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Central Bank Independence, financial instability and politics: new evidence for OECD and non-OECD countries

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Central Bank Independence, financial instability and politics: new evidence for OECD and non-OECD countries

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Abstract

This paper analyses the determinants of a new index of central bank independence, recently provided by Dincer and Eichengreen (2014), using a large database of economic, political and institutional variables. Our sample includes data for 31 OECD and 49 non-OECD economies and covers the period 1998-2010. To this aim, we implement factorial and regression analysis to synthesize information and overcome limitations such as omitted variables, multicollinearity and overfitting. The results confirm the role of the IMF loans program to guide all the economies in their choice of more independent central banks. Financial instability, recession and low inflation work in the opposite direction with governments relying extensively on central bank money to finance public expenditure and central banks' political and operational autonomy is inevitably undermined. Finally, only for non-OECD economies, the degree of central bank independence responds to various measures of strength of political institutions and party political instability.

Keywords: central bank independence; economic, political and institutional determinants; multicollinearity; factor model; linear regression.

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1. Introduction

Research on political macroeconomics during the last 20 years focused on factors affecting monetary policy and its performances. Several studies have examined the cause of monetary instability pointing out the key role of the Central Bank Independence (henceforth CBI) to account for differences in inflation rates among countries. It is widely documented, that a higher degree of CBI is associated with a lower inflation rate and that society reduces opposition to inflation and public pressure for an independent central bank (Cukierman, 2008, 2013; Alesina and Stella, 2010 for a review). The balance between flexibility and credibility in monetary policymaking determines the equilibrium degree of CBI in a country. At the same time, the trade-off between costs and benefits in delegating the power to manage paper money may depend on many aspects of the economy and on its institutional framework (Alesina and Grilli, 1995). The recognition of this fact has encouraged the study of the determinants that influence the CBI among the variety of economic, social and institutional variables that cause changes in the degree of commitment of the monetary policy. A partial list includes Farvaque (2002), Polillo and Guillén (2005), D'Amato *et al.* (2009), Pistoresi *et al.* (2011), Spyromitros and Tuysuz (2012), and Dincer and Eichengreen (2014).

Nowadays the "inflation problem" is that inflation is too low, not too high. Differently from the past, where the main goal of the central banks was to maintain an acceptable level of inflation, financial stability is now the new objective both in terms of macro-prudential supervision and to the traditional pursuit of macroeconomic stability. Following the main financial crisis since 1998, e.g. South Korea in 1998, Turkey in 2001, the Dot-come bubble 1999-2000 and in particular the Great financial crisis in 2007-2008, many central banks turned to forward guidance and/or a variety of unconventional monetary policies, such as lending to banks (and sometimes even to nonbanks) in huge volume, and large-scale asset purchases ("quantitative easing") that is they use their balance sheets to affect market conditions (see De Haan and Eijffinger, 2017). Some of these behaviours, in particular those associated with the expanded fiscal role of central banks, can be also associated with the weaknesses of political institutions. According to Buiter (2016), "*the combination of these central bank dysfunctionalities with the rising tide of populist, anti-elite, anti-technocratic and anti-expert sentiment in the US and the EU is likely to result in an early and significant reduction in the degree of operational independence of North Atlantic central banks, even where such independence makes sense - in the design and conduct of monetary policy, narrowly defined*".

In this economic and political climate, some important questions arise: has the CBI decreased since the main financial crisis since? Has the role of economic and political determinants of CBI changed? Are there differences among OECD and non-OECD economies with respect to these topics? The goal of this paper is to investigate these issues. In particular, this paper analyses the determinants of a new CBI index recently provided by Dincer and Eichengreen (2014), from a large set of economic, political and institutional variables. Our sample regards 31 OECD and 49 non-OECD economies and covers the sample period 1998-2010.

To this aim, we employ factor analysis as an appropriate statistical technique to deal with large amounts of data, as it retains a high power of data reduction and facilitate the design of aggregated variables. Moreover, it is possible to analyse the interrelations among a large list of indicators in order to understand their underlying structure, making it possible to reduce information into a small number of aggregated variables. Since factors can be saved and used in further analysis, this technique reduces the chance of double-counting highly similar attributes (multicollinearity) as well as possible biases from having redundant exogenous variables in regression (overfitting). In fact, we are then able to evaluate the relative importance of each aggregate variable (factor) on CBI in a linear regression framework. In other words, we can select determinants of CBI given a large amount of

information coming from the initial database and, at the same time, avoid collinearity issues since correlated variables are already grouped in the factor analysis step.

Our results show no evidence of CBI decreasing after the Great financial crisis, but identify new relevant determinants with respect to the previous literature. In particular, we confirm a key role of the IMF loans program as an international constraint, which seems to guide all the economies in their choice toward independent central banks. Financial instability, recession and low inflation work in the opposite direction with governments relying extensively on central bank money to finance public expenditure. In this context, central banks' political and operational autonomy is inevitably undermined for the fulfillment of their policy objective of preserving price stability. Finally, the degree of CBI in non-OECD economies responds to various measures of strength of political institutions: the less is the strength of political institution, the higher is the incentive to delegate to an independent central bank, except for corruption. In fact, greater the level of corruption, higher is the incentive to delegate to an independent central bank. Non-OECD countries with more party political instability due to heterogeneous political contexts have a higher incentive to delegate to a more independent central bank. The delegation to an independent central bank is a way to facilitate the cohesistence of actors with heterogeneous preferences within the executive, i.e. coalition or minority goverment, in particular when information asymmetries are presents, for example, between coalition goverment parties and the executive. Moreover, multiparty goverment are heavily dependent on the use of fiscal policy, and this increases the incentive to delegate in the hands of an independent institution (non-targetable) the monetary policy or unpopular policies maximising the probability to be re-elected.

The paper is organized as follows. In Section 2 we describe in detail the considered dataset. Section 3 presents the employed methodology and empirical results. Finally, Section 4 concludes.

2. Data

We examine the determinants of CBI using a new index recently provided by Dincer and Eichengreen (2014), (denoted by the authors as CBIW). It is based on the index of *legal* independence by Cukierman *et al.* (1992) (called in short CWN index), but for the period 1998-2010. The CWN index is based on measures such as the independence of the governor of the central bank, its independence in policy formulation, its objective or mandate, and the limits on its lendings to the public sector. On top of that, the CBIW is augmented by adding other aspects of the CBI ("*de-facto*" criteria) emphasized by the subsequent literature: limits on the reappointment of the governor, measures of provisions affecting (re)appointment of board members similar to those affecting the governor, restrictions on government representation on the board, and intervention of the government in exchange rate policy formulation.

Figure 1 shows an overall positive trend in the index CBIW (indicating greater independence) for both OECD and non-OECD countries over the entire period. The growth from 1998 to 2010 for the OECD group was 9.47%, and for non-OECD group 9.73%. For OECDs, the first increase regards years between 2000 and 2003, when the average rate rose from 0.59 to 0.63. In these years some countries, like Iceland, Norway, Turkey and Estonia, registered reform processes inducing a higher level of CBI with respect to the average. After the 2007-2008 financial crisis, the index CBIW started a new growth for these advanced economies, while remain relatively stable for the other countries. For non-OECDs, the line shows a jump in the years 2003-2005, when the average CBIW increased from 0.45 to 0.47. The countries that have seen biggest jumps are Venezuela, Iraq, Lithuania and Macedonia. The graph suggests that countries with lower level of development and democracy are investing

in reform processes, probably due to international pressure (e.g. from IMF) to ensure financial and price stability. In conclusion, there is no evidence that the CBIW index has decreased not even after the Great financial crisis. Different authors, surveyed by De Haan and Eijffinger (2016), also observed the same.
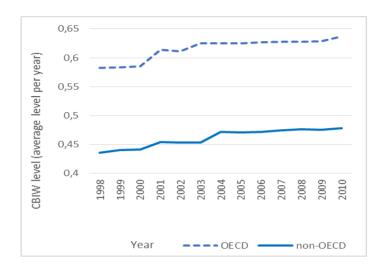

Figure 1. Plot of the values of CBIW index (from Dincer and Eichengreen, 2014) for OECD (dashed line) and non-OECD (solid line) countries during the period 1998-2010.

The 47 variables used to investigate the determinants of CBI have been selected in line with recent literature on this topic (for a survey, see Fernández-Albertos, 2015). In particular, we consider the economic and political variables also used by Dincer and Eichengreen (2014) with some additional variables suggested by D'Amato *et al.* (2009). Moreover, we refer to the institutional variables used by Farvaque (2002), and Pistoresi *et al.* (2011). Our final sample includes data for 31 OECD and 49 non-OECD economies (see Note 1 for a detailed list of countries) and covers the years from 1998 to 2010.

The economic variables are the following: Inflation (measured by CPI index), RealGDP (GDP at constant prices), RealGDPpc (RealGDP per capita), Liquidity (M3 to GDP), Openness (import to GDP), IMFlending (as a ratio of GDP), CorrelationCycle (correlation between the country GDP growth and world GDP growth, i.e. the worldwide common component in the business cycle), Deficit (as a ratio of GDP), and Expenditure (government final expenditure to GDP). Those economic determinants are taken from IMF, World Bank and FED databases and are averaged over the considered period.

The political variables are taken from different sources. In particular, Stability (presence/absence of terrorism or political violence), Rule of Law (the confidence of the agents in societies rules, e.g. the quality of contracts enforcement and defense of property rights), GovEffectiveness (quality of public services, effectiveness of policies, credibility of government effort in the actuation of such policies), Accountability (perception of citizens to participate to the selection of their government members, freedom of speech and presence of free media), RegulatoryQ (ability of government to make laws and regulations to promote the development of the private sector), and Corruption (corruption of public institutions, magnitude of corrupting acts and the presence of "elite" and private interests at the head of state government) are taken from WGI database. Legal origin (civil or common-law system) and Transparency are obtained from Dincer and Eichengreen (2014). Finally, Democracy

(the possibility to express different preferences on different political alternatives, the existence of constraints on the exercise of power by the executive, the guarantee of political and civil liberties) is taken from Polity IV database. Also these variables are averaged over the selected years.

The institutional variables are found in the DPI database of the World Bank, originally published by Beck *et al.* (2001). The database is divided into five groups of variables taken at the year 2010, which are the following: 1) *Chief Executive variables*, which are relevant to characterize the executive power: system (if presidential, assembly elected or parliamentary), yrsoffc (number of years in office), finittrm (presence of finite term in offce), yrcurnt (years left in current term), military (if the chief executive is a military officer), allhouse (control of all the houses by executive party); 2) *Party variables in the legislature*, which are relevant to the parties that make up the legislative power: numgov and numvote (number of seats and vote share of the government parties, respectively), totalseats (total seats of the parliament in the legislature), gov1seat and gov2seat (number of seats of the first and second government parties, respectively), numopp and oppvote (number of seats and vote share of the opposition parties, respectively), opp1seat, opp2seat and opp3seat (number of seats of the first, second and third opposition parties, respectively), legelec and exelec (presence of legislative or executive elections); 3) *Electoral rules*: liec and eiec (indeces of legislative and executive competitiveness), mdmh (mean district magnitude), plurality and pr (plurality or proportional representation), housesys (in mixed electoral systems, which governs the majority or all the House seats); 4) *Stability and checks and balance*, which relates to the stability of the political system: tenlong and tenshort (longest and shortest tenure of a veto players), tensys (duration of democratic or autocratic system), checks (number of veto players); 5) *Federalism*, which relates to the state form: state (if local governments are elected). Finally, note that all the cited databases in this Section and their sources are detailed in Note 2.

3. Results

The resulting dataset has been analysed using well-known statistical tools such as factor analysis and linear parametric modelling. Firstly, factors are identified and variables grouped to specify a particular aspect of the initial dataset. Secondly, we evaluate the relative importance of each factor as determinants of CBI index.

3.1 Factor Analysis

The factors are identified following the recommended guidelines of Hair *et al.* (1995) and their number is selected in accordance to the Kaiser criterion of corresponding eigenvalues greater than one in modulus. Moreover, the cumulative explained variance of each selected factor is also reported and it is satisfactory.

The analysis of the component matrices in Tables 1 and 2 indicates the type of dimension captured. Table 1 considers factors extracted from the economic and political groups. The first factor, named "*political factor*", mainly captures different measures of strength of political institutions, since it is highly positively correlated to the group of political variables (with correlation higher than 0.9): Rule of Law, GovEffectivness, Accountability, RegulatoryQ and Corruption. The second factor is only directly related to the degree of openness of the economy (with correlation higher than 0.7) and for this reason we label it as "*openness factor*". Finally, the third factor is directly related to the national deficit to GDP and indirectly related to the IMF lending to GDP, so we name it "*financial factor*" (with major correlation over 0.57).

Table 2 shows correlations between the institutional variables and the extracted factors. Particularly, the first and

the second factors are positively related to characteristics of the parties that make up the legislative power. The "*opposition factor*" is directly related to the number of seats of the first-largest, second-largest and third-largest opposition parties (with correlation greater than 0.75). Moreover, it relates to the total number of seats of the opposition coalition and to the total seats of the parliament in the legislature. The "*goverment factor*" is directly related to the number of seats of the first-largest government party and to the total number of seats of the goverment (correlations are higher than 0.75). The third factor, named "*electoral rules*", concerns variables that are relevant for the electoral system: if countries have uninominal majority system or proportional representation and in mixed electoral systems (correlations over 0.66). The residual factor, named "*chief executive factor*", contains variables which are relevant to characterize the tenure and turnover of the executive power: how many years the chief executive has been in office and years left in current term (correlations are above 0.58).

Table 1. Extraction of factors from economic and political groups of variables.

	political factor	*openness factor*	*financial factor*
Trasparency	.789	-.211	-.187
Inflation	-.510	.069	.153
Openness	-.012	**.716**	-.188
Liquidity	.650	-.016	.024
Deficit	-.053	.578	**.586**
Expenditure	.548	.079	-.250
RealGDPpc	.855	.107	.234
RealGDP	.358	-.495	.397
CorrelationCycle	-.017	-.171	.502
IMFlending	-.272	-.140	**-.573**
Stability	.745	.397	-.054
Democracy	.708	-.318	-.294
Rule of Law	**.968**	.105	.051
GovEffectivness	**.970**	.129	.063
Accountability	**.914**	-.125	-.154
RegulatoryQ	**.947**	.066	-.048
LegalOriginUK	.270	-.530	.336
Corruption	**.951**	.159	.125
Eigenvalue	8.185	1.820	1.543
Explained Variance	45.474	10.113	8.574
Cumulative Explained Variance	45.474	55.587	64.610

Note. The table reports correlations between factors and variables. Bold face enlights the highest correlations. Factors are extracted following Kaiser criterion (eigenvalues greater than one in modulus) and satisfactory cumulative explained variance.

Table 2. Extraction of factors from institutional group of variables.

	opposition factor	*government factor*	*electoral rules factor*	*chief executive factor*
system	0.268	-0.331	0.142	-0.230
yrsoffc	-0.377	0.210	0.471	**0.588**
finittrm	0.291	-0.241	-0.521	-0.305
yrcurnt	-0.047	0.154	-0.093	**-0.650**
military	-0.075	0.551	0.179	-0.189
allhouse	-0.256	0.489	0.045	-0.184
numgov	0.523	**0.758**	0.191	-0.103
numvote	-0.146	-0.213	0.646	-0.400
numopp	**0.884**	0.239	-0.022	0.117
oppvote	0.203	-0.566	0.294	-0.214
totalseats	**0.749**	0.633	0.093	0.029
gov1seat	0.415	**0.808**	0.125	-0.111
gov2seat	0.432	0.011	0.238	0.022
opp1seat	**0.772**	0.304	-0.104	0.122
opp2seat	**0.787**	0.108	0.138	0.032
opp3seat	0.618	-0.035	0.182	0.034
legelec	0.146	-0.060	-0.086	0.548
exelec	-0.015	-0.015	-0.071	0.367
liec	0.429	-0.563	-0.237	0.244
eiec	0.512	-0.631	-0.350	-0.088
mdmh	-0.054	-0.107	0.442	0.021
plurality	0.011	0.429	**-0.676**	0.121
pr	0.330	-0.256	**0.659**	-0.125
housesys	0.165	-0.276	**0.773**	-0.180
tenlong	-0.439	0.262	0.323	0.281
tenshort	-0.328	0.082	0.331	0.541
tensys	0.409	-0.412	0.275	0.198
checks	0.376	-0.503	-0.227	0.263
state	0.504	-0.062	0.205	0.292
Eigenvalue	5.476	4.492	3.501	2.374
Explained Variance	18.884	15.491	12.074	8.187
Cumulative Explained Variance	18.884	34.375	46.449	54.636

Note. The table reports correlations between factors and variables. Bold face enlights the highest correlations. Factors are extracted following Kaiser criterion (eigenvalues greater than one in modulus) and satisfactory cumulative explained variance.

3.2 Regression Analysis

After having identified the relevant group of variables in factors, we aim at evaluating the relative importance of each factor as determinants of the CBI index. Therefore, we conduct linear regression analysis where the identified dimensions are the independent variables and the CBIW index is the dependent one. Results are shown in Table 3.

The *financial factor* defined by the national deficit and IMF lending enters negatively and significantly in all the specifications, i.e. in full sample models and in both OECD and non-OECD restricted models. Taking in mind the correlations between this factor and variables (seen in Table 1), we conclude that economies with more IMF lending retain more CBI. This outcome is coherent with the current policy of IMF that controls the laws and regulations affecting autonomy, transparency, and governance at the central bank. The Fund pressures the economies benefiting from loans programs to reform their central banks toward greater independence, avoiding that their government interference can undermine the bank's autonomy and increase the risks associated with its operations. The strong estimated relevance of this variable reflects the importance of the IMF loans program in the considered period. In fact, the transition process in Central and Eastern Europe and the crises in emerging market economies led to an increase in the demand for IMF resources in the 1990s. Morever, the deep crises in Latin America and Turkey kept demand high for IMF resources in the early 2000s. Finally, IMF loans rose again since late 2008 with the global financial crisis. The IMF currently has programs with more than 50 countries around the world and has committed more than $325 billion in resources to its member countries since the start of the global financial crisis.

Table 3 also suggests that economies with less deficit show a higher CBI (see also Table 1 for the relation between the *financial factor* and deficit). The commitment literature suggests that CBI should be a mechanism for signalling the anti-inflationary creditworthiness of governments to international investors. Countries with a weak public budget suffer from an excessive inflationary bias, which may increase the interest burden. Therefore, the benefits from commitment will tend to be larger (see, Cukierman, 1992). In this context, the expected sign for the deficit should be positive. However, our negative sign may be explained as follows. The central bank lending to the government, for example of short terms loans, has increased during the periods of financial instability (e.g. the Great 2007-2008 financial crises), since a number of governments have turned to central banks for money as government liabilities increased, tax revenues declined, and financing for fiscal imbalances from domestic and international capital markets was expensive or unavailable. Hence, during deep financial crises, recession and long period of low inflation (e.g. 2008-2012 period), society becomes accustomed to deficit monetization, thereby reducing opposition to deficit and public pressure for an independent central bank.

To summarize, IMF loans program works like an "external constraint" for the economies with high deficit and more incentive to monetize it, but the financial instability and recession in a period of low inflation (or deflation) work in the opposite direction with governments relying extensively on central bank money to finance public expenditure. Hence, central banks' political and operational autonomy is inevitably undermined for the fulfillment of their policy objective of preserving price stability.

Now we focus on the institutional factors. Dincer and Eichengreen (2014) state that "*there is no evidence that countries with more robust political institutions strengthened the independence of their central banks, perhaps because the level of CBI was already high*". This is true for OECD economies. However, Table 3 shows that the *political factor* (e.g. freedom of speech, trust in legal system) enters negatively and significantly in the specification for non-OECD countries: the less is the strength of political institution, the higher is the incentive

to delegate to an independent central bank, except for corruption. In fact, greater the level of corruption, higher is the incentive to delegate to an independent central bank.

Furthermore, for non-OECD economies, the *goverment factor* also enters negatively and significantly. We recall that it only relates to the strength of the first-largest goverment party with respect to the total number of seats of the goverment coalition. This evidence, together with the results in Table 1, leads to the following consideration. Economies with strong first-largest goverment party have less incentive to delegate to an independent central bank. This is in line with the literature on the political economy approach to the CBI, (see Fernández-Albertos, 2015, and De Haan and Eijffinger, 2017). It suggests that the delegation to an independent central bank is a way to facilitate the cohesistence of actors with heterogeneous preferences within the executive, i.e. coalition or minority goverment, in particular when information asymmetries are present, for example, between coalition goverment parties and the executive. Moreover, multiparty goverment are heavily dependent on the use of fiscal policy, and this increase the incentive to delegate in the hands of an independent institution (non-targetable) the monetary policy or unpopular policies maximising the probability to be re-elected.

Finally, the *opposition, electoral rule* and *chief executive factors* are not statistically significant, but they design a coherent picture reinforcing the comment above. The *opposition factor* describes the relative weight of the three-largest opposition parties to the first-largest goverment party, that is, the degree of political fragmentation and the possible heterogeneity of preferences with the risk that intra-party conflicts over policy threaten the stability of a goverment. The fragmentation is greater in countries with mixed electoral system, i.e. partly majority based and partly proportional based. In fact, they are generally characterized by a stricter control over the goverment made by the opposition (captured by the *electoral factor*). The party political instability may be more dramatic if the executive power is characterized by low tenure or high turnover. Leaders with shorter period in office are more likely to make opportunistic decisions that entails long-run costs to society that outweigh short-run benefits (captured by the *chief executive factor*).

Table 3. Linear regression analysis for the assessment of CBI determinants.

	Basic Model			Augmented Model		
	Full Sample	*OECD*	*Non OECD*	*Full Sample*	*OECD*	*Non OECD*
Constant	0.55***	0.53***	0.49***	0.56***	0.53***	0.48***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Political factor	0.038	0.09	-0.04	-0.033	0.05	-0.15**
	(0.1)	(0.08)	(0.41)	(0.36)	(0.63)	(0.02)
Openness factor	0.018	0.05	0.01	0.018	0.03	0.04
	(0.43)	(0.21)	(0.75)	(0.52)	(0.59)	(0.26)
Financial factor	-0.092***	-0.11***	-0.08**	-0.075***	-0.09**	-0.10*
	(0.00)	(0.00)	(0.03)	(0.01)	(0.03)	(0.06)
Opposition factor	-	-	-	0.054	0.04	0.02
				(0.16)	(0.73)	(0.66)
Government factor	-	-	-	-0.085**	-0.02	-0.13***
				(0.02)	(0.86)	(0.01)
Electoral Rules factor	-	-	-	0.06*	0.07	0.02
				(0.06)	(0.46)	(0.44)
Chief Executive factor	-	-	-	0.00	-0.07	0.01
				(0.94)	(0.24)	(0.73)
N	80	31	49	57	27	30
R^2	0.21	0.41	0.10	0.41	0.55	0.51

Note. Estimated coefficients in table and relative *p*-values in parenthesis. The basic model refers to the following specification: $CBI_i = b_0 + \sum_k b_{1k} P_k + u_i$, where *i* is the country-index and P_k is the *k*th factor extracted from the economic and political groups of variables (see Table 1). The augmented model refers to the following specification: $CBI_i = b_0 + \sum_k b_{1k} P_k + \sum_j b_{2j} F_j + u_i$, where *i* is the country-index, P_k and F_j are the *k*th factor extracted from the economic and political groups of variables (see Table 1) and the *j*th factor extracted from the institutional group of variables (see Table 2), respectively. The symbols *, **, *** denote significance level at 6%, 5%, 1%, respectively.

4. Conclusion

In this paper we have implemented well-known statistical tools such as factorial and regression analysis to identify the determinants of a new CBI index from a large database of economic, political and institutional variables. The combination of these techniques has been used to synthesize information firstly and then to overcome limitations such as omitted variables, multicollinearity and overfitting. Our sample includes data for 31 OECD and 49 non-OECD economies and covers the period 1998-2010. The results confirm the role of the IMF loans program as an international constraint that seems to guide all the economies in their choice of independent central banks. However, financial instability, recession and low inflation work in the opposite direction with governments relying extensively on central bank money to finance public expenditure. Central banks' political and operational autonomy is inevitably undermined for the fulfillment of their policy objective of preserving price stability. Finally, for non-OECD economies, the degree of CBI responds to various measures of

strength of political institutions and party political instability. Non-OECD countries with more party political instability due to heterogeneous political contexts have a higher incentive to delegate to a more independent central bank or, in other words, economies with strong first-largest goverment party have less incentive to delegate to an independent monetary authority. The importance of these political and institutional factors suggest that the adoption of an independent central bank should be understood not only in terms of economic efficiency but also in terms of political convenience, as also stressed by Fernández-Albertos (2015).

References

Alesina, A.F., & Grilli, V. (1995). *The European Central Bank: reshaping monetary politics in Europe*. In Monetary and Fiscal Policy, Vol. 1: Credibility, edited by Torsten Persson and Guido Tabellini, 247-277, The MIT Press, Cambridge MA.

Alesina, A.F., & Stella, A. (2010). The politics of monetary policy. *National Bureau of Economic Research*, No. w15856.

Beck, T., Clarke, G., Groff, A., Keefer, P., & Walsh, P. (2001). New tools in comparative political economy: The database of political institutions. *The World Bank economic review*, 15(1), 165-176.

Buiter, W. (2016). Dysfunctional Central Banking. The End of Independent Central Banks or a Return to "Narrow Central Banking" - or Both?. *Citi Research*.

Cukierman, A. (1992). *Central Bank Strategy, Credibility, and Independence: Theory and Evidence*. The MIT Press, Cambridge MA.

Cukierman, A. (2008). Central Bank Independence and monetary policymaking institutions - past, present and future. *European Journal of Political Economy*, 24, 722-736.

Cukierman, A. (2013). Monetary policy and institutions before, during, and after the global financial crisis. *Journal of Financial Stability*, 9(3), 373-384.

Cukierman, A., Web, S.B., & Neyapti, B. (1992). Measuring the independence of central banks and its effect on policy outcomes. *The World Bank economic review*, 6(3), 353-398.

D'Amato, M., Pistoresi, B., & Salsano, F. (2009). On the determinants of central bank independence in open economies. *International Journal of Finance & Economics*, *14*(2), 107-119

De Haan, J., & Eijffinger, S.C. (2016). The politics of central bank independence. Forthcoming in: R. Congleton, B. Grofman and S. Voigt (eds.), *Oxford Handbook of Public Choice*, Oxford: Oxford University Press.

De Haan, J., & Eijffinger, S.C. (2017). Central bank independence under threat?. CEPR working paper No. 87.

Dincer, N.N., & Eichengreen, B. (2014). Central Bank Transparency and Independence: Updates and New Measures. *International Journal of Central Banking*, 10(1), 189-259.

Farvaque, E. (2002). Political determinants of central bank independence. *Economics Letters*, 77(1), 131-135.

Fernández-Albertos, J. (2015). The politics of Central Bank independence. *Annual Review of Political Science*, *18*, 217-237.

Hair, J.F., Anderson, Jr R.E., Tatham, R.L., & Black, W.C. (1995). Multivariate Data Analysis with Readings. Third Edition, MacMillan Publishing, New York.

Pistoresi, B., Salsano, F., & Ferrari, D. (2011). Political institutions and central bank independence revisited. *Applied Economics Letters*, *18*(7), 679-682.

Polillo, S., & Guillén, M.F. (2005). Globalization pressures and the state: the worldwide spread of Central Bank Independence. *American Journal of Sociology*, 110(6), 1764-1802.

Spyromitros, E., & Tuysuz, S. (2012). Do monetary policy transparency, independence and credibility enhance macro-financial stability?. *International Journal of Economics and Finance*, 4(4), 44-54.

Notes

Note 1. *OECD countries*: Australia, Austria, Belgium, Canada, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Mexico, Netherland, New Zealand, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Turkey, UK, and USA.

Non-OECD countries: Albania, Angola, Armenia, Azerbaijan, Belarus, Bhutan, Botswana, Bulgaria, Cambodia, Colombia, Croatia, Cyprus, El Salvador, Fiji, Georgia, India, Indonesia, Jamaica, Jordan, Kenya, Kyrgyz Republic, Lao Republic, Latvia, Lithuania, Macedonia, Malaysia, Mauritius, Moldova, Mongolia, Mozambique, Namibia, Nigeria, Oman, Papua New Guinea, Peru, Philippines, Romania, Russia, Singapore, South Africa, Sri Lanka, Syria, Tanzania, Thailand, Trinidad and Tobago, Uganda, United Arab Emirates, Venezuela, Zambia.

Note 2. Our final sample is constructed from the following databases:

International Monetary Fund (IMF), available at http://www.imf.org/en/Data;

World Bank Data, available at http://data.worldbank.org/;

Federal Reserve Data (FED), available at https://fred.stlouisfed.org/;

Worldwide Governance Indicators (WGI), available

at http://info.worldbank.org/governance/wgi/index.aspx#home;

Polity IV database, available at http://www.systemicpeace.org/inscrdata.html;

Database of Political Institutions (DPI), available at http://www.worldbank.org/en/research.

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