

Elections and inflation

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In search of a political business cycle

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Bachelor Thesis 2012

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ABSTRACT

Economies can suffer shocks connected to election seasons, a phenomenon especially prevalent in developing countries. This paper uses a large panel data set to examine the relation between elections and inflation, first coined by Nordhaus in his article “Political Business Cycle” in 1975. Through an inferential analysis, I find no evidence of inflationary jumps around election season on a global level from 1996-2009. Indications of an opposite connection are detected, and more research needs to be undertaken before any conclusions can be drawn.

KEYWORDS:

Elections, Inflation, Political Business Cycle

DISPOSITION

The paper consists of eight chapters. The first chapter introduces the subject and the aim of the paper. The following chapter offers a background in theory regarding the political business cycle and motivates the authors choice of theoretichal framework. Chapter three presents the data set used and reviews the weaknesses encountered in the data set. Chapter four executes empirical analysis, both descriptive and inferential. Results are presented in chapter five for each independent variable. In order to coorrect for effects attached to the regression, robustness tests are being undertaken in chapter six. The results are discussed in chapter seven, and conclusions are being drawn in chapter eight. References and data are presented in the end of the paper.

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LIST OF ABBREVIATIONS

CBI	C entral B ank I ndependence
CPI	C onsumer P rice I ndex
GDP	G ross D omestic P roduct
M2	Measure of money supply, including cash held by households and companies and bank deposits. Often used to denote money in circulation.
OECD	O rganization for E conomic C o-operation and D evelopment
PBC	P olitical B usiness C ycle

1. INTRODUCTION

The Norwegian Council for Africa spelled in September 2010 out fears of an increased spending in advance of the 2011 election in Nigeria, putting inflationary pressures on an economy with skewed distribution of income.

The impacts and prevalence of inflation during election season has been investigated by a number of scholars and the original theory the “Political Business Cycle” was coined by William D. Nordhaus in 1975. Recent studies have taken a fiscal spending approach, investigating government deficits but neglecting the shock effects increased spending can have on inflation. The Norwegian Council for Africa:

“Money politics that makes politicians want to loot in office to recover their “investment” is unhealthy. It stunts the growth of democracy and economic development.”

Elections, being the fundament of a democracy are viewed as a positive public good for the voters. But the existence of election cycles might distort economic well-being, inflating the economy through fiscal and monetary policies. This study investigates the prevalence of political business cycles on a global level during the last two decades. The findings give no evidence of inflationary tendencies during election season on an international level. Because of the lack of inferential proof, earlier theories on political business cycles cannot be verified. This sheds light on the fact that the PBC theory still is a field of research where the connection between elections and inflation demands more research before conclusions can be drawn.

1.2 PURPOSE OF STUDY

This study will investigate if there is a correlation between election year and inflation, for a wide set of countries. Alesina, Cohen and Roubini examined the topic for OECD-countries in

1992, and Shi and Svensson (2005) have made cross-country comparisons on governmental spending. But the vast amount of studies lacks examination on Political Business Cycles with inflation as a dependent variable for a large set of countries. My work will contribute to the political business cycle literature, by testing for changes in inflation around election season on a large panel data. It is the author's aim, that the large scope will enhance the understanding on political business cycles on a global level. Dispositionen, hur jag lägger upp det?

2. THEORY

2.1 FOUR CONCEPTS FOR STARTERS

When approaching the literature on elections and inflations, there are four elementary concepts (Shi & Svensson 2005, p.1369) that will be presented before examining the theoretical literature:

Information asymmetry – the electorate and incumbents have different access to information. The incumbents are aware of this, and in order to signal their competency before an upcoming election, fiscal and/or monetary instruments are being mobilized (raising transfers, lowering taxes, investing in high-exposed projects). But the leeway for policy actions and the available information for the electorate depend on the institutional constraints.

Institutional constraints – The monetary policy is often constrained by the central bank, setting the interest rate and controlling the money supply. Such actions limit the possibilities for a government to finance a social project during election season, aiming at increasing its' popularity. The press poses another institutional constraint, scrutinizing (to different extents) the politicians and making information accessible. Another indicator of the access to information is the dictated by the supply and prevalence of consumer communications such as computers, internet and cellular phones.

Incentives – since both information and financial policies are two ways of exerting an influence on the electorate, incumbents try to use these as tools for shaping the public opinion and to get re-elected.

Time inconsistency – Policies are time consistent when there are no incentives to diverge in the future from promises made in the past. The government can pledge to consistently keep the inflation rate low, but once there is an incentive to deviate from the promises - like in the

light of winning an election, the possibility of expanding demand and lowering unemployment may become too tempting.

2.2 NORDHAUS'S POLITICAL BUSINESS CYCLE

Abovementioned arguments ignited a debate in the 1970's on the interaction between economic and political factors, a field previously dominated by macroeconomic studies, taking political factors as exogenous (Nordhaus 1989, p.2). The new view on elections where economic and political factors interacted was pioneered by William D. Nordhaus, who released his theoretical paper named "Political Business cycle" (PBC) in 1975. He argued that incumbents aim at maximizing votes during election season. But since the electorate does not have perfect information, a striving incumbent do best in signaling his competence. How the competence is received depends on the conception of the electorate. The understanding of the electorates' characteristics would prove to become one of the main points dividing the scholars. Nordhaus claimed that the voters have little information on policies, and choose to form their expectations on incumbent parties based on past behavior. If the party running for re-election fails to reach these expectations, the voter will vote against the incumbent (Nordhaus 1975, p.172). Nordhaus's cycle was later named "the opportunistic cycle", analyzing the Phillipsian dilemma between inflation and unemployment.

There are a number of different Political Business Cycle Models, which will be polarized in order to motivate why I have chosen one of them – the opportunistic model – as the framework for this study. But first I will review previous findings.

2.3 PREVIOUS FINDINGS

2.3.1 Theoretical findings

Over the years, a handful of theories on elections and inflation has emerged. Hibbs focused on the political colors' influence on elections and their aftermath, and came to the conclusion that right-wing incumbents rather fight inflation than unemployment. Left-wing incumbents consider low unemployment as an end in itself, inflation being the mean to achieve it (Hibbs 1997, p.1467). Assumptions on the ideological preferences over the trade-off between inflation and unemployment (commonly named partisan theory) were further developed by Alesina, introducing partisan cycles. Left-wing governments were claimed to lower the unemployment and raise inflation at the beginning of term of office, opposite to right-wing governments. Compared with the PBC, Alesina argues that right-wing governments do show a pattern of growth and unemployment consistent with the view of Nordhaus' PBC. Whereas

left-wing governments' fight high unemployment and achieve economic expansion early in their terms. The pattern of output growth and unemployment has no support in Nordhaus's theories (1975). But partisan theories and the PBC share consensus on a pattern of pre-election financial expansion, and a shortsightedness among the politicians. At the end of the 1980's, Kenneth Rogoff released his theory on PBC's- "Political Equilibrium Political Budget Cycles" (1990), questioning Nordhaus's assumption on voters being naïve and retrospective. Rogoff argued that voters are rational and forward-looking and that both electorate and incumbents were utility maximizing. The paper introduces an "equilibrium framework", designed for analyzing how to mitigate electoral cycles (Rogoff 1990, p.2) He also included a measure for Central Bank Independency in the calculations.

Rogoff finds that efforts to mitigate the election cycles can prove to be counterproductive, because mitigation might impede the signaling process (incumbents efforts to convince the electorate of their competency) or by inducing politicians to choose more expensive ways to signal. Pre-election budget antics might be a socially efficient mechanism in order to diffuse up-to-date information about their competence (Rogoff 1990, p.4).

2.3.2 Empirical findings

After Nordhaus's release of the PBC, conclusions on the political business cycle were generally drawn upon studies of the US-elections until the late 1980's, (Chappell & Keech 1983; Alesina & Sachs 1987). During the 1990's and 2000's studies started to focus on OECD-countries (Alesina & Roubini, 1990) and developing countries (Brender & Drazen, 2003; Shi & Svensson, 2005). Alesina and Roubini tested for if GNP growth, unemployment and inflation are systematically affected by the timing of elections and changes in governments. They found no evidence for the opportunistic cycle of Nordhaus for either output or unemployment (except for 3 out of 16 countries). This is to be viewed in the light of a rational electorate (the authors used the theory of Rogoff) imposing limiting the leeway for incumbents pursuing opportunistic policies. For inflation, an electoral cycle was found, consistent with the budget cycle models outlined in Rogoff & Sibert (1988). Alesina & Roubini claimed further that opportunistic monetary and fiscal policies might be a rule rather than exception, when observing the changes in inflation (Alesina & Roubini 1990, p.31) But timing the expansions before election season might be hard to achieve (Alesina & Roubini 1990, p.30).

From a theoretical framework, one could argue that election cycles would be even more common among developing countries. With a short experience of electoral politics, a state-controlled media, the electorate's lack of information and a weak central bank, fiscal manipulation might prevail on a greater scale.

Brender and Drazen (2003) investigated this hypothesis, taking a state-focused perspective and investigating fiscal balance, revenues and expenditure in order to identify political fiscal cycles. They found political fiscal cycles being a phenomenon of new democracies. The cycles are allowed to proceed, since the electorate lack experience with electoral politics. Using models viewing the voters as "fiscal conservatives", the authors claim that once a country gains experience in electoral politics, the political fiscal cycle should disappear from the macro level (Brender & Drazen 2003, p.21).

Shi and Svensson (2005) do also take a fiscal approach to cycles. Examining a great panel of countries (85 countries between 1975-1995) the authors conclude that on average, government deficit as a share of GDP increases by almost one percentage point in election years. This implies that the fiscal deficit increases by 22% on average in election years. The political budget cycles are much larger in developing countries compared to developed countries, and statistically less biased. Strong institutional constraints on politicians in developed countries leave little room for seeking ego rents through expropriating public resources. Fiscal manipulations are also less effective, because of the supply of information to the electorate. The authors conclude how these institutional differences make a huge difference when estimating the size of the political budget cycle (Shi & Svensson 2005, p.1386).

2.3.3 Theoretical framework

This study on electoral cycles will not do explicit assumptions on the colors of the incumbents. The extent of data and diversity of countries, combined with the present time frames limits the research. Therefore, with the presumptions on a cycle, not sensitive for party affiliation, I dismiss the ideological (partisan) model. The model with ultrarational voters is based on the assumption that voters have the same access to information as parties and do not suffer from memory lapses and are forward-looking. Thus, the electorate cannot be fooled by politicians, why no political business cycles will emerge, which disqualifies the model from the study. The external shocks model predicts that shocks to the economy stems from external events. Here, the information attributed to the electorate matters a great deal. Voters with

perfect information will understand the force majeure nature of the shock, not blaming the party in office. Uninformed voters however, will blame the incumbents and vote them out of office (Nordhaus 1989, p.4ff). Because of the great sample of countries and the demand of data on information supplied to the electorate, I will not use the external shock model as a framework, since with an extensive panel data, the possibilities for identifying shocks are greater. The four models all take for granted that parties are perfectly competent, suggesting that Pareto-efficient outcomes would occur. Parties may act opportunistic or ideological, but are not wasting resources on inefficient actions. Rogoff and Sibert (1988) claimed that governments learn about their competence before the electorate, and are thus able to hide the incompetence until after the election (Rogoff & Sibert 1988, p.2). Because of the difficulties in determining the competence, especially on a larger scale, I choose to drop Rogoff and Sibert's assumption, gaining generalization but losing accuracy. One has to be aware that, when aiming for designing a model on politico-economic behavior, it is hard to detect any clear pattern. With the present diversity of institutions, party structures, sources of shocks and degrees of rationality and competence, I find a generalizable model more apt, and thus choose the opportunistic model by Nordhaus. The model's rather simple assumptions have to be seen in the light of generalization, not losing awareness of the effects that might prevail.

2.3.3.1 The opportunistic model

The opportunistic model is built upon assumptions of voters, parties, economic structure, sources of shocks and competence of parties.

- *Voters* assess the incumbent party based on past accomplishments, and do not look prospectively when deciding on what party to vote for. The electorate does not have perfect information.
- *Parties* are vote-maximizing opportunists. They use their power in order to win next election, rather than engaging in partisan politics.
- *The economic structure* outlines who controls the policy instruments. The opportunistic model assumes that parties have control over policy instruments, and policy is effective.
- *The sources of shocks* are internal to the economy and are assumed to come from political decisions.

- The parties are *competent*.

Parties, reacting on the lack of information and shortsightedness of the electorate, will use available policy instruments in order to signal their competence to the electorate, stimulating the economy close to election season. The model takes for granted that, in lack of good measures of performance, the electorate will rate the incumbent with economic measures (e.g. unemployment).

The behavior of the incumbent party is a typical time inconsistent act. Convincing the electorate of competence, especially when done through monetary policies postpones the burden of inflation to the future, in order to win the present election.

Politicians can use two tools to influence the economic situation: fiscal policy (taxation, raising transfers etc.) and monetary policy (changing nominal interest rates, controlling commercial banks' lending, currency boards etc.) To what extent do incumbents or politicians in general use the tools? If the central bank is independent, monetary tools are not available to use for short-run actions (such as financing by printing money). Another gatekeeper is the press, scrutinizing budget policies. The voters' readiness to control and question the policies depends on the economic situation, and incentives. If the economic situation is unsecure, some voters might seek short-run gains instead of peeking into uncertainty. Corruption does occur and as Rothstein among others writes, households' votes can be bought in exchange for subsidized food, shortened waiting-time for medical service and other advantages (Ahlbäck Öberg et. al, 2010).

3. DATA

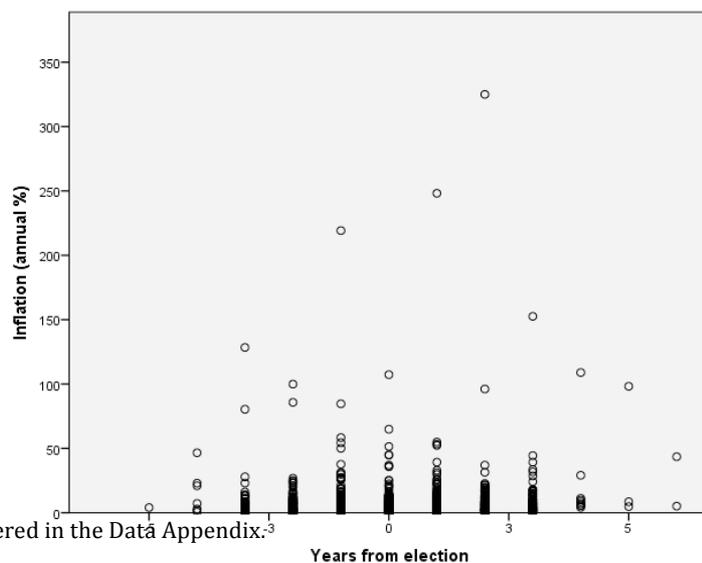
3.1 OVERVIEW

The panel data consists of cross-sectional and stationary data for 96 countries; including years of election, inflation (annual % change in CPI), GDP and a central bank independence index (CBI)¹ between 1996 and 2010. Inflation and GDP are downloaded from the World Bank’s database and the election data is extracted from the International Foundation for Electoral Systems (IFES) Election Guide². The central bank independence index is created by Cukierman et. al (1992) and modified by Polillo and Guillén (2005). I include the CBI, based on the general assumption that countries with a higher central bank independency have average lower inflation rates. This is supported by the empirical research of Alesina (1989) and Grilli, Masciandaro and Tabellini (1991). I have chosen not to include any data on freedom of press, since the panel data includes 96 countries, of whom many lack data on freedom of press over time.

Some countries conduct both legislative and presidential elections. These countries have not been included in the sample (given that the elections do not take place the same year) since it is hard to assess who controls financial and monetary policies - and even more important - who has an incentive to use the policy instruments for own gains. Some exceptions have been done, where the distribution of power

and incentives is well known (e.g. Germany). Election years have been counted if preceded and followed by a year of inflation data, and the election cycles are counted from 5 years before the election until 6 years after³.

Figure 1: Scatter plot of inflation and years from election



1

A thorough explanation of the variables is offered in the Data Appendix.³

² An international nonprofit organization launched and financed by the USAID.

³ Usually the electoral cycles are shorter, where 5 years is the average period between elections.

3.2 EXPLORING THE DATA

Plotting the observations of inflation reveal a group of outliers: Angola, Venezuela and the Democratic Republic of Congo display a number of high values, ranging from +200% to +4140% that will bias baseline findings on the panel data. The outliers have been deleted before the execution of a regression analysis. The regression analysis reveals the outliers violating the rule of 3 standard deviations from the mean value, which also has been removed. When erasing all the outliers (36), the mean changes from 11,93 to 6,27 and standard deviation changes from 111,46 to 6,27. The original sample included 1281 observations, and erasing 36 outliers (representing 2,8% of original sample) will not bias the outcome. The final sample consists of 1245 observations and 273 elections for 98 countries, which matches the requirements for sample size posed by Tabachnik and Fidell (p. 123, 2007): $N > 50 + 8 * (\text{number of independent variables})$. All observations have data on inflation and elections, but may have missing values for other variables.

Table 1: Descriptive Statistics

Variable	N	Mean	Std.		
			Deviation	Max	Min
inflation	1245	5,90	6,27	36,97	-10,07
no election	972	6,03	5,95	36,97	-10,07
election	273	5,44	5,33	36,10	-2,30
GDP	1448	11445,24	13230,38	74113,94	149,21
CBI	782	0,51	0,19	0,86	0,14

3.3 WEAKNESSES IN THE DATA

3.3.1 INFLATION

A critical attitude towards some of the data on inflation is sound, since some governments might act opportunistic and disclose some information to authorities, or lack the tools and infrastructure for collecting the data. The data on inflation may be biased by overall trends in inflation during the 1990's and first decade of 2000's. The character of inflation can pose a challenge, since high inflationary countries are prone to higher fluctuation. A higher variation could create heteroscedastic variables, which will be investigated in the regression analysis.

Other shocks influencing the price level are changes in oil prices and fluctuations on the commodity market. From the descriptive analysis on the data, both Venezuela and Turkey suffered from high and fluctuating inflation in the 1990's¹. Caution must be taken, since inflationary jumps might occur because of other factors not captured by the regression model. This will be corrected by including a time dummy in the regression, mitigating any time trends influencing the data.

3.3.2 CENTRAL BANK INDEPENDENCE

The CBI-index lacks comprehensiveness, offering observations for 49 of the 98 countries. The Cukierman CBI-index suffers from some short-comings: Lohmann (1998) points out that taking a legalistic approach when measuring central banks can be problematic. An extremely independent central bank as the German Central Bank are bound to react to political pressures, when it's institutional basis are undermined by political coalitions. Pointing out the gap between legal code and institutional practice clearly shows that measuring independency from a strictly legal perspective can prove misleading, both when analyzing developed and developing countries.

¹See Figure A1 in Appendix.

4. EMPIRICAL ANALYSIS

4.1 DESCRIPTIVE ANALYSIS

Executing a new scatter plot for the panel data without outliers, the majority are scattered between -1 to +1 years from election. This is expected, since the choice of data on election years has been chosen if preceded and followed by 1 year of inflation data. Although the concentration of observations around election year is more lower and more

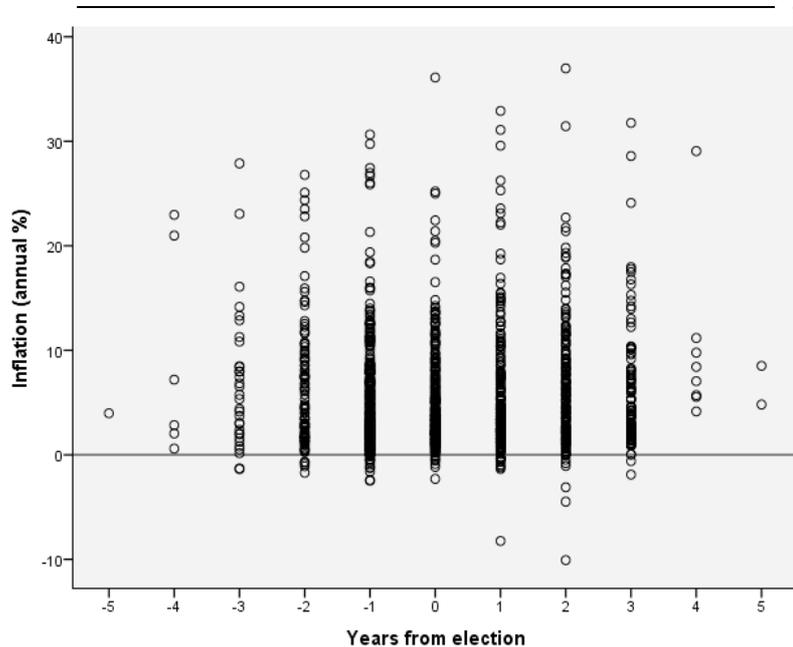
compact, the amount of variables in year -1 and +1 with higher inflation is too few to have any statistical connection between election year and inflationary jumps. Interpreting the Nordhaus's PBC, the plot would have been triangular-shaped, either peaking the election year or the following years. Thus, no evidence for a global PBC can be found on a descriptive level.

4.2 TESTING THE ASSUMPTIONS

Before executing a regression analysis, I will test the assumptions of normality, bivariate correlation homoscedasticity and multicollinearity. Autocorrelation will not occur, since the regression includes time dummies. The panel data has been checked for normality, and standardized residuals of more than 3.3 or less than -3.3 has been deleted, following the recommendations of Tabachnik and Fidell (2007, p.156).

Loungani and Sheets (1997, p.381) argues that real GDP growth is negatively correlated with central bank independence. This study takes annual GDP in account, and thus should not depend on the other dependent variable, central bank independence. But for safety reasons, I test the dependent variables in a correlation analysis. None of the coefficients show VIF-

Figure 2: Scatter plot of inflation and years from election, outliers removed



values exceeding 3,5¹, which concludes no case for multicollinearity. For correlation I have used the Pearson Correlation values, and no variables show any sign of bivariate correlation.² The correlation values were generally low, suggesting that the connection might be weak for the formulated model. The correlational issue will be covered more thoroughly in the section Regression Analysis.

In order to remove trend effects from the data, time dummies are added to the specification. The time dummies have been tested and proved to be independently significant according to the values of an F-test. Due to the limitations of the software³, I am not able to mitigate heteroscedasticity by running a regression with robust standard errors. In order to hedge out the risks of heteroscedasticity, I will revise the panel data. Since the majority of the panel data is collected by the World Bank, I presume a smaller likeliness of making errors during the collection. Outliers, another factor for heteroscedasticity, have previously been deleted. Variances in the inflation data are likely to produce different variances in the residuals, which might produce heteroscedasticity. Since the standard errors sharply declined when deleting the outliers (see Data Section), I will reject this argument. When plotting the dependent variables against the independent variable, no form possibly violating the assumption of homoscedasticity could be detected. For the panel data, heteroscedasticity could appear in the cross sectional data. Gujarati (2002, p.394) argues that even in the case of heteroscedasticity, the coefficient will be linear unbiased and consistent. But it is not efficient and thus no longer has the minimum variance. This could lead to a biased inference when executing the regression, and the possibility of rejecting a null hypothesis, even if the null hypothesis is not characteristic for the population (type II error). Another source of heteroscedasticity is that the function might not be correctly specified, resulting in wrong functional form. Relying on previous studies⁴ that include this study's variables, I reject the suspicion of wrong functional form.

¹ See table A2 in Appendix.

² See table A3 in Appendix.

³ SPSS version 5 does not offer running a regression with White-corrected robust standard errors, given that the user not has knowledge of how to construct a script.

⁴ Alesina, Roubini and Cohen (1992) investigate political business cycles in industrial economies using the rate of growth in monetary base as dependent variable. This study will use inflation as the dependent variable.

4.3 REGRESSION ANALYSIS

To test the PBC hypothesis on the pooled cross-section time-series data, the following panel regression was run:

$$INFL_{it} = \beta_0 + \beta_1 ELE_{it} + \beta_2 \ln_GDP_{it} + \beta_3 CBI_{it} + \beta_4 REG + \beta_5 YEAR + \varepsilon_{it}$$

Where $INFL_{it}$ is the annual rate of inflation for region i at time t . ELE_{it} is the election dummy, taking a value of one the year an election is held. The PBC theory argues that the coefficient of ELE_{it} should be positive and significantly different from zero, indicating that the inflation rate is higher during election year. \ln_GDP_{it} is the natural logarithm of GDP, influencing the inflation rate if significantly different from zero. The CBI_{it} is the central bank independence index which is expected to be negative (for OECD-countries) and significantly different from zero, based upon the abovementioned research of Grilli, Masciandaro and Tabellini (1991). REG is a region dummy¹, having the value one if representing the specified country. I include the region dummy suspecting to detect region-bound differences, errors that might be correlated between countries because of increased linkages. $YEAR$ is a time dummy for the years 1996-2009, which will detect any trends (e.g. oil-booms, crises and fluctuations in commodity prices) influencing the price level. The last two dummies cover fixed effects.

My hypothesis assumes a linear regression model predicting the inflation for the panel data. Since the variance among our GDP variables are not constant, and spanning over such a huge and diverse set of countries, I log the values in order to give the values with great variance lesser importance in the analysis.

¹ Countries in the sample and their respective regions are listed in the Appendix, Table A4.

Table 2: Regressions

Dep. Variable: Inflation			
Regression	1	2	3
Method	Fixed effects	Fixed effects	Fixed effects
constant	1,681** (0,803)	24,571*** -3,030	25,702*** (4,733)
ELE	-0,374 (-0,600)	-0,351 (0,586)	-0,354 (0,793)
ln_GDP		-2,242*** (0,287)	-2,249*** (0,388)
CBI			-1,312 -2,740
dum_south america	6,140*** (1,013)	3,187** (1,059)	2,874 (1,574)
dum_central america	2,919*** (0,813)	-0,320 (0,879)	-0,470 (1,501)
dum_north america	-0,736 (1,804)	,046 (1,764)	-0,423 (2,581)
dum_oceania	-0,404 (1,805)	-0,356 (1,762)	-1,071 (2,813)
dum_south asia	0,837 (1,806)	-2,608 (1,817)	-3,439 (3,009)
dum_east asia	4,050*** (0,918)	-1,077 (1,111)	-1,542 -1,790
dum_middle east	2,071** (1,006)	-0,995 (1,058)	-1,562 (1,857)
dum_subsahara	6,568*** (0,766)	0,72 (1,118)	-0,423 (1,832)
timedummies (1996-2008) included			
R2	0,118	0,160	0,161
R2 (adj)	0,102	0,144	0,130
N	1338	1338	766

Standard errors in parenthesis.

Region dummy "Europe" and time dummy "2009" have been left out.

*p<0.1

**p<0.05

***p<0.001

5. RESULTS

5.1 GDP

The variable \ln_GDP is significant throughout the tests on a 1% level, and increase the goodness of fit (adjusted R^2) from 10,2% to 14,4%. Since \ln_GDP raise the goodness of fit, I ran some different regressions, with and without the present variable. The results show that GDP on average raise the level of explanation 4,5 percentage points. Thus, GDP is an important coefficient when trying to explain different levels of inflation in our panel data. This proves that GDP is an important explaining variable when to know what determines the level of inflation. Even though a higher GDP in some south american countries proved to raise inflation, the absolute level of GDP lower a countries price level with 2,24 percentage points per unit logged GDP.

5.2 REGIONS

The coefficients for Central America are significant at 1% in regression 1. I therefore run a regression exclusively on Central America as a region. Both logged GDP and the CBI are significant, at 5% and 1% respectively. A coefficient of 20,959, claiming that with every unit of more Central Bank independence, the inflation raise with almost 21%. Rejecting the CBI might be wrong, but as mentioned in the data section has the CBI-index not proven apt for countries where the legal and institutional practices diverge. Does this tell us more about the character of the CBI-index or of the Central America as a region? Historically, Central America has proven to show some signs of PBC's. This study's relatively updated data, stretching from 1996-2009, focuses on the latest 14 years, when a great deal of institutional reform has been done (Dayton-Johnson et. al 2011, p.9). However, the results of the regression pose arguments against such theories. In South America, Central Banks Independence has no significance but GDP is significant at the 5% level with a surprising coefficient value of +4,411. When logged GDP increases by one unit, this trickles down on inflation, raising it by 4,4 percentage points. This might seem odd since for all countries, GDP on a global level decreases inflation. To what extent are the national economies of South America being influenced by inflation? Large government and a huge dependency on commodity prices (Venezuela and Bolivia) might well influence the respective price levels, given these are substantial and not captured by the time dummies. In the same regression on the central-american region, GDP displays a coefficient value of -1,259 at a significance level

of 5%, which questions our first findings. In the case of Central America, land dummies might have been preferred, because of the diverse results and different politico-economic structures in the region.

The Sub-Saharan group shows a significant value for the CBI-coefficient at a 5% level, lowering the inflation with 41% per unit CBI, an astonishing result seemingly too high for the region. The connection of central bank independence to inflation is strong; the coefficient of -41,24 suggests substantial decreases on the price level with a more independent central bank. But in the panel data, only 8 out of 25 countries have a CBI-data. This proves some explanation that the sample is not proving a population large enough to conclude the connection.

When including the natural logarithm of GDP, every region dummy but the south-american one loses its' significance at the 10% level. This suggests that the trend of an overall higher and fluctuating inflation in South America, confirmed by a relatively high mean and standard errors¹.

The election dummy is not significant in any of the groups. With a p-value never reaching a 10% significance, and coefficient-values of ± 1 (except for Sub-Sahara, displaying -2,5) clearly suggest that we cannot find evidence for any inflation jumps during election season, neither can the model be rejected (because of the insignificance) in the light of the last two decades' experiences.

5.3 ELECTION DUMMY

Regressions made do often display insignificant or values close to insignificance for the election dummy. The values range from -1.1 to -0.5, suggesting that inflation decreases during election year, on the contrary to what many scholars have suggested, launching a political business cycle. Because of the insignificant results, further research is needed, to validate any correlation.

5.4 SUMMARY

Since no earlier studies have been done on such a huge and diverse set of countries, it is hard to conclude if the results are biased or just insignificant. Price level decreases during election

¹ See table A5 in Appendix.

year could be the result of a lagged effect of increased public spending, postponing the inflationary effects. To test this, I will perform a robustness test.

6. ROBUSTNESS TEST

I ran a number of robustness tests on the results reported above. First, the original election dummy does not take into account whether election is taking place early or late in the observed year. Thus, we have reasons to believe that there might be lags attached to the expected effects of inflationary jumps. To capture this timing effect, I constructed two new election dummies: one for the year preceding the election (ELE_{t+1}) and one for the year following the election (ELE_{t-1}).

Table 3: Robustness tests

Dep. Variable:						
Inflation						
Regression	4	5	6	7	8	9
Method	Fixed effects	Fixed effects	Fixed effects	Fixed effects	Fixed effects	Fixed effects
Constant	1,646** (0,788)	24,546*** (3,027)	25,629*** (4,729)	1,508* (0,799)	24,142*** (3,029)	25,511*** (4,736)
dum_ELE_t-1	-0,444 (0,611)	-0,435 (0,597)	-0,441 (0,807)			
dum_ELE_t+1				0,185 (0,632)	0,235 (0,617)	0,217 (0,836)
ln_GDP		-2,242*** (0,287)	-2,250 (0,388)		-2,244*** (0,287)	-2,251*** (0,388)
CBI			-1,328 (2,740)			-1,271 (2,743)
dum_south america	6,144*** (1,013)	3,19** (1,059)	2,874 (1,574)	6,184*** (1,013)	3,193** (1,059)	2,890* (1,575)
dum_central america	2,927*** (0,813)	-0,250 (0,879)	-0,469 (1,501)	2,939*** (0,813)	-0,014 (0,879)	-0,439 (1,502)
dum_north america	-0,754 (1,804)	0,280 (1,764)	-0,447 (2,581)	-0,751 (1,805)	0,300 (1,765)	-0,424 (2,581)
dum_oceania	-0,388 (1,805)	-0,339 (1,762)	-1,062 (2,813)	-0,444 (1,805)	-,397 (1,762)	-1,089 (2,813)
dum_south asia	0,84 (1,805)	-2,608 (1,816)	-3,449 (3,009)	0,893 (1,805)	-2,554 (1,817)	-3,360 (3,012)
dum_east asia	4,049 (0,918)	-1,080 (1,11)	-1,551 (1,790)	4,078*** (0,918)	-1,052 (1,110)	-1,504 (1,791)
dum_middle east	2,070** (1,006)	-0,997 (1,057)	-1,571 (1,857)	2,082** (1,006)	-,985 (1,058)	-1,535 (1,859)
dum_subsahara	6,574*** (0,766)	0,750 (1,117)	-0,425 (1,831)	6,593*** (0,766)	0,092 (1,118)	-0,387 (1,833)
Time dummies included.	(1996-2008)					
R2	0,118	0,160	0,161	0,118	0,160	0,160
R2 (adj)	0,102	0,145	0,130	0,102	0,144	0,130
N	1338	1338	766	1338	1338	766

Standard errors in parenthesis.

Region dummy "Europe" and time dummy "2009" have been left out.

*p<0.1 **p<0.05 ***p<0.001

6.1 ROBUSTNESS ANALYSIS

Regressions ran with one-year-election lag do not change the values of the election dummy, nor does it become significant. The election dummy can thus not prove any effects of changing price level during and around election season. The PBC model cannot be rejected because of the insignificant value of the coefficients. On a regional level, the coefficients for the South America dummy in the 9th regression turned significant on a 10% level, stating that South America has 2,89% higher inflation rate than Europe. How does the interacting effect with the ELE_{t+1} raise the significance for the South America coefficient? Since the coefficient is not highly significant (10%) and turned significant in the third regression, it would be far-fetched to draw any strict conclusions. The goodness of fit (R^2 -values) remains the same.

Because of the absence of significance among the coefficients, the model might be specified wrong and lacking variables. Therefore, I included unemployment as an independent variable, following Nordhaus's theory on the Phillips-cycle, highlighting the trade-off between unemployment and inflation. The unemployment coefficient proved to be insignificant, and did not raise the goodness of fit.

6.2 PATHS OF INFERENTIAL IMPROVEMENT

In order to gain greater significance for the results, I will present some technical and data modifications, aiming at improving the quality of a future inferential analysis.

6.2.1 REGIONAL DUMMIES

Regional dummies might not prove apt when describing a larger population of countries, given that these countries are fundamentally different. The differences could prevail on national as well as regional levels. The electorate, lacking traditions of electoral politics, a limited media and/or free press¹ diverges between countries, especially in the Middle East region. The incentives of staying in power also matter, especially if there are many ego rents for politicians to reap. Thus, time inconsistent behavior may prevail. Institutions enforcing free press and electoral rights and scrutinizing the government also differ between countries. Land dummies could mitigate possible biases from region dummies, failing to describe the countries characteristics. But some of the region dummies carry only a small sample of countries², still not gaining any significance. The regions considered, Oceania and North

¹ Included as a dependent variable in Shi and Svensson 2005.

² See table A4 in Appendix.

America, are geographically close and similar economies, which supports the argument that the greater regions with higher divergence would benefit in an inferential analysis from land dummies.

6.2.2 THE CENTRAL BANK INDEX

The Central Bank Index of Polillo and Guillén has been criticized, and do not contribute with any explanation for our regressions. As mentioned earlier, the index offers greater accuracy when applied on countries with small divergence between juridical and institutional practice. Assessing the quality of the CBI for each country, and applying it judiciously might improve the inferential accuracy.

6.2.3 THE ELECTION DUMMY

The election dummy is simple, registering elections on a year-basis. Thus, it is hard to monitor effects and swift changes that might occur. Quarterly data on inflation and a more specific election variable could catch possible effects. But for an extensive panel data, supply of such detailed information is scarce.

6.2.4 INFLATION

Inflation is in this study measured as the annual percentage change in CPI. Alesina et. al (1992) also revised the empirical proof of PBCs for larger set of countries, but used "growth of money supply" as the dependent variable. The dependent variable in this study, inflation, might be more general and lack the precision of "growth in the monetary base" when detecting opportunistic monetary operations. However, the aim of this study is to analyze what implications political shocks has on for the consumer, and thus CPI is a more apt measure for the impacts on the consumer. Alesina's study found that the year of election was not significant and also had the wrong sign, implying that the monetary base did decrease during elections (Alesina et al 1992, p.13-14)

6.2.5 UNEMPLOYMENT

Nordhaus's original PBC treated the Phillippsian trade-off between unemployment and inflation, a phenomenon that partisan models connected to the ideological position of the party. According to the findings of this study, no proof can be given for increasing inflation during election season, but unemployment as a dependent variable has not been tested. There

might be some findings on a partisan model, but a test that rejects a left-wing government¹, will not attribute all the observed elections to inflation averse parties, since we assume that the elections are normally distributed for left- and right-wing governments.

¹ Left-wing parties give higher priority to low unemployment than stabilizing the price level, according to the partisan theory.

7. DISCUSSION

Using the arguments of Nordhaus's opportunistic model outlined in the theory section, I will assess the results of the inferential analysis.

7.1 PARTIES

Parties are interpreted as opportunistic in the model, striving for re-election and maximizing the votes. The findings cannot exclude nor confirm this point, but broaden the spectra of the incumbents. The lack of findings for opportunism shed light on alternative models such as the partisan, where the motivations are ideological and not simply opportunistic and vote-maximizing. The partisan model lack ability to explain the absence of price increases, since impeded by it's rather two dimensional view of parties as either pro-employment or inflation averse. As Alesina points out, (Drazen 2001, p.117) one policy does not have to exclude the other. Parties may use policies different, depending on the characteristics of the electorate (or, if vote-maximizing, the median voter) and the economic situation.

7.2 VOTERS

Drawing conclusions on the electorate should be done with caution, since the model does not register who wins the elections, and thus cannot detect patterns of electoral behavior. The opportunistic model argues that voters asses the incumbent party based on past accomplishments, and do not look prospectively when deciding on what party to vote for. According to the argument, there would be no use in giving up the short-run gains of generous public spending before an election. The time inconcistent public spending and the electorates' imperfect info can be questioned from the findings. If the electorate lacks perfect information, this would create a leeway for pre-election spending, given that the party not deviate from the vote-maximizing aims.

7.3 THE ECONOMIC STRUCTURE

The opportunistic model assumes that parties have control over policy instruments, and policy is effective. The findings show no signs of an opportunistic model, or that the policy instruments may not have influence on the real economy. However, if the politicians are opportunistic, the policies *might* not work. Or the politicians are not opportunistic and the policy instruments work. Considering issues of timing of shocks, the robustness test cannot find evidence for lags in presumed election shocks.

7.4 THE SOURCES OF SHOCKS

The Nordhausian model argues that shocks are internal to the economy and are assumed to come from political decisions. Since the robustness test and fixed effects regression mitigates for external effects, I cannot exclude the theory nor do I find evidence for internal shocks stemming from political decisions. If elections for the set of countries analyzed do not pose shocks to the economies, it is time to question if the period of 1996-2009 displays certain characteristics or trends in politico-economic policy-making. This period is marked by global growth and a raise in multinational interdependency. But assuming that the benefits of growth trickled down to the state level making pre-election spending unnecessary would be much of a far-fetched argument. Differences on national levels do still prevail, and governments' ability to collect ego gains has not diminished globally over a decade. Institutions and behavior even more, do not change overnight.

Since a majority of the studies on PBCs during the last decade have focused on fiscal policies, I will discuss the relation between fiscal and monetary policies briefly.

7.5 FISCAL VS. MONETARY POLICIES

In line with Drazen (2001, p.99), the role of PBC might hold for manipulations of fiscal policy, and for less of monetary policy. Even though fiscal policy instruments may not be as direct as strictly monetary operations, i.e. increasing the M2, an inflationary effect stemming from fiscal spending cannot be excluded. Wooley (1984) and Beck (1987) argue that the central bank rather follows the executive branch's demands for monetary policy during election year, avoiding too high fluctuations in the interest rate. But these statements are based exclusively upon examining the U.S Central Bank Federal Reserve, and cannot be taken valid on a global level.

Shi and Svensson (2005) found that running a government deficit prior to election prevails on a larger scale in developing countries. Since the governments in developed countries often are large (supported and sometimes fueled by foreign aid) and play a major part in the domestic economy, any increased spending would probably influence the price level. Even though a large part of the economies are made up by the informal sector, some price increases will eventually trickle down. The pre-election stimuli of generous election promises also gain more through publicity, and thus do not stay in the informal sector. Alesina argues in Drazen that the aspects are more profound than the choice between fiscal or monetary tools.

8 CONCLUSION

The PBC developed by Nordhaus argued that economies suffer from an inflationary jump during or connected the election season. I find no evidence for inflation jumps around election year on a global level during the years 1996-2009. On the contrary to Nordhaus's theory on Political Business Cycles, my regressions show that applying such a model give no statistically robust results. Thus, I conclude that the theory cannot be rejected. The inferential tests of this study show no signs of connection between elections and increasing inflation. Instead, the analysis shows some signs of a decrease in inflation during election season. These results are not significant, but the trend towards lower inflation is interesting since it questions opportunism in politics and the prevalence and effect of government policies. Is there a political business cycle at all? Earlier Studies on fiscal spending (Shi & Svensson, 2005) has detected a pattern of pre-election government spending. However, this study cannot verify that the policies result in a price level increase.

The effect of GDP on inflation is significant and negative throughout my tests, suggesting that GDP is a true determinant for lower inflation on a global level. Earlier, the rate of GDP growth has proven to be a negatively correlated to inflation (Fischer 1993). With these new findings, it can be concluded that the relative level of GDP determines inflation. The origin of the effects is yet to be explored, but a correlation between institutional stability and GDP might prove crucial in the argumentation. Lohmann (1998) examines the differences between juridical and institutional practice and one of the indicators of a refined and established institutional might be the relative level of GDP, offering an explanation to the confusing results of the central bank independence earlier in this paper. Another important characteristic of a relatively high GDP could be institutional convergence, occurring where high levels of GDP and geographic proximity is present. For further research an interesting take would be to assess the accuracy of CBI. With the findings of GDP determining inflation, that might be a better indicator of a country's price level. The question remains, if it is the most precise instrument or if a refined central bank index could raise the significance of the regression.

Future fields of research is to test the PBC on a panel data set with a greater supply of times series data and more precise variables on election, government deficit, growth of money supply and data on the ideological position of the parties.

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9.2 DATABASES

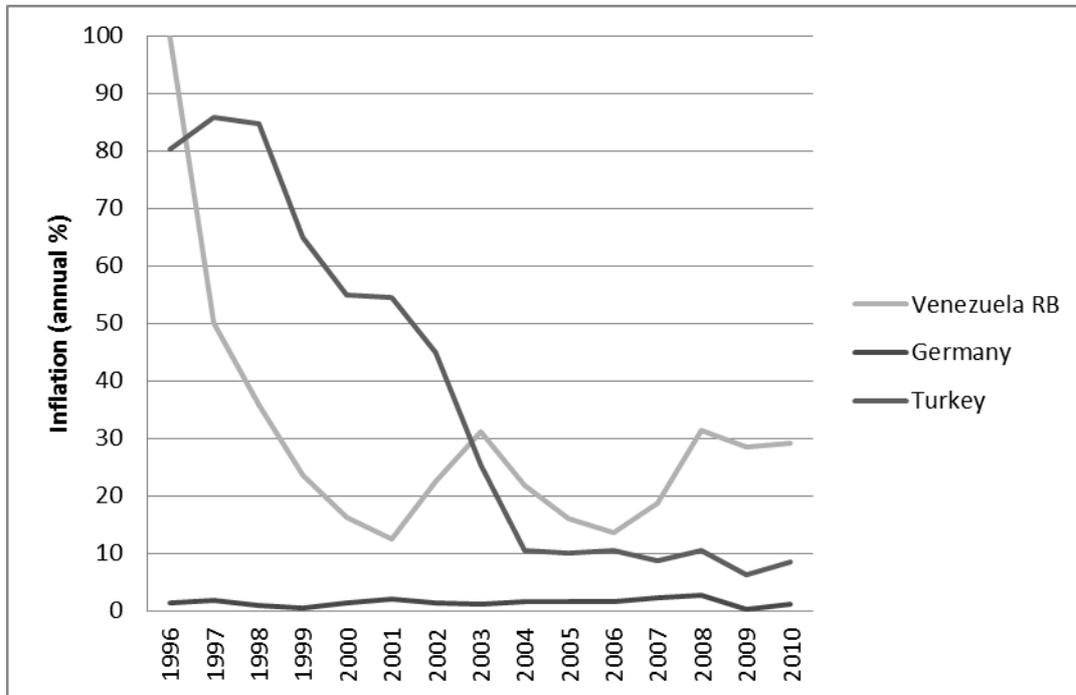
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10 APPENDIX

10.1 FIGURES

Figure 1A: Inflation 1996-2010



Germany added as a reference point.

10.2 TABLES

Table A1: Regions and countries

Variable	Data specification
Inflation	Measured by the consumer price index and reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.)
Gross Domestic Product	GDP per capita based on purchasing power parity (PPP). PPP GDP is gross domestic product converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2005 international dollars.
Central Bank Independence	The proxy for central bank independence is obtained from Cukierman-Webb-Neyapti's Central Bank Independence-index, modified by Polillo and Gulli�n (2005). The index is based upon an aggregate legal index and three indicators of actual independence: the rate of turnover of central bank governors, an index based on a questionnaire answered by specialists and the rate of the turnover. Time series cover the years 1989 – 2000. Due to lack of data for time series spanning from 2000-2009, some CBI-variables have been created through a weighted average.

Table A2: Collinearity Statistics

Model	VIF
(Constant)	
dum_election	1,046
time dummy 1996	1,408
time dummy 1997	1,419
time dummy 1998	1,392
time dummy 1999	1,378
time dummy 2000	1,396
time dummy 2001	1,392
time dummy 2002	1,400
time dummy 2003	1,402
time dummy 2004	1,403
time dummy 2005	1,413
time dummy 2006	1,400
time dummy 2007	1,410
time dummy 2008	1,406
time dummy 2009	1,411
reg_centralamerica	2,066
reg_northamerica	1,419
reg_southasia	1,266
reg_oceania	1,466
reg_middleeast	1,676
reg_southamerica	1,519
reg_eastasia	1,377
reg_europe	3,121
ln_GDP	2,840
Central Bank	1,768

Table A3: Correlation Statistics

Pearson Correlation	
Model	Inflation
Inflation	1,000
dum_election	-,051
time dummy 1996	,118
time dummy 1997	,092
time dummy 1998	,029
time dummy 1999	-,048
time dummy 2000	-,033
time dummy 2001	-,037
time dummy 2002	-,019
time dummy 2003	-,004
time dummy 2004	-,029
time dummy 2005	-,008
time dummy 2006	-,021
time dummy 2007	-,029
time dummy 2008	,103
time dummy 2009	-,056
reg_subsahara	,196
reg_centralamerica	-,032
reg_northamerica	-,068
reg_southasia	-,042
reg_oceania	-,063
reg_middleeast	-,050
reg_southamerica	,089
reg_eastasia	,022
reg_europe	-,172
ln_GDP	-,324
Central Bank	-,092

VIF-values are well below the limit 10, posed by Pallant (2007, p.156).

None of the Pearson Correlation values reaches the limit of 0,7 (Pallant 2007, p.155), which concludes no multicollinearity.

Table A4: Regions and countries

Central America	Europe	North America	Sub Sahara
Antigua and Barbuda	Belgium	Canada	Angola
Bahamas, The	Cyprus	United States	Benin
Barbados	Denmark		Burundi
Belize	Estonia	Oceania	Cameroon
Costa Rica	France	Australia	Cap Verde
Dominican Republic	Germany	New Zealand	Comoros
			Congo
El Salvador	Ireland		Republic
Grenada	Italy	South America	Congo, D.R
Guatemala	Luxembourg	Argentina	Ethiopia
Guyana	Moldova	Bolivia	Gambia
Haiti	Netherlands	Brazil	Ghana
Honduras	Norway	Colombia	Kenya
Jamaica	Spain	Ecuador	Liberia
Mexico	Sweden	Paraguay	Malawi
Nicaragua	Switzerland	Peru	Mali
Panama	Turkey	Uruguay	Mauritius
St. Kitts & Nevis	United Kingdom	Venezuela RB	Mozambique
St. Lucia			Niger
St. Vincent & the Grenadines			Nigeria
			Seychelles
			South Africa
East Asia and Pacific	Middle East and North Africa	South Asia	
Bangladesh	Bahrain	Hongkong SAR,China	Sudan
Cambodia	Iraq	Nepal	Swaziland
Fiji	Israel		Tanzania
Indonesia	Jordan		Uganda
Lao PDR	Kuwait		Zambia
Malaysia	Morocco		
Papua New Guinea	Pakistan		
Phillipines	Tunisia		
Samoa	Yemen Rep.		
Solomon Islands			
Tonga			
Vietnam			

Table A5: Regional Inflation

Region	Mean	St. Deviation	N
Central America	5,82	5,37	276
East Asia & Pacific	6,95	7,99	178
Europe	2,98	3,51	246
Middle East & North-Africa	4,98	6,04	132
North America	2,17	0,89	30
Oceania	2,49	1,09	30
South-Asia	3,78	4,45	30
Sub-Saharan	9,49	14,46	357
South-America	8,97	7,7	129