Political Monetary Cycles: An Empirical Study

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Abstract

The literature analysing how political events may impact monetary policy is marked by an ongoing discussion. In order to contribute to this literature, our paper aims to test whether electorally induced cycles exist or not in the monetary policy. Data collection over election periods and political regimes for several countries allows us to use a panel composed of 98 countries over 28 periods (1985-2012). We find evidence that such a phenomenon is observable in both developed and developing countries on average. It appears that, the growth of the monetary mass is significantly higher in pre-electoral periods. Indeed, we show that during the twelve months prior to a national election, the growth of the monetary mass (measured as the growth rate of M2) is around 1.7% higher than usual. This result is robust across the different levels of central banks independence. Our results are thus contributing to the recent literature questioning central bank independence and its implications.Thereafter, we investigate which institutional framework smooth these political monetary cycles. We underline that the adoption of inflation targeting, the increase of the number of veto players or the seniority of central banks are reducing the amplitude of political monetary cycles. Moreover, despite the electioneering being observed in every country, it seems to be more important in developing and less developed ones. The main driving forces at stake seem to be a too permissive institutional framework.

Keywords: Political Monetary Cycles, Central Bank Independence, Electioneering

JEL Codes: E32, E52, E58

1 Introduction

The nomination of Christine Lagarde as the new director of the European Central Bank as well as the repeated political pressures towards Jerome Powell and the Federal Reserve's monetary policy are raising questions about the actual level of political independence of central banks. Indeed, the first has worked in different French Ministers from 2005 to 2011 rising doubts on her capacity to remain neutral. The second one has been encouraged many times to implement a monetary policy accommodated to the American president's will[1]. These growing intrusions of incumbent governments into monetary policy can be observed in many other countries despite their level of development, the quality of their institutions or even their *ex-ante* level of central bank independence (CBI). As examples of political pressures faced by central bankers, Jones & Matthijs (2019) quote the post-Brexit England or Urjit Patel's resignation in India in late 2018. Other highly symbolic examples are Argentina in 2010 quoted by Vuletin & Zhu (2011) or Turkey in 2019 where central banker has been fired by government because of a too strict monetary policy[2]. More generally, Binder (2018)'s dataset on political pressures faced by central banks consider that 46 (over 118 studied) have faced political pressures for at least a quarter from 2010 to 2018 while 24 have succumbed to these pressures[3].

According to Jones & Matthijs (2019), this increasing number of pressures faced by central banks in recent years is mainly due to the position they obtained in the wake of the 2008-2009 financial crisis. Indeed, on the one hand, Balls et al. (2016) describe pre-crisis ideal central banks as follows: "independent from government, with a focus on price stability through an inflation target, with primary responsibility for moderating macroeconomic fluctuations." (page 5). In other words, a central bank has to be strongly independent, both from a political and operational point of view to be considered as efficient. The traditional literature dealing with central banking agree on this view and central banks' political framework has been shaped through it[4].
On the other hand, post-crisis central banks: "have accumulated a much wider range of powers than was common at the time the consensus around central bank independence was built [...] these new powers may require the central bank to coordinate closely with the government and other regulatory institutions, and to

[1]For instance, the Wall Street Journal reported a declaration made by Donald Trump on Twitter on the 16th of September 2019 : "Will Fed ever get into the game? Dollar strongest EVER! Really bad for exports. No Inflation...Highest Interest Rates [...] The United States, because of the Federal Reserve, is paying a MUCH higher Interest Rate than other competing countries.". See Ballhaus, Rebecca, "Trump Again Pressures the Federal Reserve in Wake of Saudi Attacks", September 16, 2019. Accessed September 23, 2019 - Wall Street Journal

[2]See Coskun, Orhan and Toksabay, Ece, "Turkey's Erdogan fires central bank chief as policy rifts deepen", July 6, 2019. Accessed September 24, 2019 - Reuters

[3]Countries concerned are: Algeria, Angola, Argentina, Bangladesh, Bank of Central African States (BCAS), China, European Central Bank (ECB), Ecuador, Guinea, Japan, Myanmar, Nicaragua, Nigeria, Russia, Serbia, Sri Lanka, Sudan, Turkey, Uganda, United Kingdom, United States, Venezuela, Vietnam & Zambia

[4]This relative consensus will be discussed further in the literature review of the paper

venture into politically treacherous areas with first-order distributional" (page 5). We can observe a shift in the ideal central bank definition. It still have to be strongly independent but only from an operational point of view. Political independence seems not as important as it has been in the past. On the contrary, monetary and budgetary authorities seem to have to work together as a way to implement the more efficient policy.

Thus, through new objectives (like ensuring financial stability) and new instruments (like unconventional monetary policies) at their disposal, central banks have now a more important impact on the overall economy. This new position induces politicians to use central banks as scapegoats in order to maintain their popularity and to reassure voters on their own economic skill level. As a consequence, central banks' characteristics will become more and more crucial in the analyze of monetary policy. As developed by Mishra & Reshef (2019), the past position occupied by central bankers represents a key factor shaping the monetary reform process. This situation will not lead to a decrease in CBI observed as showed by de Haan et al. (2018) but to an increasing turnover rates of central bankers (especially in developed countries) in the post-crisis years ; supporting this view of central banks used as safety valves. In other words, it would be easier for politicians to blame central bankers and the orientation of their monetary policy in order to remain credible in the eyes of the voters.
Moreover, the key position of central banks in national political life can raise questions about the orientation of the monetary policy itself. Indeed, we can imagine that a central banker may want to increase the reelection's probability of a politician sharing its preferences over monetary policy. Such a situation can lead to electioneering in the monetary policy even though the incumbent government has not pressured the central bank.

The new role of central banks combined with the growing links between politicians and central bankers may arise questions on how incumbents are able to exploit (or not) monetary policy in electorally motivated moves. Is the return of the time inconsistency of monetary policy is only a post-crisis phenomenon? Was it observable before 2007-2008's financial crisis?
In order to answer these questions, we are basing our work on the flourishing literature studying political phenomena impacts over economy.

2 Literature Review

The field of study consisting in the analyze of the political events on the economy emerged in the 1940's (Kalecki, 1943; Akerman, 1947). It became formal in the 1960's and 1970's particularly through the positive theories developed by the *Public Choice* framework(Buchanan & Tullock, 1962). Concomitantly, studies on what we call political cycles emerged and it became clear that, through both budgetary (Political Business/Budget Cycles or PBC) and monetary (Political Monetary Cycles or PMC) policies, incumbent governments are able to manip-

ulate voters. The seminal works done by Nordhaus (1975) and Hibbs (1977) have defined two approaches of electors' manipulations.
On the one hand, we can define pre-electoral political cycles due to the will of re election of the incumbents. This is what we now call the opportunistic approach. On the other hand, the partisan approach defines post-electoral cycles induced by the ideology defended by the freshly elected politicians. Through our work, we will concentrate on the first approach evading the potential partisan explanations of PMC. This choice is motivated by several papers (da Silva & Vieira, 2016; Giesenow & de Haan, 2019) arguing that there is no evidence of an interaction between the central bank decisions and the ideology of the incumbent[5].

The traditional literature on opportunistic political cycles is mainly concentrating on PBC[6]. Actually, articles focusing especially on PMC are not plentiful and the question of whether they are likely to exist or not is still debated today. This blind spot may largely be explained by the existence of a general consensus regarding the ideal form of central banks' design. Through the seminal work done by Kydland & Prescott (1977), Barro & Gordon (1983), Rogoff (1985); Rogoff & Sibert (1988) or Walsh (1995), a lot of studies (both empirical and theoretical) argued that a high CBI has to be the main characteristic of a "good" central bank. Independence allows to fight against the inflation bias induced by the time inconsistency situation faced by central bankers. Thus, it avoids ruling politicians to use monetary policy with electoral ambitions. Such a consensus will make the study of potential PMC obsolete because their existence would question widely accepted theoretical and empirical results on macroeconomic policy. Even though, several authors tried to investigate further the potential impact of the monetary authority on the election process, finding mixed results.

On the one hand, some empirical studies (Hadri et al., 1998; Gärtner, 1999; Alpanda & Honig, 2009) find that the more CBI is important, the less electorally motivated manipulations of the monetary policy are likely to occur[7]. Moreover, Clark & Hallerberg (2000) or Hallerberg et al. (2002) emphasize the importance of the exchange rate in the choice of instrument that the incumbent is going to use is he/she wants to manipulate voters. Indeed, electioneering in the monetary policy is only observable in countries where the exchange rate is flexible according to these authors. In a country with a fixed exchange rate regime, the government is going to favour fiscal policy to generate political cycles. Nevertheless, these studies may be considered as biased because, excepting the one made by Alpanda & Honig (2009), they are only focusing on developed

[5]See Adolph (2013) for a more precise discussion on whether the ideology of incumbents is impacting or not the policy implemented by the central bank

[6]Several surveys on PBC exist, for the most complete and recent ones see de Haan (2013), de Haan & Klomp (2013) or Dubois (2016)

[7]For instance, Leertouwer & Maier (2001) found that there is no evidence that the central bank is having a cyclical behaviour concerning election periods when looking at the variation of the short-term interest rate, no matter CBI level

countries that share many common characteristics (high quality institutions, an ancient and established democratic framework ...). Through these studies, we picture PMC as a concept only relevant in developing countries in which CBI is supposed to be weak due to institutional, judiciary, corruption or constitutional issues.
On the other hand, some other studies are underlying the fact that PMC are observable whether the CBI is high or low. Authors have studied the potential existence of electorally induced manipulations of the monetary policy in the United States and in Germany[8]. First, for the United States, N. Beck (1987) argue that, even if the Fed is not directly creating PMC through its policy, the central bank is not actively fighting against PBC induced by the fiscal policy implemented by the incumbent. Grier (1989) and Williams (1990) found a significant response of the monetary policy to the election cycle. Carlsen (1997) shows that in pre-election periods, Fed's policy is looser, especially when the probability of re election of the ruling party is low. We can quote Abrams & Iossifov (2006) who underlined that the Fed's monetary policy is significantly more expansionary in the seven quarters prior to a presidential election. Second, authors like Vaubel (1997) or Lohmann (1998) reach the same conclusions through the example of the *Bundesbank*. The first shows that the monetary expansion accelerates in pre-electoral periods when the incumbent has a political majority in the central bank council. The second argues that money growth increased in the four quarters before a federal election.

As we explained, the presence (or not) of PMC over different countries is still debated today even though the post-crisis shifting in central banks' design let us doubt more and more on their non existence. To settle the debate, we will investigate on the direct impact of pre-electoral periods over the growth of monetary mass (measured by the growth rate of M2). Through our econometric specification, we will ask ourselves the following questions :
Are PMC occurring in reality ? What are their determinants ? How heterogeneous are different countries regarding PMC ? How can the magnitude of PMC be constrained by institutional, constitutional, or political country-specific characteristics ?

Our results allow us to think that PMC are a real issue that matters when we are reflecting on both budgetary and monetary policies. Indeed, they seem to be present on average in an important number of countries, whatever their level of CBI, institutional quality or democracy. PMC does not seem to be observable only in developing countries. Moreover, we will show that the existence and the magnitude of PMC are conditioned by many things such as CBI of course but also the seniority of the central bank, the degree of political constraint or the competitiveness of elections.
To answer our first inquiry, we are going to present our econometric specification in Section 3. Then, we are going to present our main results, some robustness

[8]Studies dealing with Germany focusing on the former *Bundesbank*

and heterogeneity in order to validate them in Section 4, 5 and 6. Finally, we will conclude and give some potential developments of our results in Section 7.

3 Econometric Specification & Data

3.1 Econometric Specification

As a way to study the presence and the magnitude of PMC over our sample, we will implement several econometric models. Our main model will be based on the previous work made by Alpanda & Honig (2009). Though, our main econometric specification will be the following one:

$$M2_{i,t} = \beta_1 M2_{i,t-1} + \beta_2 Election_{i,t} + \beta_3 X_{i,t} + \epsilon_{i,t} \quad (1)$$

With *M2* representing the variation of the monetary mass measured by the annual variation rate of the monetary aggregate M2[9], *Election* one of our measure of electoral periods, X a vector of explanatory variables and ϵ an error term. In our main specification, X will be composed of *CBI* a measure of *de jure* central bank independence, *Inflation* the annual inflation rate measured as the Consumer Price Index, *Credit* the amount of domestic credit to the private sector in percentage of the GDP and *Fix* a dummy variable taking the value 1 if the country is characterised by a fixed exchange rate regime.

We suppose that the monetary mass is strongly correlated with its past value, that is why we will use a dynamic panel econometric model. More precisely, we have implemented a standard difference-GMM estimator as developed by Arellano & Bond (1991). This choice is motivated by mainly 5 arguments : (i) The expected correlation between *M2* and its past values, (ii) the existence of potentially endogenous variables (mainly the lagged value of *M2* and *Inflation*), (iii) the presence of time invariant country characteristics contained in the error term (fixed-individual effects)[10], (iv) a dataset characterized by a small T (28 periods) and a large N (98 countries) and (v) the very low persistence between M2 and its lagged value. The latter argument is determinant to motivate our use of a difference-GMM estimator instead of a system-GMM one[11].

Moreover, one of the key aspect when implementing an Arellano & Bond (1991) estimator is the number of instruments. Following Roodman (2009)[12], we payed high attention to their number and we have provided this information for every regression. Roughly, in the vast majority of our regressions, we

[9] As robustness checks, we are also implementing as explained variable monetary aggregate M1 and a variable *M2cycle* developed further

[10] We performed different Hausman tests over our data and the statistics obtained allow us to consider the presence of fixed-effects

[11] In Table 7, we implement a system-GMM estimator as developed by Blundell & Bond (1998) and our results remain unchanged

[12] We have used his Stata formula *xtabond2* all along our paper in order to compute our estimations

consider the lagged value of the dependent variable as endogenous (computed in the *gmmstyle(.)* part of the Stata formula) and other variables as exogenous (computed in the *ivstyle(.)* part). As robustness, we have estimated our model using *Inflation* as endogenous and/or *Credit* as predetermined (not strictly exogenous) and our results remained stableResults with endogenous *Inflation* are presented in Column (7) of Table 7; other ones are available upon request.

3.2 Data

Our database is composed of 98 countries over 28 periods (1985–2012)[13]. We have chosen the countries in our sample by respecting several constraints. First, the availability of the data. We only kept countries for which we had observations on *M2*, *Inflation*, *Credit* and *CBI* on at least 10 continuous periods among the data source used. Second, we have only kept countries for which we can observe at least 2 pre-electoral periods over our sample. Moreover, we have decided to work on data from 1985 to 2012 in order to be able to limit the potential biases of a too unbalanced panel. We would have liked to work on more recent years but our variable measuring central bank independence is not available after the year 2012.

3.2.1 Monetary Policy's Orientation

In order to approximate the behaviour of the monetary authority, we will study the annual growth rate of monetary mass as a way to measure the money supply. As debated by Alpanda & Honig (2009), a measure of the interest rate on the short run would have been better as it is the most commonly used instrument of monetary policy. Unfortunately, data on interest rates are not available for a large enough number of countries. Then, we suppose that a variation in money supply impacted (directly or not) by central banks' decisions can be considered as a good approximation of the monetary policy's orientation. To be more precise, an increase (decrease) in monetary mass will illustrate an expansive (restrictive) monetary policy.
Traditionally, monetary mass is divided in four different monetary aggregates that can simply be defined as follows: monetary base (M0) composed of currency and most liquid deposits ; narrow money (M1) composed of M0 and demand deposits ; money and close substitutes (M2) composed of M1, small savings and time deposits and broad money (M3) composed of M2 and large time deposits[14].

We would have liked to use monetary base as our main explained variable but data on M0 were not available on a large scale. As our sample is composed of a high number of developing countries, we will use M2 as our money supply measure. This choice is motivated by both the limited availability of the data on the three other monetary aggregates and the low financial development in the

[13] It represents a total of 1.641 country-period observations

[14] This classification is the on used by the Federal Reserve, for more information you can consult Bernanke (2006)

majority of the countries in our sample. The latter argument will lead M0, M1 and M2 to be close enough to be considered as evolving in comparable proportions. Nevertheless, as a way to guarantee robustness of our results, we are also going to implement our model with M1 as explained variable. Moreover, using the filter developed by Hamilton (2018), we have defined a variable *M2cycle* equal to the evolution of M2 purged from its upward trend. This allow us to guarantee that our results are not driven by a potential increase in monetary mass in every period or by a specific component of M2 not included in M1. These results are computed in the second part of Table 8 in Section 5.

Finally, as a way to avoid the monetary policy to be directly responsible of the election timing, we dropped observations of *M1* and *M2* higher than 100% [15]. Indeed, a period of high growth rate of the monetary mass can weaken incumbent government's popularity. It will encourage incumbents to implement early elections before the situation is preventing them to be re-elected. In other words, a too expansive monetary policy can induce endogenous election periods that would biased our results as election timing can not be considered as exogenous [16] (Smith, 1996, 2004). Through a similar reasoning, we also dropped the observation of *Inflation* above 100%.

In order to measure M1 and M2, we used data provided by the *International Financial Statistics* (IFS) database developed by the IMF. Since we are willing to study the variation of monetary mass, we had to transform the raw data into growth rate from one year to another.

3.2.2 Electoral Periods

Election dummy

Measuring electoral periods is one of the key aspect in the empirical literature about political impact over economy. Researchers usually use a dummy taking the value 1 on the year election is implemented and 0 otherwise. This specification represents our variable *Election*. However, as we suppose the existence of pre-electoral manipulations of the monetary policy, we have computed the variable *ElectionDpre*. This dummy aims to measure pre-electoral period as follows: it is equal to 1 on the year election is implemented only if the election takes place in the second half of the year. If election happens during the first semester, *ElectionDpre* is going to take the value 1 on the period before the election. In other words, if an election is taking place in year t from January to June, we have coded the variable *ElectionDpre* as 1 in year t-1. Conversely, if the election is taking place from July to December in period t, we have coded

[15] As robustness, we tried to put these observations in our regression but results remained unchanged

[16] See Table 9 in Section 5 to see how we treated more specifically this potential endogenous election timing problem

the variable as 1 in year t. Such a computation will reduce the potential measurement of post-electoral variation of monetary policy when trying to study only pre-electoral periods. For instance, Alesina et al. (1992, 1997) found evidences that inflation is increasing just after elections and we do not want to capt this potential effect in our electoral dummy. Conversely, as we have also tested the presence of potential post-electoral cycles, we have also defined a variable *ElectionDpost*. It takes the value 1 in year t if election occurs in the first semester of year t. If the election is taking place in the second semester, the variable *ElectionDpost* is taking the value 1 the year after the election.

Election index

In order to obtain a more precise measure, we have also computed an election index *ElectionIpre* based on the work done by Franzese (2000). The latter developed an index allowing a measure of pre-electoral periods as follows:

$$ElectionIpre_{i,t} = \frac{(M-1)+d/D}{12}$$

$$ElectionIpre_{i,t-1} = \frac{12-(M-1)-d/D}{12}$$

With t the year in which the election is implemented, M the month in which the election is occurring, d the exact day and D the number of days contained in M. As an example, an election taking place in the 23rd of January 2004 will be coded as 0.062 in 2004 and 0.938 in 2003[17].
On the same basis as for *ElectionDpost*, we have also computed a second index called *ElectionIpost* as a measure of potential post-electoral periods following the same methodology.

Data Sources

In order to compute election periods, we mostly used the *Database of Political Institutions* (DPI) developed by T. Beck et al. (2001) for the World Bank, the *Election Guide* provided by the International Foundation Electoral Systems (IFES) and the *Voter Turnout Since 1945* dataset provided by the Institute for Democracy and Electoral Assistance (IDEA). These sources are the most commonly used to define election periods but they can not be considered as exhaustive[18]. That is why we completed our election dummy by using the important work of data collection made by Nohlen & al.[19] thorough the years.

[17] We can interpret this value as follows: considering a one year pre-electoral period, 0.938% of this period is in year 2003 and 0.062% in 2004 if the election occurs on the 23rd of Jamnuary 2004

[18] For instance countries such as Antigua & Barbuda, Dominica or Seychelles are not present in these datasets

[19] Nohlen et al. (1999), Nohlen et al. (2001b), Nohlen et al. (2001a), Nohlen (2005b), Nohlen (2005a), Nohlen & Stöver (2010)

Moreover, as the exact date in which elections were held is often missing in these databases, we used data provided by Hyde & Marinov (2012) in the National Elections Across Democracy and Autocracy (NELDA) and by the Free and Fair Elections dataset computed by Bishop & Hoeffler (2014). The combination of these different sources have allowed us to study a higher number of countries than traditional studies dealing with political cycles.

As our data contains an important number of undemocratic (or not totally democratic) country, a concern was to choose if we include them or not in our study. Elections can not credibly be considered as disputed in these countries and the traditional way to deal with this problem is to take them off of the estimations. In this paper we have decided to keep these countries inside our sample. We justify their presence in our sample by the work of Soh (1988) on South Korea, Gonzalez (2002) on Mexico, Block et al. (2003) on African countries, Pepinksy (2007) on Malaysia, Guo (2009) on China or Blaydes (2011) on Egypt. Indeed, these authors argue that political manipulations are also happening in undemocratic countries. This is due to the will of political leaders to eliminate people's discontent as a way to legitimate their authority[20].

3.2.3 Central Bank Independence

CBI and its measurement is an important field of study and has lead to the development of several indicators. The vast majority of them are measuring *de jure* independence and few *de facto* independence.

On *de jure* independence, the literature is prolific (Alesina & Mirrlees, 1989; Grilli et al., 1991). Concerning our study, we have chosen to use data computed by Garriga (2016). She has calculated a CBI index based on the methodology used by Cukierman et al. (1992) making it accessible for 182 countries until 2012. Moreover, her database allows us to decompose the CBI index in its four different sub-components. We have variables measuring more specifically: the central banker's independence (*cuk_ ceo*), the monetary policy's implementation freedom (*cuk_ pol*), the independence of the central bank when choosing the objective of the monetary policy (*cuk_ obj*) and the capacity of the monetary authority to lend directly or not to the government (*cuk_ limlen*). We will see that the negative impacts of CBI among money supply is mainly driven by the *cuk_ pol* variable.

On *de facto* independence, we have faced a problem of data availability. Indeed, as described by Cargill (2016): "To date, no consistent measure of *de facto* independence over a long period of time has been offered." (p. 21). This situation will force us to use the average turnover rate of central bankers as a proxy of the *de facto* CBI. To do so, we have used data collected by Dreher

[20] Again, as robustness we have excluded these undemocratic countries of our sample and our election measure remained significant. Moreover, the less disputed are the election the more important PMC seem to be

et al. (2010) and have completed them using central banks' websites directly. Then, we have computed a moving average of the turnover rate over 15 previous periods for each country-year observation.

3.2.4 Fixed Exchange Rate Regime

A country characterized by a fixed exchange rate regime is supposed to be less free to implement its monetary policy. Indeed, such a regime induced that a parity has to be maintained at all cost with one or several foreign currencies. Thus, we are supposing that in a country with a fixed exchange rate, it is less likely to observe PMC. We justify this point of view through Mundell (1960)'s monetary policy trilemma. Indeed, in a country where both free capital flows and a fixed exchange rate regime are present, the impossible trinity is telling us that it is not possible to implement an autonomous monetary policy. Thus, in country with a fixed exchange rate, we should observe less monetary mass' volatility because of the less important flexibility of the monetary authority[21]. Nevertheless, when this variable is significant in our model, its coefficient is positive. One simple explanation is the higher importance of foreign countries in the monetary policy of a fixed exchange rate regime country. Indeed, as the country has to maintain a certain parity, the monetary mass' volatility would be higher.

In order to be able to study which countries are adopting fixed exchange rate regime, we are going to use the work done by Levy-Yeyati & Sturernegger (2016) on estimating *de facto* exchange regimes. We have computed a dummy taking the value 1 if the country is characterized by a fixed exchange regime, 0 otherwise without taking into account the round during which authors classified the observation[22].

3.2.5 Output gap, Inflation & Credit

As explained by Alpanda & Honig (2009), the output gap and the inflation rate are mainly introduced to control for potential Taylor-rule induced monetary policy. Our variable *Ygap* is obtained through a Hamilton (2018) filter[23] used to separate the cyclical and the trend components of constant GDP. Then, we used the difference between its trend and its raw values to compute our output gap[24].
Our data on constant GDP, inflation and domestic credit to private sector are all coming from the World Development Indicators (WDI) provided by the World Bank.

[21] As found by Clark & Hallerberg (2000) or Hallerberg et al. (2002)

[22] For the 15 missing values (Hungary 95, 96, 97 ; Mongolia 93 ; Nigeria 10,11,12 ; Rwanda 07, 08, 09, 10, 11, 12 ; Tanzania 90 ; Ukraine 93), we have completed our variable using the work of Ilzetzki et al. (2017)

[23] Using the Stata command *hamiltonfilter* computed by Diallo (2018)

[24] We have also estimated an inflation gap (*Infgap*) using the same methodology in Table 8

3.3 Summary Statistics

In Figure 1, we present for four different countries the evolution of M2 growth year per year. We tried to choose countries representative of our entire database with two developed and two developing ones. Moreover, we present countries for which we have data on M2 growth for every year inside our sample. Periods in which a national election is occurring are underlined by a red vertical line. We can observe that 19 out of the 28 elections presented are characterised by an increasing growth rate of the monetary mass in the year prior to an election. As supposed in our introduction, PMC seem to be a reality in our data. Contrary to the vision defended by the vast majority of the literature, this phenomenon seems to be observable since at least the mid 1980's with a certain regularity. Another interesting fact is that 13 out of the 19 pre-electoral rise in M2 growth rate are accompanied with a post electoral decrease of this same growth rate. Whereas, we will see in our regressions that this post-electoral effect is not significant on average so we did not investigate it further.

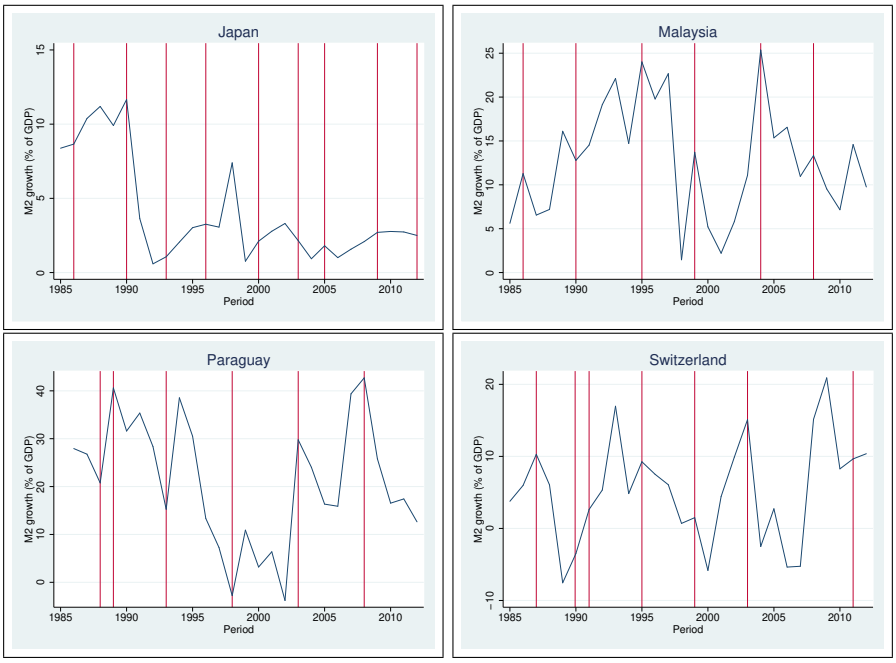

Figure 1: M2 Growth (% of GDP) Every Period

In Table 1, we have provided summary statistics for every variable used in our different specifications. As said above, our sample is composed of 98 countries over the period 1985-2012 representing 1629 observations. We present here summary statistics on the number of observations used in our different

models. For instance, *M1* and *M2* have been limited in our sample to values of -100 to 100 in order to avoid monetary policy to be directly responsible of election timing[25]. Moreover, through these simple statistics, we can observe that M1 and M2 are quite similar as supposed above.

Table 1: Summary Statistics

Variable	**Mean**	**Std. Dev.**	**Min.**	**Max.**	**N**
M1	15.393	15.204	-81.040	97.242	1530
M2	15.458	14.566	-79.882	99.355	1641
M2cycle	-10.377	57.521	-887.828	60.394	1131
Election	0.228	0.42	0	1	1641
ElectionDpre	0.237	0.425	0	1	1641
ElectionIpre	0.232	0.321	0	1	1641
CBI	0.537	0.187	0.122	0.904	1641
cuk_ceo	0.568	0.205	0	0.89	1641
cuk_obj	0.552	0.234	0	1	1641
cuk_pol	0.495	0.285	0	1	1641
cuk_limlen	0.533	0.247	0.019	1	1641
Turnover	0.16	0.168	0	2	1605
Ygap	0.035	0.226	-1.402	1.534	1641
Inflation	7.493	10.205	-18.109	89.113	1641
Infgap	-20.019	73.394	-734.982	689.534	1641
Credit	51.647	44.707	0.491	308.986	1641
Fix	0.343	0.475	0	1	1641
Trade	83.966	50.288	15.636	437.327	1564
CreationYearCB	1947.957	48.219	1668	1997	1641
CEI	0.631	0.297	0	0.982	1437
PolConV	0.498	0.283	0	0.882	1454

Our database is directly composed of 372 elections. As we have studied pre and post-electoral periods and not election years directly, we have introduced elections happening in 1984 and 2013 in our different measures. Thus, we identify 387 pre-electoral periods and 382 post-electoral ones within our database. We only kept countries with at least two pre or post-electoral periods within our database.

Table 2 is representing summary statistics on our 7 main variables splitted in between pre-electoral years and non pre-electoral ones. We can observe a more important variability of *M2* and *Inflation* in pre-electoral periods. This result let us think that money supply is more volatile in pre-electoral years, possibly because of the existence of PMC. Moreover, the mean value of Credit is significantly higher when *ElectionDpre* equals 1. One explanation can be an increase in the level of credit before the election in order to maximize incumbent's

[25]This idea has been developed in Section 3

probability of reelection.

Table 2: Summary Statistics by Pre-electoral Periods

Variable	Mean	Std. Dev.	Min.	Max.	N
ElectionDpre = 0					
M2	15.535	14.243	-21.937	96.108	1252
CBI	0.539	0.185	0.122	0.904	1252
Turnover	0.162	0.172	0	2	1226
Ygap	0.032	0.226	-1.402	1.438	1252
Inflation	7.543	9.992	-18.109	85.669	1252
Credit	50.48	43.828	0.491	248.186	1252
Fix	0.349	0.477	0	1	1252
ElectionDpre = 1					
M2	15.21	15.574	-79.882	99.355	389
CBI	0.533	0.192	0.122	0.899	389
Turnover	0.153	0.156	0	1	379
Ygap	0.043	0.224	-0.753	1.534	389
Inflation	7.332	10.876	-2.405	89.113	389
Credit	55.402	47.288	2.083	308.986	389
Fix	0.324	0.469	0	1	389

Then, in Table 3 we computed summary statistics dividing our sample in terms of level of development. We distinguished three different types of countries: developed (22 countries in our sample), developing (62 countries) and less developed (14 countries). To do so, we used the classification provided by the United Nations through its World Economic Situation and Prospects (WESP) report of 2014 (p. 143-150).
We can observe that there is sizable differences in terms of summary statistics between developed countries on the one hand and developing/less developed ones on the other hand. Indeed, developed countries are characterized by a relatively low *M2* growth, a high level of domestic credit and a low inflation rate on average. Developing and less developed countries can be describe as the opposite on this three points. Astonishing results are the relative stable value for *CBI* both *de jure* and *de facto* regardless development level. Alpanda & Honig (2009) found the same result in their own data raising doubts on the validity of these two measures. Though, we note that the results obtained through these variables and their interpretations have to be moderated.

Finally in Table 4, we present the correlation coefficients between our main variables used to estimate our main model. As expected, we can observe an im-

Table 3: Summary statistics by level of development

Variable	Mean	Std. Dev.	Min.	Max.	N
Developed Countries (22 countries)					
M2	9.202	9.319	-9.102	75.857	366
CBI	0.572	0.222	0.175	0.882	366
Turnover	0.127	0.147	0	1	366
Ygap	0.027	0.171	-0.861	0.582	366
Inflation	3.897	3.881	-1.353	28.305	366
Credit	94.675	56.064	8.997	308.986	366
Fix	0.306	0.461	0	1	366
Developing Countries (62 countries)					
M2	16.994	15.653	-79.882	99.355	1092
CBI	0.53	0.182	0.122	0.904	1092
Turnover	0.169	0.175	0	2	1067
Ygap	0.032	0.235	-1.402	1.507	1092
Inflation	8.496	11.715	-18.109	89.113	1092
Credit	43.595	31.82	0.491	166.504	1092
Fix	0.36	0.48	0	1	1092
Less Developed Countries (14 countries)					
M2	18.796	12.841	-8.202	77.858	183
CBI	0.511	0.112	0.328	0.762	183
Turnover	0.174	0.156	0	1	172
Ygap	0.068	0.261	-0.539	1.534	183
Inflation	8.695	7.214	-8.975	34.083	183
Credit	13.638	8.500	2.215	43.001	183
Fix	0.317	0.467	0	1	183

portant correlation between *M2*, *Inflation* and *Credit*. Moreover, a noticeable correlation between inflation and credit can be remarked. In order to tackle this potential endogeneity problem, we have computed our model by considering *Inflation* and *Credit* as endogenous in our econometric specification. Nevertheless, as our results were not significantly different when doing so, we did not display all of these regressions in our paper[26].

[26] They are available upon request

Table 4: Correlation Matrix

	M2	Elec.D	Elec.I	CBI	Turn.	Ygap	Inf.	Credit
M2	1							
Elec.D.	-0.004	1						
Elec.I.	0.003	0.893	1					
CBI	0.028	-0.009	-0.015	1				
Turn.	0.062	-0.023	-0.015	-0.106	1			
Ygap	0.132	0.024	0.026	0.002	-0.025	1		
Inf.	0.513	-0.010	-0.014	-0.060	0.194	-0.049	1	
Credit	-0.316	0.048	0.064	-0.149	-0.020	-0.068	-0.288	1
Fix	-0.079	-0.020	-0.033	0.091	-0.187	0.042	-0.180	-0.061

4 Main Results

Table 5 presents estimations of the equation **(1)** on all the countries included in our sample with different electoral period measures in order to assess our hypothesis of pre-electoral PMC. We implemented a methodology analogous to the one used by Mink & de Haan (2006). As they find evidences of a an electoral cycle in the fiscal policy, we find evidences of a pre-electoral cycle in the monetary policy.
When introduced, the dummy variable *Election* is not significant. As we said above, this may be due to the relative fuzziness of this variable taking into account both pre and post-electoral effects. However, when the dummy (*ElectionDpre*) is particularly designed to take into account pre-electoral periods, its coefficient is strongly significant and positively related to the growth of monetary mass. More specifically, the growth of monetary mass can be interpreted as around 1.4% higher in pre-electoral periods on average. Reasoning with our election index *ElectionIpre* gives use roughly the same average effect[27].
Moreover, when using a dummy measuring post-electoral periods, its coefficient is significant and negative validating the post-electoral recession defined through the opportunistic approach of political cycles. Nevertheless, when introducing a post-electoral index (*ElectionIpost*) this result is not valid anymore. This absence of post-electoral results may be the result of the computation of our electoral index. Indeed, we designed it as a 1 year period but it is highly possible that this effect (if it exists of course) is happening within a bigger or lower time period.

Thus, electorally-induced cycles over the monetary policy are happening in a pre-electoral context on average. This result validate our main hypothesis. In other words, we can observe that central banks allow (consciously or not) a more accommodating monetary policy before elections. As supposed above, we think that such a policy aim to back up the incumbent government in order to

[27]This result was obtained by multiplying the coefficient of *ElectionIpre* by its average value (0.713) when our dummy variable *ElectionDpre* is taking the value 1

increase its reelection's probability. Even though, we are not excluding potential partisan explanations of this phenomena but we do not have the possibility to investigate them further as data on central bankers' ideology are not available on a large scale[28].
Another interesting result in Table 5 is the significance or not of our different explanatory variables. First, our *de jure* measure of CBI does not seem to play a role in *M2*'s variation which is a surprising result. We can explain the latter by mainly two arguments. First, a *de jure* measure is not accurately reflecting the reality faced by the monetary authority (Hueng, 2012; Bezhoska & Angelovska, 2017). Second, as we have mentioned above, Cukierman et al. (1992)'s index is composed of four sub-index and some of them may not play a direct role in *M2*'s variation. The first issue is solved in Table 8 where we computed a proxy of the *de facto* independence (the average turnover rate of central banker) appearing significant and negatively related to *M2*. The second aspect is investigated further in Table 6 where we split up our CBI index into its four sub-components.
Second, our variable *Credit* is not significant either. According to us, one simple explanation is that the level of credit is not having a direct impact over money supply growth. This hypothesis is strengthened by the significance of our variable *CreditXElec* in Table 7 showing us a potential effect only occuring in pre-electoral periods.
Finally, our others explanatory variables are significant and related to M2's growth as expected. In the case of *Inflation*, the more it is important, the more money demand will increase and so on the more money supply will react positively. In the case of the output gap, the positive sign of the coefficient underline that monetary policy is more accommodating in economic expansion periods and less accommodating in recession ones.

Then, as done by Alpanda & Honig (2009), we have computed regressions in Table 6 using various interaction terms in order to investigate further the effect of our control variables on the growth of *M2*. Contrary to the authors cited above, we found a high significance of our election cycle measure for our full sample and not only for developing countries with these interaction terms. Only one of these three interaction terms is significant and negatively related to our monetary policy orientation measure. The sign and the significance of this variable *CreditXElec* shows us that countries characterized by a high level of domestic credit to private sector are experimenting less important variability of the monetary mass in pre-electoral periods. This result motivated us to investigate further the link between the level of credit, the PMC and the growth of M2 but unfortunately our observations are not numerous enough to investigate this relationship further[29].

[28] We tried to use data computed by Mishra & Reshef (2019) on central bankers' careers but the number of observation was not important enough within our sample to guarantee us valid results

[29] When splitting countries according to their level of *Credit*, Sargan C-test and Hansen J-test informed us that the model can not be considered as relevant

On the second half of Table 6 (Column (13) to (17)), we have divided our CBI index into its four sub-components in order to investigate which aspects are influencing our dependent variable. As we can see, only *cuk_ pol* seems significant and is negatively correlated to the variation of the monetary mass as expected. This variable represents directly the independence of the central bank toward incumbent and his/her fiscal policy. Using Cukierman et al. (1992) computation, we can conclude that three main characteristics of the central bank (measured by *cuk_ pol*) are requisite in order to smooth potential PMC. The law has to guarantee that: (i) the monetary policy is formulated by the central bank on its own, (ii) when the central bank is in conflict with the budgetary authority about monetary policy, the central bank has to be able to have final word and (iii) the central bank is playing a role in the government's budgetary process. Moreover, *cuk_ obj* and *cuk_ limlen* do not seem to be playing an important role in the variation of *M2*. This can be explained by the less direct link between these variables and money supply growth.
One major concern regarding the recent literature over central bank independence and its impact over monetary policy is the non significance of the variable *cuk_ ceo*. Recent studies as Adolph (2013) emphasize the importance of central bankers (through their past career and studies, personal networks...) when analyzing monetary policy. Unfortunately, we think that this insignificance can be explained by the relatively low degree of information on central bankers included in *cuk_ ceo*. Again, further investigations on this effect would be interesting in a future paper but would need an important work of data collection.

5 Robustness

In this section, we tried to assess the robustness of our results. First, in Table 7, we do it by estimating our model on different sub-periods. We can observe that no matter the starting year of our sample, *ElectionIpre* remains significant and positively related to *M2*. Moreover, from Column (1) to Column (3) the coefficient related to the pre-electoral period is increasing letting us think that the manipulation may be greater in recent times. On average, M2 is around 1.6% higher in the year prior to an election in our overall sample. This effect rises to nearly 2.1% for the sub-period 1995-2012. This result supports Balls et al. (2016) when he says that modern central banking is characterised by a closer link between fiscal and monetary authorities. Even though, this result should be qualified by the results presented in Column (4) showing a decreasing coefficient related to *ElectionIpre*.
Moreover, the first part of Table 7 shows us a relative less importance of Taylor rule components (output gap and inflation) impact over *M2*'s variability over time. We suppose that this result can be explained by the relatively low inflation

Table 5: Main Results

M2 growth (% of GDP)								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
M2(t-1)	0.208***	0.212***	0.210***	0.213***	0.205***	0.207***	0.211***	0.207***
	(0.062)	(0.063)	(0.060)	(0.061)	(0.062)	(0.062)	(0.060)	(0.062)
CBI	-4.874	-4.998	-4.820	-4.995	-5.001	-5.430	-4.782	-5.077
	(3.482)	(3.518)	(3.446)	(3.504)	(3.531)	(3.548)	(3.415)	(3.529)
Ygap	6.836***	6.693***	6.787***	6.638***	6.806***	6.539***	6.830***	6.769***
	(1.386)	(1.377)	(1.371)	(1.364)	(1.387)	(1.336)	(1.349)	(1.375)
Inflation	0.376***	0.370***	0.369***	0.362***	0.374***	0.355***	0.372***	0.371***
	(0.074)	(0.074)	(0.074)	(0.075)	(0.074)	(0.076)	(0.074)	(0.075)
Credit	-0.018	-0.018	-0.019	-0.021	-0.019	-0.017	-0.018	-0.018
	(0.034)	(0.034)	(0.033)	(0.034)	(0.034)	(0.033)	(0.033)	(0.034)
Fix	1.059	1.026	1.124	1.067	1.055	0.973	1.125	1.038
	(0.989)	(0.996)	(0.978)	(0.988)	(0.989)	(0.975)	(0.960)	(0.991)
Election		-0.557		-1.175		0.470		
		(0.619)		(0.720)		(0.682)		
ElectionDpre			1.342**	1.692**				
			(0.626)	(0.721)				
ElectionDpost					-0.409	-3.024**		
					(0.579)	(1.302)		
ElectionIpre							1.877***	
							(0.714)	
ElectionIpost								-0.960
								(0.794)
Nbr. observations	1436	1436	1436	1436	1436	1436	1436	1436
Nbr. instruments	31	32	32	33	32	33	32	32
AR(1) test	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) test	0.477	0.458	0.509	0.482	0.498	0.554	0.514	0.505
Sargan C-test	0.009	0.009	0.010	0.009	0.009	0.014	0.010	0.009
Hansen'J-test	0.482	0.444	0.553	0.510	0.496	0.467	0.578	0.499

Table 6: Interaction Terms & Splitted CBI index

M2 growth (% of GDP)									
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
M2(t-1)	0.211***	0.214***	0.213***	0.216***	0.214***	0.220***	0.210***	0.214***	0.206***
	(0.059)	(0.059)	(0.060)	(0.060)	(0.058)	(0.059)	(0.059)	(0.059)	(0.059)
ElectionIpre	1.522	2.699**	1.793**	3.075	1.915***	1.857**	1.884***	1.861**	1.956***
	(2.199)	(1.265)	(0.896)	(2.598)	(0.722)	(0.713)	(0.714)	(0.712)	(0.720)
CBI	-5.020	-4.940	-4.801	-4.835					
	(3.595)	(3.455)	(3.416)	(3.572)					
cuk_ceo					-6.781				-6.109
					(5.251)				(4.181)
cuk_obj						-0.710			2.335
						(1.495)			(1.446)
cuk_pol							-3.498**		-3.775**
							(1.755)		(1.659)
cuk_limlen								-2.995	-1.375
								(2.325)	(2.584)
Ygap	6.834***	6.768***	6.786***	6.731***	6.635***	6.727***	6.743***	6.846***	6.738***
	(1.360)	(1.358)	(1.339)	(1.366)	(1.400)	(1.377)	(1.371)	(1.344)	(1.358)
Inflation	0.367***	0.369***	0.370***	0.365***	0.375***	0.382***	0.375***	0.376***	0.368***
	(0.075)	(0.074)	(0.073)	(0.074)	(0.074)	(0.073)	(0.074)	(0.073)	(0.074)
Credit	-0.018	-0.014	-0.019	-0.015	-0.023	-0.023	-0.019	-0.017	-0.017
	(0.033)	(0.031)	(0.032)	(0.031)	(0.034)	(0.033)	(0.033)	(0.032)	(0.033)
Fix	1.140	1.124	1.126	1.152	1.072	1.098	1.177	1.091	1.178
	(0.955)	(0.954)	(0.887)	(0.879)	(0.988)	(0.951)	(0.969)	(0.947)	(0.983)
CBIxElec	0.574			-0.694					
	(4.039)			(4.358)					
CreditxElec		-0.016		-0.017					
		(0.013)		(0.014)					
FixxElec			0.265	0.070					
			(1.793)	(1.851)					
Nbr. observations	1436	1436	1436	1436	1436	1436	1436	1436	1436
Nbr. instruments	33	33	33	35	32	32	32	32	35
AR(1) test	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) test	0.511	0.495	0.501	0.481	0.502	0.481	0.516	0.502	0.535
Sargan C-test	0.010	0.010	0.010	0.010	0.010	0.007	0.011	0.008	0.011
Hansen J-test	0.586	0.580	0.592	0.590	0.479	0.573	0.563	0.590	0.506

and growth rates faced by some countries within our sample[30] reducing the impact of Taylor rules' induced monetary policies. An additional explanation can be the relative importance of unconventional monetary policies in recent times leading central banks to focus less on output gap and inflation.

The third last columns of Table 7 show us robustness among the econometric model itself. We have estimated our model using a standard fixed effects estimator in Column (5) and a system-GMM one in Column (6). As our results remain roughly the same in terms of PMC, we can conclude that they seem robust regardless the econometric model used. However, the positive sign of our CBI index when using system-GMM method stumped us. When introducing squared CBI in this model, it is significant too. We thought about a potential non-linear relationship between CBI and M2 growth as follows: under a certain value of legal CBI, the institutional framework and/or the overall economic situation of the country does not allow CBI to be useful in tightening monetary policy. Unfortunately, we were not able to light up such a relationship in our data probably because of a too low number of observations. Then, in the last Column, we present our model estimated using a difference-GMM system where we consider *Inflation* as an endogenous parameter. Even if the coefficient attached to *ElectionIpre* decreases in this specification, our results stay roughly the same.

Second, Table 8 presents different measures of our explained and explanatory variables. We tried to measure the impact of price level over monetary mass by using an inflation gap obtained using the same methodology as our output gap. The introduction of *Infgap* is not affecting our results and it remains insignificant. Thus, on average, actions of the central bank over M2 growth do not seem to be impacted by the unexpected amount of inflation. Nonetheless, when putting *Inflation* off the model, *CBI* becomes strongly significant and negative as expected. One interpretation of this result can be that CBI's action on money supply may be conditioned to other factors such as inflation rate[31]. Then, we introduced *Trade* as an alternative measure of the impact of exchange rate policy. As in Column (8), the introduction of this new variable is not impacting our results.
Finally as a way to investigate further the impact of CBI over money supply, we have introduced a proxy of the *de facto* independence. Contrary to the *de jure* measure, *Turnover* is significant and impacting negatively *M2* growth. As expected, we can observe that the more average turnover is important in previous periods, the less central bankers are incite to implement permissive policies. Indeed, theoretical analysis of bureaucrats' behaviour shows that central bankers are motivated by career concerns (Stigler, 1971; Chant & Acheson, 1972). Then, a dismissal can undermine their credibility and reputation. Thus, when central bankers observe that one or more of their predecessors have been

[30] Mainly advanced countries

[31] For instance, we can imagine that CBI is effective in limiting M2 growth when the inflation rate is low enough

fired (no matter the reasons), they are going to implement a more restrictive monetary policy in order to maximize their chance to find a better job at the end of their term (inside our outside the bureaucracy). Moreover, this pressure effect is reinforced by the growing accountability of central bankers and their policy choices among years (Balls et al., 2016) leading monetary policy to be more and more under the spotlights.

Third, in the second part of Table 8 we tried to use alternative measures of the monetary policy in order to assess if our results are driven by variables used or not. We can observe that whichever measure of monetary mass is used, we can observe PMC. Column (11) is computed a model where the explained variable is M2 gap computed as *Ygap* or *Infgap* using a Hamilton (2018) filter. We can observe that even with this measure of monetary policy's orientation, we can observe PMC. Though, we can conclude that our results are not driven by the upward trend characterizing the evolution of M2 as its detrended value is significantly impacted by our election variable.

Finally in Table 9, we have investigated the importance of potentially endogenous election timing. Following Brender & Drazen (2005), we defined 123 of our 387 (approximately 32%) election periods as potentially endogenous. When splitting both *ElectionDpre* and *ElectionIpre* into pre-determined and endogenous electoral periods we conclude that PMC are only observable when the election timing is exogenous[32]. This is an expected result because incumbent and central banker have no reason to manipulate voters through fiscal and/or monetary policy when they are already setting political agenda at their advantage. Thus, manipulations leading to PMC are only observable when election-timing is impossible to modify.

[32]See Table 10

Table 7: Different Periods & Models

M2 growth (% of GDP)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	1985-2012	1990-2012	1995-2012	2000-2012	FE model	System-GMM model	Inflation as endogenous
L.M2	0.211***	0.208***	0.217***	0.195**	0.085*	0.188***	0.129**
	(0.060)	(0.057)	(0.064)	(0.082)	(0.043)	(0.056)	(0.054)
ElectionIpre	1.877***	2.116***	2.488***	1.941*	1.155	2.528***	1.366*
	(0.714)	(0.761)	(0.800)	(1.023)	(0.764)	(0.697)	(0.803)
CBI	-4.782	-6.616	-9.711	0.048	-4.900	10.913***	-0.372
	(3.415)	(4.504)	(6.467)	(5.634)	(3.957)	(1.821)	(4.210)
Ygap	6.830***	6.861***	6.318***	4.446**	7.915***	7.305***	7.760***
	(1.349)	(1.327)	(1.383)	(2.127)	(1.514)	(1.311)	(1.437)
Inflation	0.372***	0.336***	0.292***	0.196*	0.434***	0.607***	0.591***
	(0.074)	(0.088)	(0.103)	(0.112)	(0.077)	(0.059)	(0.107)
Credit	-0.018	0.022	0.017	-0.099	-0.026	-0.012	-0.022
	(0.033)	(0.034)	(0.044)	(0.106)	(0.036)	(0.008)	(0.032)
Fix	1.125	1.258	1.248	2.865**	0.823	1.230	0.955
	(0.960)	(1.183)	(1.310)	(1.296)	(0.897)	(0.749)	(0.924)
Constant					13.979***		
					(3.345)		
Nbr. observations	1436	1280	1145	888	1534	1534	1436
Nbr. instruments	32	27	22	17		33	57
AR(1) test	0.000	0.000	0.000	0.000		0.000	0.000
AR(2) test	0.514	0.735	0.763	0.980		0.763	0.995
Sargan C-test	0.010	0.007	0.028	0.032		0.004	0.020
Hansen J-test	0.578	0.259	0.232	0.696		0.653	0.262

Table 8: Different Measures of Explanatory & Explained Variables

M2 growth (% of GDP)				**M2cycle**	**M1**
	(8)	(9)	(10)	(11)	(12)
M2(t-1)	0.290***	0.204***	0.228***		
	(0.056)	(0.068)	(0.056)		
M2cycle(t-1)				0.613***	
				(0.023)	
M1(t-1)					0.114*
					(0.062)
ElectionIpre	1.826**	1.471*	1.659**	2.652*	1.753*
	(0.757)	(0.788)	(0.728)	(1.328)	(0.906)
CBI	-9.446**	-6.257		2.403	-3.935
	(4.490)	(3.842)		(2.892)	(3.982)
Ygap	4.741***	7.203***	6.617***	5.015**	4.262**
	(1.446)	(1.504)	(1.443)	(2.377)	(1.707)
Infgap	0.003				
	(0.007)				
Credit	-0.026	-0.019	-0.030	-0.000	-0.077
	(0.038)	(0.035)	(0.035)	(0.018)	(0.050)
Fix	1.171		1.100	0.824	1.801
	(1.038)		(0.982)	(0.824)	(1.495)
Inflation		0.353***	0.404***	-0.017	0.323***
		(0.082)	(0.070)	(0.105)	(0.087)
Trade		-0.002			
		(0.030)			
Turnover			-4.513		
			(2.861)		
Nbr. observations	1436	1354	1404	994	1334
Nbr. instruments	32	32	32	32	23
AR(1) test	0.000	0.000	0.000	0.005	0.000
AR(2) test	0.236	0.819	0.395	0.375	0.890
Sargan C-test	0.001	0.012	0.006	0.000	0.086
Hansen J-test	0.465	0.415	0.541	0.307	0.206

Table 9: Endogenous/Exogenous Elections

M2 growth (% of GDP)						
	(13)	(14)	(15)	(16)	(17)	(18)
M2(t-1)	0.210***	0.210***	0.211***	0.211***	0.210***	0.212***
	(0.061)	(0.061)	(0.060)	(0.060)	(0.061)	(0.060)
End.D	0.963		1.081			
	(0.782)		(0.774)			
Ex.D		1.358	1.412*			
		(0.852)	(0.847)			
End.I				0.862		0.884
				(0.963)		(0.958)
Ex.I					1.922**	1.917**
					(0.951)	(0.946)
CBI	-4.906	-4.897	-4.897	-4.900	-4.673	-4.681
	(3.422)	(3.505)	(3.446)	(3.446)	(3.492)	(3.461)
Ygap	6.826***	6.770***	6.768***	6.829***	6.796***	6.797***
	(1.379)	(1.383)	(1.374)	(1.382)	(1.359)	(1.354)
Inflation	0.374***	0.372***	0.370***	0.374***	0.376***	0.374***
	(0.074)	(0.074)	(0.074)	(0.074)	(0.074)	(0.074)
Credit	-0.016	-0.020	-0.019	-0.016	-0.019	-0.017
	(0.033)	(0.034)	(0.033)	(0.033)	(0.034)	(0.033)
Fix	1.044	1.128	1.115	1.039	1.134	1.115
	(0.988)	(0.992)	(0.989)	(0.990)	(0.976)	(0.977)
Nbr.observations	1436	1436	1436	1436	1436	1436
Nbr. instruments	32	32	33	32	32	33
AR(1) test	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) test	0.481	0.497	0.504	0.477	0.498	0.501
Sargan C-test	0.009	0.010	0.010	0.009	0.010	0.010
Hansen J-test	0.508	0.523	0.549	0.504	0.550	0.568

6 Heterogeneity

Our three last regression tables are willing to guarantee robustness of our results by modifying the composition of the sample used. In Table 10, we tried to see if the seniority of the central bank can have an impact on PMC. Information were computed using central banks' websites listed in the central bank hub provided by the Bank for International Settlements (BIS)[33]. Thanks to this data collection, we have been able to compute regressions where we divided our sample by taking into account the age of their central bank. In Column (1), we have only kept countries where the central bank have been created less than 50 years ago adding 10 years for each next columns. Two main results can be drawn from this computation. First, when implementing this robustness check, our results are broadly similar, we can still observe PMC. The only difference is the significance of our *de jure* CBI index in some specifications (Column (2) & (3)). But, as the coefficient is negative this is not problematic. Second, we can observe that the younger central banks are, the greater the impact of pre-electoral periods on *M2*'s variation is. Considering central banks as institutions[34], we can underline a potential learning effect in the conduct of their monetary policy. Indeed, older monetary authority are impacted by smoother PMC. One explanation can be a direct link between seniority of the monetary institution and its efficiency as an organization allowing it to fight more efficiently against political pressures (Mantzavinos et al., 2004).

As our database is composed of both democratic and undemocratic countries, one can argue that our results are driven by the countries where the government can easily manipulate electoral results. In order to tackle this issue we have separated our electoral periods in terms of competitiveness in Table 11. To do so, we have used the Competitive Election Index (CEI) provided by the V-Dem database (variable *v2xel_frefair*). This variable is an index going from 0 to 1. A low score stands for an undemocratic electoral event and *vice versa*. Then, we have only considered in Column (7) the election associated with a CEI score minus 0.25 and so forth. As expected, we can observe that the less free and fair are the elections the greater the amplitude of the PMC is. Although, even in the most democratic countries we can observe electoral impact over monetary policy reflecting that increasing electoral competitiveness is smoothing PMC but not avoiding them.
Second part of Table 11 presents an investigation on the impact of the number of veto players over PMC. The veto players approach developed by Tsebelis (2002) teaches us that some individuals (designated veto players) have the power to maintain the political *status quo* by blocking some political decisions. We suppose that a high number of veto players within a political system can prevent monetary authority to serve incumbents' wishes by spreading decision-making in between actors with different preferences. As a way to test the impact of veto players among PMC, we used the index of political constraint ($PolConV$)

[33] consulted on different days in November 2019
[34] As defined by North (1991)

developed by Henisz (2000) in its 2017 version. This index takes into account the number of veto points but also the preferences of individuals composing these veto points[35]. Then, we apply the same methodology than the one used with the CEI index. In Column (10) we coded as 0 every pre-electoral periods characterised by a $PolConV$ above 0.25 and so on in the two following columns. We can conclude that the more compelled is the government, the less important are PMC's range and significance. This is an expected result because a high political constraint represents a limitation to electoral manipulation. Indeed, the number of person you need to convince is higher thus it is more complicated to defend your personal preferences towards monetary policy.

In a last table, we investigate the institutional framework that may directly impact monetary policy. For instance, membership in a monetary union or inflation targeting (IT) policy can add constraints over monetary authorities and reverberate on central banks' behaviour. Column (13) shows that dropping inflation targeters is not modifying the significant and positive impact of pre-electoral periods on *M2* growth. We can also observe this result when dropping monetary union members from our sample. Nonetheless, when dropping these countries, we can observe a decreasing magnitude of *ElectionIpre*. In order to be sure that countries engaged in an economic convergence process are not driving our result, we dropped both monetary unions members and countries part of the European System of Central Banking (ESCB). By doing so, we find a diminishing amplitude and significance of the coefficient attached to *ElectionIpre*. It seems that monetary union members are characterised by political manipulations of the common monetary policy. It is quite an unlikely result because, the more members there is in a monetary union, the harder it is for one country to manipulate unilaterally the whole monetary policy.
On the second part of Table 11, we try to know if the level of development of our countries is conditioning PMC as we have supposed it in Section 4. We found that considering only developed countries (Column (16)) is leading to a non significance of *ElectionIpre*. Nevertheless, as the number of observation for these countries is really low in our sample, we have to be careful when interpreting it. Moreover, dropping developed countries (Column (17)) is leading to a significance of our variables *Credit* and *Fix*. We suppose that this result meets the conclusion of Arcand et al. (2015). Indeed, developed countries may not use credit to private sector to stimulate growth because when it reaches a level of 100% of GDP or above, the relationship turns negative. Thus, only developing countries may be characterised by a link between *M2* growth and the domestic credit to private sector. Moreover, when removing the less developed countries out of our sample in the next column, the amplitude of PMC decreases. One explanation is the potential relative importance of this phenomenon in these countries. As the institutional framework is less complex, it is easier for incumbents to monetize public expenditures. When pulling out of

[35] A $PolConV$ value near 0 convert a low political constraint over incumbent government and a value near 1 represents a high constraint

our model both developed and less developed countries, *ElectionIpre* appears less significant confirming that, on average less developed countries seem to be the main drivers of the average PMC observed. Nevertheless, even when they are not in our sample, PMC can still be observed. We can suppose a negative correlation between PMC's amplitude and level of development but, PMC are still observable on average regardless of institutional framework in place.

Table 10: Central Bank's age

M2 growth (% of GDP)						
	(1) CB created less than 50 years ago	(2) CB created less than 60 years ago	(3) CB created less than 70 years ago	(4) CB created less than 80 years ago	(5) CB created less than 90 years ago	(6) CB created less than 100 years ago
M2(t-1)	0.120*	0.171**	0.137*	0.136*	0.180***	0.184***
	(0.071)	(0.076)	(0.076)	(0.078)	(0.066)	(0.066)
ElectionIpre	2.921**	2.892***	2.079**	2.132**	2.013**	2.007**
	(1.289)	(0.949)	(0.946)	(0.905)	(0.811)	(0.790)
CBI	-10.763	-14.352**	-14.108**	-8.038	-7.030	-7.600
	(7.528)	(6.117)	(5.868)	(5.862)	(4.857)	(4.918)
Ygap	6.872***	6.122***	5.735***	6.844***	6.900***	6.788***
	(1.577)	(1.589)	(1.706)	(1.511)	(1.382)	(1.435)
Inflation	0.320***	0.315***	0.314***	0.378***	0.384***	0.376***
	(0.111)	(0.113)	(0.112)	(0.094)	(0.082)	(0.082)
Credit	-0.013	0.000	-0.003	-0.005	-0.020	-0.018
	(0.077)	(0.063)	(0.066)	(0.059)	(0.045)	(0.042)
Fix	0.861	0.953	0.696	0.644	1.041	1.132
	(1.479)	(1.549)	(1.557)	(1.309)	(1.069)	(1.094)
Nbr. observations	822	980	1083	1171	1274	1295
Nbr. instruments	32	32	32	32	32	32
AR(1) test	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) tes	0.688	0.666	0.588	0.541	0.452	0.428
Sargan C-test	0.044	0.051	0.071	0.042	0.031	0.032
Hansen J-test	0.352	0.257	0.288	0.341	0.585	0.587

Table 11: Elections' freedom Political Constraint

M2 growth (% of GDP)	(7) CEI below 0.25	(8) CEI below 0.5	(9) CEI below 0.75	(10) PolConV below 0.25	(11) PolConV below 0.5	(12) PolConV below 0.75
M2(t-1)	0.212***	0.207***	0.209***	0.220***	0.217***	0.215***
	(0.060)	(0.060)	(0.061)	(0.060)	(0.060)	(0.061)
ElectionIpre	4.561**	3.763**	2.471*	4.421**	2.604**	1.593
	(2.285)	(1.758)	(1.354)	(1.993)	(1.241)	(1.032)
CBI	-4.407	-4.382	-4.477	-3.940	-4.505	-4.967
	(3.398)	(3.338)	(3.450)	(3.411)	(3.460)	(3.503)
Ygap	6.760***	6.726***	6.779***	6.706***	6.691***	6.728***
	(1.353)	(1.353)	(1.368)	(1.352)	(1.366)	(1.385)
Inflation	0.379***	0.381***	0.376***	0.376***	0.369***	0.365***
	(0.072)	(0.072)	(0.073)	(0.072)	(0.074)	(0.076)
Credit	-0.018	-0.021	-0.019	-0.017	-0.020	-0.021
	(0.033)	(0.033)	(0.034)	(0.033)	(0.033)	(0.033)
Fix	0.994	0.983	1.006	0.986	1.051	1.121
	(0.976)	(0.976)	(0.980)	(0.983)	(0.969)	(0.984)
Nbr. observations	1436	1436	1436	1436	1436	1436
Nbr. instruments	32	32	32	32	32	32
AR(1) test	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) test	0.473	0.522	0.505	0.429	0.469	0.481
Sargan C-test	0.012	0.010	0.010	0.011	0.009	0.009
Hansen J-test	0.539	0.538	0.527	0.566	0.578	0.542

Table 12: Monetary Policy Institutional Framework

M2 growth (% of GDP)					
	(13) No IT countries	(14) No monetary unions	(15) No monetary unions & ESCB	(16) Only developed countries	(17) No developed countries
M2(t-1)	0.179***	0.206***	0.190***	0.648***	0.126**
	(0.068)	(0.062)	(0.064)	(0.086)	(0.059)
ElectionIpre	1.781*	1.275*	1.304*	0.190	2.474**
	(0.924)	(0.715)	(0.781)	(0.912)	(0.938)
CBI	-5.329	-6.099*	-6.432*	2.444	-8.730
	(3.698)	(3.418)	(3.466)	(2.903)	(7.254)
Ygap	4.991***	6.784***	6.427***	8.020	6.539***
	(1.510)	(1.674)	(1.757)	(5.121)	(1.460)
Inflation	0.302***	0.349***	0.341***	0.051	0.385***
	(0.092)	(0.079)	(0.080)	(0.426)	(0.084)
Credit	-0.043	-0.005	-0.003	0.004	-0.093***
	(0.044)	(0.032)	(0.044)	(0.013)	(0.033)
Fix	0.997	0.950	0.626	1.499	1.519
	(1.294)	(0.905)	(0.960)	(1.434)	(1.242)
Nbr. observations	1157	1269	1177	322	1114
Nbr. instruments	32	32	32	21	26
AR(1) test	0.000	0.000	0.000	0.006	0.000
AR(2) test	0.247	0.635	0.672	0.173	0.441
Sargan C-test	0.003	0.004	0.013	0.000	0.035
Hansen J-test	0.198	0.577	0.619	0.452	0.347

7 Conclusion

With this paper, we tried to contribute to the present debate on elections' impact over monetary policy. As we have supposed it, on average, we found a pre-electoral rise in the growth of monetary mass. This result is robust regardless the econometric model, the period and the variable used to measure monetary mass' variations. We also found that the amplitude of PMC is directly impacted by several aspects of both political and institutional framework. For instance, a high number of veto players or the membership in a monetary union is reducing PMC's amplitude. Moreover, some aspects of the central banking process like its seniority or the average turnover rate of central bankers can play a role in reducing PMC. Then, we investigated further electoral design and noticed that the more competitive elections are, the less severe is electioneering. Finally, robustness results show us that PMC are not driven by a potential endogeneity of electoral agenda despite the presence of undemocratic countries within our sample.

Our results tackle the traditional vision of the monetary policy where central banks are too often considered as independent experts only focused on inflation. As we show, political phenomenon are impacting monetary policy and then, their integration within monetary policy studies is a concern not to be dismissed. In addition, it may be interesting to investigate further into the transmission channels through which political events may impact modern central banking. Another research path might be the analysis of the potential mutually-reinforcing effects of both fiscal and monetary policy in terms of electorally induced manipulations.

8 Appendice

Table 13: Data Sources

Variable	**Sources**
M1	*International Financial Statistics* (IFS) database - International Monetary Fund
M2	*International Financial Statistics* (IFS) database - International Monetary Fund
Election	*Database of Political Institutions* (DPI) - T. Beck et al. (2001) 2017 version *Election Guide* - International Foundation for Electoral Systems (IFES) *Voter Turnout Since 1945* database - Institute for Democracy and Electoral Assistance (IDEA) Data computed by Nohlen et al. (1999, 2001a,b, 2005a,b, 2010) National Elections Across Democracy and Autocracy (NELDA) - Hyde & Marinov (2012) 2015 version Free and Fair Elections - Bishop & Hoeffler (2014) 2016 version
CBI	Data computed by Garriga (2016) - 2019 version
CreationCB	Data computed using the central bank hub - Bank for International Settlements (BIS)
Turnover	Data computed by Dreher et al. (2010) - 2017 version
Ygap	*World Development Indicators* (WDI) database - World Bank
Inflation	*World Development Indicators* (WDI) database - World Bank
Credit	*World Development Indicators* (WDI) database - World Bank
Fix	Data computed by Levy-Yeyati & Sturernegger (2016) Completed using the work of Ilzetzki et al. (2017)
Trade	*World Development Indicators* (WDI) database - World Bank
CEI	Variable *v2xel_frefair* - *Varieties of Democracy* (V-Dem) database Version 9 (2019)
PolConV	Data computed by Henisz (2000) - 2017 version

Table 14: List of Countries

Countries		
Albania	Ethiopia	Paraguay
Algeria	Fiji	Poland
Antigua & Barb.	France	Portugal
Armenia	Gabon	Rep. of the Congo
Azerbaijan	Georgia	Romania
Bahamas	Ghana	Russia
Bangladesh	Grenada	Rwanda
Belarus	Guatemala	Saint Lucia
Bhutan	Guyana	Samoa
Bolivia	Haiti	Seychelles
Botswana	Honduras	Singapore
Brazil	Hungary	Slovenia
Bulgaria	Iceland	Solomon Islands
Burundi	Indonesia	South Africa
Cambodia	Italy	South Korea
Cameroon	Jamaica	Spain
Canada	Japan	Sri Lanka
Cape Verde	Jordan	St. Kitts & Nev.
Central Afr. Rep.	Kenya	St. Vincent & the Gre.
Chad	Kuwait	Suriname
Chile	Lesotho	Sweden
China	Lithuania	Switzerland
Colombia	Malawi	Tanzania
Costa Rica	Malaysia	Thailand
Czech Republic	Malta	Tonga
Congo, Dem. Rep.	Mexico	Trinidad & Tobago
Denmark	Moldova	Turkey
Dominica	Mongolia	Uganda
Dominican Rep.	Morocco	Ukraine
Egypt	Netherlands	United States
El Salvador	New Zealand	Uruguay
Equatorial Guinea	Nicaragua	Zambia
Estonia	Nigeria	

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