

# Inflation and Democracy in Former Extractive Colonies: Analysis with Instrumental Variables

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## Abstract

This paper analyses the link between inflation and democracy in developing countries (DC) basing on the median voter theorem. The argument of this paper is that democracy is likely to increase inflation in DC because of the low aversion of the median voter against money creation, and her weak preference for stabilization policies. I thus identify monetary, fiscal, and trade openness policies like transmission channels of the effect of democracy on inflation. In order to establish a causal relationship between inflation and democracy, I instrument democratic institutions with the date of political independence. The application of the criterion of Stock and Yogo (2002, 2005) for weak instrumental variable in my sample of DC reveals that the date of independence is a good instrument for democratic institutions.

I find a positive causal relationship between inflation and democracy over the 1960-2003 period, in a sample of 62 DC former extractive colonies including 32 African countries. This result is robust to several robustness checks. It appears that democracy involves not only a rise in money supply, but also difficulties for the implementation of stabilization policies when the DC of my sample are democratized. A case study based on Chile, Ghana, and Sri Lanka makes it possible to better illustrate my result relating to the relation between inflation and democracy in DC.

**Keywords:** Democracy, Inflation, Median Voter, Stabilization Policies, Weak Instruments Test.

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# 1 Introduction

What is the link between inflation and democracy in developing countries (DC)? Do DC become more democratic in expense or in profit of macroeconomic stability? The question is then to know if there is a tradeoff between economic and political reform, and how the policy makers of DC manage this tradeoff. Indeed, economic reform supposes the implementation of macroeconomic stabilization policies whose possible consequence is the loss of political power (because of nonsatisfaction of voter's preferences), but whose most probable result is the fall in inflation. Political reform corresponds to the democratization of political regimes, whose consequence is the need for satisfying the voter's preferences in order to be maintained in power, possibly at the expense of the fall in inflation.

The study of the relationship between inflation and democracy in DC is important. Indeed, most of DC depend on international aid, and more and more, the international aid agencies condition the allocation of aid to the implementation of economic and political reforms in DC. In addition, in order to ensure their economic development, DC must control their levels of inflation because inflation is bad for economic growth (Fischer, 1993; De Gregorio, 1993; Barro, 1995; Bruno and Easterly, 1995; Fischer et al., 2002). Lastly, the participation of DC to globalization and the possibility that they benefit from it, require that DC control their levels of inflation.

This paper is related to the literature of political economy of inflation, and tackles particularly the question of the effect of political regime type on inflation, question analysed according to two different approaches in the literature. In the "state capture" approach, inflation is a result of pressures from elites who derive private benefits from money creation at the expense of the majority of citizens. The proponents of this approach see in democratization a solution to the control of inflation in DC since democracy involves political and institutional constraints, which limit the elite's rent seeking behaviour. Such is the opinion shared by Bates and Krueger (1993) and Geddes (1995).

In the "populist" approach, inflation is the result of public demand for transfers financed by inflation tax, suggesting that inflation and democracy are positively correlated. The proponents of "populist" approach see in democratization of DC a threat for the control of inflation. Thus, Nelson (1993) proposes the concentration of power in a strong chief of executive, or the delegation of the management of economic policies to independent technocrats (Williamson, 1994), or the need for a central authority (Haggard and Kaufman, 1992) to avoid high rates of inflation in DC.

The objective of this paper is to test the two alternative approaches of political economy of inflation in the context of DC, while identifying the channels of transmission of the effect of democracy on inflation. In so doing, I argue that *popular demand for public goods and services financed by money creation, the uncertainty of the results of stabilization policies, and the slow materialization of these results make it difficult the control of inflation in democratic DC*. Indeed, in DC where the majority of citizens do not have access to the basic public goods and services (school, health, water, etc) and where the governments have limited resources to finance their expenditures, the median voter (MV) would express a high demand for public goods during the elections. Democratic governments are likely to mainly finance these public goods by money

creation in order to ensure their maintenances in power. In the same way, the uncertainty of the results of stabilization policies and the slow materialization of these results, in terms of economic growth would reduce the preference of the MV for stabilization policies in DC. In this situation, democratic governments in DC would be less incited to make necessary efforts for an effective implementation of stabilization policies, which would represent a threat for their maintenances in power.

Because of the risk of endogeneity of democratic institutions, I use the date of independence as instrumental variable for democratic institutions. I establish a positive causal relationship between inflation and democracy in a sample of 62 DC former extractive colonies, over the 1960-2003 period. Moreover, it appears that the positive relationship between democracy and inflation in my sample of DC is due not only to the rise in money supply but also to the difficulties which democracy generates for the implementation of stabilization policies in DC. Indeed, democracy positively and significantly affects the growth rate of money supply, democracy reduces trade openness in the DC of my sample.

The positive effect of democracy on inflation that I obtain, corresponds to the result envisaged by the “populist” approach of political economy of inflation. My result also is in the same line as the one envisaged by Alesina and Drazen (1993). Indeed, these authors argue that polarized governments (usual characteristic of democratic political regime) are likely to record high levels of inflation because of the delay in stabilization policies implementation. Lastly, the recent results of empirical works relating to the analysis of political business cycles also confirm my result. Indeed, it was recently established that political business cycles are of a greater width in DC than in developed countries (Brenda and Drazen, 2005; Shi and Svenson, 2002a, 2000b). In this situation, democracy which means partly the multiplication of the electoral consultations, is likely to represent a challenge to macroeconomic stability in DC.

My results are however in contradiction with those obtained recently as for the effect of democracy on inflation. Indeed, Satyanath and Subramanian (2004, 2005), establish a negative relationship between democracy and inflation. In the same way, Desai et al. (2003) establish a positive relationship between democracy and inflation conditionally on the level of income inequality, and a negative relationship between democracy and inflation, independently of the level of income inequality. Why this divergence between my results and those of these authors?

The first source of difference is the sample composition. The sample of Satyanath and Subramanian (2004, 2005) is composed of 70 developed countries and DC including 48 ex-colonies of extraction and settlement. As for the sample of Desai et al. (2003), it is composed of more than 100 countries, including developed countries and DC. My sample is composed only of 62 DC ex-colonies of extraction. The second source of difference is the method of estimate. Satyanath and Subramanian (2004, 2005) use 2SLS with cross section data, whereas Desai et al. (2003) use the first differenced GMM estimator with annual panel data. I use 2SLS with five years pooled data. My technique of estimate compared to that of Satyanath and Subramanian (2004, 2005) has the advantage to consider the temporal dynamics of inflation and democracy and the covariant shocks affecting all the countries. Compared to the method of estimate of Desai et al. (2003), mine has the advantage of the use of instrumental variable resulting from natural experi-

ment. In addition, knowing the criticisms addressed to the first differenced GMM estimator, the advantage of my technique of estimate compared to that of Desai et al. can be admitted.

Beyond the sources of difference between my results and those of Satyanath and Subramanian (2004, 2005) and Desai et al. (2003), it is important to note that my paper suggests a new instrumental variable for democratic institutions.

The remainder of this paper is organized as follows. Section 2 presents my theoretical arguments and their empirically testable predictions. Section 3 is devoted to the empirical analysis. A first part of this section presents the arguments justifying the use of the date of independence as instrument for democratic institutions. The second part of section 3 contains my empirical results, while a third part is interested in the analysis of the mechanisms of the effect of democracy on inflation, by identifying *monetary, fiscal, and trade openness policies* like transmission channels. Section 4 presents a case study comparing the institutional performances and inflation in Chile, Ghana, and Sri Lanka. Section 5 concludes.

## 2 Theoretical arguments

In democracy, the majority of citizens has the right to vote, to express her preferences for economic policies and the government is supposed to represent the preferences of the whole population (Acemoglu and Robinson, 2006). In the same way, in democracy the preferences of the MV are most important for the various candidates to the elections because any candidate who manages to satisfy the preferences of the MV is persuaded to be elected: this is the principle of the MV theorem. Thus, in a democratic system made up of two political parties for which the leaders are only worried about their accessions to power, one should observe a convergence of the parties' policy platforms towards the preferences of the MV (Downs, 1957; Hotelling, 1929)<sup>1</sup>.

I use the MV theorem to analyse the effect of democracy on inflation in DC. In so doing, I make the assumption that in DC the MV is poor because the majority of people are poor there<sup>2</sup>. A poor MV is characterized by an income  $Y^M$  lower than the average national income  $\bar{Y}$ , and belongs to the majority of the citizens (Acemoglu et Robinson, 2006). In this theoretical configuration, the policy preferences of the poor voters are those which should prevail in a democratic system. Because the MV is poor and it is supposed that there is a clear separation between the policy preferences of the poor citizens and those of the rich citizens. Moreover, it

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<sup>1</sup>The MV is the voter whose preference for economic policies shares the whole of the voters in two equal proportions i.e. 50% of the voters prefer a policy higher than that of the MV, and 50% others have a preference lower than that of the MV. To see the argument behind the MV theorem, imagine individuals are voting between  $q^M$  and some policy  $\tilde{q} > q^M$ . Because preferences are single peaked, all individuals who have ideal points less than  $q^M$  strictly prefer  $q^M$  to  $\tilde{q}$ . This follows because indirect utility functions fall monotonically as we move from individuals' ideal points. In this case since the MV prefers  $q^M$  to  $\tilde{q}$ , this individual plus all the people with ideal points smaller than  $q^M$  constitute a majority, so  $q^M$  defeats  $\tilde{q}$  in pairwise vote. This argument is easily applied to show that any  $\tilde{q}$  where  $\tilde{q} < q^M$  is defeated by  $q^M$  (now all individuals with ideal points greater than  $q^M$  vote against  $\tilde{q}$ ). Using this type of reasoning we can see that the policy that wins in democracy must be  $q^M$ . So in democracy all the candidates have interest to propose a policy platform which is as close as possible to the policy preferred by the MV. This illustrative example is drawn from Acemoglu and Robinson (2006).

<sup>2</sup>In their chapter 4, Acemoglu and Robinson (2006) make the same assumption of a poor MV in a context where the majority of individuals are poor, i.e. the majority of the individuals have an income lower than the national average.

is admitted that part of the poor citizens cannot constitute with part of the rich citizens the electoral majority and vice versa (Acemoglu and Robinson, 2006).

The assumption of a poor MV in DC is extremely plausible and important for my theoretical predictions<sup>3</sup>. Moreover, the weak access of the majority of citizens to the fundamental public goods and services (water, health, school, etc), the slow materialization of the results of stabilization policies and the uncertainty of these results, in terms of economic growth are structural characteristics of DC which condition the attitude of the MV towards inflation. Scheve (2003, 2004) presents a literature on the structural characteristics of economies conditioning the attitude of citizens towards inflation.

## **2.1 Attitude of the MV towards inflation in Developing Countries**

I analyse the attitude of the MV towards money creation and stabilization policies to deduce her attitude towards inflation. My analysis of the attitude of the MV towards inflation is then through her attitude towards the tools used to lower inflation. A low (high) aversion of the MV against money creation, and a weak (high) preference of the MV for stabilization policies, both of the two, represent an implicit preference (aversion) for inflation. Thus theoretically, I admit that money creation, and the stabilization policies are the transmission channels of the effect of democracy on inflation.

### **2.1.1 Access to fundamental public goods and services and attitude of the MV towards money creation**

The citizens in DC have a limited access to the fundamental public goods (water, health, school, etc). This fact is less debatable and has motivated the commitment of the international community and DC leaders in 2000 in favour of the Millenium Development Goals (MDGs). The MDGs aims to reduce poverty by half by 2015 essentially, via the increase in public goods' provision in DC. In DC the access to public goods is more limited for the poorest citizens to which belonged the MV. The quantity of public goods and services consumed by the MV in DC is socially suboptimal. This suboptimality can be appreciated in terms of distances covered by the children of poor families to go to school, distances covered to have access to drinking water, to have access to the centers of health, etc. The less the quantity of public goods consumed by the MV is, the less high is the utility of the MV, because her utility is positive and increases with the consumed quantity of public goods provided by the government.

In DC, during the presidential and legislative elections, the MV would express a high demand for fundamental public goods and services (water, health, school, etc) with an aim of improving her well being. The governments can decide to satisfy this demand for public goods. However, in DC the financing of public goods by tax or by borrowing is limited. Indeed, in DC because of the limited capacity of saving of the households, the governments can only borrow in limited way on domestic market. The weak solvency of governments in DC limits their capacity of external borrowing. The structural and technological characteristics of DC reduce the capacity of tax

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<sup>3</sup>Sheve (2004) and Jayadeva (2006) have established a positive relationship between the level of poverty and the preference for inflation in developed countries sample.

levy. The inflation tax appears so, as the source of financing by which governments in DC can increase their expenditures (Cukierman et al., 1992 ; Edwards and Tabellini, 1991).

While focusing on the degree of accessibility to the fundamental public goods and services of the MV, and by making the assumption of a weak independence of the Central Banks in DC<sup>4</sup> my theoretical reasoning makes it possible to make the following deduction: If a government in a DC wishes to be maintained in power whereas its capacities of tax levy and borrowing are limited, this government can only resort to the seignuriage to satisfy the demand for public goods and services expressed by the MV. The governments are more incited to resort to money creation to satisfy the demand of the MV for public goods since this demand can be interpreted as an implicit demand of the MV for inflation<sup>5</sup>. In the same way, a high demand for public goods by the MV in DC can be interpreted as the revelation of a low aversion of the MV against money creation. This interpretation appears justifiable if it is admitted that when the MV does not have access to the basic public goods and services, its first concern is to be able to acquire these goods independently of the cost of their modes of financing.

Whatever the interpretation that the governments in DC can give to the demand for public goods by the MV, my theoretical reasoning indicates that democracy can allow the majority of citizens in DC to express their preferences for public goods and services. In the same way, my theoretical reasoning makes it possible to show that when the governments aim to be maintained in power, they respond to the demand of the MV for public goods by seignuriage because of the limited character of the other sources of financing of public expenditures in DC. The combination of these two arguments makes it possible to put forward the low aversion of the MV against money creation as a first cause of a possible positive relationship between inflation and democracy in DC.

## **2.2 Results of macroeconomic stabilization policies and attitude of the median voter towards macroeconomic stabilization policies**

The level of inflation is one of the measurement of macroeconomic stability used in the literature. Macroeconomic stabilization can be achieved by adequate monetary, fiscal, and exchange policies. These policies are considered as traditional stabilization policies (World Bank, 2005). However, recent works show that trade openness can also contribute to macroeconomic stabilization in the sense that it can contribute to lower inflation (Romer, 1993 ; Campillo and Miron, 1996, 1997 ; Lane, 1997 ; Rogoff, 2003).

I am interested in the attitude of the MV towards macroeconomic stabilization policies in DC. In so doing, I mention two characteristics of macroeconomic stabilization policies in DC that are: *The uncertainty and the slow materialization of the results of stabilization policies*. These two characteristics of stabilization policies are due to several factors including the structural

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<sup>4</sup>The assumption of a weak independence of the Central Banks is quite plausible in the context of DC. Indeed, Cukierman et al., (1992) show that the national Central Banks in underdeveloped countries are de facto slightly independent with respect to the chief of the executive.

<sup>5</sup>The notion of implicit demand for inflation, can also be found with Gordon (1975). Gordon used this notion to characterize the preference of certain citizens for inflation tax to finance public expenditures.

characteristics of DC <sup>6</sup> and can influence the attitude of the MV towards these policies.

The non acceleration and the uncertainty of the results of stabilization policies in DC can be highlighted while referring at the authors of *Economic Growth in the 1990s: Learning from a Decade of Reform*, World Bank (2005). The authors of this book admit that the economic reforms implemented in DC and inspired on Washington consensus have generated disappointing results in the 1990s. Indeed, these authors admit that economic growth during the 1990s in DC was lower than expected. In Africa, in spite of the implementation of the reforms and a rather favorable international environment, economic takeoff seems absent. The few rare cases of success in Africa appeared fragile. In Latin America, in spite of economic reforms, the 1990s were marked by slow economic growth compared to the 1950-1980 period. The few cases of Latin American success were completed by financial and exchange crises.

I can also mention cases of specific countries to illustrate the slowness and the uncertainty of the results of economic reforms in DC. Indeed, Nelson (1993) supports that the reforms undertaken at the end of 1970s and 1980s in Chile and Mexico, generated a rise in investments and economic growth only several years afterwards. In Bolivia, the reforms initiated in 1985 generated a positive economic growth only in 1991.

If it is admitted that the results of stabilization policies are not accelerated and uncertain in DC, the question is then to know how these two characteristics can influence the attitude of the MV towards the stabilization policies.

When the results of stabilization policies are not accelerated, they are less likely to be preferred by the MV in DC. Indeed, as I mention it above, the MV in DC is poor. Poverty can lead the MV to have a high preference for the present: A poor MV is a short-sighted individual who adheres with difficulty to the policies promising him a better future. This attitude of the MV is more possible as the results of these policies are not accelerated and are uncertain.

In addition, the non acceleration of the results of stabilization policy reduces the initial social support that the policy reform enjoys (Nelson, 1993). In this case, the stabilization policy has little chance to be continued what reduces the probability of the MV to enjoy the stabilization policy results. Indeed, the results of stabilization are diffused to all the social groups and the poorest in particular, only if the stabilization policy is fully implemented (Nelson, 1993; Hellman, 1998).

The uncertainty of the results of stabilization policies is not either a characteristic likely to cause the adhesion of the MV to the stabilization policy in DC. Indeed, the uncertainty of the policy results reduces the probability of its continuation. However, as I mention it, the more uncertain the full implementation of policy reform is, the less certain is the diffusion of the results of stabilization to the poorest people among which the MV belongs.

When the result of a policy is uncertain, the first results are captured by the political and/or economic elite. The feeling of frustration resulting from the accapuration by the elite of the first results of stabilization policy can involve socio-political instability and consequently, compromise the continuation of stabilization policy. In addition, the uncertainty of the result of stabilization

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<sup>6</sup>For a recent development of the causes of the uncertainty and the slow materialization of macroeconomic stabilization policies results in DC, see World Bank (2005) and Rodrik (2006).

policy can involve a partial reform whose consequence is the concentration of the first results of the reform in the hand of a minority of elite which blocks the continuation of the reform (Hellman, 1998).

The weak preference for stabilization policies of the MV in DC can dissuade the governments of these countries from an effective implementation of stabilization policies when the political regimes become democratic. In this situation, democracy is likely to involve a rise in inflation because the governments will not undertake undesirable reforms for the MV, this represents a threat for their maintenances in power.

I take as a starting point the median voter theorem to analyze the relation between inflation and democracy in the context of DC. In addition, I mention the structural characteristics of developing economies and the situation of poverty of the MV for better understanding of the relation between democracy and inflation in DC. The combination of these various elements enables me to make the following empirically testable proposal:

*In DC, democracy is likely to involve a rise in inflation because of the low aversion of the MV for money creation and her weak preference for stabilization policies. Money creation can make it possible to finance the fundamental public goods and services to which the MV has slightly access. The uncertainty and the slow materialization of the results of stabilization policies in terms of economic growth, make it difficult the continuation of stabilization policies, and thus reduce the diffusion of the results of stabilization policies to the poorest social group to which belonged the MV.*

### 3 Empirical Strategy

When one studies the relationship between inflation and democracy, the problem of endogeneity is the first that she/he may face. Indeed, a high level of inflation is likely to involve political and institutional instability. Historical examples illustrate political changes due to high inflation rates as the seizure of power by Hitler in 1933, the changes in political regimes in Brazil in 1964, Ghana and Indonesia in 1966, Chile in 1973, and Argentina in 1975. Beyond the simultaneity, the subjective character of the measurement of democracy level can involve measurement error likely to generate biased coefficients. In addition, an omission of relevant variables can induce biased results. So, the three traditional sources of endogeneity can be present in my data. To solve the endogeneity problem, I resort to instrumentation technique while using the date of independence as instrumental variable for democratic institutions in my sample of 62 DC former extractive colonies<sup>7</sup> including 32 African countries.

The second problem in the study like the one that I carry out, is the identification of the mechanisms by which democracy affects inflation. Indeed, inflation is the outcome of the macroe-

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<sup>7</sup>The choice of former colonies as my country sample is justified by the opportunity that this sample offers to me to have an instrumental variable resulting from natural experiment. Moreover, as I am interested in the analysis of the effect of democracy on inflation in DC, the choice of my sample is also justified because it is well representative of DC. Indeed, my sample comprises a big DC, economically and demographically like India; emerging countries like Argentina, Brazil, and Singapore. Lastly, my country sample comprises an important number of African countries which are the poorest of DC. The list of these 62 countries are imposed to me by data availability on democratic institutions.

conomic policies pursued by a country and democracy is a political system conditioning the choice of these policies. While basing on my theoretical arguments, I test the effect of democracy on the following macroeconomic policy variables: *fiscal balance, broad money, and trade openness*, but also the effect of these macroeconomic policy variables on inflation while considering their risk of endogeneity.

My empirical strategy is mainly constituted of three steps. I initially estimate the bivariate relation between inflation and democracy, then I add the transmission channels variables, finally, I control for the other determinants of inflation evoked in the literature.

### **3.1 Theoretical arguments on the relationship between the date of independence and the quality of democratic institutions**

The date of political independence can be considered as instrumental variable for democratic institutions in order to establish a causal relationship between inflation and democracy in my sample of DC. Indeed, it is difficult to imagine another channel by which the date of independence can affect the level of inflation of a country, than only through its effect on the quality of political institutions of this country. Moreover, I mention three theoretical arguments likely to explain the relationship between the date of independence and democratic institutions. The first argument is based on the thesis of Acemoglu et al. (2001) related to colonization strategy. The second argument is related to the ideological beliefs of post-colonial national political leaders. The last argument is related to the externalities of the timing of independence acquisition.

#### **3.1.1 Quality of democratic institutions and date of independence: argument based on the thesis of Acemoglu et al. (2001)**

Acemoglu et al. (2001) support that European colonialists had adopted different colonization strategies according to whether Europeans could settle in colony. In colonies where Europeans faced high mortality rates, they could not settle and they set up extractive institutions<sup>8</sup>.

I support that, the longer a country where prevailed extractive colonization strategy lived under colonial administration, the more likely the country in question should inherit bad institutions at the time of its independence. Indeed, the longer the colonial period lasts, the more persistent the strategy of extraction and the institutions of bad quality should be, in a former extractive colony. Because the extractive colonization strategy as described by Acemoglu et al. (2001) existed due to the implementation of institutions of bad quality. My assumption is possible while admitting that the extractive colonization strategy changed little in the course of time since the climatic conditions did not change in the colonies. However, as Acemoglu et al. (2001) support it, the climatic conditions constituted an important factor for the definition of the strategies of colonization.

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<sup>8</sup>According to Acemoglu et al., (2001) the colonies from Africa, Latin America and Caribbean have tropical climat and so hostile to the survival of European colons. These colonies were extractive colonies and had inherited bad institutions from colonization. in opposite, United States, Canada, New Zealand, and Australia have climatic conditions near to the one of Europe. These colonies were colonies of settlement and so had inherited good institutions from colonization.

In addition, the persistence of institutions makes that a country which inherits institutions of bad quality at the time of its independence is also very likely to have bad institutions today. Thus, the nature, the duration of extractive colonization strategy, and the persistence of institutions<sup>9</sup> enable me to support the existence of a negative relationship between the date of independence and the quality of democratic institutions in the ex-colonies of extraction. In other words, the later an ex-colony of extraction acquires its independence, the less its democratic institutions should be of good quality.

The theoretical argument that I support, based on the thesis of Acemoglu et al. (2001) can be summarized by the following diagram:

Date of independence  $\Rightarrow$  Duration of extractive colonization strategy  $\Rightarrow$  Post colonial political institutions  $\Rightarrow$  Current democratic institutions  $\Rightarrow$  Inflation rate

### **3.1.2 Quality of democratic institutions and date of independence: argument based on countries' ideological choices**

The quality of democratic institutions depends on the institutional choices carried out by the countries and on the way in which the countries react with respect to their possible errors of choice. The institutional choices are sometimes justified by ideological beliefs<sup>10</sup>.

I support that countries which soon acquired their political independence are countries which early could carry out institutional choices, even though these choices may not be free. These countries thus got time to observe the consequences of their choices, and to realize of the possible errors in their choices. According to whether these countries correct or do not correct their errors of institutional choices, this affects the trajectory of their institutions.

Through this argument, a positive or a negative relationship can be expected between the date of independence and the quality of democratic institutions, all depends on the way in which the errors of institutional choices are managed. If the errors of institutional choices are reinforced in the course of time, then countries which soon acquired their independence are those which would record bad institutional scores. Conversely, if at a given time the errors of institutional choices are courageously corrected, this would modify positively the countries' institutional trajectory. In this case, the sooner a country acquires its political independence, the more likely the country in question would have good institutions today.

Countries can realize of their errors of institutional choices by comparing their economic performances with those of their neighbors who carried out different institutional choices. Thus, for example, the North Korean leaders could have realized of their errors of institutional choices by comparing their economic performances with those of their counterparts of South Korea. In west Africa, countries close to Ghana would have realized of the institutional changes carried

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<sup>9</sup>Acemoglu et al. (2001) mention among other factors, the lack of financial resources in the new independent countries, the lack of interests of the new local elite and the ex-colonial powers to explain the persistence of institutions in the ex-colonies.

<sup>10</sup>Acemoglu et al. (2003, 2005) develop arguments on the importance of the differences in ideological beliefs likely to explain the difference in the quality of institutions among countries. In the same way, Piketty (1995) and Romer (2003) highlight the importance of the ideological beliefs for differences in countries' choices of economic policies.

out by Ghana, and which contributed to the good economic performances of this country these last years. Indeed, it is interesting to note the current ghanean political stability and the fall (compared to the 1980s) in the number of young ghanean people in the close countries, carrying out odd jobs to ensure their survivals. This downward trend of the number of young ghanean in the close countries can be related to the improvement in the socio-economic conditions in Ghana, thanks to the various institutional reforms that President Rawlings carried out.

Through these two examples, I do not support that the leaders of the countries close to Ghana should have transposed in their own countries the same institutional changes carried out by Ghana, or that the North Korea should have copied the institutions of South Korea. I know that such transpositions are neither easy, nor necessarily effective <sup>11</sup>. I only want to illustrate through these two examples, the importance of the difference in the institutions' choices and the choice of institutional changes for the countries' institutional trajectory.

The theoretical argument linking the date of independence to the quality of democratic institutions because of the possibility that political independence offers to countries to carry out institutional choices is summarized schematically as follows:

Date of independence  $\Rightarrow$  Political independence  $\Rightarrow$  Choice of post colonial political institutions  
 $\Rightarrow$  Correction or not of institutional choice errors  $\Rightarrow$  Current democratic institutions  $\Rightarrow$   
 Inflation

### **3.1.3 Quality of democratic institutions and date of independence: argument based on the externalities of the moment of acquisition of independence**

I can mention arguments in favour of a positive relationship between the date of independence and the quality of institutions. These arguments are related to the positive externalities of the moment of acquisition of political independence.

Indeed, the later a country acquires its independence the more this country has opportunities to avoid the errors of the predecessors independent countries. Such an argument is valid by supposing for example, that the leaders of the countries having acquired later their independence could avoid undertaking policies which caused coups d'Etat in the first independent countries.

In the same way, the later a colonized country acquires its independence, the more the local civils servant of the colonial administration would have had time to improve their competences in management of the public affairs. Such a situation contributes indirectly to the formation of the local elite likely to ensure the management of the public affairs after the independence.

Lastly, a country having acquired later its independence could benefit from the externalities related to the international context. Thus, an independent country in the 1990s is more likely to inherit democratic institutions. The 1990s coincide with the fall of the Berlin Wall and mark the beginning of the will of the international community to spread democratic practices in the

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<sup>11</sup>In addition, Acemoglu et al. (2003, 2005) show that for the problems of credibility of commitments between the elite and the citizens, the choice of good institutions and consequently that of institutional change can be difficult to be achieved. If the citizens are not convinced to effectively reap the share of the overall pie of institutional change that the elite promises them, the citizens will then oppose to the institutional change. In the same way, the elite will not initiate institutional change if they are not convinced that the citizens will respect their commitments to give them their share of institutional change pie, even in the case of power loss.

not yet democratic countries. In the opposite, a country having acquired its independence at the time of the cold war can have institutions of bad quality without being disturbed by the Western powers as long as the country in question defends the same ideology as that of the Western powers. This is illustrated by the support brought by the United States to the dictator President Mobutu of the ex-Zaire which supported Savimbi in the fight against the communist regime of Angola at the time of the cold war.

Thus, while benefiting from the positive externalities related to the moment of independence, and because of the persistence of the quality of institutions, a country having acquired later its independence could inherit at the time of its independence good institutions which will persist. Schematically one obtains:

Date of independence  $\Rightarrow$  (Local elite formation, Avoidance of political errors of the first independent countries, international context)  $\Rightarrow$  Post colonial political institutions  $\Rightarrow$  Current democratic institutions  $\Rightarrow$  Inflation rate

### **3.1.4 Empirical implications of the various theoretical arguments on the relationship between the quality of democratic institutions and the date of independence**

The first and the third argument respectively envisages a negative and a positive relationship between the date of independence and democratic institutions. As for the second argument, it envisages a positive or a negative relationship between the date of independence and democratic institutions. Anyway, the mechanisms underlying the expected relationship between the date of independence and the quality of democratic institutions differ according to the argument used.

Indeed, according to the argument based on the thesis of Acemoglu et al. (2001), a negative relationship between the date of independence and democratic institutions should exist in the ex-colonies of extraction. Because the longer these ex-colonies lived under colonial administration, the more likely they would inherit from the colonial period an initial endowment of bad democratic institutions which persist in time.

As for the argument relating to the externalities of the moment of acquisition of independence, it envisages a positive relationship between the date of independence and democratic institutions. According to this argument, a country having acquired later its independence could benefit from the positive externalities of the moment of independence and inherit from the colonial period, good democratic institutions which persist in time.

Lastly, the argument relating to the institutional choices based on ideological beliefs envisages a positive or a negative relationship between the date of independence and democratic institutions, depending on the way in which the errors of institutional choices are managed. The mechanism underlying this argument envisages an independent relationship between the date of independence and the quality of the initial institutions inherited from the colonial period. According to this argument, the institutional choices carried out by the colonized countries and the way in which these countries are adjusted to their possible errors of choice after the independence, are the determining factors of the institutional trajectory of the colonized countries. Which of the three arguments or mechanisms will prevail, remains an empirical question.

### 3.2 Specification of the empirical models and description of variables

The goal of my paper is to estimate the effect of democracy on the level of inflation in DC while correcting for the endogeneity of democracy. I then estimate the following equations:

$$\text{Log}(infl_{it}) = c + \alpha Dem_{it} + v_t + \epsilon_{it} \quad (1)$$

$$Dem_{it} = c + \beta \text{Log}(date_i) + v_t + \sigma_{it} \quad (2)$$

$$Dem_{i0} = c + \delta \text{Log}(date_i) + v_t + \omega_{it} \quad (3)$$

$$Dem_{it} = c + \varphi Dem_{i0} + v_t + \mu_{it} \quad (4)$$

Equation (1) makes it possible to estimate the bivariate relationship between democracy and the rate of inflation. In this equation,  $\text{Log}(infl_{it})$  is the logarithm of the rate of inflation in country  $i$ , at time  $t$ . The data on the rate of inflation are obtained from WDI (2005) database. The annual inflation rate measures the annual change in the index of the consumer price.  $Dem_{it}$  corresponds to the index of democracy in country  $i$ , at time  $t$ . This index is obtained from Polity IV database and corresponds to the Polity 2 variable, varying from -10 to +10. This index is the measurement of the level of democracy corrected for the degree of dictatorship of a political regime. The Polity 2 index measures the degree of political pluralism, the competition in the election of the chief executive, and constraints on the chief executive. A high value of this index especially when it is positive indicates a high level of democracy.  $V_t$  corresponds to the temporal fixed effects,  $\epsilon_{it}$  to the error term, and  $c$  is the constant.

My theoretical arguments envisage a positive relationship between democracy and the rate of inflation in DC, I therefore expect a positive coefficient  $\alpha$ . The choice of the functional form of equation (1) enables me to reduce the weight of outliers in the estimates i.e. observations corresponding to very high rates of inflation, but also to take account of nonlinearity in the relationship between inflation and democracy. I choose to estimate the relationship between democracy and inflation with five years pooled data while considering temporal fixed effects. The choice of such technique of estimate has some advantages.

Indeed, thanks to the use of temporal fixed effects, I can take into account some events as the oil crises which involved a rise in the prices in the world. In the same way, in the course of time, various economies succeeded to better control inflation due to the improvement in the practices of Central Banks and the increase in trade openness (Rogoff, 2003). These two factors according to Rogoff, affected all the economies in the world. So ignore them risks to involve a bias in favour of democracy since the level of democracy also improved in the course of time almost everywhere in the world. Thus, taking into account time fixed effects, makes it possible to reduce the bias due to omitted variables.

The reduction in the bias of omitted variables reduces the bias in the coefficients but the establishment of a causal relationship between inflation and democracy requires the use of a technique of instrumentation, that is why I also run the models of equations (2), (3) and (4). Equation (2) is the first stage equation and makes it possible to test the effect of the date of independence on democratic institutions. The data on the date of independence are obtained

from CIA Factbook (2005) and CD Rom Atlas Universal Larousse (2003). In case of divergence between the two sources, I consider the date of political independence which corresponds to the total absence of colonial presence in a country. Equation (2) comprises temporal fixed effects, which makes it possible to take into account factors which involved movements of democratization in various countries. These events are for example the fall of the Berlin Wall in 1989, or the speech at Baule of François Mitterrand in 1990, inviting all the French-speaking African countries to be democratized in order to continue to benefit from the french government aid for development. While estimating equation (2), I can identify which of the three arguments relating to the relationship between the date of independence and democracy will be revealed coherent with my data.

Equation (3) makes it possible to test the effect of the date of independence on the initial endowment in countries' democratic institutions. Through this equation, I try to know wheter the fact to acquire independence later is an advantage or a disadvantage for the acquisition of good democratic institutions at the time of independence. A negative  $\delta$  indicates that countries having acquired later their independence are those which would have inherited democratic institutions of bad quality. Conversely, a positive  $\delta$  indicates that the later a country acquires its independence, the better is its initial endowment in democratic institutions. Equation (3) thus makes it possible to identify the mechanism underlying each argument relating to the relationship between the date of independence and the initial quality of democratic institutions. In equation (3),  $Dem_{i0}$  corresponds to the measurement of the level of democracy the year country  $i$  becomes independent.

Equation (4) makes it possible to test the assumption of the persistence of institutions. A positive  $\varphi$  indicates that countries having acquired good (bad) democratic institutions at the time of their independence are also those which have good (bad) democratic institutions over the 1960-2003 period. By confronting the results of equation (3) and (4) I can find an explanation to the result which I will obtain from equation (2).

The results of equation (1) without instrumentation will be presented beside those obtained after instrumentation, which makes it possible to test the robustness of my results and especially to identify the source of endogeneity in my data. Equation (3) will also be estimated with a probit model. In this case, the explained variable is a dummy variable taking the value of one if country  $i$  inherits at independence, a positive institutional score, and zero otherwise.

I run all the models with my total sample of 62 DC former extractive colonies with data covering the 1960-2003 period. The list of the countries as their dates of independence are in appendix <sup>12</sup>.

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<sup>12</sup>In appendix, one can also find the descriptive statistics of the variables used in this paper and graph 1 which illustrates the relationship between inflation and democratic institutions in my total sample of DC over the 1960-2003 period. It appears in graph 1, a rise in inflation since 1974 until 1994, and a beginning of fall in inflation since 1995. As for the index of democracy, it records an improvement in its value at the beginning of the 1980s. Broadly one observes a positive relationship between democracy and inflation from 1975 to 1994, and a negative relationship between the two variables from 1995 to 2003.

**Table 1:** Results of bivariate relationship between inflation and democracy 1/

	OLS (1)	2SLS (2)	OLS (3)	OLS (4)	Probit (5)	OLS (6)
	Log(infl)	Log(infl)	Dem	$Dem_0$	$Dem_0$	Dem
dem	0.013 (1.63)	0.178 (4.20)***				
log(date)			-47.918 (6.02)***	47.213 (9.12)***	21.392 (8.19)***	
$dem_0$						0.425 (10.19)***
Constant	1.256 (6.70)***	1.419 (5.39)***	360.894 (6.07)***	-357.869 (9.18)***	-162.217 (8.20)***	-0.192 (0.29)
Number of observations	469	469	469	558	558	543
$R^2$	0.21	-	0.19	0.08	0.16	0.29
F-statistic	-	-	14.10***	-	-	-
Log of vraisemblance	-	-	-	-	-305.015	-

Note: \*\*\*, denote significant coefficients at the threshold of 1%. The figures in bracket are t-Student robust to the heteroskedasticity.

1/ The estimates are carried out with my sample of 62 DC ex-colonies of extraction. Column (3) corresponds to the first stage equation, i.e. that of the regression of the index of democracy on the date of independence. The F-statistic of the first stage is higher than 10, which shows that the date of independence is not a weak instrument for democratic institutions according to the criterion of Stock and Yogo (2002, 2005). The estimates contain temporal dummies whose coefficients are not shown.  $Dem_0$  measures the level of democracy the year a country of my sample acquires its independence.

### 3.3 Results

Table 1 presents the result of the effect of democracy on inflation. Column (2) of table 1 indicates that after instrumentation (2SLS), democracy positively and significantly affects inflation in DC ex-colonies of extraction. The comparison of the result of column (1) to that of column (2) of table 1 indicates that, democracy would be endogenous because of measurement errors in the quality of democratic institutions, since in OLS the coefficient associated with democracy is lower than its value in 2SLS.

The first stage result in column (3) of table 1 shows that the date of independence is a satisfactory instrumental variable for democratic institutions. Indeed, the coefficient associated with the date of independence in this equation is very significant, with a t-Student equal to 6, and the R-squared of the first stage equation is 0.19.

In addition, a deep diagnosis of the quality of my instrumental variable, indicates that the date of independence is not a weak instrument for democratic institutions. Indeed, according to the criterion of Stock and Yogo (2002, 2005), an instrument is known as weak if the F-statistic of the first stage is lower than 10 when the model contains only one endogenous variable. In my case, the F-statistic is equal to 14.1 what shows that the date of independence is a good instrument for democratic institutions in my sample of DC.

The first stage indicates a negative relationship between the date of independence and the quality of democratic institutions: countries having acquired later their independence are those which have bad democratic institutions over the 1960-2003 period. Such a result is the one envisaged by my argument based on the thesis of Acemoglu et al. (2001), and is illustrated by

graph 2 in appendix. This result does not mean that the democratic institutions would have been of better quality if independence had intervened earlier in the ex-colonies of extraction, because nobody knows what would have happened. The question is to know which mechanisms underlying the various arguments relating to the relationship between the date of independence and the quality of democratic institutions will be coherent with my data.

The mechanism based on the thesis of Acemoglu et al. (2001) envisages a negative relationship between the date of independence and the initial endowment in democratic institutions of the various countries. As one can note it in columns (4) and (5) such a prediction is rejected by the data. Indeed, through the results contained in these columns, it appears a positive relationship between the date of independence and the initial quality of democratic institutions: countries having acquired later their independence are those which have inherited at the time of their independence relatively good democratic institutions. Graph 3 in appendix illustrates the relationship between the date of independence and the initial endowment in democratic institutions. Column (6) of table 1 indicates the persistence of democratic institutions: countries which would have inherited good democratic institutions at independence are also those which would have good democratic institutions over the 1960-2003 period.

The results of table 1 indicate a positive relationship between the date of independence and the initial countries' endowment in democratic institutions. The same results indicate the persistence of democratic institutions. Then, how can one understand the negative relationship between the date of independence and the quality of democratic institutions in my sample?

Such a result means a negative reversal of the characteristics of democratic institutions of the countries, i.e. countries having inherited good democratic institutions at independence are those which have bad democratic institutions over the 1960-2003 period. Such an inversion of situation is not coherent with my data since these data indicate the persistence of democratic institutions.

None of my arguments nor of the mechanisms underlying these various arguments, completely explains the relationship between the date of independence and the quality of democratic institutions. The argument based on the thesis of Acemoglu et al. (2003) envisages a negative relationship between the date of independence and the quality of institutions, because of an initial endowment of bad democratic institutions which the countries having acquired later their independence would have inherited. On contrary, the data show that countries having acquired later their independence would have inherited relatively good democratic institutions at the time of their independence, as the argument based on the positive externalities of the moment of independence envisages it. However, this last argument too, does not completely explain my results, since it envisages a positive relationship between the date of independence and the quality of democratic institutions because of the persistence of institutions. This is not the case although the persistence of institutions is indeed a phenomenon which I observe in my data. The third argument relating to the relationship between the date of independence and the quality of democratic institutions envisages an independent relationship between the date of independence and the initial endowment in institutions of the countries. Such a result is not obtained because the data indicate a positive and significant relationship between the date of

independence and the level of democracy at independence year.

The data that I have at my disposal do not allow me to explain empirically and completely, the relationship between the date of independence and democratic institutions through the various arguments and mechanisms which I mention. However, it appears that the date of independence has a very significant effect on democratic institutions, and the application of the criterion of weak instrument reveals the good quality of the date of independence like instrumental variable for democratic institutions, which is rather reassuring for the analysis that I carry out.

I obtain a positive bivariate relationship between democracy and inflation as my theoretical arguments predict it. This is a causal relationship since it results from a technique of instrumentation using an instrumental variable which is revealed good. The question is to know if the positive relationship between inflation and democracy is robust.

### 3.3.1 Robustness checks

The change in the functional form is the first robustness check<sup>13</sup> which I carry out. At the place of the logarithm of the rate of inflation as explained variable, I consider the following transformation:  $\Pi_{it}/(1 + \Pi_{it})$  suggested by Cukierman et al. (1992, 2000),  $\Pi_{it}$  is the rate of inflation in country  $i$ , at time  $t$ . This transformation according to Cukierman has the advantage of reducing the heteroskedasticity of the error while reducing the weight of outliers without involving a loss of observations. The second functional form that I consider is the rate of inflation in level. In this case, no transformation is applied to the rates of inflation. In spite of these changes in functional form, the positive causal relationship between inflation and democracy remains.

I consider the deflator of GDP as a measurement of inflation rate. In this case too, the positive bivariate relationship between inflation and democracy remains unchanged.

I test the robustness of my results compared to the changes in the index of democracy. At the place of the index of democracy from Polity IV, I consider the index of constraint on the executive also obtained from Polity IV, as a measurement of democracy. In this case too, the positive effect of democracy on inflation remains. I also use the index of democracy from Freedom House (political right), like a measurement of democracy, which does not change my result about the positive relationship between democracy and inflation.

From 1960 to 2003, DC did not live under democratic regimes during the whole period. It is at the end of the 1980s that a number of DC started being democratized. My result could thus be due to the mixture of periods of dictatorship and democracy, in order to avoid this situation I run the model with data covering only the 1980-2003 period. The positive relationship between inflation and democracy also remains unaffected by this change of period of analysis.

I test the robustness of my results compared to the level of inflation because it may be that for very high rates of inflation, democracy does not have any significant effect on inflation. Thus, I carry out estimates with only the observations whose value is higher than the median value of the logarithm of the rate of inflation in my sample. With this reduced number of observations, I also obtain a positive relationship between inflation and democracy.

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<sup>13</sup>The results of the robustness checks are not shown but remain available upon request.

My sample includes countries which have institutional organizations predisposing them to record low rates of inflation. This is the case of African Franc Zone countries which for political and historical reasons, have regional Central Banks, what would have contributed to lower inflation in these countries. Thus, my result could be due to the high variability of the rate of inflation in my total sample. I thus estimate the relationship between inflation and democracy while excluding african countries of Franc Zone. In this reduced sample, I also obtain a positive relationship between inflation and democracy.

The positive relationship between inflation and democracy is robust. By which mechanisms does democracy involve such a result in DC former extractive colonies?

### 3.4 Mechanisms of transmission of the effect of democracy on inflation

#### 3.4.1 Effects of democracy on macroeconomic policies and of macroeconomic policies on inflation

Theoretically, I support that democracy involves a rise in inflation in DC because of the difficulties which it could generate for the control of money supply and/or for the implementation of macroeconomic stabilization policies. In addition, the rate of inflation of a country is the reflection of the economic policies followed by this country and democracy conditions the choice of these policies. So it appears judicious to test the effect of democracy on the following macroeconomic policies: *monetary, fiscal, and trade openness policies*.

The monetary policy is approximated by the logarithm of the growth rate of money supply (log (broad money growth)) obtained from WDI (2005), the fiscal policy is measured by the fiscal balance (revenues - expenditures), obtained from IFS and World Bank African database (2005), and the trade openness policy is measured by the sum of exports and imports and is extracted from WDI (2005). All the proxy for macroeconomic policies except the proxy for monetary policy are expressed in percentage of GDP. These three variables represent sufficiently the macroeconomic policies of a country, and their use enables me to decide between my various theoretical arguments. Indeed, through the effect of democracy on the monetary policy, I will know if democracy involves or not difficulties for the control of money supply. The effects of democracy on fiscal and trade openness policies make it possible to know if it is more difficult or not to set up stabilization policies when DC become democratic. I then estimate, the following equations:

$$M_{it} = c + \eta Dem_{it} + v_t + \omega_{it} \quad (5)$$

$$F_{it} = c + \gamma Dem_{it} + v_t + \theta_{it} \quad (6)$$

$$O_{it} = c + \lambda Dem_{it} + v_t + \phi_{it} \quad (7)$$

In equation (5), the explained variable is the growth rate of broad money. In this equation if democracy makes difficult the control of money creation, the coefficient associated with democracy should be positive and significant. In equation (6), the explained variable is fiscal balance. The difficulties associated with setting-up sound fiscal policy when DC are democratized appear

through a negative coefficient associated with democracy in equation (6). Lastly, in equation (7), the dependent variable is trade openness. If when DC are democratized they have difficulties to practice trade liberalization, the coefficient associated with democracy should be negative and significant in equation (7).

I estimate these various equations with my total sample. I instrument democratic institutions by the date of independence in order to establish a causal relationship between democracy and the macroeconomic policy variables because of the risk of endogeneity of democratic institutions.

It is important to note that, I cannot say that the macroeconomic policy variables which I identify are good transmission channels of the effect of democracy on inflation, if these same variables do not significantly affect inflation. This justifies the interest for estimating the respective effect of the various macroeconomic policy variables on inflation through the following equation:

$$\text{Log}(infl_{it}) = c + \xi \text{MacroPol}_{it} + v_t + \rho_{it} \quad (8)$$

In equation (8), the independent variable can be one of the macroeconomic policy variables which I mention above. Since years, the positive effects of money supply and public deficit on inflation are more or less admitted in the literature at least theoretically, even though the empirical relations are far from being obvious. In opposite, the effect of trade openness on inflation emanates from relatively recent works, and these various works envisage and establish a negative effect of trade openness on inflation (Romer, 1993; Campillo and Miron, 1996, 1997; Lane, 1997; Rogoff, 2003).

I estimate equation (8) by instrumenting the various macroeconomic policy variables to take into account the risk of their endogeneity. Thus I use the instrument of Frankel and Romer (1999) for trade openness<sup>14</sup>, the one year lagged value of the log of broad money growth like instrument for monetary policy, and the lagged value of fiscal balance as instrument for fiscal policy. A positive relationship between trade openness and the instrument of Frankel and Romer (1999) is expected, a positive relationship between the growth rate of broad money and its lagged value is expected because of the inertia of monetary policy. The inertial character of fiscal policy makes that I expect a positive relationship between the fiscal balance and its lagged value. The use of the lagged variable as instrumental variable is valid only if the errors are not autocorrelated. Fortunately, the absence of autocorrelation in pooled data is less doubtful (Wooldridge, 2002 chapter 6).

The results of table 2 indicate that in 2SLS, democracy involves a significant rise in money supply, it involves a significant improvement in fiscal balance, and reduces trade openness in my total sample of DC ex-colonies of extraction. Democracy thus has differentiated effects on macroeconomic policies in my sample of DC <sup>15</sup>.

*It appears that, the rise in money supply would not be the only cause of the positive effect*

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<sup>14</sup>This instrument corresponds to the predicted value of trade openness due to the individual countries' geographical characteristics. Frankel and Romer (1999) use this instrumental variable to estimate the effect of trade openness on economic growth. I think that such an instrument can also be valid if it is used to establish a causal relationship between trade openness and inflation.

<sup>15</sup>Similar results are obtained by using 3SLS, to take account the correlation between the errors of the equations of the effects of democracy on the various macroeconomic policy variables.

**Table 2:** Effects of democracy on macroeconomic policies 1/

	OLS	2SLS	OLS	2SLS	OLS	2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
	Mon	Mon	Fiscal	Fiscal	Open	Open
dem	0.013	0.058	0.002	0.007	0.005	-0.046
	(1.51)	(2.21)**	(4.07)***	(4.47)***	(2.15)**	(4.58)***
Constant	3.030	2.690	-0.037	-0.014	0.526	0.743
	(11.91)***	(23.51)***	(1.54)	(1.30)	(11.77)***	(10.78)***
Number of observations	509	509	439	439	503	503
$R^2$	0.06	-	0.04	-	0.05	-
F-statistic	-	20.97***	-	15.48***	-	20.67***

Note: \*\*\*,\*\* denote significant coefficients respectively at the thresholds of 1% and 5%. The figures in bracket are t-Student robust to the heteroskedasticity.

1/ The estimates are carried out with the whole sample of 62 DC former extractive colonies. The estimates contain temporal dummies whose coefficients are not shown. The F-statistics are those of the first stage for which the totality of the results is not shown.

of democracy on inflation, but also the difficulties related to the implementation of stabilization policies which democracy generates would be an additional source of the positive effect of democracy on inflation in DC. The rise in money creation for electoral considerations that democracy could cause in DC, as one could fear it, seems to be confirmed in my data. Indeed, in spite of the fall in public deficit that democracy involves, democracy also involves a significant rise in money supply in my sample of DC. This result could be interpreted as the manifestation of the syndrome of financing of extra budgetary expenditures that democracy would generate in DC.

Table (3) presents the results of the specific effect of each macroeconomic policy on inflation. Through this table, it appears that all the macroeconomic policies exert their expected effects on inflation in my sample. The rise in money creation positively affects inflation, the improvement in the fiscal balance reduces inflation, as does the rise in trade openness. The coefficients associated with the various macroeconomic policy variables are significant at the threshold of 1%.

The first stage equations indicate that the instruments exert their expected effects on the various macroeconomic policy variables. Indeed, through the first stage equations it appears a positive relationship between the growth rate of money supply and its lagged value. The lagged value of fiscal balance exerts a positive effect on the current fiscal balance what illustrates the inertia of fiscal policy. Lastly, the instrument of Frankel and Romer (1999) positively and significantly affects the level of trade openness. The analysis of F-statistic of the first stage equations, indicates that none of the instrumental variable for the macroeconomic policies can be regarded as a weak instrument according to the criterion of Stock and Yogo (2002, 2005).

Thus, I show that democracy affects macroeconomic policies, and that macroeconomic policies also affect inflation in my sample of DC former extractive colonies. So, one can admit that the macroeconomic policy variables that I consider can be transmission channels of the effect of democracy on inflation.

The question is to know whether the positive effect of democracy on inflation will remain once I consider the effects of the various macroeconomic policy variables.

**Table 3:** Effects of macroeconomic policies on inflation 1/

	2SLS (1)	OLS (2)	2SLS (3)	OLS (4)	2SLS (5)	OLS (6)
	Log(infl)	Mon	Log(infl)	Fiscal	Log(infl)	Open
mon	0.841 (7.33)***					
lagged money		0.513 (6.87)***				
fiscal			-7.075 (2.61)***			
lagged fiscal				0.669 (8.93)***		
open					-1.617 (7.56)***	
FR instrument						1.497 (22.12)***
Constant	-0.524 (1.49)	1.671 (8.19)***	1.914 (14.49)***	-0.002 (1.17)	1.972 (8.76)***	0.226 (7.85)***
Number of observations	422	422	369	369	452	452
$R^2$	0.38	0.37	0.18	0.49	0.27	0.44
F-statistic	-	15.11***	-	13.65***	-	61.08***

Note: \*\*\*, denotes significant coefficients at the threshold of 1%. The figures in bracket are t-Student robust to the heteroskedasticity.

1/ The estimates are carried out with my whole sample of 62 DC former extractive colonies and contain temporal dummies whose coefficients are not shown. Lagged money is the lagged value of the logarithm of broad money growth. Lagged fiscal is the lagged value of fiscal balance as percent of GDP. The OLS estimates are the results of first stage equations.

**Table 4:** Simultaneous effects of democracy and macroeconomic policies on inflation 1/

	2SLS		2SLS		2SLS	
	(1)		(2)		(3)	
	Log(infl)		Log(infl)		Log(infl)	
dem	0.084 (2.92)***		0.265 (3.93)***		0.064 (1.73)*	
mon	0.741 (5.69)***					
fiscal			-19.470 (3.28)***			
open					-2.402 (5.60)***	
Constant	-0.668 (1.65)*		2.142 (6.39)***		2.263 (7.56)***	
Number of observations	399		349		431	
First Stage Equations						
	OLS	OLS	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)	(5)	(6)
	Dem	Mon	Dem	Fiscal	Dem	Open
log(date)	-54.257 (6.86)***	-2.474 (1.95)*	-48.039 (5.21)***	-0.097 (2.18)**	-49.211 (5.85)***	1.406 (4.85)***
lagged money	0.074 (0.29)	0.502 (6.54)***				
lagged fiscal			24.022 (3.39)***	0.670 (8.65)***		
FR instrument					3.602 (1.12)	1.471 (9.69)***
Constant	408.575 (6.23)***	19.880 (2.08)**	369.276 (5.19)***	0.740 (2.18)**	371.655 (5.86)***	-10.379 (4.75)***
$R^2$	0.20	0.36	0.21	0.51	0.19	0.30
Instruments quality diagnosis						
Cragg-Donald statistic (1993) 2/	16.96		9.83		13.59	
Critical values (r = 0.1)	7.03		7.03		7.03	
Critical values (r = 0.15)	4.58		4.58		4.58	

Note: \*\*\*, \*\*, \* denote significant coefficients respectively at the thresholds of 1%, 5%, and 1%. The figures in bracket are t-Student robust to the heteroskedasticity.

1/ The estimates are carried out with my total sample of 62 DC former extractive colonies and contain temporal dummies whose coefficients are not shown. Lagged money is the lagged value of the logarithm of broad money growth. Lagged fiscal is the lagged value of fiscal balance as percent of GDP.

2/ The statistic of Cragg Donald (1993) is suggested by Stock and Yogo (2002, 2005) for weak instruments test. This statistic is used when a model comprises more than one endogenous variable. If the calculated statistic is lower than the tabulated statistic of Cragg Donald, this indicates that the instruments could suffer from a certain weakness according to the size of error (r) which one is ready to admit.

### 3.4.2 Simultaneous effects of democracy and macroeconomic policies on inflation

Table 4 indicates that taking into account the effects of macroeconomic policies does not affect the positive relationship between democracy and inflation in my sample of DC ex-colonies of extraction. Whatever the macroeconomic policy considered, the effect of democracy on inflation remains positive and significant. Thus, at this stage it seems that democracy has an independent and positive effect on inflation: democracy exerts another effect on inflation than the one only due to the various macroeconomic policy variables that I consider. Moreover, the results of table 4 show that all the macroeconomic policy variables exert a significant effect on inflation and the coefficients associated with these macroeconomic policy variables have their expected signs. In table 4, it appears that independently of the first stage equation considered, the assumption of weak instrumental variables is rejected.

The independent effect of democracy is subject to the same robustness checks as its direct effect on inflation. In this case, in spite of the changes in functional forms, measurement of inflation, index of democracy, level of inflation, period of analysis, and samples, the positive and independent effect of democracy on inflation remains overall robust. These results are not shown but are available upon request.

### 3.5 Taking into account the other determinants of inflation

Until now I estimate the effects of democracy and macroeconomic policies on inflation without considering the effects of the other determinants of inflation. Such a situation can involve a bias in my results due to omitted variables. So I need to control for the other determinants of inflation.

While referring to the article of Cukierman et al. (1992), I control for the variables characterizing the structure of economies. These variables correspond to the GDP per capita obtained from Pen World Table 6.2, to the share of the agricultural production in the GDP from WDI (2005), and to the rate of urbanization also obtained from WDI. Countries whose GDP per capita is high lay out more capacity of tax levy and resort less to the seignuriage. A high urbanization would facilitate the tax levy and could contribute to the control of inflation, but it can also cause a development of informal activities contributing thus to the rise in inflation. A significant share of the agricultural production in the GDP means a dense agricultural sector and consequently a significant share of the richness of a country escaping the tax authorities, what should contribute to the rise in inflation. I also control for the passed inflation to take into account in a certain extent, the social preferences for inflation or the persistent aspects of the factors that determine inflation (Campillo and Miron, 1996, 1997).

I also control for the variables characterizing the duration of political institutions. It is about variable measuring the stability of political regime obtained from Polity IV. Cukierman et al. (1992) show that the instability of political regime positively affects inflation. In order to reduce the simultaneity errors, I consider the lagged value of the political regime stability.

Lastly, I control for the variables of economic situation. While basing on the Philips curve theory, I control for the lagged economic growth and expect a negative effect of economic growth

on inflation. Indeed, in period of economic growth unemployment should drop and consequently, the need for the authorities to resort to surprise inflation is reduced. In the same way, it is easier to stabilize an economy during the period of economic expansion than during the period of recession, by cutting government expenditures. On the basis of the theory of “dutch disease”, I control for terms of trade and expect a positive effect of terms of trade on inflation. The data on the growth rate are obtained from WDI (2005) and those of terms of trade from World Bank Network Growth Database <sup>16</sup>.

As one can note it in table 5, while taking into account the other determinants of inflation, the effect of democracy on inflation remains positive but nonsignificant except in the specification with fiscal policy. The independent effect of democracy on inflation disappears once the effects of the other determinants of inflation are taken into account. However, as it appears in column 4 of table 5, while controlling for the other determinants of inflation without taking into account the effect of any of the macroeconomic policy variables, I continue to obtain a *positive and significant* effect of democracy on inflation<sup>17</sup>. This illustrates again that the macroeconomic policy variables that I consider are good transmission channels of the effect of democracy on inflation in my sample of DC.

In my sample of DC former extractive colonies, the variables of economic structure and duration of political institutions significantly affect inflation. So my results are close to those of Cukierman et al. (1992) who find significant effects on seigniorage of political instability and economic structure variables. The persistence of inflation is a phenomenon that I find in my sample of DC. This result is close to the one of Loungani and Swagel (2001) who also find the persistence of inflation in a group of DC. In opposite, it seems that the economic situation variables do not have any significant effect on inflation once the effects of democracy and those of the other determinants of inflation are taken into account. However, the economic situation variables have their expected sign whatever the specification considered.

Through theoretical arguments, I show that the relationship between democracy and inflation could be positive in DC. The data seem to confirm my assumption. I will present a case study with three specific countries to better illustrate my results.

## 4 Case study

My case study consists in comparing the performances in terms of democracy and inflation rates in Chile, Ghana, and Sri Lanka. Africa, Latin America, and Asia which constitute the principal under developed areas are represented through my case study. The choice of these three countries is based on the work of Nelson (1993) who compares the experiments of economic reforms in the 1970s and 1980s of these three countries.

In Chile, table 6 indicates that the rate of inflation reached its peak estimated at 200%

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<sup>16</sup>I would like to control for the independence of Central Banks. However, the index of independence of Central Banks of Cukierman et al. (1992) which is most used in the literature are available only for hardly 50% of my sample. Moreover, these data cover only the period 1950-1989 whereas my paper relates to the 1960-2003 period.

<sup>17</sup>I obtain the same result when I use the log of colons mortality rates from Acemglu et al. (2001) as instrument for democratic institutions instead of the independence date. Result not shown but available upon request.

**Table 5:** Effects of democracy, macroeconomic policies, and other determinants on inflation 1/

	2SLS (1)	2SLS (2)	2SLS (3)	2SLS (4)			
	Log(infl)		Log(infl)				
dem	0.029 (0.67)	0.228 (3.49)***	0.012 (0.23)	0.135 (2.86)***			
mon	0.563 (4.63)***						
fiscal		-16.922 (2.88)***					
open			-1.875 (3.90)***				
<i>Economic structure</i>							
lagged inflation	0.006 (0.63)	0.025 (1.64)*	0.028 (2.23)**	0.025 (1.93)*			
log(gdp)	-0.551 (2.93)***	-0.522 (1.92)*	-0.281 (1.22)	-0.856 (3.78)***			
agriculture	0.768 (1.28)	3.384 (2.52)**	-0.182 (0.19)	2.035 (2.22)**			
urbanization	2.859 (4.90)***	2.743 (2.73)***	2.066 (2.93)***	3.682 (5.06)***			
<i>Duration of political institutions</i>							
political regime stability	-0.001 (0.15)	-0.019 (2.43)**	-0.006 (1.34)	-0.008 (1.68)*			
<i>Economic situation</i>							
lagged gdp growth	-0.020 (1.10)	-0.006 (0.15)	-0.015 (0.70)	-0.009 (0.36)			
term of trade	0.253 (1.81)*	0.092 (0.26)	0.037 (0.17)	0.323 (1.17)			
Constant	1.847 (1.40)	3.461 (1.86)*	5.181 (3.59)***	7.050 (4.40)***			
Number of observations	292	254	312	313			
<b>First Stage Equations</b>							
	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)
	Dem	Mon	Dem	Fiscal	Dem	Open	Dem
log(date)	-52.466 (4.06)***	-5.197 (2.52)**	-50.429 (3.72)***	-0.051 (0.85)	-49.667 (4.05)***	2.138 (3.98)***	-51.956 (4.15)***
lagged money	0.214 (0.75)	0.503 (5.36)***					
lagged fiscal			19.447 (2.21)**	0.573 (6.46)***			
FR instrument					2.313 (0.64)	1.453 (10.01)***	
Constant	392.251 (3.96)***	41.242 (2.61)**	379.768 (3.65)***	0.354 (0.78)	370.374 (3.92)***	-16.185 (3.80)***	387.962 (4.02)***
R <sup>2</sup>	0.29	0.38	0.29	0.46	0.29	0.46	0.29
Instruments quality diagnosis							
Cragg-Donald statistic (1993) 2/		6.11		5.56		6.04	
Critical values (r = 0.1)		7.03		7.03		7.03	
Critical values (r = 0.15)		4.58		4.58		4.58	
F-satistic							13.78***

Note: \*\*\*, \*\*, \* denote significant coefficients respectively at the thresholds of 1%, 5%, and 1%. The figures in bracket are t-Student robust to the heteroskedasticity.

1/ The estimates are carried out with the total sample of 62 DC former extractive colonies and contain temporal dummies whose coefficients are not shown. Lagged money is the lagged value of the logarithm of broad money growth. Lagged fiscal is the lagged value of fiscal balance as percent of GDP.

2/ The statistic of Cragg Donald (1993) is suggested by Stock and Yogo (2002, 2005) for weak instruments test. This statistic is used when a model comprises more than one endogenous variable. If the calculated statistic is lower than the tabulated statistic of Cragg Donald, this indicates that the instruments could suffer from a certain weakness according to the size of error (r) which one is ready to admit.

The first stage equations contain the other exogenous explanatory variables of the model. The coefficients associated with these variables are not shown in order to save space.

**Table 6:** Comparisons of the performances of Chile, Ghana and Sri Lanka 1/

Countries	Periods	Money Growth	Fiscal balance 2/	Trade Openness	Inflation	Dictatorship 3/	Democracy 4/	Constraint executive 5/
Chile	61-64	45.44	-2	28	28	0	5	4
	65-69	41.57	-1	29	25.4	0	6	5
	70-74	187.15	-7	47	200	3	1	3
	75-79	198.88	1	45.7	150	7	-7	1
	80-84	31.46	0.3	59	22.4	7	-7	1
	85-89	34.00	0.2	60	20	4	-2	2
	90-94	22.7	1.5	57.6	17.5	0	8	7
	95-99	14.46	1	64.5	6	0	8	7
	00-03	4.88	0.1	..	3	0	9	7
Ghana	61-64	17.09	..	39.3	..	9	-9	1
	65-69	5.75	-5	38.7	9	8	-6	0
	70-74	21.44	-4	26	11.7	5	-3	3
	75-79	41.92	-9	13	66	5	-3	2
	80-84	40.46	-4	38	70	6	-4	2
	85-89	49.67	-0.1	50	26	7	-7	1
	90-94	38.15	-0.7	75.5	23	3	-3	1
	95-99	33.87	-5	100	32	1	1	4
	00-03	39.29	-8	25	25	1	5	6
Sri Lanka	61-64	9.84	0	80	2	0	7	7
	65-69	5.39	0	67	3	0	7	7
	70-74	9.89	0	52	7	0	8	7
	75-79	29.95	0	68	6	0	7	6
	80-84	22.18	-0.1	74	17	1	5	5
	85-89	11.14	0	62	8.5	1	5	5
	90-94	20.30	0	72	13	1	5	5
	95-99	17.86	0	80	9	1	5	5
	00-03	14.95	0	82	9	1	6	6

Note: 1/ All the macroeconomic variables (fiscal balance, trade openness) are expressed as a percentage of GDP. The growth rate of money corresponds to the growth rate of broad money. The data are from the same sources as those described in the body of the paper.

2/ The values of fiscal balance are very small reason for which I record the value 0 in the case of Sri Lanka. That does not mean that the budget is all the time balanced in Sri Lanka quite to the contrary these figures are often negative.

3/ It is the index of Freedhome House which actually taken in its rough form measures the level of dictatorship in a country.

4/ 5/ denote respectively the index of democracy and constraint on the executive from Polity IV.

during the 1970-1974 period, and since this period inflation has not ceased decreasing to reach its lowest level estimated at 3% during the 2000-2003 period. Through table 6, it appears that the spectacular falls in inflation in Chile were achieved from 1974 to 1984, period of hard dictatorship of Augusto Pinochet (1973-1990). Indeed, Pinochet arrived in power in 1973 in an environment of hyperinflation. Five years after his arrival at the head of State, Pinochet reduced about 50 points of percentage the rate of inflation which was estimated at 150% during the 1975-1979 period compared to 200% the previous five-year period.

From 1980 to 1984, Chile continued its effort of inflation control under the hard reign of Pinochet. Compared to the 1975-1979 period, the 1980-1984 period recorded a fall in the rate of inflation of 128 points of percentage. The 1980-1984 period corresponds to that when the statute of Pinochet passed from that of the President of a military junta governing Chile, to that of the President of the Republic of Chile, at the head of an authoritarian constitutional regime.

Table 6 indicates well that the control of inflation was achieved at the time of the Chilean dictatorship. Indeed, when Pinochet seized the power the level of democracy as measured by the experts of Polity IV was equal to 1. But from 1975 to 1984, the level of democracy remained on average equal to -7 reflecting thus a transformation into a dictatorship of the Chilean political regime. The same tendency to the authoritarian drift of the regime of Pinochet is observed whatever the index of measurement of democratic performance considered.

The reign of Pinochet was marked by the dictatorship and the control of inflation in Chile. Table 6 shows that the control of inflation was made possible thanks to a sustained budget surplus, and the increase in trade openness, whereas the money supply started its fall only nearly ten years after the arrival of Pinochet to the power. Let us note that in spite of the end of the dictatorship of Pinochet in 1990, the Chilean authorities continued to fight inflation, which is the proof that the control of inflation initiated by Pinochet is understood by its successors as a national priority.

In Ghana, table 6 indicates that inflation reached its maximum value estimated at 70% during the 1980-1984 period. From this period, inflation recorded a continuous fall until 1994. From 1995 to 1999, inflation set out again to rise. The most important fall in inflation took place in Ghana during the 1985-1989 period, with the passage of the rate of inflation from its maximum value of 70% to a value of 26% during the 1985-1989 period, i.e. a fall of 44 points of percentage.

The significant fall in the rate of inflation took place during the presidency of Jerry Rawlings who seized the power at the end of 1981, following his second military coup d'Etat in three years. Rawlings arrived in power in an environment of high inflation and undertook economic reforms in an austere and authoritarian way in order to stabilize the ghanean economy (Nelson, 1993; Block, 2002). Rawlings succeeded to reduce inflation in a significant way more than five years after his arrival in power, but at the expense of democracy. Indeed, as one can note it in table 6, all the indicators show the fall in the level of democracy in Ghana from 1980 to 1989. The drop in inflation in Ghana was achieved thanks to the reduction in public deficit, and the rise in trade openness.

The 1990-1994 period is also characterized by a fall in inflation but in a less proportion compared to the 1980s. This proves a reduction in effort of the ghanean authorities in their

inflation fight, reduction in effort which continued during the 1995-1999 period, characterized by a rise in the rate of inflation of nine points of percentage compared to the 1990-1994 period. It thus appears that the 1990-1999 period was that when the efforts of the ghanean authorities in inflation fight were relatively weak, and yet Rawlings was always in power during this period. Then, how can one understand such a relaxation of effort?

Indeed, the 1990-1999 period is that of the beginning of democratization in Ghana as one can note it in table 6, which shows an improvement in the scores of democracy in Ghana. In 1992, following the interior and external pressures, President Rawlings organized the first democratic elections in Ghana. Days before these elections, Rawlings yielded at the demand of civil servants and increased their wages of 50 to 70% whereas the wages were reduced in the 1980s in order to decrease public expenditure (Block, 2002). Rawlings was elected in 1992, and its party NDC (National Democratic Council) obtained 198 seats out of the 200 that constituted the Ghanean Parliament.

The macroeconomic stabilization effort of President Rawlings thus decreased when since the 1990s, he engaged his country in the way of democratization. Indeed, from 1990 to 1999, public deficit increased by four points of percentage, whereas all the indices of the quality of democratic institutions recorded an improvement in their values during the same period, as one can note it in table 6. Ghana, thus constitutes a case of developing country being democratized at the expense of macroeconomic stability. Moreover, table 6 shows that, after the departure of Rawlings from the power in 2000, public deficit and money supply do not cease increasing in Ghana.

The evolutions of the rate of inflation and democracy are less clear in Sri Lanka like Nelson (1993) also points out it. However, through table 6, one can note that the inflation rate recorded a fall of 50 points of percentage during the 1985-1989 period, compared to the 1980-1984 period when inflation reached its peak. The fall in inflation is due primarily to the reduction in public deficit and money supply. Table 6, indicates that the fall in inflation in Sri Lanka was achieved without significant changes in democratic institutions, since the indices of democracy remained constant for the 1980-1989 period, even though in fall compared to the previous periods.

## 5 Conclusion

In this paper I analyze the relationship between inflation and democracy in developing countries (DC) while basing on the theorem of the median voter (MV). *I support that democracy is likely to involve a rise in inflation in DC because of the low aversion of the MV against money creation, and her weak preference for stabilization policies.* I mention the limited access to the basic public goods and services (water, health, school, etc) of the majority of citizens to which belonged the MV in DC, to deduce the low aversion against money creation of the MV. The non acceleration of the results of stabilization policies as well as the uncertainty of these results in terms of economic growth, make it possible to deduce the weak preference of the MV for stabilization policies in DC. Indeed, money creation because of the limited character of the other sources of financing of public expenditures in DC, can make it possible to finance the public goods which the MV needs. The non acceleration of the results of stabilization policies and the uncertainty of these

results, make difficult the continuation of stabilization policies and thus reduce the diffusion of the results of these policies to the poorest social group to which belonged the MV.

I use the date of independence like instrument for democratic institutions in order to establish a causal relationship between democracy and inflation in DC ex-colonies of extraction. By applying the criterion of Stock and Yogo (2002, 2005) for weak instrumental variable, it appears that the date of independence is a good instrument for democratic institutions in my sample of DC. I identify monetary, fiscal, and trade openness policies like transmission channels of the effect of democracy on inflation. The link between democracy and money supply makes it possible to know if it is difficult or not to control money supply when DC are democratized. As for the effect of democracy on fiscal and trade openness policies, it makes it possible to know whether it is difficult to implement stabilization policies in democratic DC.

The econometric estimates with a sample of 62 DC ex-colonies of extraction including 32 African countries, over the 1960-2003 period, enable me to establish a positive causal relationship between democracy and inflation. The positive effect of democracy on inflation is robust to the level of inflation considered, changes in functional forms, measurement of inflation, indices of democracy, period of analysis, samples, and to the consideration of the other determinants of inflation. A case study based on Chile, Ghana, and Sri Lanka makes it possible to better illustrate my result as for the relationship between democracy and inflation in DC.

*It appears that the positive link between inflation and democracy in my sample of DC is not due only to the rise in money supply which democracy generates in DC, but also to the difficulties of these countries of implementing stabilization policies when they are democratized.* Indeed, in my sample of DC, democracy involves a significant rise in money supply. Democracy reduces trade openness in my sample, this illustrates the pro inflationary effect of democracy on the nonmonetary causes of inflation. In the same way, democracy involves a reduction in public deficit in the DC of my sample, this illustrates the anti inflationary effect of democracy on the nonmonetary causes of inflation. The good news of my results is that democracy has an anti inflationary effect on fiscal policy in DC. The bad news is that the anti inflationary effect of democracy on fiscal policy, is insufficient to counterbalance the effect of democracy on money creation and the pro inflationary effect of democracy on trade openness policy.

The policy implication of my results is *not* a questioning of the need of democratization of DC because nobody can deny the intrinsic values of democracy. On the other hand, my results indicate the need for finding means to control money supply, and to facilitate the implementation of stabilization policies in DC when those countries are democratized; otherwise economic and political reforms are likely to be substitutes in DC. Several tracks have already been proposed for the good management of money creation in DC, it is advisable to reinforce these tracks especially at this moment when the majority of DC start their democratic transitions. In order to facilitate the implementation of stabilization policies in DC, it would be desirable to accelerate and to reduce the uncertainty of the results of stabilization policies in terms of economic growth. Otherwise, the reforming candidates would have evil to be elected or to effectively implement stabilization policies. Indeed, if the results of stabilization policies are not accelerated and less uncertain, these policies are less likely to attract the adhesion of the majority of citizens in DC.

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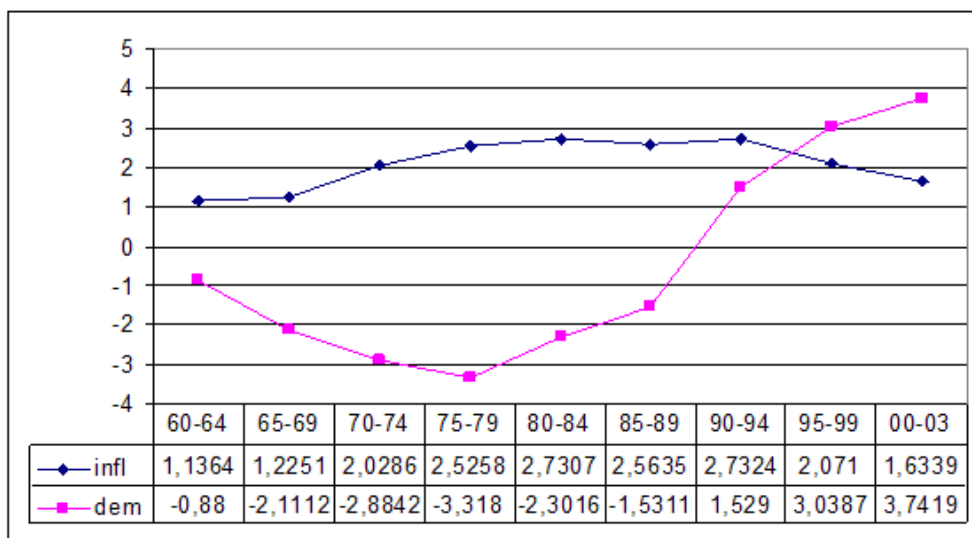
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APPENDIX

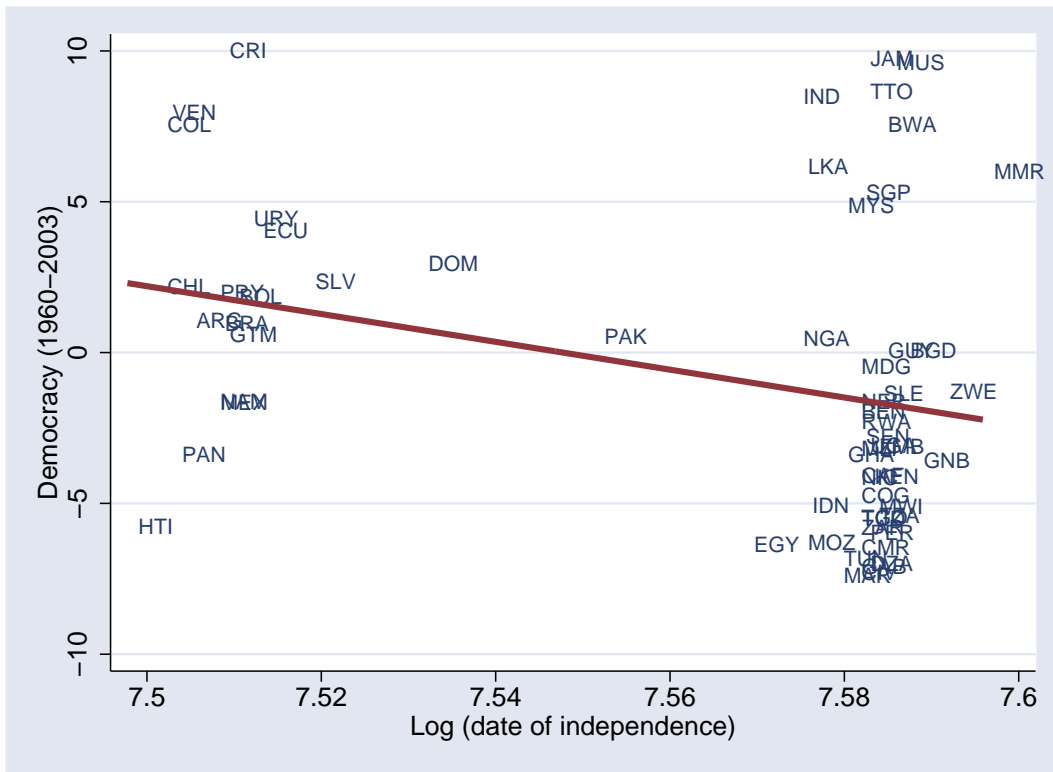
**Descriptive Statistics of Variables**

Variables	Observations	Mean	Standard Error	Minimum	Maximum
Log(inflation)	498	2.129	1.258	-1.122	7.614
Democracy (Polity IV)	543	-0.493	6.517	-9.8	10
Log(monney growth)	541	2.918	1.091	-0.471	8.725
Fiscal Balance	464	-0.027	0.060	-0.809	0.057
Openness	531	0.616	0.360	0.089	2.319
Log(independence date)	585	7,560	0.033	7.497	7,5
Log(lagged monney growth)	476	2.977	1.105	-0.146	8.726
Lagged Fiscal Balance	407	-0.027	0.062	-0.809	0.058
Frankel and Romer Instrument	585	0.197	0.149	0.03	0.981
Log(GDP per capita)	558	7.325	1.115	4.648	10.268
Agriculture	519	0.249	0.153	0.001	0.744
Urbanization	585	0.406	0.223	0.025	1
Lagged Political regime stability	481	12.792	13.424	0	77
Log(lagged inflation)	437	0.649	3.981	-0.188	64.249
Lagged GDP growth	500	1.384	3.188	-11.591	15.808
Term of trade	438	1.151	0.387	0.245	3.324

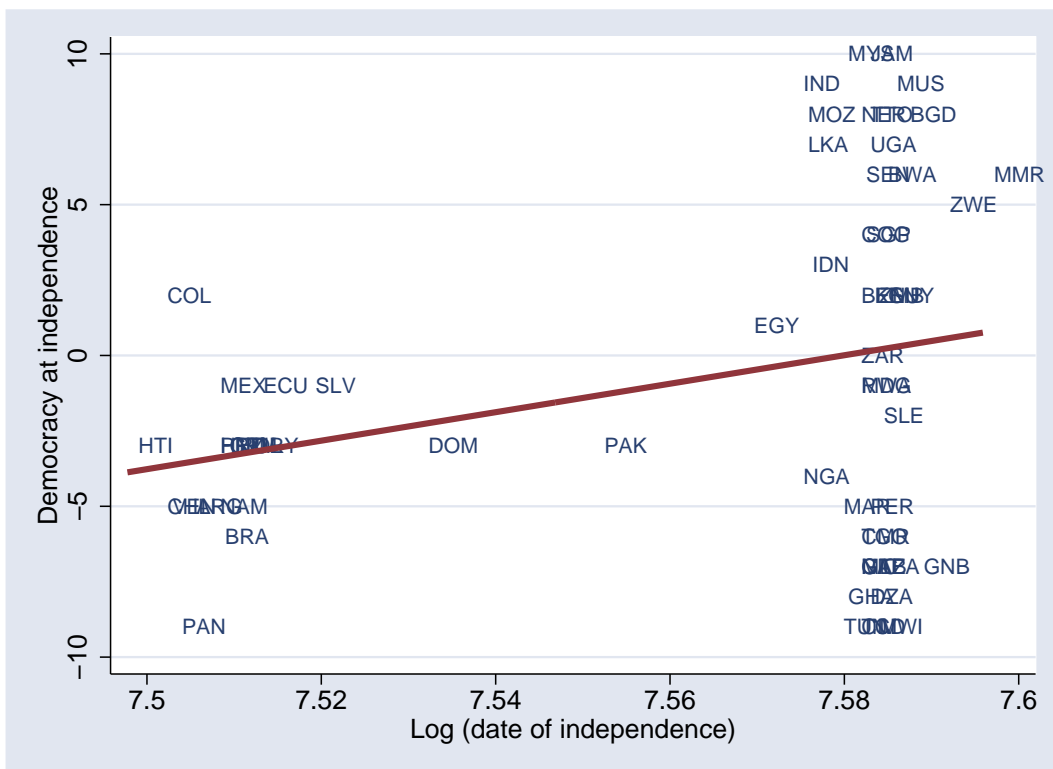
**Graph 1:** Relationship between log of inflation and democratic institutions in developing countries (1960-2003)



**Graph 2:** Relationship between independence date and democratic institutions in the total sample (1960-2003)



**Graph 3:** Relationship between independence date and democratic institutions at independence in the total sample



**List of the countries and their independence dates**

Countries	Date of independence	Countries	Date of independence
No African Countries		African Countries	
Argentina	1816	Algeria	1962
Bangladesh	1971	Benin	1960
Bolivia	1825	Botswana	1966
Brazil	1822	Cameroon	1960
Chile	1818	Central Africa	1960
Colombia	1819	Congo Democratic	1960
Costa Rica	1823	Congo Republic	1960
Dominican Republic	1865	Chad	1960
Ecuador	1830	Cote d'Ivoire	1960
El Salvador	1841	Egypt	1936
Guatemala	1823	Gabon	1960
Guyana	1966	Ghana	1957
Haiti	1804	Guinea Bissau	1974
Honduras	1821	Kenya	1963
India	1947	Madagascar	1960
Indonesia	1949	Malawi	1964
Jamaica	1962	Mali	1960
Malaysia	1957	Mauritius	1968
Mexico	1821	Morocco	1956
Myanmar	1948	Namibia	1990
Nicaragua	1821	Niger	1960
Pakistan	1947	Nigeria	1960
Panama	1903	Rwanda	1962
Paraguay	1813	Senegal	1960
Peru	1821	Sierra Leone	1961
Singapore	1965	South Africa	1961
Sri Lanka	1948	Uganda	1962
Trinidad and Tobago	1962	Tanzania	1964
Uruguay	1828	Togo	1960
Venezuela	1811	Tunisia	1956
		Zambia	1964
		Zimbabwe	1980