Central Bank Independence in the World: A New Data Set

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Central Bank Independence in the World.
A New Dataset

Ana Carolina Garriga

This article introduces the most comprehensive dataset on de jure central bank independence (CBI), including yearly data from 182 countries between 1970 and 2012. The dataset identifies statutory reforms affecting CBI, their direction, and the attributes necessary to build the Cukierman, Webb and Neyapty index. Previous datasets focused on developed countries, and included non-representative samples of developing countries. This dataset's substantially broader coverage has important implications. First, it challenges the conventional wisdom about central bank reforms in the world, revealing CBI increases and restrictions in decades and regions previously considered barely affected by reforms. Second, the inclusion almost 100 countries usually overlooked in previous studies suggests that sample selection may have substantially affected results. Simple analyses show that the associations between CBI and inflation, unemployment or growth are very sensitive to sample selection. Finally, the dataset identifies numerous CBI decreases (restrictions), whereas previous datasets mostly look at CBI increases. These data's coverage not only allows researchers to test competing explanations of the determinants and effects of CBI in a global sample, but it also provides a useful instrument for cross-national studies in diverse fields, such as liberalization, diffusion, political institutions, democratization, or responses to financial crises.

Keywords: Central banks, central bank independence, datasets, measurement, reforms

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This article introduces the most comprehensive dataset on *de jure* central bank independence (CBI) available to the date. The dataset identifies statutory reforms affecting CBI, their direction, and the attributes necessary to build the Cukierman, Webb and Neyapty (1992) (CWN) index in 182 countries between 1970 and 2012. The most commonly-used datasets include fewer than 100 countries, and cover fewer years. This dataset codes the existence of reforms in 6,764 observations, and computes the CWN index for 5,866 observations.[1] The data coverage not only allows researchers to test competing explanations on the determinants and effects of CBI in both developed and developing countries, but it also provides a useful instrument for cross-national studies in diverse fields. CBI has been a variable of interest not only for studies of the determinants and effects of monetary policy, liberalization, or diffusion, but also for the study of political institutions, democratization, or responses to crises (Adam, Delis, and Kammas 2011, Reenock, Staton, and Radean 2013, Rosas 2006). This article shows that previous data provide incorrect or incomplete conclusions about the dynamics of central bank reform in the world. For example, analysis of global data refutes "the fact that during the forty years ending in 1989 there had hardly been reforms in [central bank] legislation" (Cukierman 2008:724) . Finally, simple regressions show that associations between CBI and inflation, unemployment and growth are very sensitive to the sample used. Sample selection may have affected the generalizability of previous results in a significant manner.

CBI is the central bank's capability of controlling monetary instruments (Bernhard 2002:21) or, inversely, CBI is the set of restrictions to the government's

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[1] The largest publically available original dataset (Bodea and Hicks 2015b) includes only 2,314 observations (34.2% of this sample). The largest compilation of datasets, including own coding (Sadeh 2011), has 2,714 observations (40% of this sample).

influence on the central bank management of monetary policy. CBI can be restricted or increased on three dimensions: personnel, financial, and policy independence (Eijffinger and de Haan 1996:2). Personnel independence reflects limits to the government's influence on the central bank board's membership or tenure. Financial independence restricts the government's ability to use central bank's loans to fund its expenditures, to avoid monetary policy subordination to fiscal policy. Finally, policy independence reflects the central bank's powers to formulate and execute monetary policy. This includes the central bank's ability to set the goals and/or chose the instruments of monetary policy (Debelle and Fischer 1995). Central banks' institutional designs vary across these dimensions, resulting in different *levels* of CBI. However, providing a continuous measure for CBI with cross-sectional and temporal validity and a broad coverage has proven to be a difficult task.

In the 1980s, CBI emerged as *the* recipe to avoid the pervasive inflationary consequences of shortsighted electoral ambitions. The practical advice derived from the "rules versus discretion" literature (Barro and Gordon 1983, Rogoff 1985) was to solve the time-inconsistency problem (Kydland and Prescott 1977) by delegating the control of monetary policy to independent central banks. International agencies and policy makers embraced this advice (Bernhard, Broz, and Clark 2002:699, International Monetary Fund 1999, World Bank 1992).

The need to test the theoretical argument, and assess the consequences of delegation to central banks, spurred the interest in measuring CBI. Many studies show the stabilizing effects of CBI on the economy: CBI is linked to lower inflation, reduced variation in inflation and output, increased credibility of the monetary policy, and lower uncertainty among economic agents (Bodea and Hicks 2015a, Cukierman 1992, Cukierman, Miller, and Neyapti 2002, Cukierman, Webb, and Neyapti 1992, Persson and

Tabellini 1990, Rogoff 1985). The literature also shows that CBI has important political consequences (Bernhard and Leblang 2002, Clark, Golder, and Poast 2013).

Beyond the consequences of CBI, researchers in the fields of international and comparative political economy (Bernhard 2002, Broz 2002, Clark 2002, Hallerberg 2002), and those interested in the politics of delegation (Bendor, Glazer, and Hammond 2001), reforms (Acemoglu, Johnson, Querubin, and Robinson 2008), and diffusion (Polillo and Guillén 2005) have paid particular attention to the determinants of CBI. Although economic reasons would justify the establishment of independent central banks, the variance CBI across countries is not explained just by economic fundamentals. However, the few studies on the determinants of CBI have limitations. Most of these works show the determinants of CBI in *developed* countries (Bernhard 2002, Broz 2002, Clark 2002, Pistoresi, Salsano, and Ferrari 2011). Although there is agreement regarding the possibility that the determinants of CBI are different in developed and developing countries, data seldom allow us to test competing explanations on both sets of countries. Studies including developed and developing countries are either cross-sectional analyses (Crowe and Meade 2007) or are based on not-necessarily representative samples (Berggren, Daunfeldt, and Hellström 2014, Bodea and Hicks 2015b).

Limited data availability suggests limits to our knowledge on these matters.[2] Because the countries included in previous datasets are not representative world or regional samples, it is possible that results on global samples are biased. And additional

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[2] Siklos (2008:803) suggests that data problems may even affect the definition of CBI because empirical studies usually define CBI "sufficiently loosely […] to fit the particular needs of the group of countries under investigation." He attributes this to "the inevitable constraints imposed by the availability of limited data as well as variations in the quality of the data across countries."

problem is that most previous data coding efforts focused on legislation that was in force in certain years, providing valuable cross-sectional information, but little insight on variation within countries.

To solve these issues, one needs to collect legislation from most countries in the world, including legislation that has been revoked, and partial reforms affecting CBI. The sources are not centralized,[3] and include primary and secondary legislation, and central banks' internal rules. Furthermore, lack of translations for legislation in countries where English is not the official language poses additional challenges.

Measuring CBI

Most empirical studies using CBI as dependent or independent variable base their measures of CBI on central banks statutes (*de jure* CBI) (Alesina, Mirrlees, and Neumann 1989, Cukierman 1992, Grilli, Masciandaro, and Tabellini 1991). Some scholars have used measures of *de facto* CBI, based on questionnaires (Blinder 2000, Cukierman, et al. 1992, Fry, Goodhart, and Almeida 1996) or in the turnover rate (TOR) of central bankers (Cukierman and Webb 1995, Cukierman, et al. 1992, de Haan and Siermann 1996). However, questionnaires may not be the most reliable measure of CBI, particularly because of their narrow coverage, their problematic cross-sectional comparability, and their little within-country variation. Furthermore, although Cukierman and others found the TOR predicts inflation in developing countries, Dreher, Sturm, and de Haan (2008) show that endogeneity explains this finding: central bankers unable to control inflation are replaced more often.

[3] The IMF's Central Bank Legislation Database (CBLD) is restricted to central banks and IMF personnel. Access to this data may help completing or contrasting the sources used for this codification.

Measures based on statutes have been criticized because laws do not contemplate all contingencies that might affect the relations between the central bank and the government. Furthermore, deviations from the law are not infrequent. Even independent central banks can be influenced by the government's appointments and threats to the bank's independence (Lohmann 1998). Siklos (2008:804), on the other hand, regrets that the literature on CBI "has downplayed to an excessive degree the importance of the design of central bank legislation." In spite of criticisms, reliance on a legal-based measure is useful for several reasons. First, a measure of statutory CBI allows collecting comparable cross-sectional data across time. These data allows looking for systematic differences across observations. Second, and more importantly, the utility of the measure depends on the research question for which it is used: statutory measures of CBI are useful to assess governments' institutional choices, that is, when and to what extent governments give independence to their central banks – or limit it.

Although there are differences among different scores of *de jure* CBI (Alesina, et al. 1989, Cukierman 1992, Grilli, et al. 1991), their correlation with inflation variables is comparable. I use Cukierman, Webb, and Neyapti's (CWN) criteria instead of other available measures of CBI (Alesina, et al. 1989, Grilli, et al. 1991) for several reasons: First, CWN's criteria for coding are clear and easily replicable. Second, CWN's component variables are exhaustive and allow further recodifications for other purposes,[4] and allow the study of particular components of the index (Banaian, Burdekin, and Willett 1998. Furthermore, it has been widely used – "the current state of the art of measurement of de jure CBI" (Acemoglu, et al. 2008:20) – , and its larger cross-sectional and historical coverage allowed me to check the reliability of my own coding.

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[4] Arnone et al. (2007:39-40) include a table to convert CWN scores to the Grilli, Masciandaro, and Tabellini (1991) scale.

Other scholars have extended CWN's original coding of up to 72 countries between 1950 and 1989 (on a country-decade basis), and up to 26 post-communist countries for 1991-1998. For example, Polillo and Guillén (2005) extend this index to the period 1990-2000 for 71 countries, Crowe and Meade coded 76 countries in 2003, Sadeh combined extant sources and his own coding to cover 93 countries between 1968 and 2005, and Bodea and Hicks (2015b) coded CBI for 81 countries between 1972 and 2008. Although the literature reports results based on other datasets, they are not all publicly available (Daunfeldt, Hellström, and Landström 2013, Wessels 2006). For a list of countries and observations included in publicly available datasets, see online appendix.

The Dataset

Coding Process and Descriptive Information

The dataset codes central bank legislation in 182 countries.[5] I coded over 840 documents – constitutions, laws, amendments, and decrees that directly refer to central banks, and central bank charters (see online appendix). Legislation was collected mainly from online sources, and it was coded for all countries that had available texts in English, Spanish, French, Portuguese or Italian. This helped identifying legislation that may have been overlooked in other datasets.[6]

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[5] I obtained primary sources for 179 countries. I did not find primary sources to code the CWN components for three countries. However, I found reliable secondary sources to code the existence of reforms.

[6] I coded 100 documents in Spanish, 47 in French, 34 in Portuguese, and 7 in Italian. For Suriname's and Turkmenistan's legislation, I used automated translations.

Legislation was collected and coded in four independent processes: (1) I compiled and coded all the sample for the period 1970-2008 in 2009; (2) one research assistant (RA) compiled and two RAs coded the period 2009-2011 during 2012, and (3) one RA compiled and two RAs coded the period 1970-2012 in 2013-2014 as a reliability check on the coding of overlapping years. In the first two rounds, I relied on central banks' websites and search engines to find legislation and news about central bank reforms. The third round of data collection included "targeted searches": to find earlier reforms, I searched for older laws mentioned in new laws, and used national legislatures' search engines and central banks' official information services to find them by their number and/or date. This let me find reforms previously omitted. In the third wave, 15% of the laws coded by each of the RAs were recoded by the other RA, and we held weekly meetings to discuss differences between the coders and to agree about criteria. This third wave of coding produced a second score for each variable for the period that overlapped the previous two waves (1970-2011). (4) In the final stage, I compared both scores for each country-year. If I found a discrepancy, I went back to the laws to re-evaluate them, and decided the appropriate coding.

The dataset relies on Cukierman (1992) and Cukierman, Webb and Neyapti's (1992) rules to code central bank legislation. Each piece of legislation was coded on 16 dimensions related to four components of CBI, on a country-year basis: CEO's characteristics (appointment, dismissal, and term of office of the chief executive officer of the bank); policy formulation attributions (who formulates and has the final decision in monetary policy, and the role of the central bank in the budget process); central bank's objectives; and central bank's limitations on lending to the public sector. These 16 components are also combined into a single weighted index, ranging from 0 (lowest) to 1 (highest) CBI. I also computed the CWN unweighted index. See the online appendix for coding and weighting rules.

If reforms were partial amendments, only the variables affected by the amendments were recoded. If reforms did not affect CBI, they were not coded as reforms. When legislation was not available, variables included in the CWN index were not coded. However, if the central bank explained in its own institutional information (or official "history") that there was an institutional reform in a given year, and the information clearly allowed me to determine that reform's direction, I coded those variables.

The dataset includes additional variables: central bank creation, a central bank reform that affects CBI in a given year, its direction (CBI increase or decrease), and whether the central bank is a regional entity. The dataset includes 6,764 observations for central bank reforms, and identifies 382 reforms affecting CBI.[7] Of those reforms, 276 increase CBI, 56 decrease CBI, 39 have a zero net-effect on CWN's weighted index.[8] In 11 reforms, direction was not coded. It also includes 5,866 observations with scores for the CWN legal index of CBI.

This dataset differs from previous datasets in three aspects: First, its coverage is significantly broader (290% larger) than the largest original publicly available dataset (Bodea and Hicks 2015b).[9] Second, I include variables that account for the existence of central bank reforms and their direction, even when there is no information on the specific dimensions of CBI that were reformed. Although these categorical variables do not provide information on the magnitude of the reform, some studies can still benefit

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[7] Although the Panamanian National Bank's is not strictly a central bank, other authors consider it possible to use its legislation to code its independence.

[8] See below.

[9] When regional observations are excluded, the dataset is 253% larger than Bodea and Hicks (2015b), and 270% larger than Sadeh (2011).

from accounting for the existence and direction of reforms. Third, I identify numerous reforms omitted in previous datasets, including reforms restricting CBI, a possibility not even discussed in the literature until now. This within-country variation also permits controlling for CBI in models with fixed effects. Finally, two additional variables register whether the central bank was created in a given year, and whether the country's monetary policy is in the hands of a regional monetary union (for example, the members of the Central Bank of West African States).

The online appendix shows descriptive statistics for this dataset and other available datasets (Bodea and Hicks 2015b, Crowe and Meade 2007, Cukierman, et al. 1992, Neyapti and Dinçer 2008, Polillo and Guillén 2005, Sadeh 2011), for comparison purposes. Differences in the CWN indices' sample means are misleading because the samples vary. The correlation between this and the other five datasets ranges between .7 (Sadeh) and .92 (CWN). (See the correlation matrix in the online appendix.) This reflects a substantial consistency in the coding criteria of overlapping observations. Differences in coding often result from omitted reforms or coding of the year of the reforms in other datasets.

A caveat on regional central banks: 933 observations correspond to countries that are members of regional central banks (such as European Central Bank or the Banque des États de l'Afrique Centrale). However, only 391 of the 2,799 country-year observations that appear exclusively in this dataset correspond to regional central banks – other datasets also include regional observations, but do not single them out. In order to avoid distortions caused by the inclusion of data on regional central banks, the online appendix reproduces all the tables and graphs presented in this article excluding regional observations. The results are substantially similar to the results reported in the article.

Geographic Coverage

The broad sample is one of this dataset's most important attributes. It codes 105 countries for the full period. In subsequent years, new countries and countries whose legislation became available were added (see Figure 1).

Figure 1. Number of countries per year included in the different datasets
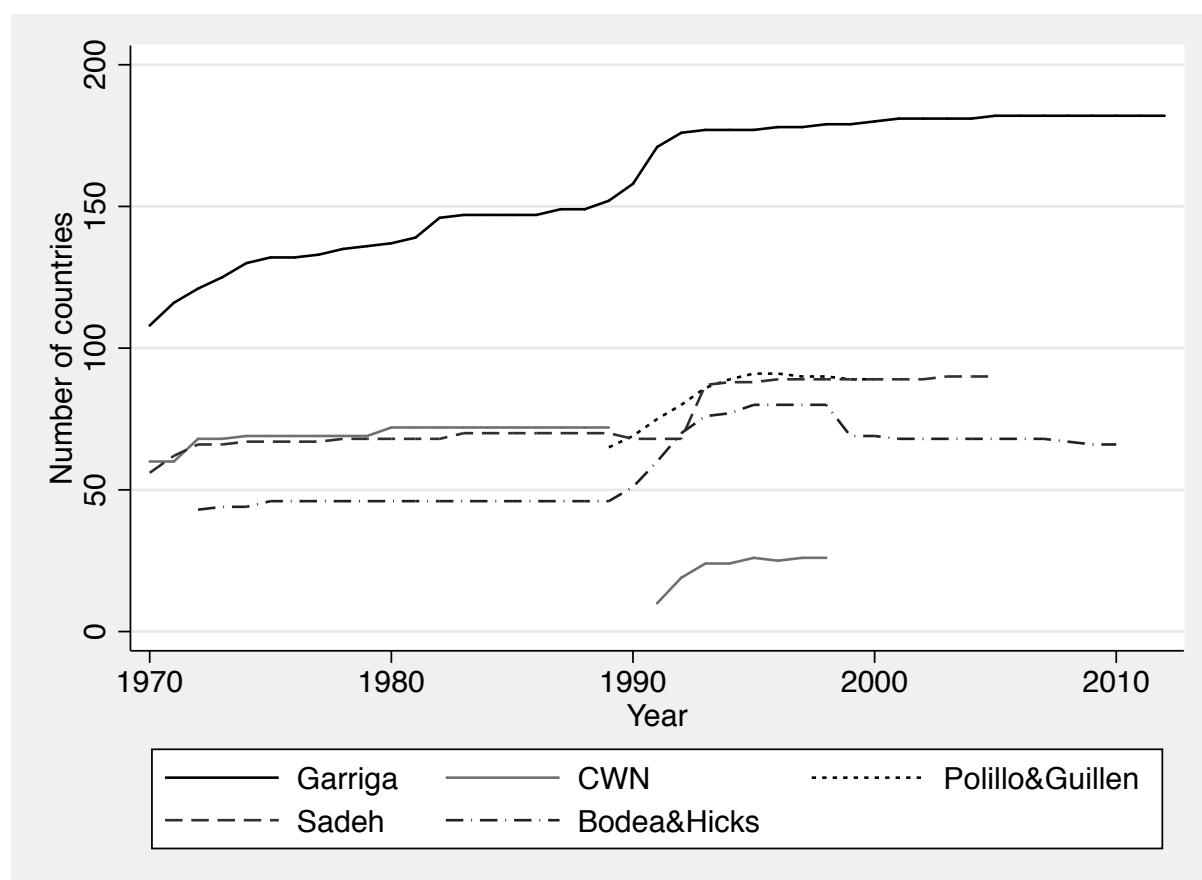
This dataset not only includes a substantial number of countries previously omitted, but also presents a more accurate picture of regional differences. Previously available data are not representative world or regional samples, imposing limits to the generalizability of previous studies. Figure 2 illustrates how the new dataset more accurately represents important groups of countries. The top panel shows that this

dataset greatly improves the representation of middle and lower income countries. The bottom panel further shows countries in regions other than North America and Europe were seriously underrepresented.

Figure 2: Countries included in different datasets, by income groups and geographic regions
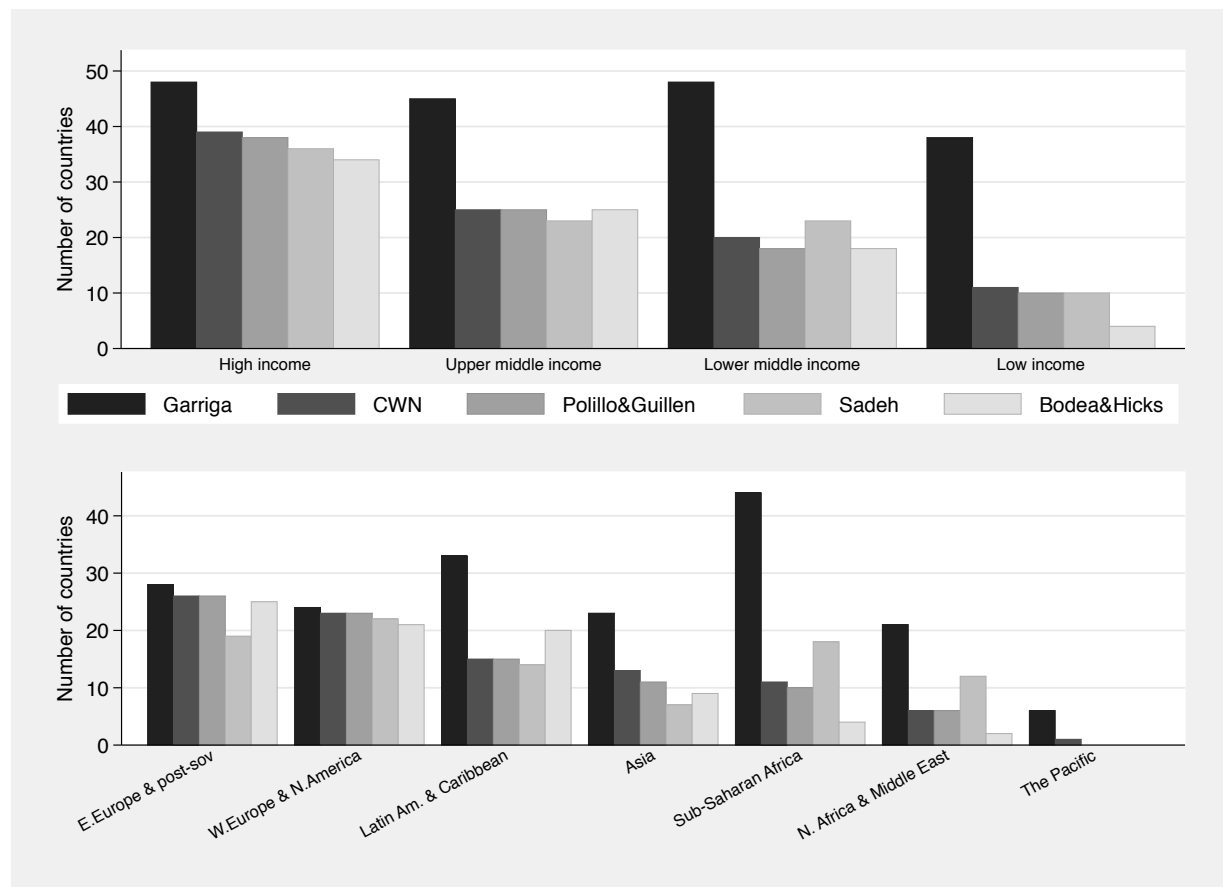

Frequent Central Bank Reforms Around the World, and in Both Directions

The identification a number of reforms previously ignored is another important contributions. The larger number of reforms in my dataset is not due to a broader conceptualization of "reform." It results from coding legislation that previous

researchers apparently overlooked, and from including additional countries (see Figure 3, top panel). 5.6% of the 6,764 observations experience reforms affecting CBI. The mean number of reforms per country in this dataset is two in 43 years.[10]

Figure 3: Number of reforms affecting CBI per year. Newly coded and previously coded countries (top panel), reforms by direction (bottom panel)

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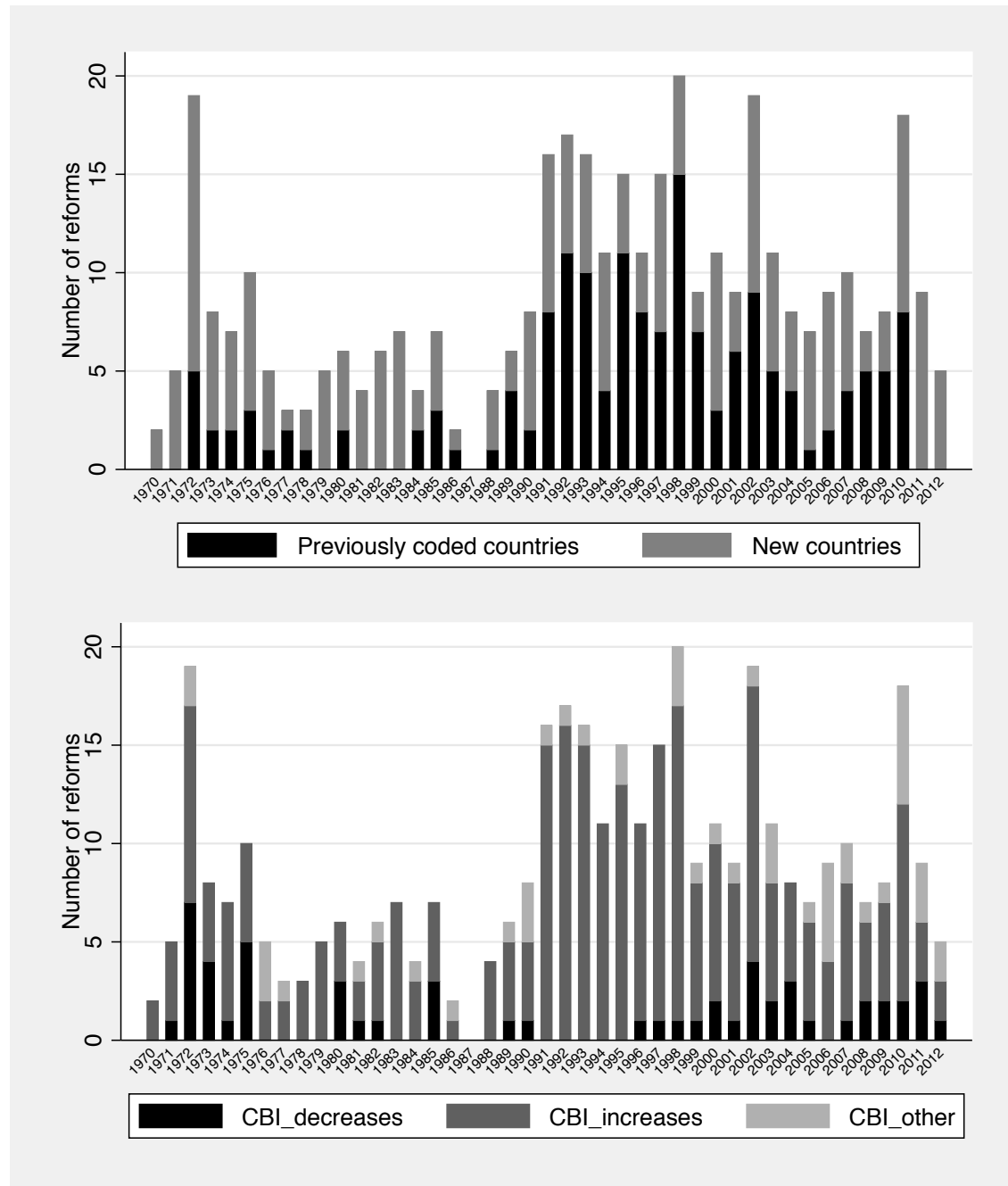
[10] The online appendix shows the frequency of reforms per country and year.

This dataset raises questions about the conventional wisdom regarding the history of CBI reforms. Scholars argue that most reforms occurred in the 1990s (see Fernández-Albertos 2015), stressing "*the fact* that during the *forty years ending in 1989 there had hardly been reforms* in [central bank] legislation" (Cukierman 2008:724, emphasis added). Examining a more representative global sample casts doubt upon this assertion: this dataset identifies 113 reforms between 1970 and 1989 (75 of them increase CBI), usually ignored in the literature.[11] On average, in the 1970s 5.3% of the sample experienced reforms affecting CBI. The percentage of observations coded as reforms is 3.2% for the 1980s, 7.9% for the 1990s, 5.5% for the 2000s, and 5.9% for the first three years of the 2010s.[12] This contrasts with other data, as shown in Figure 4.[13] This picture is similar in the light of the number of countries included in different samples (Figure 6.1 in the online appendix plots the proportion of observations included coded as experiencing CBI reforms by year in different datasets).

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[11] In the same two decades, Bodea and Hicks identify 17 reforms (nine of them increasing CBI). 84 of the 113 reforms I identify are in newly coded countries, and 29 in countries that were coded by Bodea and Hicks.

[12] The magnitude of the reforms also varies through the sample. In absolute terms, the average reform changes the index by .112 before 1989, and by .206 after that year. In relative terms, the average percentage change in CBI before 1989 is 40% (excluding Iran, a significant outlier), and 63%, between 1990 and 2012.

[13] Daunfeldt, et al. (2013) coded central bank reforms in a sample of 132 countries between 1980-2005. Their data is not public, so these data comes from their figure 1 (Daunfeldt, et al. 2013:431).

Figure 4: Number of reforms affecting CBI per year. Different datasets
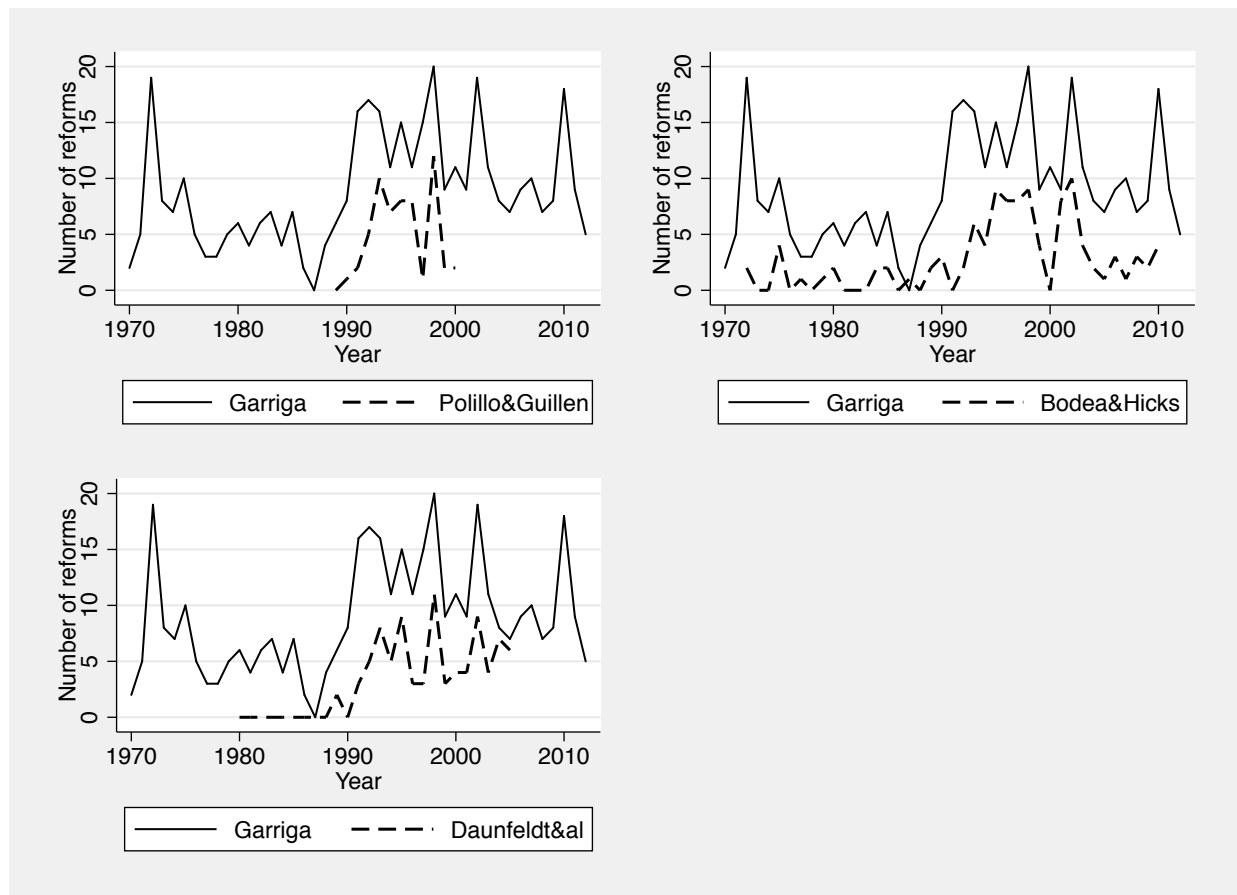
This dataset thoroughly identifies not only numerous reforms, but also their direction (see Figure 3, bottom panel). In particular, it identifies 56 reforms restricting CBI, a movement not discussed by the literature possibly because it was considered an exceptional event. Table 1 compares the number and direction of reforms identified by three datasets. I also code 39 instances in which reforms to different aspects of CBI do not affect the scores based on the CWN index, or the direction of different amendments offset each other (as in Slovenia 2007). In other eleven cases, missing data on the regulation before the reform does not allow me to code with certitude the reform's direction; therefore, direction is missing.

Table 1: CBI reforms, by direction

	Garriga		Polillo&Guillen		Bodea&Hicks	
Number of countries	182		91		81	
Period	1970-2012		1989-2000		1972-2008	
Observations	6,764		1,004		2,314	
Number of reforms						
Total (%)	382	(100%)	58	(100%)	113	(100%)
Reforms *increasing* CBI (%)	276	(72.2%)	57	(98%)	95	(84%)
Reforms *decreasing* CBI (%)	56	(14.7%)	1	(2%)	18	(16%)
Zero effect or no direction coded (%)	50	(13.1%)				

CBI in the World: A Different Picture?

This dataset shows that the global dynamics towards CBI may have been overstated as an artifact of sample selection. This section suggests that this picture is mainly a product of the overrepresentation of higher-income and post-communist countries in the samples.

The high correlation of my coding with other datasets suggests that coding criteria were consistent. However, sample selection has significant effects on our understanding of CBI. The first difference refers to the worldwide levels of CBI (see Figure 5, top panel). It is a common practice to compare the CWN data world average for 1989 and Crowe and Meade's from 2003 (Crowe and Meade 2007, Fernández-Albertos 2015). This suggests an 80% increase in the global level of CBI between 1989 and 2003. However, the global effect of central bank reforms seems less dramatic on samples including more countries, especially because the previously excluded countries show less variance in CBI (see Figure 5, middle panel). Bodea and Hicks register a 67% increase, but this article's dataset shows a more modest 40% increase in the world average CBI between 1989 and 2003.

Figure 5. CBI world average. Different datasets (top panel), different subsamples (middle panel), and by income groups (bottom panel)
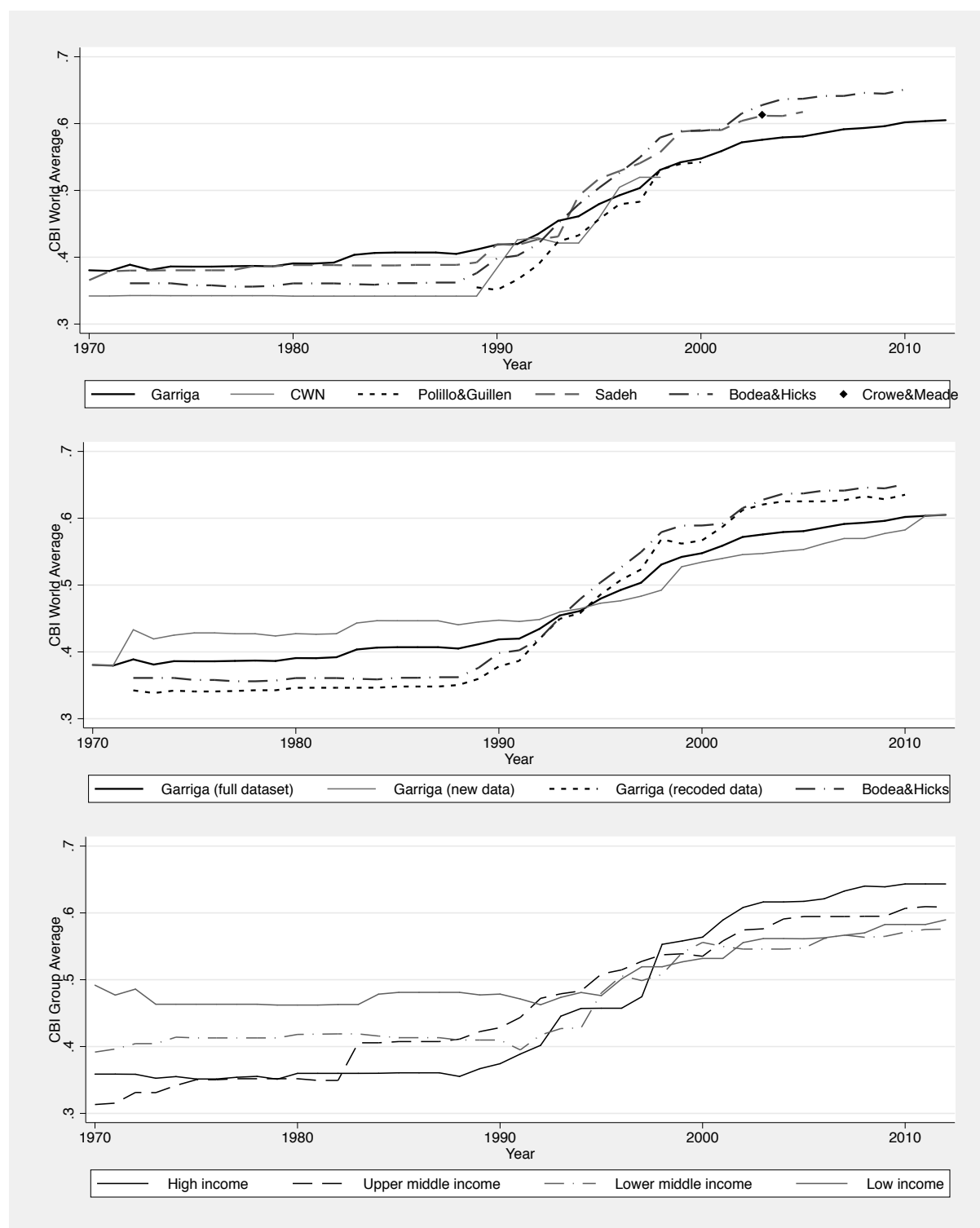
The bottom panel in Figure 5 shows that this misleading picture was mainly driven by the central bank reforms in higher-income countries, which are overrepresented in other samples. However, lower-middle income and low-income countries had more stable levels of CBI through the period. This also contrasts with the assertion that "central banks in emerging market and developing economies have seen *an even more impressive shift* towards independence over the past two decades than their advanced-economy counterparts" (Crowe and Meade 2007:73, emphasis added). Although that is certainly the case for Eastern European and post-Soviet countries, it is not an accurate description of CBI in most developing countries (see Figure 6).

Figure 6. CBI regional averages
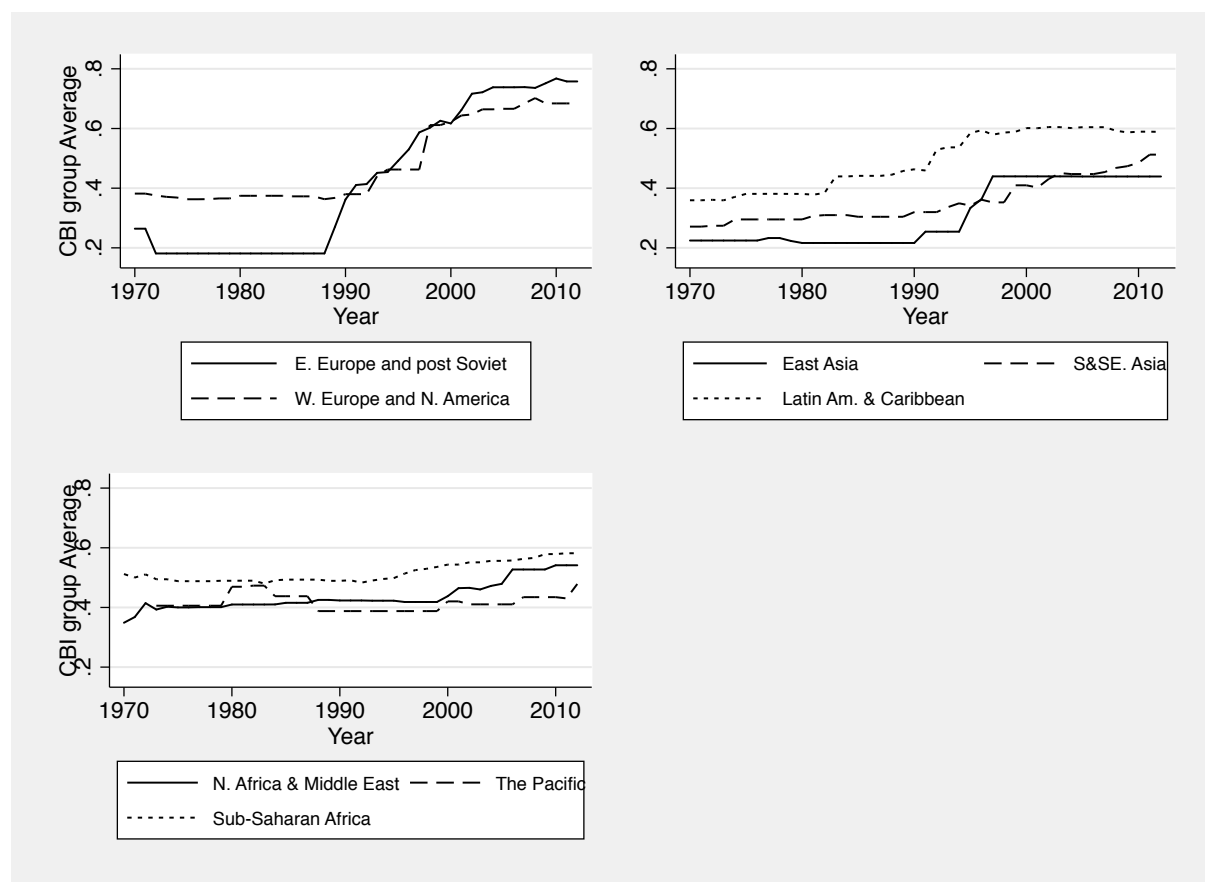
This dataset unveils important regional dynamics. During the period covered by this dataset the most dramatic increase in CBI occurred among post-communist countries in the 1990s until the mid-2000s, followed by Western European countries. These countries rarely had CBI reversals. Latin American and Asian countries also increased their CBI, but gradually, through a much longer period. Also, Latin American countries restricted CBI seven times during the 2000s. Finally, the dynamics were very different in Africa and the Pacific: these countries' CBI average was similar to Western Europe's in the 1970s, but did not change substantially throughout four decades. This new information casts doubt upon statements like "*most central banks in today's world* enjoy substantially higher levels of […] legal […] independence that twenty years ago or earlier" (Cukierman 2008:723, emphasis added).

The components of CBI

The CWN criteria permit the analysis of different components or dimensions of CBI, which show distinctive patterns. Figure 7 plots world averages of the CWN composite indices, and of their four components (see online appendix for variables included in each component). This figure shows a general tendency to convergence among the four components of the CWN index. Also, the data suggests that the weighting rules to combine the components do not alter significantly the index. Figure 8 plots the yearly average of the components, by income group.

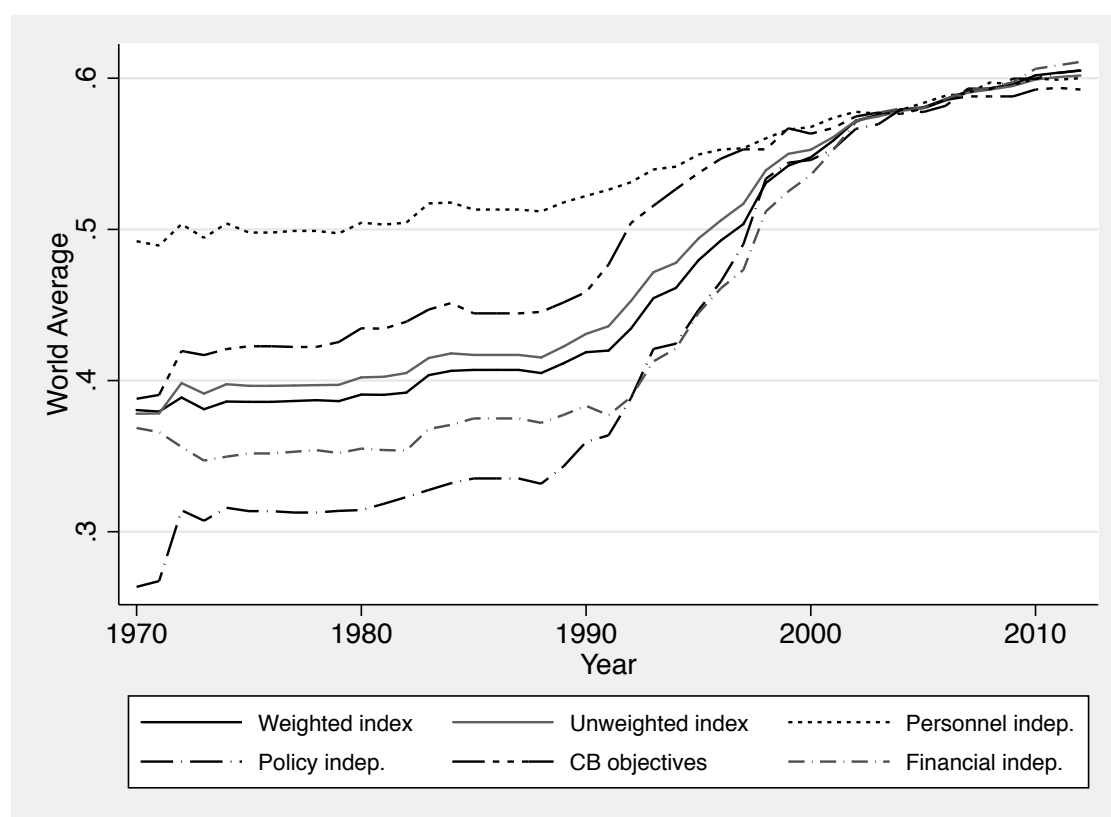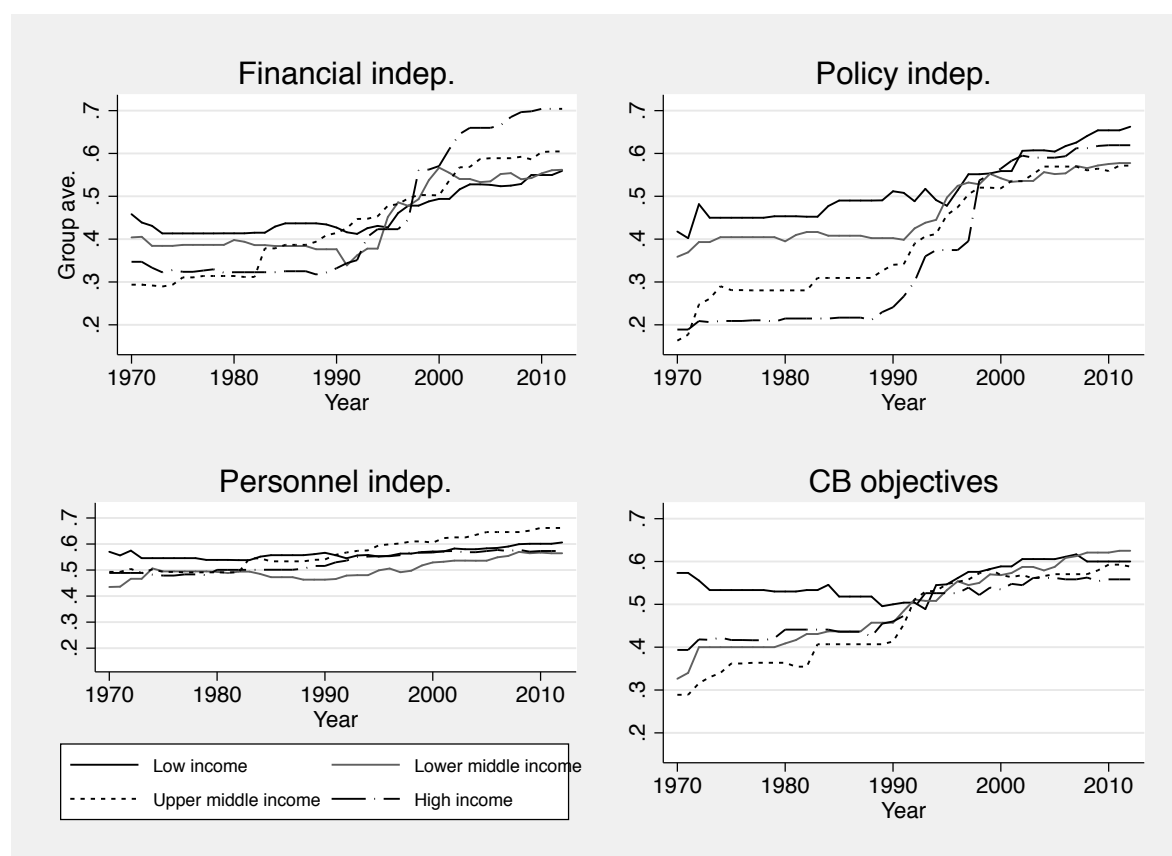Figure 7. CBI indices and their components. World averages

Figure 8. CBI components, income group averages

Regarding the main components of the CWN measure, personnel independence (CEO variables) has been the most stable throughout the sample and subsamples – consistent with Crowe and Meade's (2008) account. Financial independence (the ability of the government to use central bank credit to finance itself) exhibits the most dramatic changes through time. However, this dynamic particularly characterizes reforms in higher-income countries. Central banks in lower-income countries gained relatively more independence in policy matters and from the redefinition of the bank's objectives. Finally, the variables reflecting central banks' policy independence show the largest variance depending on the income-groups (see upper-right panel in figure 11).

Simple Tests: CBI, Inflation, Unemployment, and Growth

Table 2 shows the results of regressing inflation, unemployment and GDP growth on their lagged values and on CBI (with fixed effects). These models do not intend to test whether CBI has a causal effect on those variables, but to show the potentially important effects of sample selection (and in some cases, of measurement) on the association between CBI and variables of interest.

When inflation is regressed on CBI in the full sample, the coefficient is negative and highly statistically significant. I obtain similar results if the sample is divided between high-income and middle- and lower income countries.[14] Although these are very simple models, the fact that in a larger sample I find a negative relationship between CBI and inflation for both developed and developing countries is noteworthy – and contrasts with previous findings (see Arnone et al. 2007, Bodea and Hicks 2015:40). The relationship between CBI and inflation is very sensitive to the sample. When the same model is run

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[14] The substantive magnitude of the coefficient is larger in the middle- and lower-income countries.

on the CWN sample, there is no statistically significant relation between inflation and CBI – either with CWN's measure or my measure of CBI. I run the same model on two additional samples: Using Polillo and Guillen's data, the coefficient does not achieve statistical significance. If I replace their data with mine, on the same sample, the coefficient becomes statistically significant. This suggests that differences in coding also play a role. Finally, I replicate the exercise using Bodea and Hicks' data. In their sample, both their variable and mine are negative and statistically significant.

Table 2. Association between CBI, inflation, unemployment and growth. Different datasets and samples

Model	CBI measure (*sample*)	DV: Inflation		DV: Unemployment		DV: GDP growth	
		Coefficient	N	Coefficient	N	Coefficient	N
1	Garriga (*full*)	**-174.62 (-4.01)*** **	5672	**-.328 (-1.66)***	3443	.587 (1.02)	5474
2	Garriga (*high income*)	**-26.50 (-3.72)*** **	1897	**-.670 (-2.41)*** **	1083	**-1.310 (-1.73)***	1819
3	Garriga (*middle & lower income*)	**-329.87 (-4.20)*** **	3775	.183 (0.68)	2360	**3.267 (3.86)*** **	3655
4	CWN	-292.01 (-1.03)	1470	-1.688 (-1.30)	176	3.696 (1.10)	1364
5	Garriga (*model 4*)	-173.85 (-0.70)	1470	-1.154 (-0.99)	176	**5.307 (2.01)*** **	1364
6	Polillo & Guillen	-293.19 (-1.29)	985	-.684 (-1.47)	902	1.993 (1.60)	965
7	Garriga (*model 6*)	**-427.53 (-2.10)*** **	985	-.068 (-0.16)	902	**2.698 (2.46)*** **	965
8	Bodea & Hicks	**-241.45 (-3.80)*** **	2305	-.307 (-1.06)	1455	**1.864 (3.22)*** **	2273
9	Garriga (*model 8*)	**-273.81 (-4.09)*** **	2305	-.226 (-0.77)	1455	**1.669 (2.77)*** **	2273

Notes: DV: dependent variable. N: sample size. Coefficients after panel regression with fixed effects. Constant and lagged dependent variable omitted, t-values between parentheses.

This exercise is more interesting for the other two dependent variables. The (marginally significant) negative association between CBI and unemployment in the full sample disappears when the same model is run using any of the other datasets' subsamples (t-values<1). Separating this article's sample between developed and developing countries show a significant negative relationship for the first group of countries, and positive but insignificant coefficient for developing countries. The same analysis run on the Polillo and Guillen and the Bodea and Hicks samples also shows opposite directions for both groups of countries, but these coefficients are highly significant (not shown in table).

Finally, the opposite happens with GDP growth: CBI is far from achieving statistical significance in the full sample. However, CBI becomes significant at conventional levels in all the other datasets' samples. If the analysis is run dividing each of the samples between developed and developing countries, it is evident that the lack of significance in my full sample is a consequence of divergent relationships between CBI and growth in these two groups of countries (in the full sample, these opposite effects cancel each other). If I split the other datasets' samples, developing countries also show a positive relationship between CBI and growth. However, I find a non-statistically significant positive relationship for developed countries, suggesting that the results in the aggregate are driven by developing countries (and differences in coding or sample selection for developed countries).

These simple regressions show that differences in coding and sample selection may have important effects on relationships of interest for the study of CBI. Differences in coding are a main source of variance with the decade-invariant CWN data, and with Polillo and Guillen's data. Sample selection is especially problematic for smaller samples analyzed here. Differences with Bodea and Hicks' data are smaller because of their larger

sample and similar coding, but they appear when the analysis is broken down in sub-samples of countries.

Final Remarks

This article introduces an original dataset coding central bank reforms and CBI in 182 countries between 1970 and 2012. The correlations with previous data suggest consistent criteria when analyzing the legislation of interest. However, the importance of this dataset derives from innovations over previously available data. First, this dataset has a substantially broader coverage that will allow scholars to examine important research questions in larger and more representative samples. Descriptive data presented here shows that different samples offer different pictures of the worldwide dynamics of CBI and central bank reform. Furthermore, non-representative samples may have affected previous results, suggesting that there might be limits to the generalizability of some empirical results in the literature.

The second feature of this dataset is a finer-grained analysis of the legislation affecting CBI. A meticulous search of documents, together with the coding of sources in multiple languages, made it possible to identify numerous central bank reforms previously overlooked. Additionally, the fact the dataset's coded reforms include both increases and decreases in CBI opens new avenues for researching the determinants and consequences of monetary institutions. For example, they suggest the possibility of developing a theory to explain CBI restrictions or, more generally, liberalizing reforms reversals. Furthermore, the careful identification of reforms also results in data with within-country variance that can be exploited to answer different research questions, using CBI or central bank reforms as explanatory variables.

Indices of *legal* CBI have been criticized because they may not accurately reflect actual independence from the government. Furthermore, other aspects regarding the design and actual operation of central banks, such as their transparency or accountability, can be equally or even more important than CBI for certain research questions. Nonetheless, *de jure* measures are suitable to explore the determinants of monetary institutions. Of course, other factors such as regime type or rule of law need to be taken into account to fully understand the effects or even the meaning of CBI in different countries. CBI is seldom a consequence of merely monetary logics, and it may proxy other domestic dynamics of interest for political scientists, such as executive powers, institutional hurdles for reform, difficulties for reform implementation, or diffusion of particular policies. The new dataset described here will permit researchers to address these important questions in different fields with more certitude than was possible before, harnessing in-depth data from a globally representative sample.

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