International Journal of Economics and Financial Issues
Vol. 4, No. 2, 2014, pp.363-375
ISSN: 2146-4138
www.econjournals.com

Democracy: A Determinant Factor in Reducing Inflation

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ABSTRACT: The economic literature has often explained the causes of macroeconomic instability by purely economic arguments. Monetary and fiscal policies have been considered as the exclusive tools for ensuring macroeconomic stability and reducing inflation. The purpose of this paper is to extend the range of explanatory factors in explaining macroeconomic pathologies and to demonstrate that democracy is an important instrument in reducing inflation. The paper firstly provides a critical analysis to the median voter theory, which claims the existence of a positive relationship between democracy and inflation, by relating the Tunisian case study and then presents a literature review that sustains our point of view. The paper finally develops an empirical study that measures the impact of democracy on inflation under a heterogeneous sample of countries and a sample consisting only of developing countries, for the period 1996-2012. The estimation results show that democracy is statistically significant in reducing inflation in both samples.

Keywords: Democracy; Median voter theory; Kaufmann, Kraay and Mastruzzi (2012) democracy index; inflation; macroeconomic stabilization.
JEL Classifications: E31; E61; E63

1. Introduction

The negative effects of inflation on economic activity are widely recognized. Inflation exerts a constraining effect on the key drivers of growth. The price increase reduces consumption and therefore production and employment. It exerts an inhibitory effect on investment, due to the rise of the nominal wages and the prices of raw materials, both in local and foreign currency.

Inflation also contributes to the deterioration of trade balance when the prices of domestic goods and services rise more than those of foreign competitors. To this are added its negative effects on social activity because of the deterioration of the purchasing power.

On the academic side, the economic literature has not stopped searching the causes of this phenomenon and finding its cures. It was first discussed the role of monetary and fiscal policies, and then discuss other factors such as the degree of central bank independence.

However, over the last decade, a new wave theory has enriched this debate by focusing on the role of socio-political factors such as the degree of democratization of countries, considering these factors as the "deep determinants" of inflation and other macroeconomic pathologies.

The thesis proposed by this new theoretical wave can be summarized by the following proposal of Satyanah and Subramanian (2007): If monetary or fiscal policy causes prices, what in turn causes monetary or fiscal policy and hence instability? Similarly, if the lack of central bank independence causes instability, why do some countries chose to have such independence and others not? Such questions justify a search for deeper causes for instability.

The present study falls within the framework of this academic renewal, which gives to socio-political and institutional factors, and more specifically, the degree of democratization, a leading role in explaining the causes of inflation and considers political participation a determinant tool for reducing it.

Without calling into question the importance of the 'classic' instruments of control of inflation, that is monetary and fiscal policies, as well as other factors such as the degree of central bank independence, we are attempting to make a contribution to institutionalist theories, supporting the idea that these economic factors are "proximate determinants", that are themselves subject to the effect of socio-political factors, which are the "deep determinants".

But it should be noted that the theoretical position that supports the existence of negative relationship between democracy and inflation has not made unanimity in the academic literature and some authors support the thesis that democracy can be a source of inflation.

The "median voter" thesis of Hotteling (1929) and Downs (1957) is a very representative theoretical conceptualisation of this view. In other words, this thesis is commonly used as a theoretical underpinning of studies that supports a positive link between political participation and the rise in inflation.

The second section of this paper provides a critical analysis of this thesis, by relating the Tunisian case study. Such an analysis allows presenting all aspects which turn around this debate and critics that we will advance towards median voter thesis will provide a further justification for our purpose, namely that democracy is an effective instrument in reducing inflation.

The third section will be a theoretical support of the above statements; by presenting a review of the literature that have addressed this issue. As for the second part of our study, it will be an empirical validation to our purpose. Following an econometric framework, made on a heterogeneous sample of countries and a sample consisting only of developing countries and for the period 1996-2012, we show that democracy is statistically significant in reducing inflation in both samples.

This empirical study will however be preceded by a presentation of the index of measure of democracy that we use to quantify our variable of interest, that is the index of Kaufmann (2012). We assume that this index provides an exhaustive conceptualization of the concept of democracy.

2. A Critical Analysis of the 'Median Voter' Thesis: Tunisia Case Study

According to the median voter theory, the 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 development countries. Indeed, in development countries, 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 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 median voter for stabilization policies. In this situation, democratic governments 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 (Mijiyawa, 2007).

We understand from this thesis of median voter that the attitude of citizens towards economic reforms and the demand that they express for public goods and services are the two main channels through which democracy were positively linked to inflation. The purpose of citizens is to improve their living standards and democratic rules allow them to express their preferences towards economic policies. On the other hand, the goal of the political elite is to ensure their maintenance in power. These can therefore comply to the demands of voters, choosing to establish inflationary economic policies, and while leading to macroeconomic imbalances, but most likely to fulfils the requirements of voters, in an environment of political competition.

The median voter theory describes several concrete aspects in the relationship that links the political to the economic sphere; however, it is based on quite restrictive assumptions.

Firstly, the above reasoning find rather its application in developing countries, which, for the most part, have been colonized for many years, and that is what explains the high demand for public goods from economic agents and their reluctance towards long term stabilization policies. These assumptions would be challenged in a more heterogeneous range of countries.

Secondly, the median voter is not the only participant in electoral activity. In a democracy, power elites or the power contenders in, are under the pressure of other economic and social interest groups, such as capital owners, who are opposed to inflationary policies which cause the deterioration of the value of local currency.

Finally, we believe that the approach advocated by the thesis of the median voter does not provide an adequate illustration of the concept of democracy, as advocated by international organizations such as the World Bank, Freedom House or The International Country Risk Guide, or rating agencies.

The notion of democracy, as considered by these organizations, and as we will consider in this analysis, provides certainly soliciting the claim of most citizens, but incorporates as well the concepts of contestation, transparency and accountability, and these concepts constrain economic and policy makers to establish effective decisions in terms of economic policy, although they are sometimes socially undesirable.

We then argue in this regard that the reasoning on which is based the median voter theory reflects a populist attitude rather than a democratic one. Socio-political events that happened in "Arab Spring" countries, and more specifically in Tunisia, provide a good illustration to our remarks.

Social protests that began in December 2010 led to the fall of the authoritarian regime of former President Ben Ali and Tunisia had had elections in 23 October 2011 to choose members of a constituent assembly which primary role is to write the constitution and took charge of the formation of the government and the election of the president.

Meanwhile, Tunisia experienced after this period a clear deterioration in economic performances. Between 2010 and 2012, the budget deficit (excluding grants and privatization, as % of GDP) increased from 1.1% to 5.4%, the National Savings (in percentage of National Disposable Income) fell by 27.2 %, the investment rate (as a percentage of GDP) fell by 14% despite an increase in public debt, which rose from 40.3% in 2010 to 44.3% in 2012. This period was also marked by a continued increase in inflation. In 2010, the index of consumer prices (measured at constant prices compared to 2005) was 122.2. In 2011 this aggregate was equal to 126.5 and in 2012 it had risen to 133.5[1].

Does this mean that the socio-political changes that have occurred in Tunisia were the cause of macroeconomic indicators' deterioration? Does this mean that the democratic transition has been the cause of rising prices? The answer lies on how to define the concept of "democracy". In other words, we may wonder if Tunisia has during this period recorded really a democratic rebound. Scores of democratization and the degree of political stability for this country and for the specified period does not allow us to say that.

The democracy index assigned to Tunisia by the World Bank[2] was (-0.37) in 2011, and (-0.19) in 2012. This score has not evolved so much compared to 1996 when it was (-0.44). Furthermore, the data shows that the level of political stability has deteriorated. According to the same organisation, index of political stability was (-0.39) in 2010 and (-0.72) in 2012. In 1996, this index was equal to (+0.19).

In addition, we can note the deterioration of the score rating of Tunisia by the rating agencies. Sovereign rating decreased from Baa2 in 2010 to Baa3 in 2012 according to Moody's rating agency, which corresponds to one notch deterioration in the sovereign rating. This credit rating went from BBB in 2010 to BB + in 2012 according to Fitch Ratings, which corresponds to two notches deterioration. And it is from BBB in 2010 to BB in 2012 according to Standard & Poor's, which also corresponds to two notches deterioration in sovereign rating[3].

The evolution of the socio-political and economic events that happened in Tunisia during the post-'democratic'-transition period recall the thesis of the median voter cited above and critics that we could formulate against the policies established by Tunisian economic decision-makers are similar to those we have previously made.

To meet the demands of the median voters, governments that preceded the revolution began to accumulate external loans that was mostly affected into consumer spending (between 2010 and 2012, the total domestic consumption increased by 20.7%)[4], grants and increases in payroll. These populist practices have caused an increase in the level of public deficit, a deterioration of the balance of payments, a sharp devaluation of the Tunisian dinar and an increase in the level of inflation.

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[1] Source: Central Bank of Tunisia.

[2] Scores of democratization and political stability are measured by the indices "Voice and accountability" and "Political stability", these scores were developed by Kaufmann et al. (2012). These scores of governance range from -2.5 to 2.5, scores approaching 2.5 correspond to better results.

[3] Sources: Moody's investors services, Fitch Rating and Standard & Poor's.

[4] Source: Central Bank of Tunisia.

Although there has been an improvement in some objective criteria, such as the increase of the number of political parties or the improving of freedom of the press, the Tunisian government has not either promoted an institutional environment that allows the different socio-economic actors to really neither participate in the formulation of economic policies nor allow them to contest these policies. And this is what explains the lack of rebound in the evolution of democracy scores. This lack of democratic rebound takes away the confusion about the relationship between inflation and democracy in Tunisia.

The presence of checks and balances, of more participation and transparency would have avoided the Tunisian economy populist practices and excessive indebtedness, which has not been used for purposes of economic development, but was assigned in grants and wage increases, and this, under the pressure of the unions associations. This misallocation of resources has led to the impoverishment of the state budget, the devaluation of the Tunisian dinar relative to foreign currencies, especially the Euro and the dollar, and therefore, an increase in inflation.

Experience shows that democracy and macroeconomic stabilization policies are not incompatible. On the contrary, the presence of a democratic environment is a prerequisite to ensure that these policies can be implemented in a peaceful social environment.

We refer in this regard to the austerity policies established in the United States in 2013, which provide higher taxes on the middle class to absorb the government debt, and limiting the increase in public-expenditure in order to neutralize the effects of economic decline.

We can also mention the case of budget austerity measures undertaken by the French government. According to a recent case study conduced by OXFAM[5] organism, « since 2010, France has been through five rounds of austerity measures. In November 2011, the then-government, led by François Fillon, announced measures intended to raise €65bn by 2016 through a combination of reduction in public spending and increases in taxes, including €7bn in 2012 and €11.6bn in 2013. For 2013, the plan foresees €7.9bn of tax increases of which 86 per cent (€6.8bn) will fall on households. Since the change of government in 2012, more austerity measures have been announced for the 2013 budget with the aim of saving an additional €37bn. This new austerity plan will include an unprecedented amount of new taxes and spending cuts. It includes President Hollande's well-known electoral promise to impose a 75 per cent tax on earnings above €1m per year. Additional measures include the abolition of fiscal incentives for large companies and €10bn of cuts in public spending (focusing mainly on the ministries of Environment/Ecology, Economy, Agriculture, Foreign Affairs and Culture). Despite an attempt to raise taxes among the wealthiest people in the country, the new austerity measures are likely to affect the entire population. Indeed, the French Parliament, as part of a package to save an additional €20bn in 2014 (including €5bn in direct cuts from ministerial budgets), voted for a general hike in VAT, from 19.6 to 20 per cent, from next year. On one hand, the French government claims to be putting the burden of the tax increase on the richest, but on the other, it agrees an increase in VAT, known to be a regressive tax that impacts all social categories, especially the most vulnerable.

Being of democracies did not prevent these countries to make economic policies, although socially undesirable, but who aspire stabilizing economic indicators in the long term.

3. Literature Review

Our theoretical position is supported by several contemporary studies, among which we quote those of Satyanah and Subramanian (2007), Lavigne (2006), Desei et al. (2002) and Rodrik (2000). These authors share the view that electoral competition causes price stability and ensure macroeconomic stability.

According to Satyanah and Subramanian (2007), there is a strong causal relationship between societal divisions and democratic political institutions and long-term inflation. (…) Democracy robustly serves to reduce inflation over the long term. For example, a one standard deviation increase in inequality (roughly the move from France to the Dominican Republic) leads to a more than two fold increase in inflation. Similarly, a one standard deviation increase in democracy (roughly the move from Uganda to Chile) leads to a 3.6-fold decline in inflation. The t-values for the coefficient on

[5] Oxfam is an international confederation of 17 organizations networked together in 94 countries, as part of a global movement for change, to build a future free from the injustice of poverty

inequality and democracy are consistently significant at the 1 percent level and the relationship is robust to alternative measures of democracy, samples, covariates, and definitions of inflation.

Furthermore, we find that a wide range of macroeconomic policies and pathologies are themselves causally affected by inequality and democracy.

These assertions of Satyanah and Subramanian (2007) derive their origins from the works of Rowthorn (1979), Hirchman (1985), Linberg and Maier (1986), Dornbusch and Edwards (1990) and Sachs (1989), for whom macroeconomic policies are income redistribution tools and are themselves subject to the effect of political factors and, in particular, the degree of political participation.

According to these authors, economic policymakers establish sometimes deliberately inflationary economic policies to serve the interests of a particular socio-economic group and these economic decisions cause redistribution's conflict.

Sachs (1989) refers to the experience of some Latin Americans countries, which, during the 1970s and 1980s, have voluntarily accumulated foreign loans to serve the interests of economic groups close to the government. These practices have caused a sharp increase in the budget deficit and in the general level of prices.

This example shows that macroeconomic pathologies such as poor management of external debt and the inflation which is consequent are due to political practices governed by favouritism and rent-seeking. Democratic institutional environment characterized by participation, contestation and transparency, can counteract these practices and thus reduce inflation.

The presence of democratic checks on politician's power can alleviate distributive conflict over the long term. As Rodrik (1999) argues in the context of recoveries from terms of trade shocks, democratic institutions cause contending societal groups to moderate their efforts to pass the burden of adjustment on to other groups. (…) Separation of powers between executive and legislative bodies helps prevent the abuse of power by politicians. In effect, under these conditions the two branches discipline each other, and become more accountable to citizens in their choice of policies (Satyanah and Subramanian, 2007).

Person et al. (1997) and Acemoglu et al. (2003a) take similar arguments about those of Satyanah and Subramanian (2007): Democracy imposes constraints on executive power and implies the separation of executive and legislative powers. Therefore, it limits the discretionary power of politicians and prevents them from establishing economic reforms that benefit a particular social group.

Rodrik (2000) also defends the existence of a negative relationship between democracy and inflation. In a study covering 96 countries for the period 1975-1998, he argues that « participatory political regimes are associated with significantly lower levels of aggregate economic instability ». According to him, the realization of political compromise is the channel of influence connecting democracy to macroeconomic stability.

Democracies induce greater willingness to cooperate and compromise in the political sphere, generating greater stability as a result. One way in which democratic participation in politics can generate compromise is by altering preferences. As individuals meet and deliberate, they come to understand each other's viewpoints, develop empathy, recognize the value of moderation, internalize the common interest, and de-emphasize narrow self-interest. Liberal democracies entail constitutional rules that curtail the power of the majority to expropriate the minority. Separation of powers, specific minority protection clauses, and the rule of law are some of the more relevant mechanisms. Reducing the scope of redistributive action induces cooperative behaviour through two channels. First, winners cannot treat the losers as they please. Second, and less obviously, this fact in itself makes contending groups more willing to compromise ex ante, as it reduces both the perceived benefits of uncooperative behaviour and the perceived costs of cooperative behaviour (Rodrik, 2000).

Lavigne (2006) has also granted to political factors an important role in explaining macroeconomic conditions. According to him, several countries, including emerging market economies are now facing the major challenge to carry out their tax adjustments policies.

According to the International Monetary Fund (2003, b), it appears that in 2002, the public debt of emerging countries has exceeded 70% of GDP.

Lavigne (2006) considers that the success of fiscal adjustment plans in developed and developing countries is closely linked to the quality of the institutional framework, and particularly to the degree of democratization.

There is some evidence that high levels of transfers and subsidies diminish the probability of successful adjustment in developing countries, and that legislative majorities improve the odds. In advanced countries, strong democratic institutions appear to increase the likelihood of avoiding situations of fiscal distress (Lavigne, 2006). Conflicts of interest between socioeconomic groups and social division act significantly on redistributive policies. These factors affect the level of subsidies and transfers of income policies.

Havrylyshyn and Olding-Smee (2000) argue that spending on transfers and subsidies indicates the existence of rent-seeking vested interests and their assertion was supported by many authors (e.g., Alesina and Perotti; 1995; and Gupta et al., 2003). On the other hand, social division, resulting in income inequality and ethnic fragmentation intensifies conflicts redistribution.

Under these conditions, the State finds difficulty to establish effective tax policies adjustments which latter leads to macroeconomic imbalances and price increases.

Berg and Sachs (1988) argue in this regard that income inequality is positively correlated with the level of public debt and Sachs (1989) argues that Latin American countries were unable to establish adjustment programs to control the debt crisis because of the rigidity of public consumption.

Such rigidity was the result of the pressures exerted by socio-political interest groups who disallowed the government to establish tax reforms that adversely affect their economic interests.

In a democracy, the effects of social division and conflict of interest are mixed. Democracy imposes legal constraints that facilitate the implementation of adjustment programs benefiting all the society.

Fiscal discipline has been empirically linked to a number of institutional factors, including budgetary centralization, transparency, fiscal rules, and parliamentary procedures. In a more general sense, institutional quality is often proxied in the growth literature by an index of the rule of law, which evaluates the system of laws, conventions, and behaviour that support market economies, encourage investment, and protect public goods. It seems reasonable to expect that high institutional quality could foster a more efficient public sector and minimize corruption, translating into a better use of revenues and increased tax collection. It could also ensure that fiscal policy will not fall prey to vested interests.

The quality of democratic institutions might also have a significant impact on fiscal consolidation (Lavigne, 2006). Two important conclusions can be derived after this literature review:

Not only there is a negative causality between democracy and inflation but also, political participation is the deep determinant of inflation. Many macroeconomic aggregates, traditionally used as central variables in explaining the variability of inflation are themselves subject to the degree of democratization.

We will demonstrate this theoretical assertion using an empirical model that evaluates the impact of democracy on inflation. Our model will incorporate, along with democracy index, economic and institutional control variables that are commonly considered as powerful determinants of inflation.

This empirical study will however be preceded by the presentation of the democracy indicator that we will use as variable of interest in our model.

4. Presentation of the Kaufmann, Kraay and Mastruzzi (2012) Democracy Index

It should first be noted that the empirical literature has experienced several indices for measuring degrees of democratization. We mention for example those of the Polity IV, established by Marshall and Jaggers (2001), the Freedom House index, or that of the International Country Risk Guide, and those of Bollen (2001), Arat (1991), Coppedge and Reineke (1991), Prezworski et al. (2000), Alavez et al. (1999), Muller (1988) and Hewitt (1977).

It should nevertheless to note that even if these indices are designed to measure the same concept, namely democracy, the manner in which the above authors have quantified the degree of democratization differs. These differences are due to the fact that the conceptual origins on the basis of which the above authors have elaborated their indices differ. While some authors were inspired on the conception of Polyarchy of Dahl (1971), others have relayed on the conceptualization of Lijphart and Arend (1999).

Moreover, even the indices that are derived from a common conceptualization may experience differences, because the authors of these indices adjust their indices according to a particular aspect of the original conceptualization. For example, the conceptualization of Dahl (1971) of democracy contains two specific concepts:

The concept of participation, which reflects the following criteria: Freedom to form and join organizations, freedom of expression, right to vote and eligibility for public office.And the concept of contestation, which includes the following criteria: The right of political leaders to gain political support to compete with other parties, the existence of alternative sources of information, free and fair elections and the presence of institutions whose role is to make government policies dependent on votes and other expressions that reflect citizens' preferences.

When an index focuses on the concept of contestation, as is the case of the Polity IV index of Marshall and Jaggers (2001), and another emphasizes the concept of participation, both indices will not provide the same measure of the democratization degree of a given country.

These differences in the manner to quantify this concept had an effect in the empirical results which look into the impact of democracy on development indicators or other governance indicators (like protection of property rights, level of corruption, quality of bureaucracy, degree of political stability ...) and were the cause of theoretical divergences.

This controversy sheds light in the importance of the quality of democracy indicator and the influence of this choice on the likelihood of the econometric results and theoretical conclusions.

For the purpose of this paper, we will go beyond the comparative analysis of indices. However, we will present some arguments that demonstrate the validity of the "Voice and accountability" democracy index of Kaufmann et al. (2012). This index, among other governance indexes, was prepared for the account of the World Bank.

Kaufmann, Kraay, and Mastruzzi present estimates of six dimensions of governance covering 199 countries and territories. These indicators are based on several hundred individual variables measuring perceptions of governance, drawn from 25 separate data sources constructed by 18 different organizations (Kaufmann et al., 2010).

The governance estimates (including 'voice and accountability') are normally distributed with a mean of zero and a standard deviation of one in each period. This implies that virtually all scores lie between -2.5 and 2.5, with higher scores corresponding to better outcomes (Kaufmann et al., 2010). Collecting data from multiple sources makes Kaufmann, Kraay and Mastruzzi's specification of democracy very exhaustive.

But also, this index includes both participation and contestation's criteria.

Among the sub-indicators that reflect the participation criterion we mention:

- Freedom of association
- Freedom of speech, of assembly and demonstration
- Freedom of the Press
- Freedom of political participation
- Civil liberties

And among the sub-indicators that reflect the criterion contestation we quote:

- Accountability of Public Officials
- Equal opportunity, of excessive governmental intervention
- Effectiveness of national Parliament/Congress as a law making and oversight institution Link between donations and policy
- Government censorship
- Democratic Accountability (that quantifies how responsive government is to its people)
- How well the population and organized interests can make their voices heard in the political system
- Policy and legal framework for rural organizations
- Dialogue between government and rural organizations
- Transparency of Government policy

These are the arguments that led us to use this index as the conceptual quantification of our variable of interest, which we will use to measure the impact of democracy on inflation, and that will be the subject of the next section.

Especially since such a conceptualization of democracy coincides with our perception of this concept (as we described in the second section), that is, a concept that far from considering democracy as a populist strategy, but as an institutional process allowing to different socio-political and economic actors to participate in government policies and to challenge them. Democracy, as we specified, and as described by Kaufmann, Kraay and Mastruzzi, implies transparency and enforceability of laws and economic rules.

5. Measurement of the Impact of Democracy on Inflation

5.1 Presentation of variables

To investigate the impact of democracy on inflation, we examine the determinants of inflation using cross-national time-series data. Our estimations take the following basic form:

$INF_{it} = f\,(DEM_{it}, X_{it})$.

Where (INF_{it}) is the consumer price index (annual %)[6], (DEM_{it}) is the Kaufmann, Kraay and Mastruzzi (2012) democracy index, called 'Voice and accountability'[7] that we presented above and **X** is a vector of other conditioning variables. These variables are:

Average annual growth rate in money and quasi money *(MONgrowth)*[8], the Neperian logarithm of total reserves *(LnRES)*[9], the political stability index of Kaufmann, Kraay and Mastruzzi (2012) *(POLSTAB)*[10].

The aim of our model is to show that democracy affects negatively inflation and to evaluate the explanatory weight of democracy in the presence of proxy variables of economic policies. Variables *(MONgrowth)* and *(InRES)* represent these proxy.

Other control variables are used. It comes to annual percentage growth rate of GDP[11] *(Growth)*, with the assertion that the increase in GDP growth rate, which corresponds to an increase in productivity, will lead to price decrease, and imports plus exports as a percentage of GDP[12] (*Trade*) to control for trade openness.

These two variables were used as control variables by Desai, Ologsfard and Yousef (2002) in a study similar to ours, but the goal was to demonstrate that the impact of democracy on inflation remains conditioned by the degree of income inequality.

5.2 Empirical strategy

The first estimation we carried out covers 124 countries and for the period 1996-2012. The sample of countries covering this first estimation is heterogeneous, containing developed, developing and poor countries.

The economic relationship we are interested in identifying is:

$$INF_{it} = \alpha + \beta_1\,(DEM)_{it} + \beta_2\,(POLSTAB)_{it} + \beta_3\,(MONgrowth)_{it} + \beta_4\,(LnRES)_{it} + \beta_5\,(Growth)_{it} + \beta_6\,(Trade)_{it} + \varepsilon_{it} \quad (1)$$

Where (ε_i) is the random error term.

In a first step we have run a Haussman specification test on whether fixed or random effects are more convenient to our data's.

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[6] It reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. Source: International Monetary Fund, International Financial Statistics and data files.

[7] Source: World Bank, Worldwide Governance Indicators. http://data.worldbank.org/data-catalog/worldwide-governance-indicators. Data relating to 1997 are calculated using the average of the years 1996 and 1998's data's, those of 1999 from the average's data's relatives to the years 1998 and 2000 and those of 2001 from the average scores of 2000 and those of 2001.

[8] Money and quasi money comprise the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government. Source: International Monetary Fund, International Financial Statistics and data files.

[9] Total reserves comprise holdings of monetary gold, special drawing rights, reserves of IMF members held by the IMF, and holdings of foreign exchange under the control of monetary authorities. Data are in current U.S. dollars. Source: International Monetary Fund, International Financial Statistics and data files.

[10] Source: World Bank, Worldwide Governance Indicators. http://data.worldbank.org/data-catalog/worldwide-governance-indicators.

[11] Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2005 U.S. dollars. Source: World Bank national accounts data, and OECD National Accounts data files.

[12] The sum of exports and imports of goods and services measured as a share of gross domestic product. Source: World Bank national accounts data, and OECD National Accounts data files.

The Haussman statistic is:

$H = (\hat{\beta}_{FE} - \hat{\beta}_{RE})' \, [\, Var(\hat{\beta}_{FE}) - Var(\hat{\beta}_{RE}) \,] \, (\hat{\beta}_{FE} - \hat{\beta}_{RE}) \sim \chi^2_{(k)}$

The Haussman specification test is based on the following corps of hypotheses:

H0 : $E(\mu_i/X_i) = 0$ (the random effects estimators are non-biased)

H1 : $E(\mu_i/X_i) \neq 0$ (the random effects estimators are biased).

μ_i denotes the individual stochastic component.

The P-values associated to the $\chi^2_{(6)}$ statistic within our estimations is about 0.0000 [$\chi^2_{(6)}$ = 51.96] so we conclude that the fixed effect estimator is more consistent to our model.

Our model is therefore written as follows:

$$INF_{it} = \alpha_i + \beta_1 \, (DEM)_{it} + \beta_2 \, (POLSTAB)_{it} + \beta_3 \, (MONgrowth)_{it} + \beta_4 \, (LnRES)_{it} + \beta_5 \, (Growth)_{it} + \beta_6 \, (Trade)_{it} + \varepsilon_{it} \quad (2)$$

Where α_i is the unknown intercept for each entity. $\alpha_i = \alpha + \mu_i$ and α refers to the fixed component. We assume that residuals ε_{it} are independent, identically distributed (iid) and fulfils the following conditions, whatever i Є [1, N] and t Є [1, Ti]:

$E(\varepsilon_{i,t}) = 0$

$E(\varepsilon_{i,t}\, \varepsilon_{i,s}) = \sigma^2_E$ si t = s et $E(\varepsilon_{i,t}\, \varepsilon_{i,s}) = 0$ si $t \neq s$

Implying $E(\varepsilon_i\, \varepsilon_i^{'}) = \sigma^2_E I_T$ where I_T denotes the identity matrix (T_i,T_i)

$E(\varepsilon_{i,t}\, \varepsilon_{j,s}) = 0$ whatever $j \neq s$ and whatever (t,s)

5.3 Findings and discussion

The estimation method that we followed is to apply OLS (Least Square Dummy Variables) to our model, in which we have introduced a dummy variable for each country. The objective is to estimate our fixed effects model after correcting the (t) of Student from heteroscedasticty using the White method. This method provides the same values for the parameters estimated by OLS, the difference lies in the estimated standard deviations. Correcting errors from heteroscedasticity provides robust estimators. The estimations results for 124 countries and for the period 1996-2012 are as follow:

Table 1. Panel Least Squares Dummy Variables estimates for heterogeneous sample of countries. Dependent variable: *INF*

Variable	Coefficient	t-stat
C	7.8	0.41
DEM	-3.7	-1.89**
POLSTAB	-2.32	-2.3**
MONgrowth	0.35	3.57***
LnRES	-0.36	-0.45
Growth	-0.35	-3.3***
Trade	0.03	0.84

*,**,*** indicate statistical significance at 10%, 5% and 1% level, respectively

The Fisher-test [F(6,1744) = 8.34] indicates that our explanatory variables are jointly significant at 1% level and the R-Squared value indicates that they explain 30% of the amount of variance of inflation. The signs in the coefficients indicate that greater growth of money and quasi-money, and greater trade openness is associated to more inflation. However, greater growth of GDP, of total reserves and further efforts in insuring democracy and political stability reduce inflation.

The positive sign of the estimated coefficient relative to *(MONgrowth)* variable was expected. The increase of money supply decreases the value of the economy's medium of exchange, namely money and quasi-money, and, then, produces a rise in price levels.

The results indicate that the variable *(LnRES)* is not statistically significant. But we can explain its negative correlation with the dependent variable by the fact that reserves accumulation produces a currency appreciation which leads to prices decrease.

As for the positive relationship between trade openness and inflation, it can be explained by the phenomenon of imported inflation. But this variable hasn't either a significant effect on inflation.

The estimated coefficient of the variable *(Growth)* gets also the expected sign. As the GDP of given economy grows especially through productivity increase, price should decrease.

The results also suggest that political stability is negatively correlated with inflation and this institutional variable is statistically significant at the 5% level.

A stable political environment improves the degree of protection of property rights and social cohesion, which has a positive effect on macroeconomic performance. Against by, an unstable political environment improves the rent seeking behaviour, promotes corruption and arbitrary decisions and reduces the state control on the informal sector, which develops the black market and produces price increases.

The result that we are mostly interested in concerns the impact of democracy, proxied by the Kaufmann et al. (2012) democracy index. Democracy is statistically significant at the 1% level and is negatively correlated with inflation. This result confirms the above theoretical comments. Democracy, when it is correctly conceptualized, by integrating participation, contestation and transparency's criteria's, constitutes a significant factor in reducing inflation.

Moreover, the results suggest that in terms of impact, improving democratic standards has the highest marginal effect among all other economic and institutional variables. Indeed, a 1% improvement in democracy index, as established by Kaufmann et al. (2012) reduces inflation by 3.7%. In other words, a country that in the specified period have improved its democracy index by one percentage point have experienced, on average, a level of inflation that is 3.7 percentage point less than a country that haven't insured the same institutional effort.

The estimated coefficient of the variable democracy is, for example, higher than the estimated coefficient of the variable M2 growth, which is a very representative proxy of monetary policy and represents an important tool in handling inflation strategies.

That being, we have restricted our sample of countries to only developing and emergent countries[13] in order to demonstrate our theoretical position with respect to the thesis of the median voter. The estimation results for 82 developing countries and for the period 1996-2012 are as follow:

Table 2. Panel Least Squares Dummy Variables estimates for developing countries.
Dependent variable: *INF*

Variable	Coefficient	t-stat
C	3.04	0.13
DEM	-3.63	-2.19**
POLSTAB	-2.25	-1.77*
MONgrowth	0.37	2.64***
LnRES	-0.18	-0.19
Growth	-0.38	-2.81***
Trade	0.03	0.38

R-squared = 0.27
F(6,1744) = 6.84
Prob > F = 0.0000

Estimation results confirm our critiques of the median voter theory, which finds its purpose especially in developing countries and who implies the existence of a positive correlation between political participation and inflation. The size of the coefficients is indeed very similar to those of the previous model which is constituted by a heterogeneous sample of countries and the overall model is significant according to the overall significance test of Fisher.

In addition, the variable *(DEM)* continues to have a negative impact on inflation and the highest marginal impact compared to all other variables retained in the model. The negative impact of democracy on inflation is, therefore, independent of the level of development of countries.

6. Conclusion

In this paper, we have demonstrated that democracy; when apprehended by including concepts of participation, contestation and transparency, constitutes an important instrument in reducing inflation. The economic literature has often explained the evolution of inflation by referring to

[13]The selection of countries as developing and emerging ones has been made according to the classification of the International Monetary Fund, World Economic Outlook, April 2011.

economic policies. Our study differs from this issue and attributes to socio-political factors a fundamental role in explaining differences in macroeconomic performances, showing that by providing a theoretical and an empirical framework.

In the theoretical framework, we have argued that monetary and fiscal policies are redistributive tools under the control of policymakers and that democracy provides institutional arrangements that constrain these policymakers to use these policies in favour of general interest and avoiding inefficient macroeconomic policies. In our empirical framework, we have initially made estimations based on a heterogeneous sample, which includes developed, developing and poor countries.

The estimation results show that democracy; measured by the Kaufmann et al. (2012) democracy index is statistically significant at the 1% level and it is negatively correlated with inflation. Moreover, democracy has the highest marginal effect among all other economic and institutional variables. And we reached similar conclusions when we have restricted our sample to developing countries only. These results provide a calling into question to the median voter thesis and an empirical demonstration to the thesis we defend, namely that democracy is an important instrument to reduce inflation, whatever the level of development. Democracy is the deep determinant of inflation and the achievement of macroeconomic policies remains subject to the degree of democratization.

In the absence of institutional mechanisms that allow the participation of various socio-economic actors in the development of government policies and control mechanisms that allow these actors to challenge the decisions taken by leaders, economic policies will have a limited impact.

What is the purpose of fiscal reforms if the government force continues to serve the interests of a particular socio-economic group and where are the utility of a central bank, which seems independent, but whose decisions are in reality established for the purpose of populist decisions?

Macroeconomic stabilization policies such as measures of removing subsidies on certain products or raising taxes, in order to reduce budget deficit and increase government reserves or increasing the key interest rate in order to reduce the money supply, require strong decisions, which can only be implemented in a context of democratic political environment. Democracy allows to political and economic decision makers legitimacy, which is necessary for any given macroeconomic policy.

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Appendix

The constituent countries of the first sample are:

Albania, Argentina, Armenia, Australia, Austria, Azerbaijan, Burundi, Belgium, Benin, Burkina Faso, Bahamas, Belize, Brazil, Barbados, Brunei Darussalam, Bhutan, Central African Republic, Canada, Switzerland, China, Cameroon, Congo, Rep, Colombia, Cyprus, Czech Republic, Germany, Dominica, Denmark, Dominican Republic, Algeria, Egypt, Arab Rep., Spain, Ethiopia, Finland, Fiji, France, Gabon, United Kingdom, Ghana, Guinea-Bissau, Equatorial Guinea, Greece, Grenada, Guatemala, Guyana, Hong Kong SAR, China, India, Ireland, Iceland, Italy, Jamaica, Japan, Kazakhstan, Kenya, Cambodia, Korea, Rep., Kuwait, Lao PDR, Libya, St. Lucia, Sri Lanka, Luxembourg, Latvia, Macao SAR, China, Morocco, Moldova, Madagascar, Mexico, Macedonia, FYR, Mali, Malta, Myanmar, Mongolia, Mozambique, Mauritania, Mauritius, Malawi, Malaysia, Niger, Nigeria, Netherlands, Norway, Nepal, New Zealand, Panama, Peru, Philippines, Papua New Guinea, Portugal, Paraguay, Qatar, Russian Federation, Rwanda, Saudi Arabia, Sudan, Senegal, Singapore, El Salvador, Serbia, Slovak Republic, Slovenia, Sweden, Swaziland, Seychelles, Syrian Arab Republic, Chad, Togo, Thailand, Tonga, Trinidad and Tobago, Tunisia, Turkey, Tanzania, Uganda, Ukraine, United States, St. Vincent and the Grenadines, Vietnam, Vanuatu, Samoa, Yemen, Rep., South Africa, Congo, Dem. Rep. and Zambia.

The constituent countries of the second sample are:

Albania, Argentina, Armenia, Azerbaijan, Burundi, Benin, Burkina Faso, Bahamas, Belize, Brazil, Barbados, Bhutan, Central African Republic, China, Cameroon, Colombia, Dominica, Dominican Republic, Algeria, Egypt, Arab Rep., Ethiopia, Fiji, Gabon, Ghana, Guinea-Bissau, Equatorial Guinea, Grenada, Guatemala, Guyana, India, Jamaica, Kazakhstan, Kenya, Kuwait, Libya, St. Lucia, Sri Lanka, Latvia, Morocco, Moldova, Madagascar, Mexico, Macedonia, FYR, Mali, Mongolia, Mozambique, Mauritania, Mauritius, Malawi, Malaysia, Niger, Nigeria, Nepal, Panama, Peru, Philippines, Paraguay, Qatar, Russian Federation, Rwanda, Saudi Arabia, Sudan, Senegal, Serbia, Seychelles, Syrian Arab Republic, Chad, Togo, Thailand, Tonga, Trinidad and Tobago, Tunisia, Tanzania, Uganda, Ukraine, St. Vincent and the Grenadines, Vietnam, Vanuatu, Samoa, Yemen, Rep., Congo, Dem. Rep. and Zambia.