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Revisiting Central Bank Independence in the World:

An Extended Dataset

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Abstract

How has central bank independence (CBI) changed over time and across countries? This paper introduces the most comprehensive dataset on *de jure* CBI, including country-year observations covering 192 countries between 1970 and 2023. The dataset identifies statutory reforms affecting CBI, their direction, and codes four dimensions of CBI (personnel independence, central bank's objectives, policy formulation, and limits on lending). It includes two CBI indices and a regional diffusion variable. The broader coverage of this dataset has important implications. First, although this dataset coding decisions are generally consistent with previous research, countries included only in this dataset tend to have lower CBI and differ in other dimensions with those previously coded. This suggests that systematically missing data in other data sources may have effects on inferences. Second, extended temporal coverage allows analyzing the evolution of central bank governance for more than a decade since the Global Financial Crisis. Finally, the data show that although there is a global tendency towards more CBI, there is significant variance across and within regions, including numerous reforms reducing CBI in the past two decades. This data contribution is important for research beyond the study of monetary institutions and their effects.

Keywords: Central bank independence; central banks; data; delegation; Global Financial Crisis; Great Moderation; reforms.

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1. Introduction

In the 1980s, central bank independence (CBI) – that is, the delegation of monetary policy to central bankers to pursue price stability insulated from political pressures – was proposed as the key tool to control inflation. This prescription attempted to counter political business cycles and to solve the time-inconsistency problem of monetary commitments – with a dose of faith in the advantages of technocratic decision-making. In the following two decades, CBI was adopted worldwide, encouraged by international financial institutions (Kern, Reinsberg, and Rau-Göhring 2019) and rewarded by financial markets (Bodea and Hicks 2015a; 2018). CBI delivered price stability without apparent costs in terms of employment (Alesina and Summers 1993; Bodea and Hicks 2015b; Cukierman 1992; Garriga and Rodriguez 2020), and soon became a staple of good monetary and economic governance (Amttenbrink 2005; Maxfield 1997; McNamara 2003). Yet, as I explain below, the desirability of CBI has been questioned on different grounds, mainly as a consequence of both the Great Moderation and the Global Financial Crisis. Some countries have responded to new developments increasing CBI, whereas others have reduced their central banks' independence. Lack of up-to-date worldwide data on CBI has constrained research on how governments have reacted to these policy and academic debates regarding CBI, or about the potential effects of CBI in different contexts.

This paper addresses this lacuna by introducing new data on CBI, covering 192 countries between 1970 and 2023. The new dataset corrects and expands Garriga (2016). It codes central bank statutes and identifies reforms affecting CBI and their direction for 9,109 country-year observations, and estimates different indices of CBI for 8,546 observations.¹ This represents a 46% extension of the coverage of the most comprehensive dataset on de jure CBI available to the date (Garriga 2016). On average, this dataset includes 54 more countries per year than Bodea and Hicks (2015, updated to 2020²), 37 more than Romelli (2022), and 22 more than Garriga (2016).³ See online appendix 1 for country-year coverage of different datasets.

¹ The largest available dataset, Garriga (2016), includes up to 182 countries between 1970 and 2012, coding reforms in 6,764 observations, and estimating CBI scores for 5,853 observations.

² I thank Cristina Bodea and Raymond Hicks for sharing their updated data covering until 2020.

³ Examples of countries in this dataset not included – or included for significantly fewer years – in other datasets are Angola, Aruba, Bermuda, Bhutan, El Salvador, Eritrea, Madagascar, Papua New Guinea, Serbia and

The increased geographic coverage is important because previously omitted countries tended to be from the developing world and have lower CBI. Due to systematically missing data on countries for whom information is harder to obtain, previous research may have over-estimated the level of CBI in the world, which may have biased inferences based on smaller samples. Temporally, the new data cover central bank governance for more than a decade since the Global Financial Crisis, including the Covid-19 and inflation surge years. Importantly, this extended dataset highlights that although there is a global tendency towards more CBI, there is significant variance across and within regions, including numerous reforms that have reduced CBI in the past two decades.

These data contribute to research beyond the study of monetary institutions and their effects. CBI, one of the key reforms in the neoliberal agenda, has been widely used to study international phenomena and to proxy important domestic political dynamics. For example, CBI helps understanding global capital markets (Ba and Winecoff 2024; Ballard-Rosa, Mosley, and Wellhausen 2022; Hansen 2023; Zeitz 2022), foreign direct investment (Zhao, Chen, and de Haan 2023), banking regulation (Omori 2024), and remittances (Culver 2022). It has been an useful indicator for environmental studies – i.e., green innovation (Spyromitros 2023) and response to natural disasters (Fisera, Horvath, and Melecky 2023; Klomp 2020; Klomp and Sseruyange 2021) – and also in conflict studies (Garriga 2022; Wang 2023). In comparative politics, it has been used in research on delegation and technocratic policymaking (Betz and Pond 2023; Choudhury and Sahu 2022; Moschella and Pinto 2022; Myksvoll, Tatham, and Fimreite 2022; Pond 2021), regulatory convergence (Goldfajn, Martínez, and Valdés 2021; Emily Jones and Zeitz 2019), economic voting (Kim 2023), populism (Gavin and Manger 2023), neo-corporatism (Etchemendy 2019), and regime stability (Bodea, Garriga, and Higashijima 2019). As a dependent variable, research on the evolution of CBI can also illustrate dynamics about bureaucratic inertia, institutional stability and quality, power sharing, and potential limits for policy intervention. The data have also policy relevance, particularly for the evaluation of central bank governance, and may inform current policy debates.⁴

Montenegro, South Sudan, Syria, Swaziland/Eswatini, and Tuvalu. Online appendix 1 lists the countries included in the sample and the number of observations per country.

⁴ See, for example, the British Parliament’s inquiry “The Bank of England: how is independence working?” <https://committees.parliament.uk/work/7356/bank-of-england-how-is-independence-working/news/186474/the-bank-of-england-how-is-independence-working-economic-affairs-committee-launches-inquiry/>. Accessed on 03/26/2024.

In the next section, contextualize the importance of CBI and of data on its global evolution. Next, I describe the data collection process and the dataset. I compare this dataset with similar data collections highlighting the general coding consistency and warning on potential biased results when using geographically or temporally restricted samples. Section 4 uses the new data to describe the state of CBI in 2023, and highlights the evolution of CBI since 2000. The last section discusses potential uses for these data in different research programs.

2. Contextualizing CBI

Many argue that since the early 1990s, CBI has become “the norm” for central bank governance (Johnson 2016; Erik Jones and Matthijs 2019; McNamara 2003; Moschella 2024). However, CBI as a policy prescription emerged in a context of serious concerns about stabilizing inflation, and reliance on interest rates as the main tool for affecting price stability. “This model facilitated accountability, preserved the legitimacy of a technocratic agency, and safeguarded the much cherished independence that ensures credibility in monetary policy” (Goodhart and Lastra 2024, 7). Two important developments affected this original context: the Great Moderation (mid-1980s to 2007) and the Global Financial Crisis (late 2007 to 2009).

First, after almost two decades of Great Moderation – that is, with inflation under control in most of the developed world, and generally low inflation rates globally – the need to protect CBI to control inflation seemed less urgent. This led to two contrasting proposals: while some wanted to constrain CBI, others suggested to expand the remit of independent central banks. On the one hand, claims to constrain (independent) central bankers’ powers were based on normative and economic concerns. Normatively, some questioned the legitimacy of the central bankers’ powers and demanded mechanism to increase transparency and accountability in these independent agencies (Elgie 1998; Erik Jones and Matthijs 2019; van ’t Klooster 2020). Others focused on the negative consequences of a narrow focus on price stability, and highlighted economic trade-offs that CBI might impose particularly on income distribution (Aklin and Kern 2021; Aklin, Kern, and Negre 2021; Tomita 2023).

On the other hand, others proposed to exploit independent central banks’ potential as institutional focal points to anchor expectations even beyond domestic prices (Wansleben 2018) and to expand their remit. Central banks could serve additional goals, particularly, financial stability, a more

active role in growth, employment, and even green finance (Dikau and Volz 2021). This idea was consistent with the positive reaction of markets to independent central banks (Bodea and Hicks 2018; Gavin 2020). However, there was no clear evidence suggesting of central bank *independence* as an effective tool to address these additional concerns (Berger and Kießmer 2013).

Second, the 2008 Global Financial Crisis also affected the framework within which central banks were assessed: seemingly unable to deliver financial stability, central banks relied on unconventional tools to serve objectives beyond the price stability mandate. This raised increased scrutiny over their mandate and independence (de Haan et al. 2018; Erik Jones and Matthijs 2019; Mabbett and Schelkle 2019; McPhilemy and Moschella 2019). Altogether, increasing concerns about inequality while fears about inflation took the back seat, the economic impact of the financial crisis, and central banks' activism and free interpretation of their mandates raised further questioning of the legitimacy of central banks' powers and independence, both in the developed and in the developing world (Wachtel and Blejer 2020). This led academics to stress the need to “rethink the role that central banks play in contemporary political systems” (Fernández-Albertos 2015, 232).

How did governments react to these new demands? Under what conditions did governments alter the autonomy of their central banks?⁵ Similarly, given the change in context and expectations, have the economic and political effects attributed to central bank independence changed in the past two decades? Despite important descriptive accounts (McPhilemy and Moschella 2019), lack of comparable data regarding the design of central banks and their independence, especially in the aftermath of the Global Financial Crisis, makes it hard to empirically address these questions. This paper does not intend to answer these questions, but introduces data that will support research on these issues.

⁵ Recent research shows how central banks have adapted to these changing environment either of “new” tools, or adjusting their communications (Bianchi et al. 2023; Johnson, Arel-Bundock, and Portniaguine 2019).

3. Extending the data on CBI

3.1. Coding process and descriptive statistics

This dataset corrects⁶ and expands geographically and temporarily the largest dataset available to date (Garriga 2016), widely used among social scientists. The new dataset includes 2,693 additional observations coding formal attributes of CBI – personnel independence (central bank’s CEO variables), the exclusivity or not of the price stability mandate (objectives), independence in policy formulation, and limitations on lending to the government following the work of Cukierman, Webb, and Neyapti (1992).⁷ These variables are scored from 0 (no independence) to 1 (maximum independence) and aggregate in two overall CBI indices. The unweighted index is the raw average of the four main dimensions, and the weighted index gives more weight to the restrictions to lending than the other three dimensions.⁸ Appendix A at the end of this paper lists the variables and their weight in the index.

I replicated Garriga’s (2016) procedure to revise and extend the original dataset. Supported by student research assistants, I checked the websites of central banks yearly between 2018 and 2024, and downloaded documents listed as their legal framework. I manually coded or supervised the coding of over 2,400 documents between 2020 and 2024. During the coding process, I replicated Garriga’s (2016) “targeted searches” procedure to find earlier reforms: if a law being coded mentioned it was modifying or replacing another law, I used national legislatures’ search engines and Google to find those documents by their number, title, and/or date. This procedure allowed me to complete the temporal coverage and brought to light documents previously overlooked. In the case of consolidated

⁶ Newly retrieved central bank statutes lead to corrections in the original dataset.

⁷ I follow Cukierman, Webb, and Neyapti’s (1992) (CWN) criteria for coding CBI because their index’s indicators cover the most significant conceptual dimensions of CBI. To the two “traditional” dimensions of independence over goals and instruments (DeBelle and Fischer 1995), CWN add the legal protections to the tenure of the central bank’s governor, and an exhaustive coverage of the limits to the government to finance itself using central bank’s funding. Other coding efforts include dimensions that reflect other aspects of central bank governance that exceed the concept of CBI – i.e., central bank transparency (Romelli 2022) or speak to de facto CBI (Adrian, Khan, and Menand 2024).

⁸ Although for presentation and comparison purposes this research note relies on the weighted index, researchers may find it useful the unweighted index or some of its components.

versions of the laws, I compared the laws side by side, attributing any change to the date of the last version. If laws, amendments, or decrees that directly refer to central banks did not affect the components of CBI included in the index, they were not coded as reforms of CBI.⁹ As in previous coding efforts, in absence of legislation to code the index components, I relied on other sources to determine whether a central bank was in existence or created in a given year, or if there was a reform that altered CBI – but I did not code the CBI index variables (577 observations).

I coded the four dimensions of the CWN index (*Personnel independence, Objectives, Policy formulation and Limits on lending*) and built two indices (*CBI unweighted* and *CBI weighted*), following the coding and weighting rules described in appendix A (Cukierman, Webb, and Neyapti 1992). This dataset includes a series of dichotomous variables coded as 1 if a central bank was created (*Creation*) or was reformed in a way that affected their CBI as defined in the index (*Reform*), and whether the central bank includes more than one country in a monetary union (*Regional*).¹⁰ The direction of the reforms (*Direction*) is coded -1 if the reforms decrease CBI, and 1 if it increases the weighted index. Finally, the dataset includes regional CBI averages (*Diffusion*),¹¹ a strong predictor of the level of CBI (Bodea and Hicks 2015a; Garriga and Rodriguez 2020; 2023). Table 1 shows descriptive statistics of the new dataset, and a comparison of the weighted CBI index in this dataset, with the same variable in the three largest available datasets.¹²

⁹ I identified over 1,100 laws reforming different aspect of central banks. Only 441 affect CBI as measured here.

¹⁰ 1,419 observations (15.6% of the sample) correspond to countries that are members of regional central banks (e.g., Central Bank of West African States, Eastern Caribbean Central Bank, or European Central Bank). Unless indicated differently, all descriptive statistics refer to the full sample.

¹¹ Averages are estimated for Latin America and the Caribbean, Western Europe and North America, Eastern Europe and former Soviet countries, Africa and the Middle East, and Asia and the Pacific. For the estimation of the regional averages, “Asia and the Pacific” excludes Middle East and former Soviet countries.

¹² A new dataset (Adrian, Khan, and Menand 2024) that weights CBI legal measures with the estimates of an experts survey covers 147 countries in four updates (2010, 2015, 2020/2021, and 2023) is not available for analysis yet. However, differences in measurement and significantly shorter temporal coverage would make it less suitable for the comparisons presented in this paper.

Table 1. Descriptive statistics¹³

Variable	Observations	Mean	Std. Dev.	Min	Max
Creation	9,123	.0080	.0891	0	1
Reform	9,109	.0468	.2112	0	1
Direction	9,108	.0298	.2124	-1	1
CBI increase	9,108	.0377	.19041	0	1
CBI decrease	9,108	.0082	.0904	0	1
Regional	9,123	.1555	.3624	0	1
Components					
1. Personnel independence	8,546	.5408	.2095	0	.895
2. Objectives	8,546	.51775	.2373	0	1
3. Policy formulation	8,546	.4034	.3294	0	1
4. Limits on lending	8,546	.4872	.2738	0	1
CBI indices					
CBI unweighted	8,546	.4872	.1939	.006	.974
CBI weighted	8,546	.4898	.2051	.011	.979
<i>CBI weighted in other datasets</i>					
Garriga (2016)	5,853	.4896	.2036	.0167	.979
Bodea & Hicks (updated)	5,283	.4988	.1955	.0128	.9606
Romelli (2022) ¹⁴	5,820	.5296	.2246	.055	.979
Diffusion	9,123	.4781	.1237	.178	.7406

This dataset includes data on CBI for between 46% and 62% more observations than the largest previously available data collections. The extension is not only temporal, but also geographic: on average this dataset includes between 14 and 64 more countries per year than previous datasets (see Figure 1, left-side panel and online appendix 1). Geographically, this dataset covers a significant number of developing countries, especially from Africa and the Middle East, and Latin America and the Caribbean (see online appendix 3). This larger coverage has important implications because the observations that are omitted in the other datasets are not random: these are generally country-year observations for which information has not been easily accessible – either because governments are less invested in data transparency (Hollyer, Rosendorff, and Vreeland 2011), or because they have

¹³ Online appendix 2 reproduces Table 1 excluding observations corresponding to regional central banks.

¹⁴ I excluded observations that code central banks before the date of the law that created them. For example, Czech Republic 1991, Kyrgyzstan 1992, Liberia 1974-1997, and Equatorial Guinea 1972-1984 (the country joined the Bank of Central African States in 1985). I have not found legislation to code Brunei Darussalam (1984-2010), included in Romelli's dataset. I have included those 27 observations when describing his data.

fewer resources to digitalize legislation collections (Alcaide Muñoz, Rodríguez Bolívar, and López Hernández 2017; Sol 2013). This is evident when comparing some characteristics of countries included with those that are not included in other datasets, but covered by this paper’s data collection (see online appendix 4). The omitted observations tend to be more authoritarian countries, have significantly lower levels of capital openness, and significantly higher levels of trade openness measured as total trade over GDP. In two of the datasets, there are also significant differences in average inflation and GDP per capita between the included and excluded observations.

Figure 1. Dataset coverage and CBI average. Comparison with other datasets

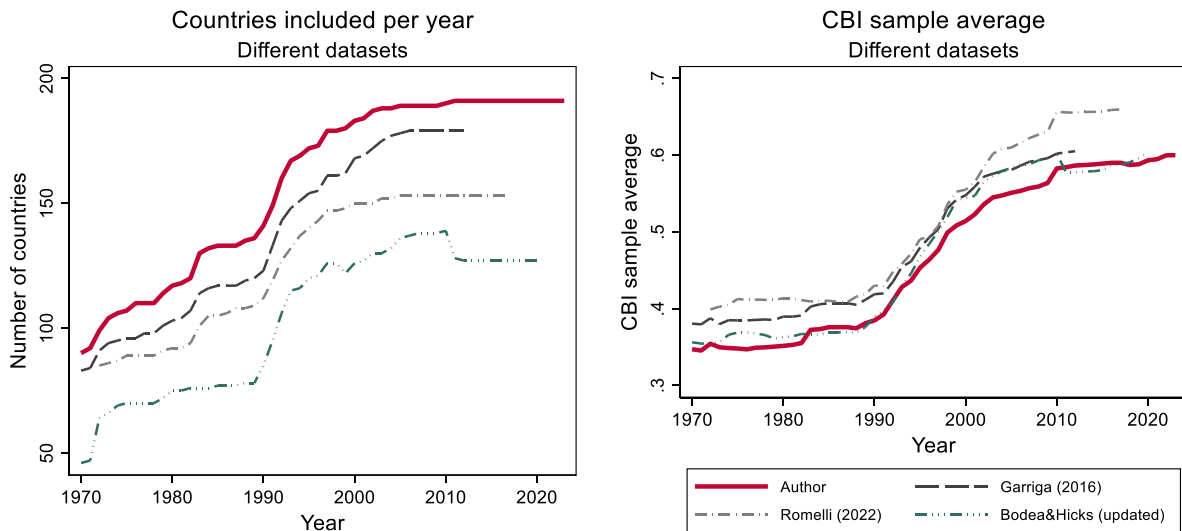


Figure 1 illustrates the importance of the larger cross-sectional and temporal coverage. The left-side panel shows the number of countries per year included in different datasets. The right-side panel plots the yearly world average of the CBI indicator in this dataset, against the yearly average of other datasets. The yearly world average CBI in this paper’s dataset is generally lower than the average

of the other data collections.¹⁵ Given the high correlation between this dataset and the other coding efforts (between 0.75 and 0.91, see online appendix 5), the lower average in this dataset can be attributed mostly to the new observations included in this sample. A similar pattern is apparent in regional subsamples. When newly coded observations are included, the regional CBI average is generally lower – that is, the newly coded observations cover central banks that tended to have less autonomy than their regional peers (see online appendices 3 and 4).

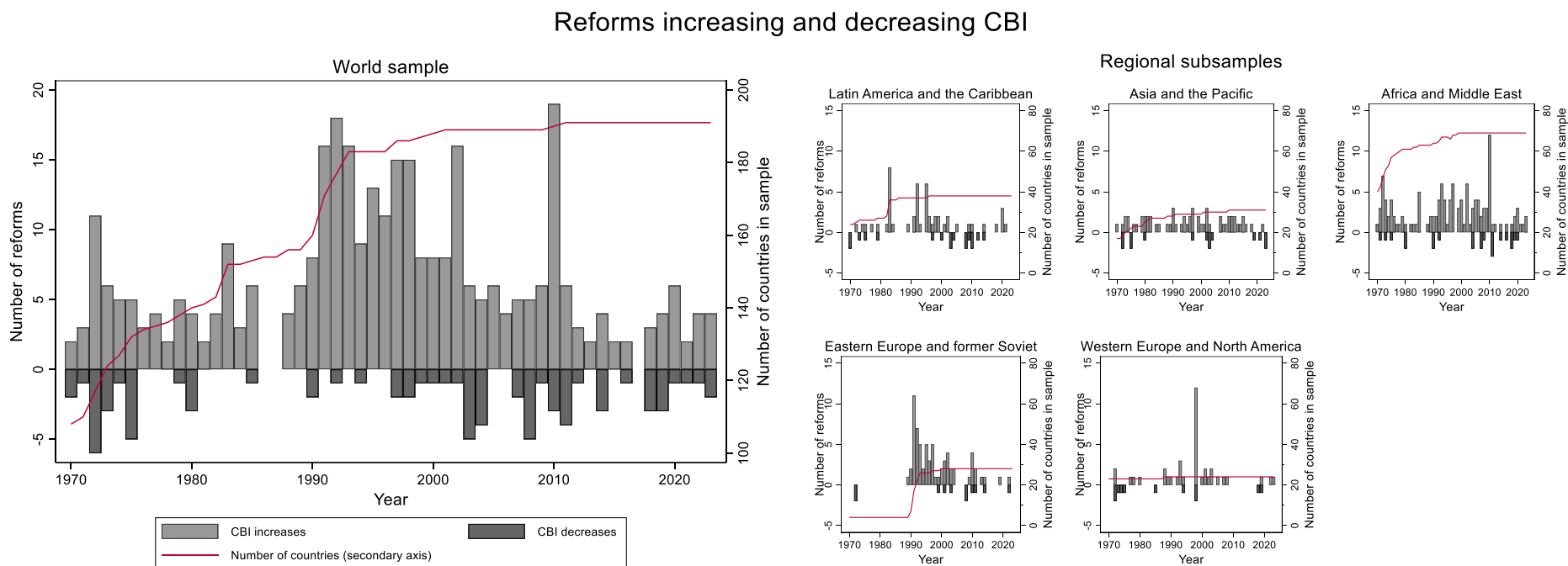
This dataset codes 426 instances of reforms that affected CBI. Of these, 345 increased and 74 reduced the weighted CBI index. There are six reforms that did not result in a change in the overall CBI index – increases in some variables offset decreases in other variables.¹⁶ In these cases, the variable *Direction* equals zero. Although the 1990s witnessed the largest number of reforms (142 reforms), most of them took place in newly independent and democratizing countries.¹⁷ Globally, the rate of reforms has dropped significantly in the 2000s, but this is not representative of regional dynamics. As Figure 2 (right side panel) illustrates, except for Western Europe and North America, reforms have taken place in most of the developing world, and in both directions – that is, increasing and decreasing independence.

¹⁵ Bodea and Hicks's data yearly average is the lowest of all series in the 1980s (1983-1990, and 1992-1993) and between 2010-2018. The first instance seems driven by the selection of Latin American cases, the second, by the exclusion of the members of the European Central Bank from their sample (see online appendix 3).

¹⁶ In the case of Georgia (law of 1992), I was unable to determine the direction of the reform due to missing data on the previous level of independence.

¹⁷ The number (sample percentage) of reforms affecting CBI per decade is 67 (5.44%) in the 1970s, 43 (2.89%) in the 1980s, 142 (7.9%) in the 1990s, 90 (4.76%) in the 2000s, and 63 (3.3%) in the 2010s, and 21 (2.75%) between 2020 and 2023.

Figure 2. Count of reforms affecting CBI, and countries included in samples. Worldwide and regional subsamples.¹⁸



Note: The sum of reforms increasing CBI are shown as positive numbers, and the sum of reforms decreasing CBI, as negative numbers. The solid line (secondary axis) indicates the number of countries coded in the world or regional sample each year.

¹⁸ Online appendix 6 replicates this figure omitting observations from countries that joined regional central banks.

3.2. Validity checks

This section has two purposes. First, to show that the coding of CBI in this dataset is consistent with other data collections – that is, to check the face validity of my coding. Second, to illustrate that smaller samples covered by other datasets may have a substantive impact on inference. To do so, I show the correlation between CBI and both inflation (Table 2) and unemployment (Table 3) using this paper’s and other authors’ data (columns 1, 2, 4 and 6, respectively) using each dataset’s full sample. Then, I re-estimate the same models using this paper’s data in samples defined by the coverage of other datasets (Columns 3, 5 and 7). These analyses are the basis for two comparisons: between the estimates from different sources (this paper’s and other authors’ datasets) in the same samples, and between estimates using this paper’s data in different subsamples defined by the coverage of other datasets to illustrate the effect of the newly coded observations. Importantly, these analyses do not intend to test the effects of CBI – to do so, theory-driven, fully specified models should be estimated – but to show coding consistency and to illustrate the potential effect of the narrower coverage of other datasets.

3.2.1. Coding consistency

The coding of CBI in this paper generally aligns with other coders’ decisions. As mentioned above, the correlation between this dataset and others is very high (0.91 with CWN original data and Garriga 2016, 0.88 with Bodea and Hicks, and 0.75 with Romelli, see online appendix 5). Most of the inconsistencies between datasets seem to originate from reforms affecting CBI coded in this paper but not identified in other collections, from the year in which some reforms were coded – I coded the year in which the law was passed – and from some instances in which coding of some variables diverges.

Consistent with a broad literature suggesting a negative association between CBI and inflation (Bodea and Hicks 2015b; Cukierman, Webb, and Neyapti 1992; Garriga and Rodriguez 2020), all coefficients associated with CBI in Table 2 are negative and statistically significant. Pairwise comparisons of coefficients obtained in the same samples – between columns (2) and (3), (4) and (5),

and (6) and (7) – show that this paper’s measure correlates with inflation in the same direction – and with a similar magnitude – than other measures discussed here.^{19 20}

Table 2. Association between CBI and inflation. Different datasets and samples

Sample <i>CBI data source</i>	Author	Garriga (2016)		Bodea-Hicks (updated)		Romelli (2022)	
	<i>Author</i>	<i>Garriga</i>	<i>Author</i>	<i>Bodea-Hicks</i>	<i>Author</i>	<i>Romelli</i>	<i>Author</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CBI _{t-1}	-0.127** (0.021)		-0.119** (0.022)		-0.109** (0.020)		-0.144** (0.026)
CBI _{t-1} (other)		-0.120** (0.021)		-0.111** (0.021)		-0.094** (0.022)	
Observations	7,726	5,646	5,646	5,154	5,154	5,454	5,454
R ² overall	0.530	0.662	0.662	0.682	0.682	0.480	0.481
Countries	186	178	178	143	143	151	151
Years	1971-2022	1971-2013	1971-2013	1971-2021	1971-2021	1973-2018	1973-2018

Notes: Dependent variable: Inflation rate (logged). Coefficients after panel OLS regressions. Constant and lagged dependent variable omitted. Standard errors in parentheses. * p<0.05, ** p<0.01.

3.2.2. The effect of broader coverage: mitigating sample selection bias

Both the correlation between datasets and previous analyses suggest consistency in the coding process. However, the analyses in Tables 2 and 3 also illustrate an important implication of the extended dataset. This dataset includes between 2,693 and 3,263 more country-year observations than the other CBI datasets examined here (Table 1). These additional observations are not just produced by updating the complete data series until 2023. The new data also cover previously excluded countries and earlier

¹⁹ I thank Reviewers for suggesting this straightforward analysis. Online appendix 7 shows these relationships hold if the regressions omit lagged dependent variable, and if they include fixed effects.

²⁰ Table 3 shows a similar pattern for the correlation between CBI and unemployment. The coefficients obtained with my data and other data when estimated on the same, smaller samples – that is, comparing columns (2) and (3), (4) and (5), and (6) and (7) – are not significantly different from each other, providing additional evidence of coding consistency.

years of countries included in other datasets (see online appendix 1). These new observations that seem to generally have lower levels of CBI. Beyond these descriptive differences, Table 3 illustrates that smaller samples covered by other datasets may have substantive impact on inference arising from sample selection bias.

Table 3. Association between CBI and unemployment. Different datasets and samples

Sample <i>CBI data source</i>	Author	Garriga (2016)		Bodea-Hicks (updated)		Romelli (2022)	
	<i>Author</i>	<i>Garriga</i>	<i>Author</i>	<i>Bodea-Hicks</i>	<i>Author</i>	<i>Romelli</i>	<i>Author</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CBI _{t-1}	-0.488** (0.105)		0.102 (0.096)		-0.161 (0.088)		-0.207* (0.083)
CBI _{t-1} (other)		0.022 (0.093)		-0.169* (0.090)		-0.196*** (0.072)	
Observations	6,033	4,231	4,230	4,387	4,373	4,412	4,320
R ² overall	0.958	0.953	0.953	0.956	0.956	0.961	0.961
Countries	183	173	173	143	143	148	148
Years	1971-2022	1971-2013	1971-2013	1971-2021	1971-2021	1973-2018	1973-2018

Notes: Dependent variable: Unemployment rate. Coefficients after panel OLS regressions. Constant and lagged dependent variable omitted. Standard errors in parentheses. * p<0.05, ** p<0.01 .

The shaded row in Table 3 shows the association between this paper’s CBI measure and unemployment in four different samples (the full sample, and the subsamples defined by observations included in the other datasets). In the full sample, using this paper’s data, the correlation is negative and statistically significant (-0.49). The same association is negative in Column (7), but the point estimates is less than half the size than in the full sample (-0.21). However, the CBI coefficient does not achieve conventional levels of statistical significance in the two other subsamples (Columns (3) and (5)). This illustrates how sample selection bias may give rise to inferential problems.²¹

These analyses are not intended to posit a causal relation between CBI and these dependent variables. However, they highlight the value of a broader coverage and suggest that sample selection

²¹ Reproducing this exercise in Table 2 also reveals differences in the magnitude of the coefficients across subsamples for the association between CBI and inflation.

bias may have an impact on inference for some outcomes, which may require thinking about scope conditions in cases where results are sensitive to changes in sample size.

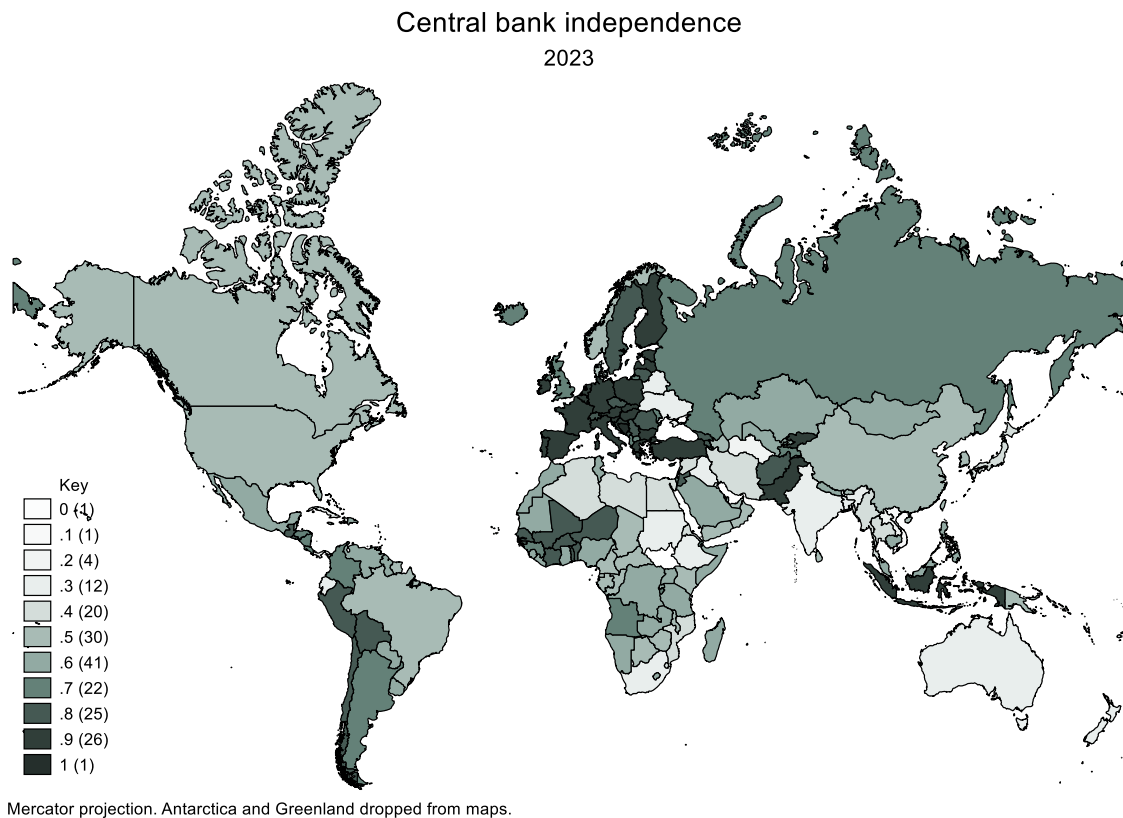
4. Trends in CBI

Since the end of 1990s, most central banks in the world can be classified as *de jure* independent, and the CBI world average remained between 0.58 and 0.6 since 2010 (see Figure 1, right-side panel). Although this may suggest global convergence towards more independent central banks and stability in central bank governance, *there is significant variance across countries, both in the overall level of CBI, and the dimensions of CBI* that are stronger. Furthermore, countries have continued reforming their central bank governance, both increasing and decreasing their central banks' autonomy in different dimensions. Below, I briefly describe some interesting patterns the data exhibit.

4.1. Central bank independence at the end of 2023: Higher independence, but significant cross-country variance

Regarding overall levels of independence, Figure 3 shows significant cross-sectional variance across countries and within regions. Large economies such as Japan, India or Australia did not have *de jure* “independent” central banks by the end of 2023. Except for Europe, there is important regional variance.

Figure 3. Central bank independence in the world (2023)

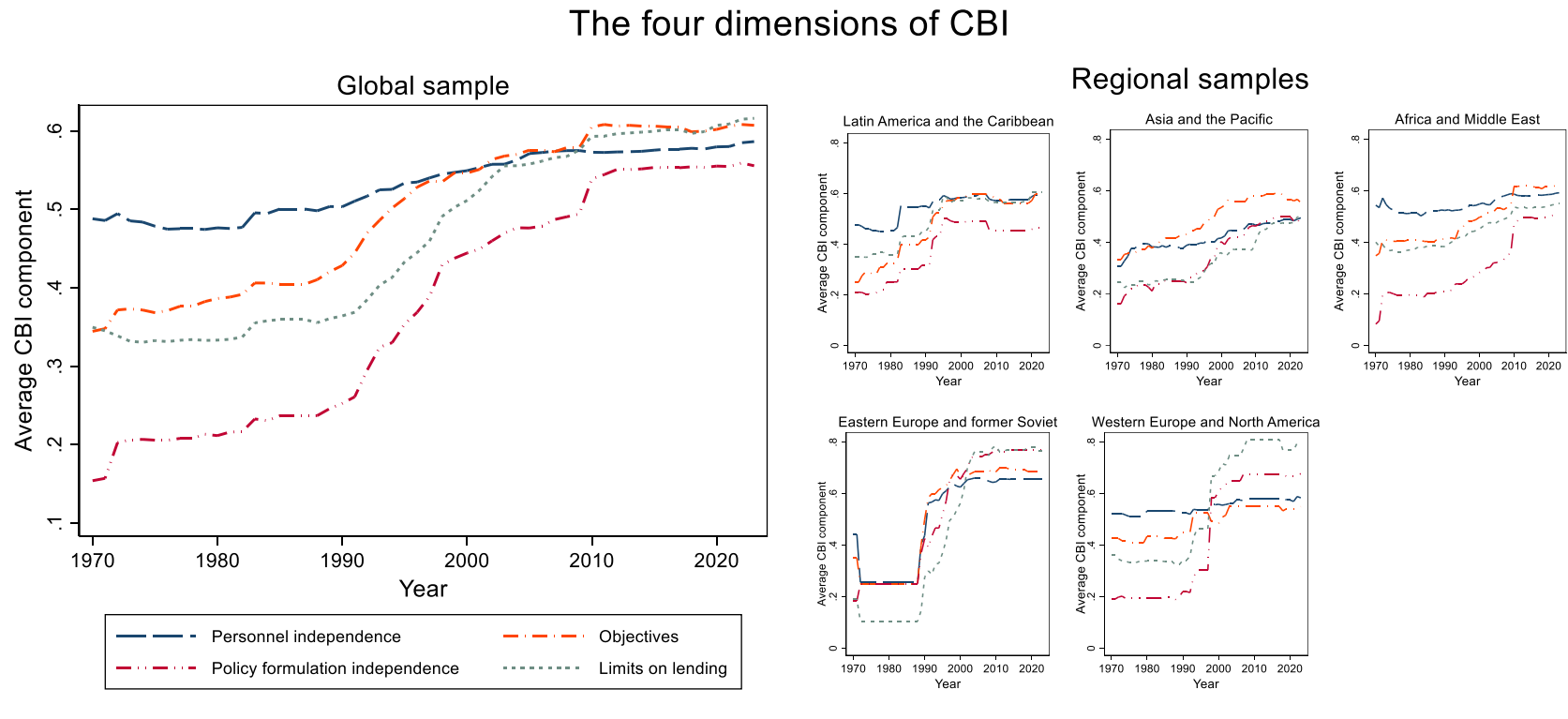


Note: The map represents the weighted CBI index, rounded to the first decimal point.

4.2. More independent central banks, but heterogeneous institutional choices

As mentioned, higher levels of CBI have resulted from heterogeneous institutional choices. Acknowledging that global and regional averages still mask the trajectory of individual countries, a closer look at the four main components of CBI suggests differences in the institutional characteristics of independent central banks.

Figure 4. Components of CBI. Average by year, global and regional samples



Note: The lines represent the sample yearly average of each of the CBI index components.

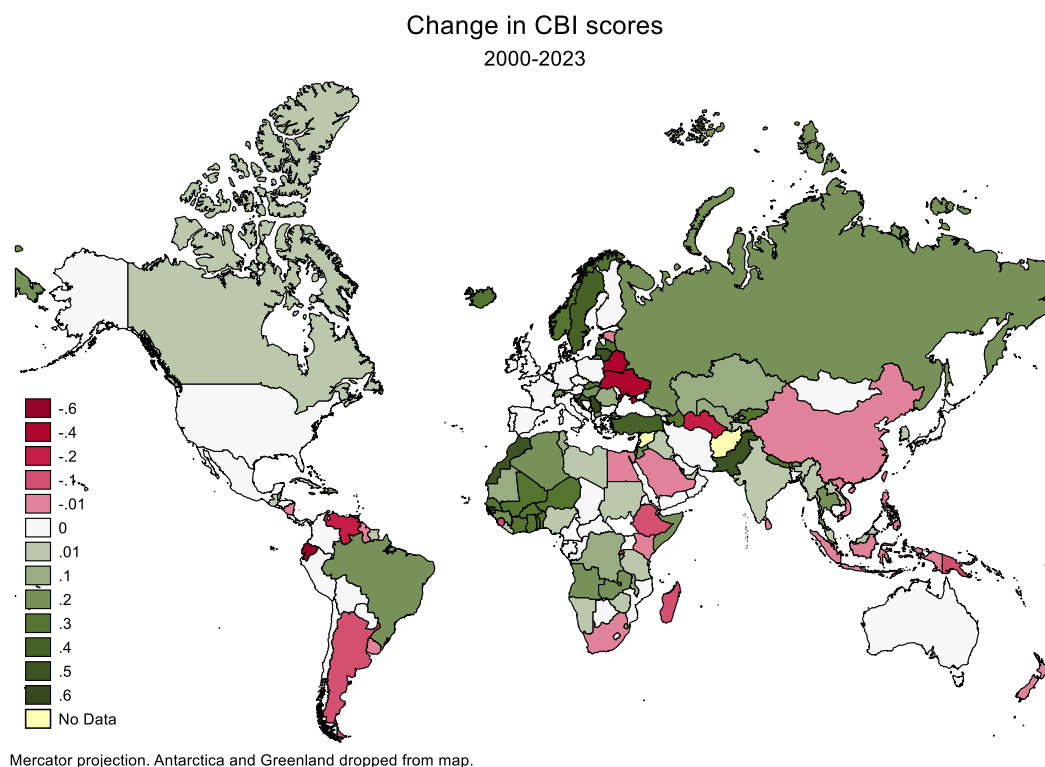
Whereas in the 1990s governments increased the autonomy of the central banks in all four dimensions measured in this dataset (personnel independence, policy formulation independence, focus on price stability and limits on lending), reforms in the 2000s do not seem to have increased the protections of the central bank's governors. As Figure 4 illustrates, personnel independence has not been increased globally or regionally – in fact, on average, personnel independence has decreased in Latin America and the Caribbean. In contrast, CBI has been generally strengthened in the other three dimension, especially in the aftermath of the Global Financial Crisis, although with marked regional differences (see Figure 4, right side panel).

4.3. Ongoing process of delegation and de-delegation

Interestingly, Figures 3 and 4 are the result of a series of reforms both increasing and decreasing CBI in the previous two decades. Since 2000, there were 174 reforms affecting CBI. 24% of them (42 observations) restricted CBI weighted index, but many reforms that increased the overall CBI score also restricted CBI in at least one of its dimensions. Figure 5 shows the net changes in CBI between 2000 and 2023, illustrating significant restrictions in independence in countries such as Belarus, Ecuador, Turkmenistan, and Venezuela, and important increases in CBI in Croatia, Lithuania, Morocco, Pakistan, and Serbia.²² Online appendix 8 reproduces this figure for changes between 2008 and 2023. A comparison of both figures shows that although many countries currently have higher levels of CBI than in 2000, some of them have decreased their independence since 2008 – for example, Macedonia.

²² Notice that these differences may be the result of more than one reform, and not necessarily all in the same direction.

Figure 5. Changes in central bank independence in the world between 2000 and 2023



Note: The map represents the difference in the weighted CBI index between 2000 and 2023. These differences might be the result of more than one reform. Marginal changes (between zero and $|0.01|$) indicated with the lightest shades.

These reforms in the span of the first 23 years of the century, both increasing and decreasing CBI in different countries, suggest that the status of central banks is not the mere result of diffusion processes and bureaucratic inertia. Central bank independence is still a product of contested politics and institutional adaptation (Bodea and Garriga 2023; Kern and Seddon 2024). This new dataset will enable further research of the dynamics of central bank governance, monetary policy choices, and delegation.

5. Final Remarks

This article introduces the largest dataset coding CBI in 192 countries between 1970 and 2023. The new data expands previous data collection coverage by at least 46%, including a significant number of

developing countries. New observations that were excluded in other datasets seem to differ from those that were included in important dimensions, including regime type, integration in trade and capital flows, and levels of CBI. Descriptive analyses show that the increased geographic and temporal coverage may have important consequences for our understanding of the evolution of CBI, and our inferences using previous data collections. In particular, the new data present a more nuanced picture in terms of the trajectory of central bank governance across countries, point to potential challenges to inference resulting from sample selection bias, and suggest heterogeneity in the general movement towards greater independence. In particular, descriptive data suggest an ongoing process re-defining the extent and nature of central banks' autonomy both during the Great Moderation and in the aftermath of the Global Financial Crisis. These facts suggest interesting avenues for future research.

These new data will help to answer question regarding central bank governance and monetary policy, such as under what circumstances central bank autonomy was affected, especially in the past two decades; to what extent governments are using central bank reforms for different purposes or following different motivations. More importantly, it will allow to explore the effect of these reforms on a range of economic and political outcomes, from capital movements (Ballard-Rosa, Mosley, and Wellhausen 2022; Culver 2022; Zeitz 2022; Zhao, Chen, and de Haan 2023) to regulation (Betz and Pond 2023; Emily Jones and Zeitz 2019; Moschella and Pinto 2022; Omori 2024; Pond 2021), from environmental (Klomp 2020; Spyromitros 2023) to conflict studies (Garriga 2022; Wang 2023).

Beyond its usefulness for understanding phenomena in international and comparative political economy, this larger dataset allows extending the temporal and geographic coverage of empirical studies across disciplines that use on CBI as a proxy for institutional quality, signaling behavior, policy diffusion and even liberalization. Importantly, comparative data, especially since 2000, can inform policy decisions in a world in which inflation has renewed its importance as a challenge for governments in both the developed and developing world.

6. References

- Adrian, Tobias, Ashraf Khan, and Lev Menand. 2024. "A New Measure of Central Bank Independence." *IMF Working Paper* 2024/035. <https://www.imf.org/en/Publications/WP/Issues/2024/02/23/A-New-Measure-of-Central-Bank-Independence-545270>.
- Aklin, Michaël, and Andreas Kern. 2020. "The Side Effects of Central Bank Independence." *American Journal of Political Science* n/a(n/a). <https://doi.org/10.1111/ajps.12580> (Accessed February 18, 2021).

- Aklin, Michaël, Andreas Kern, and Mario Negre. 2021. *Does Central Bank Independence Increase Inequality?* Washington, DC: World Bank.
- Alcaide Muñoz, Laura, Manuel Pedro Rodríguez Bolívar, and Antonio Manuel López Hernández. 2017. "Transparency in Governments: A Meta-Analytic Review of Incentives for Digital Versus Hard-Copy Public Financial Disclosures." *The American Review of Public Administration* 47(5): 550–573.
- Alesina, Alberto, and Lawrence H. Summers. 1993. "Central Bank Independence and Macroeconomic Performance: Some Comparative Evidence." *Journal of Money, Credit, and Banking* 25(2): 151–163.
- Amttenbrink, Fabian. 2005. "The Three Pillars of Central Bank Governance—Towards a Model Central Bank Law or a Code of Good Governance?" In *Current Developments in Monetary and Financial Law*, ed. International Monetary Fund. Washington, D.C.: IMF Legal Department, p. 101–132.
- Ba, Heather, and William K. Wincoff. 2024. "American financial hegemony, global capital cycles, and the macroeconomic growth environment." *Economics & Politics* 36(1): 334–372.
- Ballard-Rosa, Cameron, Layna Mosley, and Rachel L. Wellhausen. 2022. "Coming to Terms: The Politics of Sovereign Bond Denomination." *International Organization* 76(1): 32–69.
- Berger, Wolfram, and Friedrich Kißmer. 2013. "Central bank independence and financial stability: A tale of perfect harmony?" *European Journal of Political Economy* 31: 109–118.
- Betz, Timm, and Amy Pond. 2023. "Democratic institutions and regulatory privileges for government debt." *European Journal of Political Economy* 79: 102438.
- Bianchi, Francesco, Roberto Gómez-Cram, Thilo Kind, and Howard Kung. 2023. "Threats to central bank independence: High-frequency identification with twitter." *Journal of Monetary Economics* 135: 37–54.
- Bodea, Cristina, and Ana Carolina Garriga. 2023. "Central Bank Independence in Latin America: Politicization and De-delegation." *Governance* 36(1): 59–80.
- Bodea, Cristina, Ana Carolina Garriga, and Masaaki Higashijima. 2019. "Economic Institutions and Autocratic Breakdown: Monetary Constraints and Fiscal Spending in Dominant-Party Regimes." *The Journal of Politics* 81(2): 601–615.
- Bodea, Cristina, and Raymond Hicks. 2015a. "International Finance and Central Bank Independence: Institutional Diffusion and the Flow and Cost of Capital." *Journal of Politics* 77(1): 268–284.
- Bodea, Cristina, and Raymond Hicks. 2015b. "Price Stability and Central Bank Independence: Discipline, Credibility, and Democratic Institutions." *International Organization* 69(01): 35–61.
- Bodea, Cristina, and Raymond Hicks. 2018. "Sovereign Credit Ratings and Central Banks: Why do Analysts Pay Attention to Institutions?" *Economics & Politics* 30(3): 340–365.
- Choudhury, Atrayee, and Sohini Sahu. 2022. "Revisiting the nexus between fiscal decentralization and government size—The role of ethnic fragmentation." *European Journal of Political Economy* 75: 102193.
- Cukierman, Alex. 1992. *Central Bank Strategy, Credibility and Independence: Theory and Evidence*. Cambridge, MA: The MIT Press.
- Cukierman, Alex, Steven B. Webb, and Bilin Neyapti. 1992. "Measuring the Independence of Central Banks and Its Effect on Policy Outcome." *The World Bank Economic Review* 6(1): 353–398.
- Culver, Christopher A. 2022. "Manipulating Remittances: Strengthening Autocratic Regimes with Currency Overvaluation and Remittance Flows." *Remittances Review* 7(1): 21–47.
- Debelle, Guy, and Stanley Fischer. 1995. "How Independent Should a Central Bank Be?" In *Goals, Guidelines and Constraints Facing Monetary Policymakers*, Conference Series No. 38, ed. Jeffrey C. Fuhrer. Boston, MA: Federal Reserve Bank of Boston, p. 195–221.
- Dikau, Simon, and Ulrich Volz. 2021. "Central bank mandates, sustainability objectives and the promotion of green finance." *Ecological Economics* 184: 107022.
- Elgie, Robert. 1998. "Democratic Accountability and Central Bank Independence: Historical and Contemporary, National and European Perspectives." *West European Politics* 21(3): 53–76.
- Etchemendy, Sebastián. 2019. "The Rise of Segmented Neo-Corporatism in South America: Wage Coordination in Argentina and Uruguay (2005–2015)." *Comparative Political Studies* 52(10): 1427–1465.
- Fernández-Albertos, José. 2015. "The Politics of Central Bank Independence." *Annual Review of Political Science* 18(1): 217–237.
- Fisera, Boris, Roman Horvath, and Martin Melecky. 2023. "Natural Disasters and Debt Financing Costs." *Climate Change Economics* 14(03): 2350015.

- Garriga, Ana Carolina. 2016. "Central Bank Independence in the World: A New Data Set." *International Interactions* 42(5): 849–868.
- Garriga, Ana Carolina. 2022. "Central Banks and Civil War Termination." *Journal of Peace Research* 59(4): 508–525.
- Garriga, Ana Carolina, and Cesar M. Rodriguez. 2023. "Central Bank Independence and Inflation Volatility in Developing Countries." *1320-1341* 78: 1320–1341.
- Garriga, Ana Carolina, and Cesar M. Rodriguez. 2020. "More Effective Than We Thought: Central Bank Independence and Inflation in Developing Countries." *Economic Modelling* 85(1): 87–105.
- Gavin, Michael. 2020. "Independent central banks and banking crisis liquidity." *The Review of International Organizations* 15(1): 109–131.
- Gavin, Michael, and Mark Manger. 2023. "Populism and De Facto Central Bank Independence." *Comparative Political Studies* 56(8): 1189–1223.
- Goldfajn, Ian, Lorenza Martínez, and Rodrigo O Valdés. 2021. "Washington consensus in latin america: From raw model to straw man." *Journal of economic perspectives* 35(3): 109–132.
- Goodhart, Charles, and Rosa Lastra. 2023. "The Changing and Growing Roles of Independent Central Banks Now Do Require a Reconsideration of Their Mandate." <https://doi.org/10.1515/ael-2022-0097> (Accessed March 2, 2023).
- Hansen, Daniel. 2023. "The democratic (dis) advantage: The conditional impact of democracy on credit risk and sovereign default." *Economics & Politics* 35(1): 356–410.
- Hollyer, James R., B Peter Rosendorff, and James Raymond Vreeland. 2011. "Democracy and Transparency." *The Journal of Politics* 73(4): 1191–1205.
- Johnson, Juliet. 2016. *Priests of Prosperity*. Ithaca, NY: Cornell University Press.
- Johnson, Juliet, Vincent Arel-Bundock, and Vladislav Portniaguine. 2019. "Adding rooms onto a house we love: Central banking after the global financial crisis." *Public Administration* 97(3): 546–560.
- Jones, Emily, and Alexandra O Zeitz. 2019. "Regulatory Convergence in the Financial Periphery: How Interdependence Shapes Regulators' Decisions." *International Studies Quarterly* 63(4): 908–922.
- Jones, Erik, and Matthias Matthijs. 2019. "Rethinking central-bank independence." *Journal of Democracy* 30(2): 127–141.
- Kern, Andreas, Bernard Reinsberg, and Matthias Rau-Göhring. 2019. "IMF Conditionality and Central Bank Independence." *European Journal of Political Economy* 59: 212–229.
- Kern, Andreas, and Jack Seddon. 2024. "The Politics of Reversing Central Bank Independence." *Journal of Political Institutions and Political Economy* 5(3): 443–485.
- Kim, Hyunwoo. 2023. "Monetary technocracy and democratic accountability: how central bank independence conditions economic voting." *Review of International Political Economy* 30(3): 939–964.
- Klomp, Jeroen. 2020. "Do natural disasters affect monetary policy? A quasi-experiment of earthquakes." *Journal of Macroeconomics* 64: 103164.
- Klomp, Jeroen, and John Sseruyange. 2020. "Earthquakes and Economic Outcomes: Does Central Bank Independence Matter?" *Open Economies Review*. <https://doi.org/10.1007/s11079-020-09593-4>.
- Mabbett, Deborah, and Waltraud Schelkle. 2019. "Independent or lonely? Central banking in crisis." *Review of International Political Economy* 26(3): 436–460.
- Maxfield, Sylvia. 1997. *Gatekeepers of Growth: The International Political Economy of Central Banking in Developing Countries*. Princeton, NJ: Princeton University Press.
- McNamara, Kathleen. 2003. "Rational Fictions. Central Bank Independence and the Social Logic of Delegation." In *The Politics of Delegation*, eds. Marc Thatcher and Alec Stone Sweet. Portland, OR: Frank Cass, p. 47–76.
- McPhilemy, Samuel, and Manuela Moschella. 2019. "Central banks under stress: Reputation, accountability and regulatory coherence." *Public Administration* 97(3): 489–498.
- Moschella, Manuela. 2024. *Unexpected revolutionaries: how central banks made and unmade economic orthodoxy*. Cornell University Press.
- Moschella, Manuela, and Luca Pinto. 2022. "The multi-agencies dilemma of delegation: Why do policymakers choose one or multiple agencies for financial regulation?" *Regulation & Governance* 16(4): 1250–1264.

- Myksvoll, Thomas, Michaël Tatham, and Anne Lise Fimreite. 2022. "Understanding bureaucratic support for coerced institutional change." *Governance* 35(4): 1119–1138.
- Omori, Sawa. 2023. "Do institutions matter? Political economy of the enhancement of banking supervision." *Journal of Banking Regulation*. <https://doi.org/10.1057/s41261-023-00215-w>.
- Pond, Amy. 2021. "Biased politicians and independent agencies." *Journal of Theoretical Politics* 33(3): 279–299.
- Romelli, Davide. 2023. "The political economy of reforms in Central Bank design: evidence from a new dataset." *Economic Policy* 37(112): 641–688.
- Sol, Daniel Albalade del. 2013. "The Institutional, Economic and Social Determinants of Local Government Transparency." *Journal of economic policy reform* 16(1): 90–107.
- Spyromitros, Eleftherios. 2023. "Determinants of Green Innovation: The Role of Monetary Policy and Central Bank Characteristics." *Sustainability* 15(10).
- Tomita, Yosuke. 2023. "Effects of the rule of law and central bank independence on economic inequality and surplus value." *Applied Economics* 55(11): 1184–1200.
- Wachtel, Paul, and Mario I. Blejer. 2020. "A Fresh Look at Central Bank Independence." *Cato Journal* 40(1): 105–132.
- Wang, Zhiyuan. 2023. "Unemployment, Central Bank Independence, and Diversionary Conflict." *International Interactions*: 1–27.
- Wansleben, Leon. 2018. "How expectations became governable: institutional change and the performative power of central banks." *Theory and Society* 47(6): 773–803.
- Zeit, Alexandra O. 2022. "Global Capital Cycles and Market Discipline: Perceptions of Developing-Country Borrowers." *British Journal of Political Science* 52(4): 1944–1953.
- Zhao, Yanping, Qing Chen, and Jakob de Haan. 2023. "Does central bank independence matter for the location choices of Chinese firms' foreign investments?" *International Business Review* 32(4): 102092.

Appendix A. CBI index: Components, variables included, and their weights (Cukierman, Webb, and Neyapti 1992)

Components (weight in the index)	Variables (weight in the component)	Score	Descriptors
Personnel independence (0.20)	1. Term of office of CEO (0.25)	1	Equal or more than 8 years
		0.75	6 years or more but less than 8 years
		0.50	Equal to 5 years
		0.25	Equal to 4 years
		0	Less than 4 years
	2. Who appoints the CEO (0.25)	1	The Central Bank Board
		0.75	Council composed by executive and legislative branch and Central Bank Board
		0.50	By legislative branch
		0.25	By executive branch
		0	By one or two members of executive branch
	3. Provisions for dismissal of CEO (0.25)	1	No provision
		0.83	Only for non-policy reasons (e.g., incapability, or violation of law)
		0.67	At a discretion of Central Bank Board
		0.50	For policy reasons at legislative branch's discretion
		0.33	At legislative branch's discretion
	4. CEO allowed to hold another office in government (0.25)	1	Prohibited by law
0.5		Not allowed unless authorized by executive branch	
0		No prohibition for holding another office	
0.2		Central Bank charter does not contain any objective	
0		Some goals appear in the charter, but price stability is not one of them	
Central bank objectives (0.15)	5. Central Bank objectives (1)	1	Price stability is the only or major goal, and in case of conflict with government, the Central Bank has final authority
		0.8	Price stability is the only goal
		0.6	Price stability along with other objectives that do not seem to conflict with the former
		0.4	Price stability along with other objectives of potentially conflicting goals (e.g., full employment)
		0.2	Central Bank charter does not contain any objective
Policy formulation independence (0.15)	6. Who formulates monetary policy (0.25)	1	Central Bank has the legal authority
		0.67	Central Bank participates together with government
		0.33	Central Bank in an advisory capacity
		0	Government alone formulates monetary policy
		1	Central Bank given final authority over issues defined in the law as objectives
0.8	Government has final authority over issues not clearly defined as Central Bank goals		

Components (weight in the index)	Variables (weight in the component)	Score	Descriptors
	7. Government directives and resolution of conflicts (0.50)	0.6	Final decision up to a council whose members are from the Central Bank, executive branch, and legislative branch
		0.4	Legislative branch has final authority
		0.2	Executive branch has final authority, but subject to due process and possible protest by Central Bank
		0	Executive branch has unconditional authority over policy
	8. Central Bank given active role in formulation of government's budget (0.25)	1	Yes
		0	No
Limits on central bank lending to the government (0.50)	9. Limitations on advances (0.30)	1	Advances to government prohibited
		0.67	Permitted but subject to limits in terms of absolute cash amounts or relative limits (government revenues)
		0.33	Permitted subject to relatively accommodative limits (more than 15 percent of government revenues)
		0	No legal limitations on advances. Subject to negotiations with government
	10. Limitations on securitized lending (0.20)	The same as in 9	
	11. Who decides control of terms of lending to government (0.20)	1	Central bank controls terms and conditions
		0.67	Terms of lending specified in law, or Central Bank given legal authority to set conditions
		0.33	Law leaves decision to negotiations between the Central Bank and government
	12. Beneficiaries of Central Bank lending (0.10)	0	Executive branch alone decides and imposes to the Central Bank
		1	Only central government
		0.67	Central and state governments, as well as further political subdivisions
	13. Type of limits when they exist (0.05)	0.33	Public enterprises can also borrow
		0	Central Bank can lend to all of the above and to the private sector
1		As an absolute cash amount	
0.67		As a percentage of Central Bank capital or other liabilities	
14. Maturity of loans (0.05)	0.33	As a percentage of government revenues	
	0	As a percentage of government expenditure	
	1	Limited to a maximum of 6 months	
	0.67	Limited to a maximum of 1 year	
		0.33	Limited to a maximum of more than one year
		0	No legal upper bounds

Components (weight in the index)	Variables (weight in the component)	Score	Descriptors
	15.Restrictions on interest rates (0.05)	1 0.75 0.50 0.25 0	Must be at market rate On loans to government cannot be lower than a certain floor Interest rate on Central Bank loans cannot exceed a certain ceiling No explicit legal provisions regarding interest rate in Central Bank loans No interest rate charge on government's borrowing from Central Bank
	16. Prohibition on Central Bank lending in primary market to Government (0.05)	1 0	Prohibition from buying government securities in primary market No prohibition

Revisiting Central Bank Independence in the World:

An Extended Dataset

Online appendix

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APPENDIX 1. NUMBER OF OBSERVATIONS CODED PER COUNTRY. DIFFERENT DATASETS.....	1
APPENDIX 2. DESCRIPTIVE STATISTICS EXCLUDING REGIONAL CENTRAL BANKS' OBSERVATIONS.	4
APPENDIX 3. DATASET COMPARISON BY REGIONS. NUMBER OF COUNTRIES AND CBI AVERAGE, PER YEAR	5
APPENDIX 4. COMPARISON BETWEEN INCLUDED AND EXCLUDED OBSERVATIONS IN PREVIOUS DATASETS. SUBSAMPLE AVERAGE OF SELECTED INDICATORS.	6
APPENDIX 5. CBI WEIGHTED INDEX: PARTIAL CORRELATION	6
APPENDIX 6. COUNT OF REFORMS AFFECTING CBI, AND COUNTRIES INCLUDED IN SAMPLES. WORLDWIDE AND REGIONAL SUBSAMPLES EXCLUDING OBSERVATIONS PERTAINING TO REGIONAL CENTRAL BANKS.	7
APPENDIX 7. ASSOCIATION BETWEEN CBI, INFLATION AND UNEMPLOYMENT. ADDITIONAL MODELS	8
APPENDIX 8. CHANGE IN CBI SCORES 2008-2023.....	10

Appendix 1. Number of observations coded per country. Different datasets.

Country	Author	Garriga 2016	Bodea & Hicks	Romelli 2022	Country	Author	Garriga 2016	Bodea & Hicks	Romelli 2022
1. Afghanistan	21	10		15	35. Cayman	28			
2. Albania	33	22	29	26	36. Central African Republic	52	41		46
3. Algeria	54	10	49	46	37. Chad	52	41		46
4. Angola	48		24	21	38. Chile	54	43	51	46
5. Anguilla	41			31	39. China	54	43	26	23
6. Antigua & Barbuda	41	30		35	40. Colombia	54	43	51	46
7. Argentina	54	43	51	46	41. Comoros	45	34		31
8. Armenia	31	20	28		42. Congo, DR/Zaire	53	43		25
9. Aruba	33				43. Congo, Republic of	52	41		46
10. Australia	54	43	51	46	44. Costa Rica	54	43	51	46
11. Austria	54	43	41	46	45. Croatia	32	21	29	27
12. Azerbaijan	32	21	29	22	46. Cuba	27	16	24	46
13. Bahamas	51	40		44	47. Cyprus	22	11	9	46
14. Bahrain	51	7	15	45	48. Czech Republic	32	21	29	26
15. Bangladesh	52	41	49	15	49. Denmark	54	43	51	46
16. Barbados	52	41	49		50. Djibouti	32	13	16	
17. Belarus	34	23	29	28	51. Dominica	41	30	31	35
18. Belgium	54	43	41	46	52. Dominican Republic	54	23		46
19. Belize	42	31	21		53. Ecuador	32	21		46
20. Benin	54	43		46	54. Egypt	54	43	49	46
21. Bermuda	54				55. El Salvador	45	22	30	
22. Bhutan	42	31			56. Equatorial Guinea	39	28		34
23. Bolivia	54	43	51	46	57. Eritrea	31			
24. Bosnia-Herzegovina	27	16	24	21	58. Estonia	31	20	19	25
25. Botswana	49	38	46	43	59. Ethiopia	54	43	49	24
26. Brazil	54	43	51	46	60. Fiji	41	40	36	
27. Brunei Darussalam	14		11	46	61. Finland	54	43	29	46
28. Bulgaria	33	22	30	27	62. France	54	43	41	46
29. Burkina Faso	54	43		46	63. Gabon	52	41		46
30. Burundi	31	20	28	46	64. Gambia	19	8	16	46
31. Cambodia	28	17	25	46	65. Georgia	29	18	26	23
32. Cameroon	52	41		46	66. Germany	54	43	29	46
33. Canada	54	43	51	46	67. Ghana	54	43	49	43
34. Cape Verde	22	11	19		68. Greece	54	43	41	46
					69. Grenada	41	30		35

Country	Author	Garriga 2016	Bodea & Hicks	Romelli 2022
70. Guatemala	54	43	31	46
71. Guinea	30	19	27	24
72. Guinea-Bissau	27	16		
73. Guyana	29	18	31	
74. Haiti	45	34		39
75. Honduras	54	43	51	
76. Hungary	54	43	30	27
77. Iceland	54	43	49	46
78. India	54	43	51	46
79. Indonesia	54	43	51	46
80. Iran	54	43	49	46
81. Iraq	48	9		46
82. Ireland	54	43	41	46
83. Israel	54	43	51	
84. Italy	54	43	41	46
85. Ivory Coast	54	43		46
86. Jamaica	54	36	28	26
87. Japan	54	43	51	46
88. Jordan	53	42	29	46
89. Kazakhstan	31	20	28	25
90. Kenya	54	43	51	34
91. Korea, Republic of	54	43	51	46
92. Kuwait	54	36	14	46
93. Kyrgyzstan	31	20	28	25
94. Laos	29	18	26	23
95. Latvia	32	21	29	
96. Lebanon	54	43	49	26
97. Lesotho	24	13	21	46
98. Liberia	25	14	47	19
99. Libya	31	20		22
100. Lithuania	32	21	30	24
101. Luxembourg	54	43	12	35
102. Macedonia	30	19	26	26
103. Madagascar	51	19	48	
104. Malawi	35	24	31	29

Country	Author	Garriga 2016	Bodea & Hicks	Romelli 2022
105. Malaysia	54	43	51	36
106. Maldives	43	32		36
107. Mali	40	29		34
108. Malta	54	43		24
109. Mauritania	54	43	48	46
110. Mauritius	54	9	49	46
111. Mexico	54	43	51	46
112. Moldova	32	21	30	26
113. Mongolia	33	22	30	22
114. Montenegro	24	13	16	13
115. Montserrat	41			
116. Morocco	54	43	49	46
117. Mozambique	32	21	29	
118. Myanmar (Burma)	34	23		46
119. Namibia	34	16	31	28
120. Nepal	54	43	19	46
121. Netherlands	54	43	41	46
122. New Zealand	54	43	51	46
123. Nicaragua	54	43	51	
124. Niger	54	43		46
125. Nigeria	54	43	49	46
126. Norway	54	43	51	46
127. Oman	50	39	47	18
128. Pakistan	54	43	49	46
129. Palestine	27			
130. Panama	54	43	29	46
131. Papua New Guinea	51	13	21	
132. Paraguay	54	43	31	46
133. Peru	54	43	51	46
134. Philippines	54	43	51	46
135. Poland	54	43	30	21
136. Portugal	54	43	29	46
137. Qatar	51	40	28	25
138. Romania	54	43	30	27
139. Russian Federation	34	22	28	26

Country	Author	Garriga 2016	Bodea & Hicks	Romelli 2022
140. Rwanda	27	16	24	21
141. Saint Lucia	41	30		35
142. Samoa	40	29	41	
143. San Marino	36	25		
144. Sao Tome and Principe	32	21		
145. Saudi Arabia	54	43		46
146. Senegal	54	43		46
147. Serbia/Serbia- Montenegro/Yugoslavia	54	33	17	
148. Seychelles	41	30	17	32
149. Sierra Leone	54	13	49	46
150. Singapore	54	43	50	27
151. Slovakia	32	21	19	26
152. Slovenia	33	22	20	27
153. Solomon Islands	48	31	39	
154. Somalia	54	43		46
155. South Africa	54	43	51	46
156. Spain	54	43	41	46
157. Sri Lanka	54	43	47	46
158. St. Kitts and Nevis	41	30		35
159. St. Vincent and the Grenadines	41	30		35
160. Sudan	54	43		
161. Sudan, South	13			
162. Suriname	54	43	16	
163. Swaziland/Eswatini	50		42	
164. Sweden	54	43	51	46
165. Switzerland	54	43	51	46

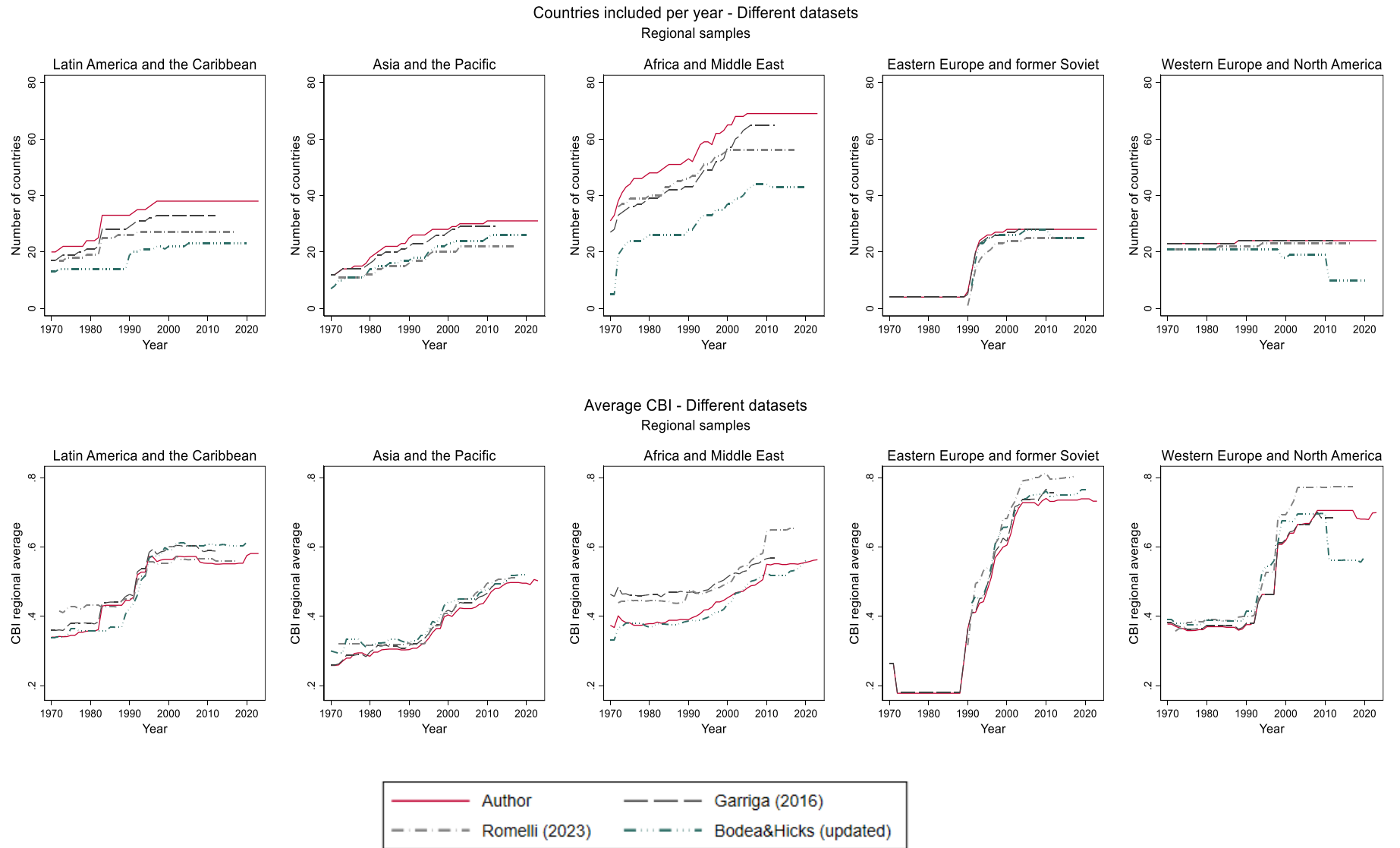
Country	Author	Garriga 2016	Bodea & Hicks	Romelli 2022
166. Syria	22	11		
167. Taiwan	45	34	42	39
168. Tajikistan	33	22	28	
169. Tanzania	54	43	49	46
170. Thailand	54	43	51	46
171. Timor-Leste	23	12	10	
172. Togo	54	43		46
173. Tonga	36	25	33	
174. Trinidad and Tobago	54	43	31	46
175. Tunisia	54	43	49	46
176. Turkey	54	43	51	46
177. Turkmenistan	33	22	29	24
178. Tuvalu	44			
179. Uganda	54	43	49	46
180. Ukraine	33	22	30	27
181. United Arab Emirates	44	33	41	38
182. United Kingdom	54	43	51	46
183. United States of America	54	43	51	46
184. Uruguay	54	43	51	46
185. Uzbekistan	33	22	29	18
186. Vanuatu	44	33	41	
187. Venezuela	54	43	51	46
188. Vietnam	34	16	24	28
189. Yemen	24	13	21	27
190. Yemen, North	20			18 ¹
191. Zambia	54	43	49	46
192. Zimbabwe	54	43	51	46
Total	8,546	5,853	5,278	5,832

¹ Romelli extends the data for Yemen (1990-1999) to Yemen North (1971-1989). There is a 1971 law for the Arab Republic of Yemen.

Appendix 2. Descriptive statistics excluding regional central banks' observations.

Variable	Observations	Mean	Std. Dev.	Min	Max
Creation	7,704	.0086	.0922	0	1
Reform	7,690	.0499	.2178	0	1
Direction	7,689	.0303	.2194	-1	1
CBI increase	7,689	.0395	.1949	0	1
CBI decrease	7,689	.0095	.0970	0	1
Regional	7,704	0	0	0	0
Components					
1. Personnel independence	7,127	.4973	.1966	0	.895
2. Objectives	7,127	.5056	.2410	0	1
3. Policy formulation	7,127	.3666	.3094	0	1
4. Limits on lending	7,127	.4565	.2657	0	1
CBI indices					
CBI unweighted	7,127	.4564	.1869	.006	.974
CBI weighted	7,127	.4584	.1981	.011	.979
<i>CBI weighted in other datasets</i>					
Garriga (2016)	4,932	.4494	.1879	.0167	.979
Bodea & Hicks (2015)	5,123	.4904	.1906	.0128	.9606
Romelli (2022)	4,687	.5129	.2148	.055	.979
Diffusion	7,704	.4717	.1220	.178	.7406

Appendix 3. Dataset comparison by regions. Number of countries and CBI average, per year



Note: The panels labelled “Asia and the Pacific” exclude Middle Eastern and former Soviet countries.

Appendix 4. Comparison between included and excluded observations in previous datasets. Subsample average of selected indicators.

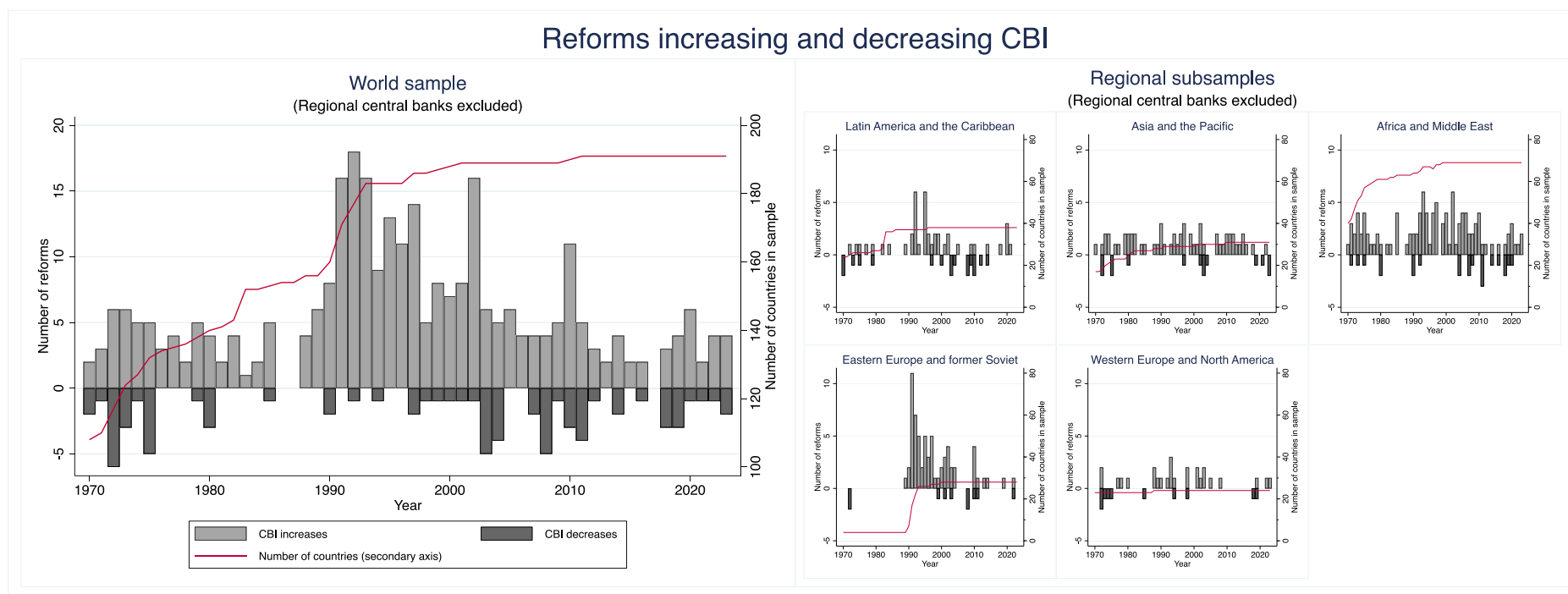
	Sample (number)	Polity 2	Inflation	GDP per capita	Trade openness	Capital openness	CBI weighted index (author's data)
Author	Included (N=8,546)	3.11	31.44	11,778.63	77.56	0.463	0.490
Garriga (2016)	Included (N=5,853)	3.13	38.99	10,658.15	73.985	0.457	0.468
	<i>Excluded (N=603)</i>	<i>-2.31</i>	<i>37.82</i>	<i>14,493.31</i>	<i>88.56</i>	<i>0.290</i>	<i>0.339</i>
Bodea&Hicks (updated)	Included (N=5,283)	4.52	34.49	11,544.38	75.638	0.497	0.488
	<i>Excluded (N=2,726)</i>	<i>-0.46</i>	<i>27.60</i>	<i>11,632.08</i>	<i>82.298</i>	<i>0.382</i>	<i>0.468</i>
Romelli (2022)	Included (N=5,820)	3.49	28.98	11,842.47	74.557	0.479	0.498
	<i>Excluded (N=1,614)</i>	<i>0.94</i>	<i>55.55</i>	<i>9,352.92</i>	<i>90.509</i>	<i>0.356</i>	<i>0.404</i>

Note: This table shows the mean of these variables in subsamples defined by other datasets (“included”) and the observations included in this paper’s dataset but excluded in the other sources (“excluded”). The purpose of this table is to show the difference in means for the included and excluded observations by dataset.

Appendix 5. CBI weighted index: partial correlation

	Author	Garriga	CWN	Bodea&Hicks	Romelli
Author	1.0000				
Garriga	0.9055	1.0000			
CWN	0.9086	0.9233	1.0000		
Bodea&Hicks	0.8843	0.8865	0.9153	1.0000	
Romelli	0.7507	0.6527	0.7417	0.8106	1.0000

Appendix 6. Count of reforms affecting CBI, and countries included in samples. Worldwide and regional subsamples excluding observations pertaining to regional central banks.



Note: To avoid overrepresenting the number of reforms to central banks, this figure omits observations from countries that joined regional central banks – reflected by the line of number of countries included in the samples.

Appendix 7. Association between CBI, inflation and unemployment. Additional models

Table 7.1. Association between CBI and inflation. Different datasets and samples. No lagged DV

Sample <i>CBI data source</i>	Author <i>Author</i>	Garriga (2016)		Bodea-Hicks (updated)		Romelli (2022)	
		<i>Garriga</i>	<i>Author</i>	<i>Bodea-Hicks</i>	<i>Author</i>	<i>Romelli</i>	<i>Author</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CBI _{t-1}	-0.747** (0.035)		-0.806** (0.042)		-0.931** (0.042)		-0.743** (0.041)
CBI _{t-1} (other)		-0.870** (0.043)		-1.023** (0.045)		-0.648** (0.038)	
Observations	7,762	5,673	5,673	5,163	5,163	5,461	5,461
R ² overall	0.0243	0.0254	0.0202	0.0272	0.0280	0.0125	0.0239
Countries	186	178	178	143	143	151	151
Years	1971-2022	1971-2013	1971-2013	1971-2021	1971-2021	1973-2018	1973-2018

Notes: Coefficients after panel OLS regressions. Constant and lagged dependent variable omitted. Standard errors in parentheses. * p<0.05, ** p<0.01

Table 7.2. Association between CBI and inflation. Different datasets and samples. Fixed effects

Sample <i>CBI data source</i>	Author <i>Author</i>	Garriga (2016)		Bodea-Hicks (updated)		Romelli (2022)	
		<i>Garriga</i>	<i>Author</i>	<i>Bodea-Hicks</i>	<i>Author</i>	<i>Romelli</i>	<i>Author</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CBI _{t-1}	-0.814** (0.037)		-0.880** (0.044)		-1.043** (0.044)		-0.810** (0.043)
CBI _{t-1} (other)		-0.963** (0.045)		-1.167** (0.047)		-0.734** (0.040)	
Observations	7,762	5,673	5,673	5,163	5,163	5,461	5,461
R ² overall	0.0243	0.0254	0.0202	0.0272	0.0280	0.0125	0.0239
R ² within	0.0612	0.0775	0.0691	0.108	0.0996	0.0603	0.0621
R ² between	0.000754	0.000272	0.000557	0.000191	0.000836	0.00139	0.00176
Countries	186	178	178	143	143	151	151
Years	1971-2022	1971-2013	1971-2013	1971-2021	1971-2021	1973-2018	1973-2018

Notes: Coefficients after panel OLS regressions. Constant omitted. Standard errors in parentheses. * p<0.05, ** p<0.01.

Table 7.3. Association between CBI and unemployment. Different datasets and samples. No lagged DV

Sample <i>CBI data source</i>	Author	Garriga (2016)		Bodea-Hicks (updated)		Romelli (2022)	
	<i>Author</i>	<i>Garriga</i>	<i>Author</i>	<i>Bodea-Hicks</i>	<i>Author</i>	<i>Romelli</i>	<i>Author</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CBI _{t-1}	0.779** (0.231)		1.917** (0.264)		0.283 (0.280)		0.984** (0.257)
CBI _{t-1} (other)		1.751** (0.274)		0.286 (0.296)		1.477** (0.240)	
Observations	6,260	4,428	4,428	4,493	4,493	4,471	4,471
R ² overall	0.0147	0.0206	0.0389	0.0234	0.0242	0.0241	0.0211
Countries	186	178	178	143	143	151	151
Years	1971-2022	1971-2013	1971-2013	1971-2021	1971-2021	1973-2018	1973-2018

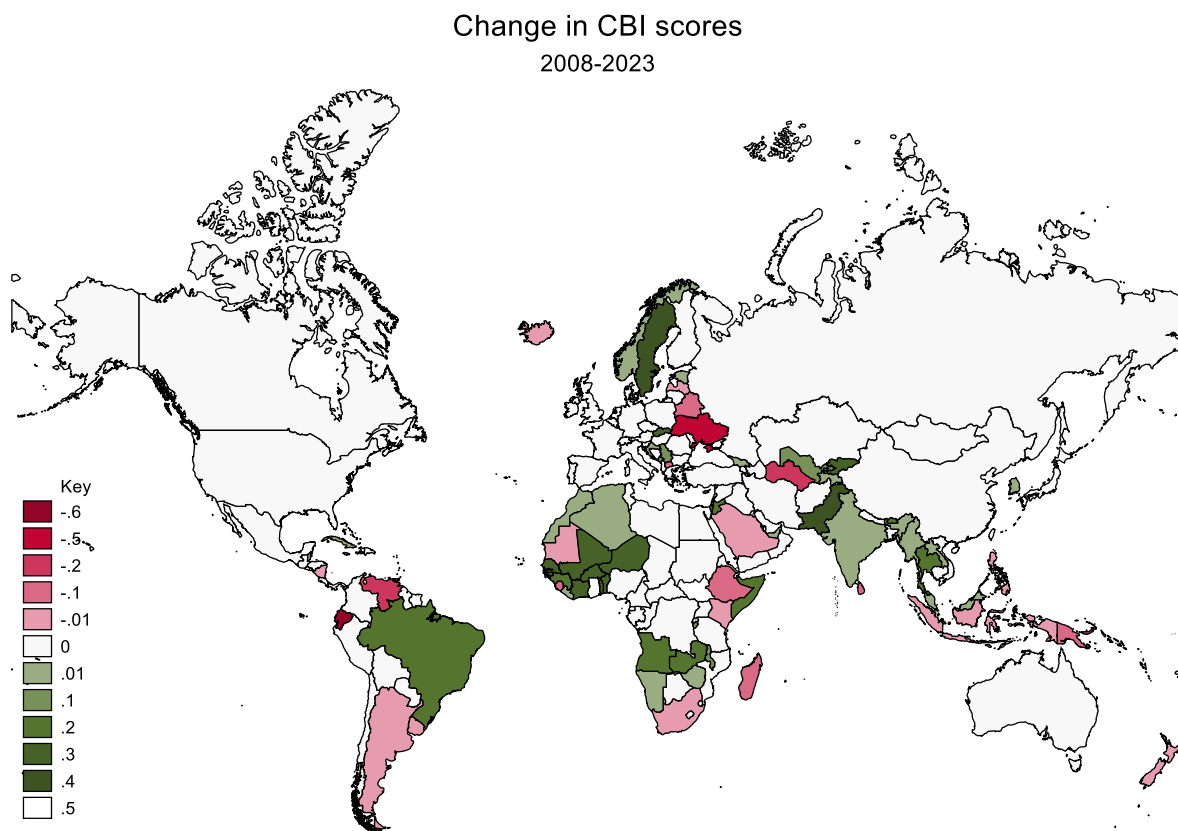
Notes: Coefficients after panel OLS regressions. Constant omitted. Standard errors in parentheses. * p<0.05, ** p<0.01.

Table 7.4. Association between CBI and unemployment. Different datasets and samples. Fixed effects

Sample <i>CBI data source</i>	Author	Garriga (2016)		Bodea-Hicks (updated)		Romelli (2022)	
	<i>Author</i>	<i>Garriga</i>	<i>Author</i>	<i>Bodea-Hicks</i>	<i>Author</i>	<i>Romelli</i>	<i>Author</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CBI _{t-1}	0.736** (0.232)		1.838** (0.265)		0.203 (0.281)		0.928** (0.258)
CBI _{t-1} (other)		1.698** (0.275)		0.199 (0.297)		1.435** (0.241)	
Observations	6,260	4,428	4,428	4,493	4,493	4,471	4,471
R ² overall	0.0147	0.0206	0.0389	0.0234	0.0242	0.0241	0.0211
R ² within	0.00165	0.00888	0.0112	0.000103	0.000120	0.00815	0.00298
R ² between	0.0278	0.0344	0.0766	0.0547	0.0577	0.0360	0.0497
Countries	186	178	178	143	143	151	151
Years	1971-2022	1971-2013	1971-2013	1971-2021	1971-2021	1973-2018	1973-2018

Notes: Coefficients after panel OLS regressions. Constant omitted. Standard errors in parentheses. * p<0.05, ** p<0.01.

Appendix 8. Change in CBI scores 2008-2023.



Mercator projection. Antarctica and Greenland dropped from map.