 anti-informality campaign - Bunching features, persistence and growth implications

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Abstract
This article studies the effects of tax thresholds on the behavior of small firms using the tax administration data of the universe of the Albanian firms during and after the anti-informality campaign of the year 2015. The main comparisons are between the year 2014, 2015 and 2016. The features of the firms that did bunch in 2015 were evaluated through a Probit regression. The bunching did persist through the three years in discussion, so it is not a temporary behavior. At the end, the tax threshold does influence in the growth of the firms, especially those firms that have a turnover just under the first threshold.

1. Introduction

Albania is the last country in Europe to start from scratch a new tax system in 1991. Tax administration was not improving a lot during the transition from dictatorship to democracy. In 2017, Albania did complete the three-year cooperation program with IMF, which influenced in many tax reforms. In July 2016, IMF published the results of several missions, including a report by End & Thackray (2016) about the tax policies, tax evasion and informality. That report comprises some of the main problems that Albania has with the tax administration and tax policies, namely the high level of minimum salary, the high level of VAT threshold and the income tax threshold. This was the first paper linked with an important financial institution that mentioned the problem of tax thresholds in Albania.

In another report Engleschalk & Loeprick (2016) state the evolution of tax thresholds in Albania and in the region till 2015. It appears that Albania has the highest number of changes in that area. The tax thresholds do separate different levels of tax liability. As a result, small firms try to stay in the lowest thresholds, in order to avoid higher tax liabilities. The lowest tas threshold in Albania has been in the level of 2,000,000 ALL (Albanian Lek).

This article comprises the analyzes of the effects of tax thresholds on the behavior of small firms using the tax administration data of the universe of the Albanian firms during and after the anti-informality campaign of the year 2015. The main comparisons are between the year 2014, 2015 and 2016.

To uncover the features of the firms that did bunch in 2015, it was used the Probit regression. The bunching did persist through the three years in discussion, so it is not a temporary behavior. At the end, the tax threshold did influence in the growth of the firms, especially those firms that have a turnover just under the first threshold.

2. Literature review

In general, the persistence to certain behaviors in relation to tax evasion was studied mainly concerning the tax morale (Torgler, 2003). In this case, the main intention was to understand if the democracy could influence a better tax morale, after controlling many potential factors. This is evidenced by the data from the World Values Survey.

On the other hand, this paper is focused mainly on the persistence to declare similar levels of turnover, and specifically to target the level of turnover. This persistence is analyzed in general by Almunia & Rodriguez (2014) for Spain and by Harju, Matikka, & Rauhanen (2015) for the Value-Added Tax threshold in Finland. On the other hand, Paetzold (2017) has examined the persistence of declaring similar levels of personal income for Austria. Brockmeyer & Hernandez (2016) have examined the case of Costa-Rica about the Income Tax. In this case, the average tax rate is related to the total income of the companies and the tax thresholds are updated each year according to the annual inflation. Yunus (2006) has evidenced a certain level of persistence in the evasion through the individual tax income in the United States. The same situation was evidenced by Mortenson & Whitten (2015) as they confirmed that the taxpayer bunching is not a transitory phenomenon, but a long-term behaviour, especially for the taxpayers with two children.

3. The bunching of firms at the lower threshold

3.1 The profile of the firms that bunch at the lower threshold

It is very important to examine of behavior of the firms, in order to determine which factors or features do impact mostly in the bunching under the thresholds. The Albanian tax system during 2013 – 2016 had three thresholds, so in four years they might be 12 possible situations. If the bunching would be tested for each factor, we would have hundreds of graphs and their respective results. This would not be very feasible. In general, there are two main research questions that can interpret the profile of the firms in relation to the bunching at the thresholds.

Research question 1: Which are the main factors that do influence in the bunching of the firms under the main threshold during 2013-2016?

This research questions can be analyzed with a probit regression that comprises all the data for all the factors. If otherwise, for example, there was a partial use of data for only the firms of the South of Albania, then the lesser number of firms would not have a sizable distribution of firms in the respective bins under the threshold.

In order to analyze the factors for the determinants of the bunching, it was used the data of the threshold on 2 million ALL for the year 2015 and 2016.

3.2 Probit regression for the bunching under 2 million ALL for the year 2015

To investigate the features of the firms that have a tendency to bunch under the first threshold, it was used the probit regression model. Probit regression is a very common method to study the binary dependent variables, by using plenty of explanatory variables. The data were transformed in the necessary form, as requested by this regression. As mentioned before in the methodology section, the independent variable has a qualitative nature, in relation to the fact that firms bunch or not in the closest bins under the threshold (2 million ALL). The firms that do bunch are considered as 1 and the other firms are considered as 0.

The year 2015 is considered as in the middle of the anti-informality cyclone and campaign that the Tax Administration and the Government of Albania did organize.

Some of the main factors considered are the age of the firm, the regional residence (North, Tirana, Durres & Elbasan, South), sector of the business, business suspension in later years

(2016 & 2017). Moreover, the firms' data of 2015 are matched with their respective data in 2014 and 2016, in order to check if there is any persistence in this behavior.

The variable *Ln(Mosha)* is the natural logarithmic of the age of the firms, which was obtained by using the Number of the Identification of the Taxable Person (NIPT in Albanian). The first letter and the following first number of the NIPT show the year of the registration of the subject. Then, the age of the firm is calculated as the distance from the year 2015, according to the following rules:

- NIPTs that start with the letter J, and a number after the respective letter, are registered in the years 1996-1999, so the firm with a NIPT of J9XXXXXXXX is registered in the year 1999.

- NIPTs that start with the letter K, and a number after the respective letter, are registered in the year 2000-2009, so the firm with a NIPT of K2XXXXXXXX is registered in the year 2002.

- NIPTs that start with the letter L, and a number after the respective letter, are registered in the year 2010-2019, so the firm with a NIPT of L3XXXXXXXX is registered in the year 2013.

After scrutinizing 87,523 firms that have declared a turnover of more than 0 ALL and less than 10 million ALL, there is this distribution of firms according their first year of registration.

Tabele 1.1. The year of registration of the small businesses of 2016

Year	No. of Firms	Year	No. of Firms	Year	No. of Firms
1996	311	2003	8804	2010	4126
1997	106	2004	1747	2011	3577
1998	63	2005	1722	2012	3611
1999	73	2006	3005	2013	4270
2000	93	2007	2780	2014	7588
2001	108	2008	3702	2015	26456
2002	114	2009	2906	2016	12359

Source: Author's calculation

As it can be noticed in the table, in the first seven years there is a very modest number of firm's registration. The year 2003 could be considered as the first wave of registrations, followed by the second big wave in the year 2015 and 2016. As mentioned before, in 2015 there was the anti-

informality campaign that added more than 26 thousand new registered firms, while having a rolling influence even in 2016.

The variable *statusNo* was created a binary variable by using the situation of the firms in the May 2017. If the firms had requested suspension of the activity, or have acquired deregistration from the tax system, then the variable is 1, and otherwise it is 0 for the firms that are still active in May 2017.

The inclusion of the geographic comparison was realized by separating the firms in four regions, by creating the region of Tirana, the region of Durres – Elbasan, the region of South and the region of North of Albania. Each region was included as a separate variable in the regression, except the North Region, as it had fewer variables and the exclusion was needed to avoid the multicollinearity.

Firms are grouped according to the sectors of activity, by using three main sectors, as the sector of manufacturing, the sector of services and the sector of commerce, and another fourth sector that included both the sector of transport and construction. The other sectors were not included in the analysis.

The variable *dummy2014* was used as a binary variable to include the firms that were positioned in the very next bin under the threshold of 2 million ALL in 2014 (getting the value of 1). The database of 2014 was matched with the database of 2015, in order to include the firms that were present in that bin in 2014. Those firms can be considered as "bunchers".

The variable *grup2016mil2* was used to include in the regression the firms that were positioned in the very next bin under the threshold of 2 million ALL in 2016 (comprising the turnover between 1,800,000 ALL and 2,000,000 ALL) The database of 2016 was matched with the database of 2015, in order to include the firms that were present in that bin in 2016.

The variable *grup2016mil5* was used to include in the regression the firms that were positioned in the very next bin under the threshold of 5 million ALL in 2016. As there is a lessening of the bunching under the 2 million ALL threshold in 2015 and a notable increase of bunching under the 5 million ALL threshold, this variable can intercept if there is a continues jump between thresholds while targeting the same behavior of bunching under the threshold.

The Probit regression was executed with all these variables. A positive coefficient shows that an increase in the independent variable would imply an increase in the predicted probability of the

dependent variable. The statistic of z test comprises the ratio between the coefficient of each variable to the standard error (*std. err.*) and it has a normal standard distribution behavior that can be used to test the hypothesis that the coefficient of the variable is not zero.

$P > |z|$ is the probability that the statistics of the z test could be observed for the null hypothesis, which predicts a coefficient close to zero. For a given level of alpha (5%) $P > |z|$ determines if the null hypothesis can be rejected. If $P > |z|$ is less than alpha, than the null hypothesis can't be rejected and the parameters can be considered as valid.

By investigating the results of the regression, it can be noted that one of the main factors that influence the bunching behavior in the first threshold is the bunching persistence over time. The regression coefficient for *dummy2014* is 0.82 with a z=26, which implies that in other constant conditions, the probability of the likelihood to stay in a same bin over two consecutive years is very high. A big number of firms that have been bunching in 2014, do bunch even in 2015.

Moreover, the coefficient of the variable *grup2016mil2* is 0.47 with a high level of z, implying a similar behavior. Although in the year 2016 it is a lower difference in the tax liability in relation to the threshold, the bunching persistence continues in 2016.

The age of the firms is analyzed through the variable *Ln(mosha)*, which results in a coefficient of 0.19 with z=19, showing a highly statistically significant feature, albeit having a lower coefficient that entails a lower probability of the influence in the bunching behavior with other conditions in constant terms.

The regional distribution of the firms shows that the firms residing in the region of Tirana, with the variable *TR*, do have the highest coefficient with the highest statistical z, confirming the fact that the firms in Tirana have a stronger tendency to bunch at the threshold.

Firms that operate in the trade sector, identified by the variable *Trade*, have a higher coefficient with a high statistical z, confirming the perception that the firms in the trade sector have a stronger tendency to bunch under a certain threshold in order not to increase their tax liability.

Figure 1: Probit regression of bunching at 2 million ALL

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Iteration 0:   log likelihood = -12554.754
Iteration 1:   log likelihood = -11111.433
Iteration 2:   log likelihood = -10948.552
Iteration 3:   log likelihood = -10947.224
Iteration 4:   log likelihood = -10947.224

Probit regression                               Number of obs   =      75164
                                                LR chi2(12)     =    3215.06
                                                Prob > chi2     =     0.0000
Log likelihood = -10947.224                     Pseudo R2       =     0.1280
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grupim2015	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
LNxhiro	.3172413	.0114293	27.76	0.000	.2948403	.3396423
LnMosha	.1930177	.0101445	19.03	0.000	.1731348	.2129007
statusNo	-.1925817	.0362397	-5.31	0.000	-.2636102	-.1215532
TR	.1266195	.032252	3.93	0.000	.0634067	.1898323
DREL	.0844687	.0350952	2.41	0.016	.0156833	.1532541
SOUTH	.0718535	.0328704	2.19	0.029	.0074287	.1362784
Production	.0465077	.0385364	1.21	0.227	-.0290222	.1220376
Services	.037633	.0305001	1.23	0.217	-.0221462	.0974122
Trade	.0937927	.0297902	3.15	0.002	.035405	.1521803
grup2016mil2	.4713328	.0314713	14.98	0.000	.4096501	.5330155
grup2016mil5	-.0001542	.0477157	-0.00	0.997	-.0936752	.0933668
dummy2014	.8298123	.0317949	26.10	0.000	.7674954	.8921293
_cons	-6.760913	.1652766	-40.91	0.000	-7.084849	-6.436976

Future closure of the firms was identified with the variable statusNo. Variable *statusNo* – has a coefficient of -0.19 with z=-5.3, which means that an increase in the likelihood that the firm would require a suspension or deregistration till the year 2018, decreases the chances that the firm had bunched under the threshold in the year 2015.

4. Persistence in bunching

4.1 Persistence to bunching under the threshold

As shown in the previous Probit regression, the firms can persist to bunch in consecutive years. These results need a more thorough analysis, as it can push the firms to stay in the favorable tax regimes for a long time. There are a lot of firms that can stay in the same bin under the threshold for two or more years. This can be a more common phenomenon, as more firms can target specific turnovers not only close to the given thresholds. So, some firms can target similar turnovers every year. To further check these issues, I drafted two research questions, as below:

Research question 2: Is the bunching persistence relevant in different thresholds?

The persistence to declare similar levels of turnover is a behavior that shows the tendencies of some firms to decrease their turnovers, and moreover, to specifically target the level of turnover. This persistence is analyzed by Almunia & Rodriguez (2014), for the big businesses in Spain and from Harju, Matikka, & Rauhanen (2015) for the VAT threshold in Finland. On the other hand, Paetzold (2017) has examined the persistence of declaring similar levels of personal income. Moreover, the phenomenon of the persistence to stay in similar levels of turnover decreases the need to bunch directly under the thresholds. Brockmeyer & Hernandez (2016) have examined the case of Costa-Rica about the Income Tax. In this case, the average tax rate is related to the total income of the companies and the tax thresholds are updated each year according to the annual inflation. This complex situation produced 58 thresholds in eight years. Even though the thresholds were changing almost every year, the persistent bunching at the thresholds continued and was not driven by round-number thresholds. Yunus (2006) has evidenced a certain level of persistence in the evasion through the individual tax income in the United States.

4.2 Visualizing the persistence in similar levels of turnover

The behavior of the firms' persistence to stay in similar levels of turnover is measured by comparing two consecutive years. In this case, the firms that are present in a turnover bin in one given year are compared to the firms of the same turnover bin in the following year. The percentage of firms that stay in the same bind constitutes the persistence of that bin. The analysis included the firms that were present in the year 2014 in a big interval of turnovers from 1 million ALL to 6 million All, an interval which comprises both turnovers of interest. The firms are distributed in small bins of 200,000 ALL. For example, all firms that were present in the bin of 1,000,000 – 1,199,999 ALL in 2014 are compared to the firms that are present to the same bin in 2015. The comparisons are done through the function *vlookup* in the Microsoft Excel. This is considered as the percentage of the persistence of the firms in the same level of turnovers. As it is shown in the graph, the persistence of the firms in 2015 has two peaks in the bins that are under the thresholds, namely 22.2% under the threshold of 2 million ALL and 17.6% under the threshold of 5 million ALL.

Furthermore, for each bin under the threshold of 2 million ALL, there is a high level of persistence of more than 13%, much higher than the levels shown in the literature, especially in the study of Harju, Matikka, & Rauhanen (2015). On the other side, the persistence over the second

Percetange of firms in the same bin from 2014 to 2015

22.2%

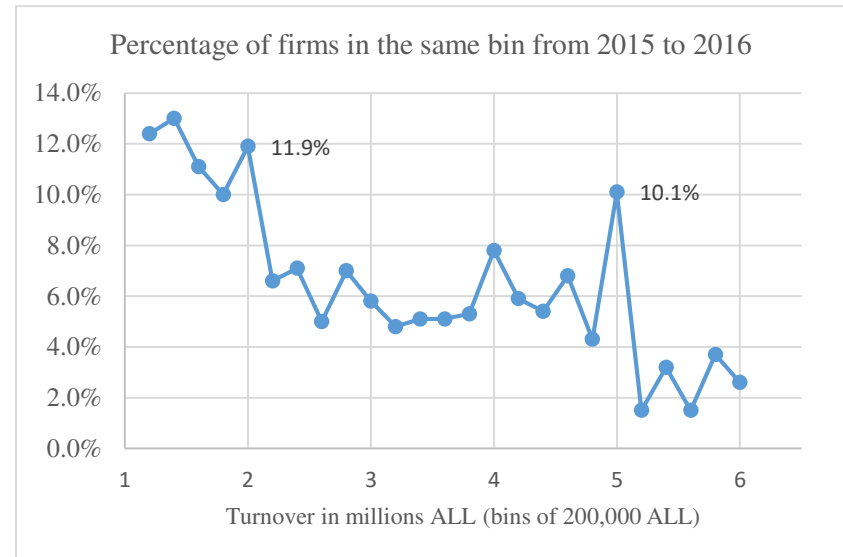17.6%

Turnover in millions ALL (bins of 200,000 ALL)
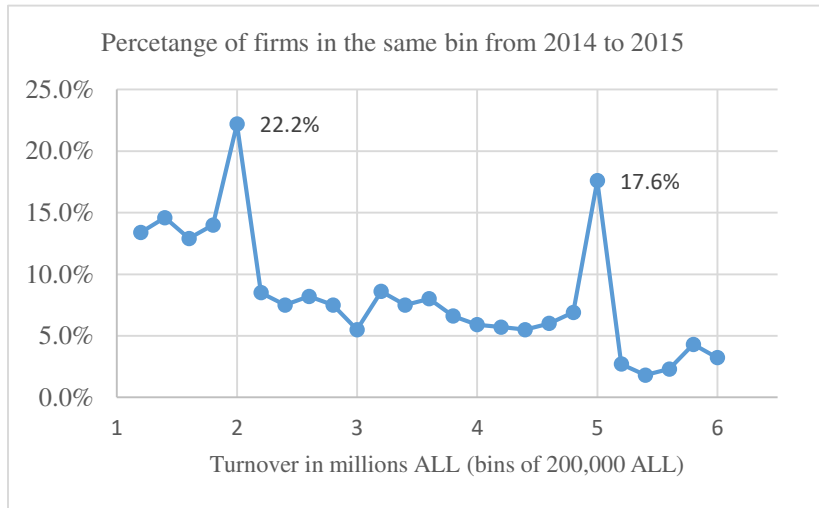
threshold of 5 million ALL decreases notably confirming the perception that the persistence under the two thresholds is maintained to avoid the overcoming of the tax thresholds.

It is a different story when the persistence is calculated between 2015 and 2016. It appears that the anti-informality campaign has influenced a lot the behavior. Only 11.9% of the firms in the turnover bin of 1,800,000 – 1,999,999 ALL have persisted in the same turnover as in 2015. Over the first turnover, there are only 5-7% of firms that maintain the same bin through the two years period. Under the threshold of 5,000,000 ALL there is another spike of the persistence in the 10.1%. Over the threshold of 5,000,000 ALL there are no real advantages to

Figure 3: Bunching persistence from 2015 to 2016

Percentage of firms in the same bin from 2015 to 2016

11.9%

10.1%

Turnover in millions ALL (bins of 200,000 ALL)

persist in similar levels of turnover, and as a result the level of persistence falls below 4%.

4.3 The implications on growth effects

The persistence under the tax thresholds has a certain impact on the increase of turnover of the firms, as mentioned in the papers of Almunia & Rodriguez (2014) and Harju, *et al*, (2015).

It is important to determine the way to calculate the increase of the turnover of the firms each year. The intuition based on the previous analysis implies that the firms that are close to the thresholds try not to increase their declared turnover in order to avoid the turnover overpass. If this happens in a large scale, we can have at the same time the bunch under the threshold, the persistence in similar turnover, and probably even a decrease of turnover under the thresholds. Some authors (Chetty, Friedman, Pistaferri, & Olsen, 2011), (Bastani & Selin, 2014) have used the full administrative data by using sales and expenses to determine the effects on the growth of the firms. In the case of less data, the use of only sales/income is not uncommon.

One of the ways to analyze the growth is through the part or probability that the firms will have an increase in turnover from year *t* to year *t + 1*. If 60% of firms in the big bin of 1,000,000 to 1,999,999 ALL will have an increase in the turnover, then this figure can represent the increase of all the bin.

Another way to measure the growth is by using the median of growth in the next year, by using the logarithmic form of the turnover, as in:

$$Median(\ln(y_{i,t+1}) - \ln(y_{i,t})).$$

Almunia & Rodriguez (2014) did use the median instead of the average of the growth, as the dispersion of the growth rates to have some big outliers that could impact[1] the calculations.

In this case, it was calculated the natural logarithm of turnover for all the firms in a specific bin of 200,000 ALL length from 2014 to 2015. After that, it was calculated the difference between to logarithmic numbers. These differences are ranked in a vector, and then it was found the mediam of this vector. This median is the representative of the growth/decline of the firms in this bin.

By using these to comparative measures, there is the possibility to interpret indirectly the bunching under the threshold and the respective persistence.

In order to calculate the behavior of the turnover growth, it was used the distributions of firms in small bins of 200,000 ALL. Then, it was calculated the difference between the natural logarithm of the turnover to 2015 with the respective figure of 2014. For each bin, it was

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[1] In practice there could be cases of exponential growth rates and cases of reduction to 0 turnover, which can hugely impact the average of growth in a certain bin.

calculated the median of the growth through the difference. In all the bins, except that from 1,800,000 – 1,999,999, it was present a certain level of growth. This was possibly strongly influnced by anti-informality
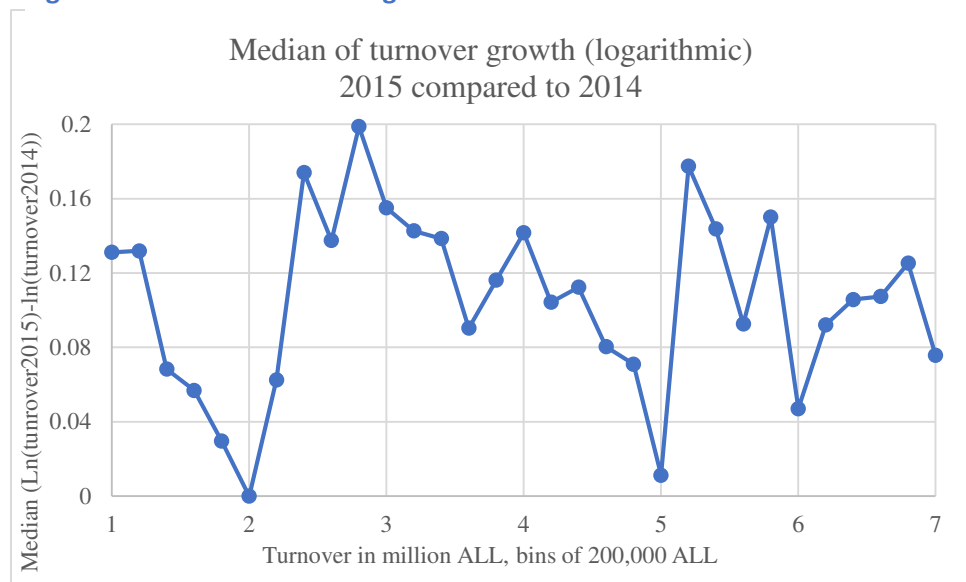
campaign. Moreover, it it noted that the first threshold of 2 million ALL has a strong influence in the growth of firms, as in the 4 bins under this threshold there is a small level of growth, between 0-6.5%. Over the turnover of 2 million ALL, the firms are less conservative to declare robust growth rates with a median rate of over 10%. The highest growth is between 2,400,000 ALL to 3,000,000 ALL.

In a similar fashion, the vicinity under the 5 million threshold gives a strong impact in the growth declared rates, with the first bind under the threshold with a growth rate of only 1%. Over the second threshold of 5 million ALL, the levels of growth appear to be higher.

5. Conclusions

Probit regression was used to respond to the first research question. Small firms in the trade sector are more inclined to bunch under the threshold. Moreover, firms that are present in Tirana region are more inclined to bunch. On the other side, firms that suspend or close their activity have a smaller tendency to bunch. Older firms tend to bunch and the bunching behavior is not temporary, as it tend to be repeated in the following years.

Another research question was drafted in relation to the persistence of the bunching in similar levels of turnover. The data confirmed the fact that there was a sizable persistence in similar levels of turnover, especially under the first threshold of 2 million ALL. On the other hand, the anti-informality campagn had a strong influence in reducing the persistence, as the figures in relation to persistence did decline strongly in 2016.

As small firms try to reap for a long time the benefits of staying under the thresholds, this behavior can undermine their prospecting of growth. It was shown that the firms that position their turnover just under the first threshold, have the tendency to have the smallest growth compared to their counterparts.

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