



ELECTION-RELATED CYCLES IN PUBLICLY SUPPLIED GOODS IN ALBANIA

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Abstract

It is widely perceived by public opinion that incumbents try to improve the economic situation before elections to impress voters, typically through fiscal and/ or monetary expansion policies, creating in this way Political Business Cycles (PBC). However, governments in transition countries may use additional instruments, up to now not covered by the PBC literature. Throughout the transition, the electricity supply has not been regular in Albania, reflected in systematic daily interruptions to supply for households and business throughout the country, seriously affecting their wellbeing. Thus, it is rational that the incumbent commits to improving electricity supply to please the voters before elections, using its monopoly position in the production and supply of electricity. The results confirm our hypotheses that before elections, the supply of electricity increases significantly above usual levels, followed by a contraction after elections

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1. Introduction

There is a general consensus that the economic performance of a government determines to a large extent its likelihood of re-election, as confirmed by Fair (1978, 1982, 1988), Madsen (1980) or Lewis-Beck (1988), and therefore economic factors influence political factors and the other way around. Furthermore, incumbents may use their power and the instruments available to them to influence the economic environment, especially prior to election to improve the likelihood of reelection. Over the last decades, there has been plenty of research and numerous articles published on such behaviour patterns of politicians, aiming to analyze and explain the use of fiscal and monetary instruments by the incumbent to stimulate economic performance before elections, in order to impress the voters. The traditional Political Business Cycle (PBC) literature, as introduced by Nordhaus (1975), concentrated on an exploitable Phillips curve, to explain the use of economic instruments to affect macroeconomic variables, such as unemployment and GDP.

After Nordhaus' (1975) initial contribution there was increasing research interest, focusing on budget cycles, based on the observations of Tufte (1978) and Frey and Schneider (1978a, b). Even though there is a wide consensus about the importance of the actual economic conditions in pleasing the voters, there is still doubt about the ability to influence the macroeconomic variables in a precisely predictable manner. Taking the limitations into account, newer approaches focused on pre-election manipulations of fiscal policy instruments. As shown by Brender and Dazen (2005) and Shi and Svensson (2006), new democracies are especially vulnerable to such political budget cycles. While Alt and Lassen (2006) show the relevance of transparency, Brender and Dazen (2005) also emphasize the lack of experience that voters have in new democracies regarding the existence of political fiscal cycles. Meanwhile, Shi and Svensson (2006) see not only the aspect of information, but also the incumbents' rents of staying in power as a relevant aspect.

Evidence of PBC was also found in several less developed and democratic countries. Gimpelsen (2001) and Asutay (2004) provided clear evidence of the presence of PBC in Russia and Turkey respectively. Previous research on PBC in Albania has also indicated that the incumbent manipulates fiscal instruments, increasing public expenditure before elections, including public investments, expenditure on compensation of employees, social assistance (Imami and Lami, 2006).

However, incumbents may not only use classical instruments like the composition and the size of the public budget, if there are other instruments available. The approaches mentioned above may explain why political budget cycles occur, even though the voters should punish such behaviour. One problem related to political budget cycles is the timing of the activity. Since the incumbent cannot precisely estimate the lag between the stimulus as a change in the public budget and the impact on

the economic environment, they may be interested in using other instruments with a more direct impact on the economy and the wellbeing of the voters.

We try to shed light on the question, whether incumbents may use other instruments available, beside classical fiscal instruments, to impress voters in election years. Given that political budget cycles seem to be a phenomenon of developing countries or new democracies, we focus on Albania, a country with a relatively short experience of democracy, which is characterized by a minimum level of fiscal transparency (IBP 2009a, b). In this paper we focus specifically on electricity, which is a publicly provided good in Albania and which is characterized by special features. Given that electricity represents one of the most basic needs, households and businesses should be highly sensitive to the importance of a sufficient supply of electricity. Furthermore, it is quite expensive to store electricity, and only for selected purposes, such as heating or cooking, are substitutes available and partly used. Furthermore, in the case of Albania we have a limited supply while demand has increased dramatically since the change of the political system. Finally, the Albanian electricity market is a quasi public monopoly.

Given that electricity supply (consumption) relies on both imports and domestic production, it is important, in this context, to analyze both sources of electricity – supply and consumption presenting the aggregated effect. Therefore, we analyze consumption as well as the production and import dynamics of electricity by KESH, which is a quasi- monopoly in the supply of electricity in Albania, and is publicly run. Our hypothesis is that before elections, electricity consumption, production and imports may increase above the usual levels, followed by a contraction after elections. In this paper we focus on the parliamentary elections in 2001 and 2005 – during the time when it was common to observe electricity supply shortages throughout Albania. In our analysis we use the modern standard econometric approach, used widely for research related to PBC, aiming to test if elections can explain changes in electricity supply in the form of production and imports.

In the next chapter we will present a short overview of electricity provision in Albania to provide background information concerning the existing undersupply as a precondition for using electricity supply as an instrument before elections to impress the voters. Chapter three provides an overview of the method and data used, while chapter four presents the main findings.

^{1.} In the time span of our analysis, OSSH (Operatori i Sistemit te Shperndarjes – Distribution System Operator) was part of KESH.

2. Background of electricity supply and consumption in Albania

Since 1998, Albania has been a net importer of electricity, while the main source of domestic production is hydroelectric power. In addition to transmission constraints, limitations in financing have also hampered sufficient electricity imports, entailing frequent interruptions in power supply since 2000. Table 1 gives an overview of the developments in estimated demand, national production, imports and the resulting undersupply over years.

2000 2001 2002 2003 2004 2005 Demand 6.161 6.223 6.201 6,372 6,517 6.417 Net Generation 4,709 3.655 5,394 5,357 3,123 4,818 Net Imports 1,002 1,750 2,227 937 567 385 Load Shedding 851 450 818 662 556 630 As percentage of Demand 7.3% 13.7% 10.4% 8.5% 13.1% 9.8%

Table 1. Electricity situation in Albania in GWh

Source: World Bank (2006): p. 235, own calculations

Other major problems are the low tariffs which do not cover the costs, network losses and unpaid bills. As a result, the Albanian government has had to subsidize the state-owned electricity company KESH. In 2005 (when general parliamentary elections also took place), KESH produced a remarkable quasi public deficit of 1.8 percent of GDP, as losses were covered by the public budget (World Bank: 2006: p 25).

There are different reasons for interruption of the electricity supply. One of the main reasons is that more than 95 percent of electricity production, is based on hydroelectric power (Nashi 2009), so oscillation in water deposit levels, affected by natural factors (rain, drought) directly affect the availability of electricity. The gap between demand and production, is partially covered by imports, while the remaining gap, not covered by domestic production or imports (for natural, financial or technical reasons) is translated into systematic, but oscillating, interruption of the electricity supply.

Turning to household consumption, Albanians have suffered because of unmet basic needs. In 2002, based on the non income poverty indicators, every third Alba-

nian had to be considered poor, and every tenth Albanian extremely poor. Indicators such as inadequate water and sanitation, inadequate housing, crowding or lack of education can only be influenced in the longer term. However, the supply of electricity can be influenced even in the short term, as the electricity grid has a broad reach and therefore, electricity could be available virtually everywhere. In 2002, more than 13 percent of Albanian households suffered power cuts for 6 hours or more per day (World Bank, 2003: p. 17).

Table 2. Frequency of power supply interruption in percent

	Tirana	Urban	Rural	Total
Never	28.3	21.7	6.7	13.8
Several times a month	6.3	8.7	3.4	5.3
Several times a week	9.8	11.1	6.4	8.3
Every day	55.6	58.4	83.4	72.7
Total	100.0	100.0	100.0	100.0

Source: World Bank (2003): p.16

Table 2 gives an overview of the frequency of the interruptions, based again on the Living Standard Measurement Survey (LSMS) of 2002. The time without electricity supply varied between more than 9 hours in rural areas and 5.6 hours in the capital Tirana. The situation improved in the following years; however, in 2005 nearly 40 percent still reported daily interruptions of power supply (World Bank, 2007: p. 11).

These irregularities hamper the economic development of Albania as well. In 2002, more than three out of four firms stated power supply as a problem for their business, which is more than three times higher than the South Eastern Region average. As a result of the electricity shortages, a loss of 2.7 to 5.4 percent of GDP is estimated for 2001-2002. Concerning the total costs, we also have to add cumulative investments in backup power supplies, roughly of the same extent as the direct impact, but spread over several years (World Bank 2006, pp. 239-240).

3. Method and Data

3.1. Specifications of variables, data and empirical tests

Since electricity is an essential good for households and businesses, we assume that the incumbent may try to improve its supply before elections, by increasing production and/or increasing imports. Electricity is an important source of energy in Albania. In addition to its wide use in industry, electricity is a main source of heating and cooking for households. As already discussed before, the supply of electricity in Albania, is characterized by systematic interruptions whose effects have been deemed very negative for development of businesses, especially in some sectors, in addition to having direct implications for households' well-being.

In this research, we intend to test for possible statistically significant increase of electricity consumption, production and import before elections, in line with the incumbents' interest in "pleasing" voters, in order to increase their likelihood of being re-elected. At first glance, the idea of testing for supply as well as covered demand seems to be redundant. However, consumption represents the aggregated effect, while production and imports answer the question of which measure is used to increase the supply.²

The time series of production, imports and consumption of electricity is on a monthly basis, extending from M1-2000 to M12-2008 (from January 2000 to December 2008), adding up to 108 observations. The unit on which the data analysis is based is MW/H. There are two parliamentary elections taking place in this period, namely June 24, 2001 and July 3, 2005.

As mentioned above, more than 95 percent of the production of electricity comes from hydroelectric power. Therefore, it might be possible that external, climatic factors may affect the above mentioned results. This may hold for higher rainfall before the election and an increase of the water level in the cascades of central power stations, or the opposite occurrence after the elections. To control for these factors we calculate an index of production per meter of cascade level (MWH/m) called Production/Level (PROLEV) and use it as the dependent variable in conjunction with the election timing, instead of simple production (MWH). We chose this technique rather than introducing the cascade level as an additional explanatory variable in the model to avoid any spurious regression problems.

Following the standard approach in this field,³ we will apply the Intervention Analysis based on Box and Tiao (1975), a methodology for constructing a statistical

^{2.} Albania also exports electricity. Including exchange, it reached a peak in 2005, reflecting 11 percent of the national sources as home production and total imports.

^{3.} See for example McCallum (1978), Hibbs (1977), Alesina and Sachs (1988), Alesina and Roubini (1992). Hibbs (1987) offers a good introduction to the Box-Tiao technique.

model in our study. In this paper we test the hypothesis of the existence of changes in the supply – as production and imports – beside the aggregated effect as consumption of electricity. Basically, the test proceeds by subjecting the monthly seasonally adjusted time series of these variables to a Box-Tiao intervention analysis using the most appropriate autoregressive-moving average (ARIMA) for the social process and an intervention term; here the intervention term models the time distance to the election day.

A simple formal representation of the intervention analysis is:

$$z_t = \sum_{i=1}^{s} \alpha_i z_{t-i} + b_0 + \omega_t PD_t + \varepsilon_t$$

where z denotes the outcome level of electricity, modelled using a suitable ARMA(p,q) model and PD_t a political dummy variable specified later on.

The parameter ω_0 measures the change caused by the intervention as modelled by the political dummy variable and is estimated along with the ARIMA time series component. The estimation procedure provides an estimate of ω_0 and a confidence interval for the parameter. In our case the dependent variable z_t is either consumption as the aggregated effect or disaggregated production and imports of electricity (each in MW/H) that is assumed to be affected because of elections, and finally production per cascade level to test for external effects. We have created two kinds of political dummy variables to capture the impact of the elections on electricity related variables, namely cumulative dummy and discrete dummy.

We have six cumulative t = -3, -2, -1, 1, 2, 3 election political dummies (PD_t) and each of them is defined as:

$$PD_{t} = \begin{cases} 1 - for \ the - t \ months \ prior \ to \ election, \ t \in [-3; -1] \\ 0 - otherwise \end{cases}$$

$$PD_{t} = \begin{cases} 1 - for \ the \ t \ months \ after \ election \ must \ be, \\ 0 - otherwise \end{cases}, \ t \in [1; 3]$$

$$PD_{t} = \begin{cases} 1 - for \text{ the } t \text{ months after election must be}, & t \in [1;3] \\ 0 - otherwise \end{cases}$$

In the same manner we defined three discrete elections dummy variables, covering only the monthly and not the cumulative effect of the three months before the election. If the election has taken place before the 15th of the month, the month will be counted as prior to the election, otherwise as after the election.

3.2. Estimation of the empirical model

In the first stage, we have followed precisely the Box-Jenkins (BJ) Methodology (1970). In the beginning of the process, the first step was to remove the seasonal patterns from the time series. Next we carefully investigated the stationarity of the time series as a necessity in further steps.

Based on Box-Tiao's (1975) intervention analysis, after ensuring for the stationarity, the time-series is modelled as ARMA (Auto-Regressive Moving Averages). By modelling through ARMA it is possible to prove if elections can explain the changes of the dependent variable, in addition to the inherent characteristics of the variable and the random error term. Hence, it is necessary to identify the ARMA (p,q) benchmark model. To find the "best" ARMA model for each time series we straightforwardly followed Box-Jenkins methodology (1970). Hence, in order to model the analyzed time series as an ARMA we went through an iterative process of identification, estimation and diagnostic checking of several ARMA models until we found the most plausible one, deemed as the "best" for each series.⁴

In the second stage we individually incorporated each of the political dummy variables in the related ARMA model tentatively found in the first stage and re-estimated the whole model now with an additional incorporated PD_t aiming at capturing the possible impact of elections on the dependent variable and testing whether elections have any impact on the econometric time-series utilized by this study in addition to the variable's past value and its respective error term. Thus, the impact of elections is considered to be an intervention or shock in the determination of the value of the analyzed variable by forcing the value of the variable to shift during the intervention or shock periods. The statistical significance of the political dummy variables is tested using the t-test.

4. Results and Discussions

Regarding the supply side of electricity, in both cases the original series were non stationary and the Augmented Dickey-Fuller tests showed significant signs of a unit root. We always used first difference to proceed with the analysis. Meanwhile, the first differences of the original series were stationary, based on Dickey Fuller test and ACF, PACF correlograms.

After testing and comparing several models the one with a single monthly seasonal term, MA (12) for production and MA (4) for imports seemed to be the most appropriate model as their residuals presented pure white noise. The estimated equations of production and imports are presented below:

^{4.} Gujarati (2003) and Enders (2009) provide a simple and clear explanation of the Box – Jenkins Methodology.

DPRODUCTION =
$$-608.9 + 0.213 * MA(12)$$

DIMPORT = $882.1 - 0.176 * MA(4)$

The first difference of the index Production/Level (PROLEV) defined as MWH/meter of cascade level is stationary but exhibiting some seasonal behaviour. The "best" model tentatively found for PROLEV index seems to be an ARMA model with an AR (2) term (only for the second lag) and a MA (12) term explaining the seasonal autocorrelation.

DPROLEV =
$$5.9 - 0.266 * AR(2) + 0.434 * MA(12)$$

DLNCONSUMPTION = $0.001 - 0.598 * MA(3) + 0.584 * MA(12)$

In case of electricity consumption, the original series was also non stationary and the Augmented Dickey-Fuller tests showed significant signs of a unit root. The series showed also signs of heteroskedasticity. We used the first difference of the natural logarithm which proved to be stationary. In case of consumption, the most appropriate model tentatively found has two moving average terms, one of lag three and the other of lag twelve.

PD_t	Production	ProLev	Import	Consumption
-3	104612***	175.467	41579**	0.05096
-2	159582***	331.385**	56018**	0.19328***
-1	206723***	538.010***	78087***	0.23874**
1	-357776***	-947.486***	-141476**	-0.56715***
2	-239556***	-605.198***	-47297**	-0.30351***
3	-170395***	-428.730***	-39395**	-0.36262***
-3d	-1868	73.1882	9527	-0.24043***
-2d	110594	1.72618	36947	0.14865

Table 3. Empirical Results

Table 3 summarizes the main findings. Concerning the **electricity production**, the estimated coefficients also confirm a "manipulative" behaviour of the incumbent party before the elections. All relevant cumulative political dummy variables have a

^{*} implies that the result is significant at a 10%, ** at a 5 % level and *** at 1 % percent level.

positive sign and are significant at least at 1 percent level. The estimated coefficient for PD-1 implies an increase by 56 percent of the average production one month prior to elections.⁵ The coefficient is higher for PD_{-1} and decreases monotonically for the other two dummy variables implying a stronger "manipulative" behaviour of the incumbent as the elections come closer. Furthermore, we tested more directly the intensification of this behaviour by using the discrete dummy variables PD_t d. It appears that the estimated parameters are significant only for one month prior to and after the election which are identical with PD_{-1} respective PD_{1} . This implies that the "manipulative" attempt focuses strongly on the month prior to elections. Finally, the estimated post-election periods' parameters show significant decrease in power production, confirming our expectations. Based on the modified setting, which takes into account the cascade level (ProLev), we obtain similar results beside the three months prior to the election result. Therefore, external, climatic factors might not have affected or explained the above mentioned results in production. The findings reflect again the intensification on the variable difference increasing positively as the elections come closer.

Moving on to **imports of electricity**, the estimated coefficients of all cumulative political dummy variables have a positive sign and are significant at least at 5 percent level. The cumulative political dummy coefficients show an increasing amplitude as the election day comes closer $(PD_{-3} < PD_{-2} < PD_{-1})$. The estimated coefficient for PD_t shows an average increase from 42 to 78 GWH in the monthly absolute change of imports level prior to elections. These changes equal 28 to 51 percent of the average monthly level of imports. The monotonically increasing behaviour is also evident when using a discrete political dummy, although the dummies related to three and two months before elections are not significant on the conventional levels. During the months after elections there appears a statistically significant and considerable decrease of the absolute change in the imports level, strengthening the argument for a political cycle also in this respect.

Also in the case of **electricity consumption** the coefficients of the cumulative dummy variables are positive and statistically significant at one percent level except for three months before elections. They reflect a monthly increase of power consumption of roughly 20 percent prior to elections. The major increase in the power consumption takes place only during the last month prior to the election day, as the second discrete political dummy (PD_2 d) is not significant at conventional levels and the third one (PD_3 d) shows a significant decrease of about 24 percent of power consumption. The contraction after the election is also pretty evident and statistically

^{5.} In absolute figures, we have an increase of 207 thousand MW/H one month prior to elections, while the average production per month is about 370 thousand MW/H.

significant ranging from 30 to 50 percent of monthly reduction, in line with our expectations.

In all the variables that we analyzed - imports, production and consumption - the derived results provide some evidence that electricity supply is used for the purpose of influencing voters before elections. As far as significant, the results reflect the expected cyclic behaviour of an increase in the month before the election and a downturn afterwards.

This study shows - for the first time in the PBC related literature, as far as we know - the use of publicly provided goods, in general, and the use of electricity supply, specifically for election purposes, thus making a modest but new contribution to the PBC theory and empirics. There is a wide consensus that PBC leads to inefficient outcomes, and therefore, should be avoided. In our case, the shortages of electricity, above usual levels, taking place after elections, to compensate for the "abundance" of electricity supply before elections, may have negative consequences for household and business wellbeing. In this case we have two scenarios – if the incumbent loses elections, it may blame the new government for cutting down electricity supply after elections (although such a decision is unavoidable normally), and if it re-wins elections, it expects that "bounded" rational voters will forget somehow, after four years, during the next elections, and be more affected by the "positive" experience in the months before the next elections than by earlier bad experiences.

Therefore, conducting research on PBC in Albania, and other transition countries, and looking into new special features which are not present and explored in the current PBC literature, which focuses mostly on Western countries, and publishing the results, will contribute to raising awareness of the existence of PBC, the related disadvantages and the importance of avoiding this phenomenon.

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