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Abstract

The phenomena of manipulation of the economy by the incumbent for electoral purpose are called Political Business Cycles (PBC), introduced by Nordhaus (1975). Using policy control economic instruments, as fiscal and monetary instruments, government may manipulate the economy to gain electoral advantage by producing growth and decreasing unemployment before elections.

In addition to increased public expenditures, also the production/supply of certain publicly provided goods may score improvements. In Albania, production and supply of electricity (for the time span of our analyzes) was controlled by KESH (Korporata Energjitike Shqiptare – Albanian Energy Corporation) which is a quasi-monopoly in the supply of electricity in Albania, and it is publicly run. Throughout the transition, supply of electricity, due to various technical and economic reasons, has not been stable, and characterized by systematic interruption for households and businesses users, affecting their well-being and performance (electricity is a main source of energy for households, including heating and cooking). Therefore, it seems so that there is an incentive and rationale for the incumbent to use also the provision of electricity to impress the voters before elections, beside of the classical instruments of expenditures.

In this paper we analyze consumption, production and import of electricity in Albania. Our hypothesis is that before elections, electricity consumption may increase above usual levels, followed by a contraction after elections. In our analysis we use modern standard econometric approach, used widely for research related to PBC. By ARMA modelling it is possible to prove if elections can explain changes in electricity production, in addition to the past history of the variable and the random error term.

Keywords: Political Business Cycle, Electricity, Albania

JEL classification code: P26, E32, D72, H72

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1. Introduction

It seems to be obvious that the economic performance of a government determines to a large extent its likelihood of reelection 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 influence the economic environment especially prior to election to improve the likelihood of re election. Over the last decades, there has been plenty of research and articles published on such an opportunistic behaviour of politicians, aiming to analyze and explain the use of fiscal and monetary instruments by the incumbent to stimulate economic performance before elections, 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, GDP, etc. Evidence of PBC was also found in several less developed and democratic countries. Gimpelsen (2001) made a research on the existence of PBC in Russia, finding evidence in support of it. Another study of Asutay (2004) provided clear evidence for the presence of PBC in Turkey. The incumbent in Turkey has used fiscal and monetary policy instruments to create PBC in order to improve the chances of being reelected. Also previous research on the existence of PBC in Albania indicated that the incumbent manipulates fiscal instruments, increasing public expenditures before elections, including public investments, expenditure on compensation of employees in parliamentary, social assistance, while regarding the macroeconomic outputs, we have found, partial evidence of PBC in GDP and unemployment but not in inflation (Imami and Lami, 2006).

After Nordhaus (1975) initial contribution there was an 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 indicator in a precise 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), especially new democracies are vulnerable for such political budget cycles. While Alt and Lassen (2006) show the relevance of transparency, Brender and Dazen (2005) also pronounce the lack of experience that voters have in new democracies regarding the existence of political fiscal cycles. Meanwhile, Shi and Svensson (2006) see beside the aspect of information also the incumbents' rents of staying in power as a relevant aspect.

However, incumbents may not use only classical instruments as the composition and the size of the public budget if there are also other instruments available. These approaches mentioned above may explain why political budget cycles arise even though those voters should punish such behaviour. Another 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 to use other instruments having a more direct impact on the economy and the well being of the voters.

We try to shed light on the question, whether incumbents may use other instruments available, beside classical fiscal instruments, to impress voter in years of election. Based on the results that political budget cycles seems to be a phenomenon of developing countries or new democracies, we focus on Albania, a country with a relatively short experience of democracy, which provides only a minimum 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 should be highly sensible concerning sufficient supply of electricity. Furthermore, it is quite expensive to storage electricity and only for selected purposes, such as heating or cooking, substitutes are available and partly used. Furthermore, in the case of Albania we have a limited supply meanwhile demand has increased dramatically after the system change. And finally, the Albanian electricity market was a quasi public monopoly.

Given that electricity supply (consumption) relies largely on both imports and domestic production, it is important, in this context, to analyze both these sources of electricity – in addition to consumption per se. In our paper we analyze consumption as well as production and import dynamics of electricity by KESH which is a quasi-monopoly in the supply of electricity in Albania, and it is publicly run.[1] Our hypothesis is that before elections, electricity consumption, production and import may increase above usual levels, followed by a contraction after elections. In this paper we focus on the parliamentary elections in 2001 and 2005 – during that period was common to observe electricity supply shortages throughout Albania. In our analysis we use modern standard econometric approach, used widely for research related to PBC, aiming to test if elections can explain changes in electricity supply in form of production and import.

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

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 hydropower plants. In addition to transmission constraints, limitations in financing have also hampered sufficient electricity imports, implying frequent interruptions in power supply since 2000. Table 1 gives an overview about the development concerning estimated demand, national production, imports and the resulting undersupply.

Table 1. *Electricity situation in Albania in GWh*

	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	3,123	4,818	5,394	5,357
Net Imports	1,002	1,750	2,227	937	567	385
Load Shedding	450	818	851	662	556	630
As percentage of Demand	7.3%	13.1%	13.7%	10.4%	8.5%	9.8%

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

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

Major problems are also the low tariffs which do not cover the costs, network losses and unpaid bills. As a results, the Albanian government has had to subsidize the state own electricity company KESH. In 2005, KESH produced a quasi public deficit of 1.8 percent of the GDP, implying losses to be covered by the public budget (World Bank: 2006: p 25).

There are different reasons for interruption of electricity. One of the main reasons is that more than 95% of electricity production, is based on hydro power (Nashi 2009), so oscillation in hydro deposit levels, affected by natural factors (rain, draught) directly affect the availability of electricity. The gap, between the 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 electricity.

Turning to household consumption, Albanians have still suffered under unmet basic needs. In 2002, based on the non income poverty indicators, every third Albanian has to be considered as poor and every 10th Albanian as extremely poor. Indicators as inadequate water and sanitation, inadequate housing, crowding or lack of education can only be influenced in the longer run. Meanwhile, the supply of electricity can be influenced even in the short run, as the electricity grid has a broad reach and therefore, electricity could be virtually everywhere available. In 2002, more than 13 percent of the Albanian households suffered under power shut offs for 6 hours or more per day (World Bank, 2003: p. 17).

Table 2. *Frequency of power supply interruption*

	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 has 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 compared to the South Eastern Region. As a result of the insufficient electricity sector, a loss of 2.7 to 5.4 percent of GDP is estimated for 2001-2002. Concerning the total costs, we have also to add cumulative investments in backup power supplies, roughly of the same extend the direct impact, however, spread over several years (World Bank 2006, p. 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 the wide use in the industry, electricity is a main source of heating and cooking for households. As already discussed before, supply of electricity in Albania, is characterized by systematic interruptions whose effects have been deemed as very negative for development of businesses, especially in some sectors, in addition to direct implications for households' well-being.

In this research work, we intend to test for possible statistically significant increase of electricity consumption, production and import before elections, in line with the incumbent interest to "please" voters, in order to increase likelihood to be re-elected. The time series of production, imports and consumption of electricity time are on monthly basis, spanning from M1-2000 to M12-2008 (from January 2000 to December 2008), adding up to 96 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.

Following the standard approach in this field, [2] we will apply the Intervention Analysis based on Box and Tiao (1975), a methodology for constructing a statistical model in our study. In this paper we test the hypothesis of the existence of changes in the supply – as production and imports – as well as consumption of electricity. Basically the test proceeds by subjecting the monthly seasonally adjusted time series

[2] 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.

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:

$$z_t = \mu + I_t + N_t$$

where μ denotes the mean level, the term I_t denotes the intervention effect and N_t denotes the noise of the time series which is modelled using a suitable ARMA(p,q) model,

$$N_t = \phi_1 N_{t-1} + \ldots + \phi_p N_{t-p} + E_t - \theta_1 E_{t-1} + \ldots + \theta_p E_{t-q}$$

where E_t denotes an independent error sequence.

The simplest, which corresponds to the t-test in a non-time series setting, is the Intervention term/variable, which in this case takes the form of a Pulse Intervention, meaning an abrupt jump in the series and then a gradual decline at the normal level of the series. Formally the pulse intervention term can be expressed as:

$$I_t = \omega_0 P_t^{(T)} \text{ where } P_t^{(T)} \text{ is a pulse function, } \quad P_t^{(T)} = \begin{cases} 0 & t \neq T \\ 1 & t = T \end{cases}$$

The parameter ω_0 measures the change caused by the intervention 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 or production or imports of electricity (each in MW/H) that is assumed to be affected because of elections. The intervention variable It is expressed as a binary variable (dummy variable) indicating a specific time prior to election, as shown below. And the noise component of each specific dependent variable, N_t, is modelled by an appropriate ARIMA (p,d,q) found by following Box-Jenkins (BJ) Methodology (1970) as explained in more detail below.

We have created two kinds of political dummy variables (It) to capture the impact of the elections on electricity related variables, namely cumulative dummy and discrete dummy. Note: For convenience we have denote $P_t^{(T)}$ with *PDi* standing for Political Dummy

We have six cumulative election political dummies (*PDi*) and each of them is defined as:

$$PD-3=\begin{cases} 1-\text{for the three months prior to election} \\ 0-\text{otherwise} \end{cases}$$

$$PD-2=\begin{cases} 1-\text{for the two months prior to election} \\ 0-\text{otherwise} \end{cases}$$

$$PD-1=\begin{cases} 1-\text{for the (one) month prior to election} \\ 0-\text{otherwise} \end{cases}$$

and, similarly, *PD1*, *PD2* and *PD3*, for the months after elections. 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 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 on the stationary 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 past history 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 thought 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.[3]

As mentioned above, more than 95 percent of the production of electricity comes from hydro-power. Therefore, it might be possible that the external, climacteric factors may affect the above mentioned results. This may hold for higher rainfall before the election time and an increase of the water level in the cascades of power central 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) or

[3] Gujarati (2003) makes a simple and clear explanation of the Box – Jenkins Methodology.

Production/Level (PROLEV) and use it as the dependent variable in conjunction with the election timing, instead of simple production (MWH). Therefore, we introduce the cascade level as an additional explanatory variable in the model to avoid any possible spurious regression problems.

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 *PDi* aiming at capturing the possible impact of elections on the dependent variable and test whether elections have any impact on the econometric time-series utilized by this study in addition to 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 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. These models manifested an acceptable fit as their residuals presented a pure white noise.

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.

In case of electricity consumption, the original series was as well 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 resulted 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 12.

Table 3. *Empirical Results*

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

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

Table 3 summarizes the main findings. Concerning the **electricity production**, the estimated coefficients are also confirming a "manipulative" behaviour of the incumbent party before the elections. All relevant cumulative political dummy variables have a 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. [4] 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 PDid. It results that the estimated parameters are significant only for PD-1d and not for the others, implying that the "manipulative" attempt focuses strongly on one month prior to elections. Finally, the estimated after elections periods parameters show significant decrease of the 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 month prior to election result. Therefore, external, climacteric 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.

Going on with **import 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 elections day comes closer (*PD-3<PD-2<PD-1*). The estimated coefficient for PDi shows an average increase from 42 to 78 GWH in the monthly

[4] 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.

absolute change of imports level prior to elections (DIMP). These changes equal 28 to 51 percent of the average monthly level of imports. The monotonically increasing behaviour is also evident when using discrete political dummy, although the dummies related to three and two months before elections are not significant in 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 political cycle also in this component.

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 (PD2d) is not significant at conventional levels and the third one (PD3 d) shows a significant decrease of about 24 percent of power consumption. The contraction after the election is also pretty evident and statistically 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 as far as we know for the first time in the PBC related literature, the use of publicly provided goods, in general, and the use of electricity supply, specifically for election purposes, thus bringing a new modest contribution to the PBC theory and empirics. There is a wide consensus that PBC lead 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 on household and business wellbeing. In this case we have two scenarios – if the incumbent looses 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, expects that "bounded" rational voters will forget somehow, after four years, during the next elections, and in their memory will loom more the "positive" experience in pre-elections months before next elections compared the "older" 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 in Western countries, and publishing the results will contribute to raising the awareness of the PBC existence, related disadvantages and importance of avoiding this phenomenon.

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Appendix

PRODUCTION

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PD-1	206723.8	65985.19	3.132882	0.0022
MA(12)	0.266739	0.096198	2.772822	0.0066
R-squared	0.126598	Mean dependent var		-508.1121
Adjusted R-squared	0.118280	S.D. dependent var		103031.1
S.E. of regression	96746.18	Akaike info criterion		25.81608
Sum squared resid	9.83E+11	Schwarz criterion		25.86604
Log likelihood	-1379.160	Durbin-Watson stat		1.840705
PD-2	159582.0	46195.30	3.454507	0.0008
MA(12)	0.270601	0.096207	2.812703	0.0059
R-squared	0.142002	Mean dependent var		-508.1121
Adjusted R-squared	0.133830	S.D. dependent var		103031.1
S.E. of regression	95889.27	Akaike info criterion		25.79829
Sum squared resid	9.65E+11	Schwarz criterion		25.84825
Log likelihood	-1378.209	Durbin-Watson stat		1.921842
PD-3	104612.7	38707.52	2.702645	0.0080
MA(12)	0.246735	0.096984	2.544068	0.0124
R-squared	0.108998	Mean dependent var		-508.1121
Adjusted R-squared	0.100512	S.D. dependent var		103031.1
S.E. of regression	97716.11	Akaike info criterion		25.83604
Sum squared resid	1.00E+12	Schwarz criterion		25.88599
Log likelihood	-1380.228	Durbin-Watson stat		1.989454
PD-2d	110594.2	68783.87	1.607851	0.1109
MA(12)	0.223662	0.097331	2.297948	0.0235
R-squared	0.070927	Mean dependent var		-508.1121
Adjusted R-squared	0.062079	S.D. dependent var		103031.1
S.E. of regression	99781.86	Akaike info criterion		25.87788
Sum squared resid	1.05E+12	Schwarz criterion		25.92783
Log likelihood	-1382.466	Durbin-Watson stat		2.140868
PD-3d	-1868.409	69814.02	-0.026763	0.9787
MA(12)	0.212600	0.097568	2.178991	0.0316
R-squared	0.048186	Mean dependent var		-508.1121
Adjusted R-squared	0.039121	S.D. dependent var		103031.1
S.E. of regression	100995.7	Akaike info criterion		25.90206
Sum squared resid	1.07E+12	Schwarz criterion		25.95202
Log likelihood	-1383.760	Durbin-Watson stat		2.047774

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PD1	-357776.9	59876.55	-5.975242	0.0000
MA(12)	0.243177	0.097426	2.496025	0.0141
R-squared	0.288952	Mean dependent var		-508.1121
Adjusted R-squared	0.282180	S.D. dependent var		103031.1
S.E. of regression	87292.35	Akaike info criterion		25.61043
Sum squared resid	8.00E+11	Schwarz criterion		25.66039
Log likelihood	-1368.158	Durbin-Watson stat		1.913812
PD2	-239556.4	43245.85	-5.539408	0.0000
MA(12)	0.244068	0.097422	2.505267	0.0138
R-squared	0.263995	Mean dependent var		-508.1121
Adjusted R-squared	0.256985	S.D. dependent var		103031.1
S.E. of regression	88811.09	Akaike info criterion		25.64493
Sum squared resid	8.28E+11	Schwarz criterion		25.69488
Log likelihood	-1370.004	Durbin-Watson stat		2.149879
PD3	-170395.7	36824.68	-4.627214	0.0000
MA(12)	0.222703	0.098214	2.267524	0.0254
R-squared	0.210971	Mean dependent var		-508.1121
Adjusted R-squared	0.203456	S.D. dependent var		103031.1
S.E. of regression	91954.55	Akaike info criterion		25.71449
Sum squared resid	8.88E+11	Schwarz criterion		25.76445
Log likelihood	-1373.725	Durbin-Watson stat		2.097978

ProLev

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PD1	538.0099	203.3373	2.645898	0.0094
AR(2)	-0.234087	0.096951	-2.414490	0.0175
MA(12)	0.464369	0.087796	5.289184	0.0000
R-squared	0.297506	Mean dependent var		6.924762
Adjusted R-squared	0.283732	S.D. dependent var		393.0454
S.E. of regression	332.6447	Akaike info criterion		14.48018
Sum squared resid	11286554	Schwarz criterion		14.55601
Log likelihood	-757.2096	Durbin-Watson stat		1.956480
PD2	331.3849	150.1460	2.207085	0.0295
AR(2)	-0.170470	0.098373	-1.732893	0.0861
MA(12)	0.440578	0.089361	4.930312	0.0000
R-squared	0.278732	Mean dependent var		6.924762
Adjusted R-squared	0.264589	S.D. dependent var		393.0454
S.E. of regression	337.0605	Akaike info criterion		14.50656
Sum squared resid	11588196	Schwarz criterion		14.58238
Log likelihood	-758.5942	Durbin-Watson stat		2.052477
PD3	175.4670	113.1892	1.550210	0.1242
AR(2)	-0.239724	0.096877	-2.474510	0.0150
MA(12)	0.440256	0.089642	4.911284	0.0000
R-squared	0.268081	Mean dependent var		6.924762
Adjusted R-squared	0.253730	S.D. dependent var		393.0454
S.E. of regression	339.5399	Akaike info criterion		14.52122
Sum squared resid	11759311	Schwarz criterion		14.59704
Log likelihood	-759.3638	Durbin-Watson stat		2.108063
PD-2d	1.726181	211.9958	0.008143	0.9935
AR(2)	-0.265941	0.096104	-2.767223	0.0067
MA(12)	0.434439	0.090368	4.807425	0.0000
R-squared	0.251364	Mean dependent var		6.924762
Adjusted R-squared	0.236684	S.D. dependent var		393.0454
S.E. of regression	343.3957	Akaike info criterion		14.54380
Sum squared resid	12027901	Schwarz criterion		14.61963
Log likelihood	-760.5495	Durbin-Watson stat		2.178206
PD-3d	73.18816	210.6066	0.347511	0.7289
AR(2)	-0.276882	0.095845	-2.888862	0.0047
MA(12)	0.436933	0.090078	4.850601	0.0000
R-squared	0.252160	Mean dependent var		6.924762
Adjusted R-squared	0.237496	S.D. dependent var		393.0454
S.E. of regression	343.2130	Akaike info criterion		14.54273
Sum squared resid	12015105	Schwarz criterion		14.61856
Log likelihood	-760.4936	Durbin-Watson stat		2.179767

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PD1	-947.4864	185.0989	-5.118812	0.0000
AR(2)	-0.300237	0.095930	-3.129768	0.0023
MA(12)	0.491610	0.084984	5.784741	0.0000
R-squared	0.406963	Mean dependent var		6.924762
Adjusted R-squared	0.395335	S.D. dependent var		393.0454
S.E. of regression	305.6331	Akaike info criterion		14.31080
Sum squared resid	9527979.	Schwarz criterion		14.38663
Log likelihood	-748.3171	Durbin-Watson stat		2.072460
PD2	-605.1977	147.9213	-4.091350	0.0001
AR(2)	-0.174401	0.103142	-1.690875	0.0939
MA(12)	0.460800	0.087766	5.250326	0.0000
R-squared	0.362272	Mean dependent var		6.924762
Adjusted R-squared	0.349767	S.D. dependent var		393.0454
S.E. of regression	316.9401	Akaike info criterion		14.38346
Sum squared resid	10246003	Schwarz criterion		14.45929
Log likelihood	-752.1315	Durbin-Watson stat		2.261936
PD3	-428.7299	103.2773	-4.151251	0.0001
AR(2)	-0.280074	0.095896	-2.920605	0.0043
MA(12)	0.471912	0.087458	5.395893	0.0000
R-squared	0.361134	Mean dependent var		6.924762
Adjusted R-squared	0.348607	S.D. dependent var		393.0454
S.E. of regression	317.2227	Akaike info criterion		14.38524
Sum squared resid	10264283	Schwarz criterion		14.46107
Log likelihood	-752.2251	Durbin-Watson stat		2.206271

IMPORT

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PD-1	78087.48	32282.64	2.418869	0.0173
MA(4)	-0.240877	0.095787	-2.514709	0.0134
R-squared	0.075551	Mean dependent var		645.1963
Adjusted R-squared	0.066746	S.D. dependent var		48602.39
S.E. of regression	46952.36	Akaike info criterion		24.37017
Sum squared resid	2.31E+11	Schwarz criterion		24.42013
Log likelihood	-1301.804	Durbin-Watson stat		2.170655
PD-2	56018.48	22979.75	2.437732	0.0165
MA(4)	-0.214867	0.096719	-2.221561	0.0285
R-squared	0.079247	Mean dependent var		645.1963
Adjusted R-squared	0.070478	S.D. dependent var		48602.39
S.E. of regression	46858.40	Akaike info criterion		24.36616
Sum squared resid	2.31E+11	Schwarz criterion		24.41612
Log likelihood	-1301.590	Durbin-Watson stat		2.231117
Inverted MA Roots	.68	.00-.68i	-.00+.68i	-.68
PD-3	41578.98	18804.68	2.211097	0.0292
MA(4)	-0.225347	0.096366	-2.338454	0.0213
R-squared	0.069364	Mean dependent var		645.1963
Adjusted R-squared	0.060501	S.D. dependent var		48602.39
S.E. of regression	47109.20	Akaike info criterion		24.37684
Sum squared resid	2.33E+11	Schwarz criterion		24.42680
Log likelihood	-1302.161	Durbin-Watson stat		2.218977
PD-2d	36946.79	33406.46	1.105977	0.2713
MA(4)	-0.171890	0.097468	-1.763556	0.0807
R-squared	0.039498	Mean dependent var		645.1963
Adjusted R-squared	0.030351	S.D. dependent var		48602.39
S.E. of regression	47859.15	Akaike info criterion		24.40843
Sum squared resid	2.41E+11	Schwarz criterion		24.45839
Log likelihood	-1303.851	Durbin-Watson stat		2.320321
PD-3d	9527.190	33472.87	0.284624	0.7765
MA(4)	-0.179690	0.097089	-1.850784	0.0670
R-squared	0.029005	Mean dependent var		645.1963
Adjusted R-squared	0.019757	S.D. dependent var		48602.39
S.E. of regression	48119.86	Akaike info criterion		24.41929
Sum squared resid	2.43E+11	Schwarz criterion		24.46925
Log likelihood	-1304.432	Durbin-Watson stat		2.267663

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PD1	-141475.7	30321.01	-4.665930	0.0000
MA(4)	-0.219792	0.096595	-2.275384	0.0249
R-squared	0.194252	Mean dependent var		645.1963
Adjusted R-squared	0.186578	S.D. dependent var		48602.39
S.E. of regression	43834.46	Akaike info criterion		24.23274
Sum squared resid	2.02E+11	Schwarz criterion		24.28270
Log likelihood	-1294.452	Durbin-Watson stat		1.988356
PD2	-47296.97	23273.30	-2.032241	0.0447
MA(4)	-0.174277	0.097359	-1.790039	0.0763
R-squared	0.065129	Mean dependent var		645.1963
Adjusted R-squared	0.056225	S.D. dependent var		48602.39
S.E. of regression	47216.28	Akaike info criterion		24.38138
Sum squared resid	2.34E+11	Schwarz criterion		24.43134
Log likelihood	-1302.404	Durbin-Watson stat		2.275984
PD3	-39394.73	18968.96	-2.076799	0.0403
MA(4)	-0.177736	0.097255	-1.827525	0.0705
R-squared	0.066670	Mean dependent var		645.1963
Adjusted R-squared	0.057782	S.D. dependent var		48602.39
S.E. of regression	47177.34	Akaike info criterion		24.37973
Sum squared resid	2.34E+11	Schwarz criterion		24.42969
Log likelihood	-1302.316	Durbin-Watson stat		2.178401

CONSUMPTION

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PD-1	0.238741	0.091810	2.600388	0.0107
MA(3)	-0.606766	0.050723	-11.96223	0.0000
MA(12)	0.563441	0.036774	15.32181	0.0000
R-squared	0.296999	Mean dependent var		-0.000110
Adjusted R-squared	0.283480	S.D. dependent var		0.195675
S.E. of regression	0.165634	Akaike info criterion		-0.730436
Sum squared resid	2.853199	Schwarz criterion		-0.655497
Log likelihood	42.07834	Durbin-Watson stat		2.201854
PD-2	0.193277	0.063621	3.037941	0.0030
MA(3)	-0.570620	0.051484	-11.08340	0.0000
MA(12)	0.571557	0.038386	14.88970	0.0000
R-squared	0.309743	Mean dependent var		-0.000110
Adjusted R-squared	0.296469	S.D. dependent var		0.195675
S.E. of regression	0.164126	Akaike info criterion		-0.748730
Sum squared resid	2.801478	Schwarz criterion		-0.673791
Log likelihood	43.05705	Durbin-Watson stat		2.146566
PD-3	0.050962	0.053885	0.945752	0.3465
MA(3)	-0.583645	0.051783	-11.27097	0.0000
MA(12)	0.577459	0.037180	15.53158	0.0000
R-squared	0.257044	Mean dependent var		-0.000110
Adjusted R-squared	0.242756	S.D. dependent var		0.195675
S.E. of regression	0.170276	Akaike info criterion		-0.675157
Sum squared resid	3.015363	Schwarz criterion		-0.600218
Log likelihood	39.12089	Durbin-Watson stat		2.358291
PD-2d	0.148651	0.093994	1.581488	0.1168
MA(3)	-0.570420	0.053127	-10.73697	0.0000
MA(12)	0.582475	0.039436	14.77020	0.0000
R-squared	0.267866	Mean dependent var		-0.000110
Adjusted R-squared	0.253787	S.D. dependent var		0.195675
S.E. of regression	0.169031	Akaike info criterion		-0.689831
Sum squared resid	2.971437	Schwarz criterion		-0.614892
Log likelihood	39.90597	Durbin-Watson stat		2.390489
PD-3d	-0.240430	0.086594	-2.776513	0.0065
MA(3)	-0.608685	0.053395	-11.39966	0.0000
MA(12)	0.595295	0.039856	14.93617	0.0000
R-squared	0.299437	Mean dependent var		-0.000110
Adjusted R-squared	0.285965	S.D. dependent var		0.195675
S.E. of regression	0.165346	Akaike info criterion		-0.733910
Sum squared resid	2.843304	Schwarz criterion		-0.658971
Log likelihood	42.26419	Durbin-Watson stat		2.289615

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PD1	-0.567149	0.076166	-7.446215	0.0000
MA(3)	-0.539565	0.050076	-10.77498	0.0000
MA(12)	0.599346	0.034663	17.29047	0.0000
R-squared	0.509810	Mean dependent var		-0.000110
Adjusted R-squared	0.500384	S.D. dependent var		0.195675
S.E. of regression	0.138310	Akaike info criterion		-1.091002
Sum squared resid	1.989484	Schwarz criterion		-1.016063
Log likelihood	61.36859	Durbin-Watson stat		2.247625
PD2	-0.303513	0.057970	-5.235713	0.0000
MA(3)	-0.554674	0.055018	-10.08162	0.0000
MA(12)	0.610965	0.034441	17.73968	0.0000
R-squared	0.408762	Mean dependent var		-0.000110
Adjusted R-squared	0.397392	S.D. dependent var		0.195675
S.E. of regression	0.151898	Akaike info criterion		-0.903576
Sum squared resid	2.399597	Schwarz criterion		-0.828637
Log likelihood	51.34132	Durbin-Watson stat		2.487681
PD3	-0.362618	0.067603	-5.363946	0.0000
MA(3)	-0.093596	0.099240	-0.943136	0.3478
MA(12)	0.342293	0.090448	3.784420	0.0003
R-squared	0.343131	Mean dependent var		-0.000110
Adjusted R-squared	0.330499	S.D. dependent var		0.195675
S.E. of regression	0.160107	Akaike info criterion		-0.798310
Sum squared resid	2.665967	Schwarz criterion		-0.723371
Log likelihood	45.70959	Durbin-Watson stat		2.159000

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