(In)dependent Central Banks*

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Abstract

Since the 1980s many countries have reformed the institutional framework governing their central banks to increase operational independence. Collecting systematic biographical information, international press coverage, and independent expert opinions, we find that over the same period appointments of central bank governors have become more politically motivated, especially after significant legislative reforms aiming to insulate central banks and their governors from political interference. We also show that politically-motivated appointments reflect lower de facto independence, and are associated with worse inflation and financial stability outcomes. Given the increase in central banks' powers worldwide, our findings inform the debate about their political accountability and credibility.

JEL classification: E58, G00, P16

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1 Introduction

In the late 1980s, central bank independence (CBI) arose as an institutional solution to the time inconsistency problem analysed by Kydland and Prescott (1977) and Calvo (1978).[1] The main idea was to wrest control of monetary policy away from elected politicians, whose re-election concerns could generate either inflation bias or political cycles (Barro and Gordon, 1983; Alesina and Roubini, 1992). By giving control of monetary policy to unelected technocrats, or even more dramatically a conservative central banker caring only about inflation (Rogoff, 1985), the U.S. experience of high inflation during the 1970s would not be repeated again.[2] This argument was used successfully around the world and increasingly many countries reformed the institutional framework governing central banks to protect these institutions from undue political influence and safeguard price stability. Several studies have quantified the significant and widespread increase in legal or *de jure* CBI over the past decades (Grilli, Masciandaro, and Tabellini, 1991; Cukierman, Web, and Neyapti, 1992; Romelli, 2022).[3]

However, de jure CBI does not necessarily translate into actual or *de facto* CBI (Cukierman et al., 1992). Laws are incomplete and even when the law is explicit, actual practice may deviate. Policy reforms may also give rise to a "seesaw effect": when a policy reform takes place in one dimension, but the political equilibrium remains largely unchanged, politicians may try to use a different instrument to attain the goal previously targeted with the instrument that is being reformed (Acemoglu, Johnson, Querubin, and Robinson, 2008). One way in which politicians may seek to retain control is by getting "their own people" into the top jobs. Anecdotal evidence consistent with this idea is plentiful in the financial press, both for developed and emerging economies. For example, *The Economist* (April 13, 2019) notes that "President Donald Trump has demanded that interest rates should be slashed, speculated about firing the boss of the Federal Reserve [...] India's government has replaced a capable central-bank chief with a pliant insider who has cut rates ahead of an election [...] Rather than win by force of argument, they

[1] See, for example, Alesina and Stella (2010) for an excellent overview of this literature.

[2] In 1971, President Richard Nixon successfully pressured the Federal Reserve Chairman Arthur Burns to lower interest rates to help with his re-election. Americans paid dearly for Nixon's victory, however, as the low-interest rates helped fuel a double-digit inflation throughout most of the 1970s and hurt the value of the U.S. dollar. The recently published diaries of Chairman Burns by Ferrell (2010) confirm President Nixon's key role in using the "float" to generate inflation through dollar depreciation right before the 1972 presidential election.

[3] After the Global Financial Crisis, the importance of CBI is reemphasized by Bernanke (2010) and Fischer (2015).

are seeking an edge by getting their own people into the top jobs".[4]

Given the increase in central bank powers worldwide, we collect systematic biographical information, international press coverage, and independent expert opinions to examine whether central bank governor appointments have become more, or less political, following significant institutional reforms aiming to insulate the central bank and its governor from political interference. It is natural to expect that if the original goal of improving de jure CBI were to reduce political interference, de jure CBI should be negatively correlated with politically-motivated appointments. A politically-motivated governor appointment is defined as one where the appointment is skewed towards candidates who can be classified, using different metrics, as being more loyal to the executive making the appointment rather than the central bank mandate. Therefore, if the stated goal is to make the central bank more politically independent, then we should expect less politically-motivated governor appointments, so that de jure CBI more convincingly becomes de facto CBI. This intuition suggests that the correlation between metrics of de jure CBI and more independent governor appointments should be positive.

However, a positive correlation is not the only possible outcome. Political processes have a status quo bias (Fernandez and Rodrik, 1991), either because political habits are hard to change, or because laws are very hard to reverse. Politicians used to appoint close allies at the central bank might look for alternative ways to circumvent the enacted CBI legislation, especially when reversing such legislation is difficult. Therefore, the correlation between de jure CBI and more independent governor appointments may disappear, or even turn negative, if politicians actively seek to reverse the institutional reforms by appointing central bank governors with close ties to the government.

The goal of this paper is to examine which of these narratives better describes the data, whether this description is constant across countries and over time, and how politically-motivated appointments relate to central bank policy outcomes. We should clarify that our paper does not inform the debate concerning the appropriate, or even optimal, level of central bank independence. We take as given a certain level of existing de jure CBI and ask whether the central

[4]In March 2021, President Erdogan dismissed the third central bank governor in two years after disagreements on whether lower interest rates cause higher inflation (*The Financial Times*, May 25, 2021). In 2014, the central bank governor of Nigeria, Lamido Sanusi, was fired after "charging the national oil company with failing to turn over billions of dollars" (*The New York Times*, February 20, 2014).

bank governor appointments are consistent with the initial motivation of enhancing central bank independence.

We focus on central bank governors because of their disproportionate importance in running the central bank. An argument might still be made that central banks are run by boards of directors and/or monetary policy committees, and therefore focusing on one particular person on the board might be missing important elements of central bank independence. Riboni and Ruge-Murcia (2010) argue that for five major central banks a model closer to a "consensus model, where a super majority is required for a policy change", captures central banking decisions best. However, there are a number of arguments that make us confident that focusing on the governor appointment is a useful first step in investigating political interference in central bank matters.

First, in many countries there is a disproportionate amount of attention on the political decision to appoint (or re-appoint) a governor, and this attention is much more prevalent than when appointing other members of the board.[5] Second, political pressures on central banks often concentrate on the governor. When pressures escalate and dismissals occur, they typically concentrate on the governor rather than other members of the board.[6] Third, a key reason to focus on governors is the significantly important literature that leaders matter (Jones and Olken, 2005; Besley, Montalvo, and Reynal-Querol, 2011; Funke, Schularick, and Trebesch, 2021; Brown, 2022). In corporate finance, Bertrand and Schoar (2003) show that managers matter, and these empirical observations should also hold for central bankers.

Even though the evidence on leadership might be more sparse for central banking, the idea is also supported by the narrative of the Great Depression in Friedman and Schwartz (1963). "[I]f Benjamin Strong could have had twelve months more of vigorous health, we might have

[5]For example, the recent article by the editorial board of *The Financial Times* on the re-appointment of Federal Reserve Chairman Jerome Powell supports this argument ("Jay Powell should get a second term at the Fed", November 9, 2021).

[6]President Trump's pressure on the Federal Reserve to keep interest rates low concentrated on Governors Yellen and Powell. In 2017, "[Trump] left open the possibility of renominating Federal Reserve Chairwoman Janet Yellen once her tenure is up next year, a shift from his position during the campaign that he would 'most likely' not appoint her to another term. 'I do like a low-interest rate policy, I must be honest with you,' Mr. Trump said at the White House, when asked about Ms. Yellen" (*The Wall Street Journal*, April 12 2017; *Reuters*, April 12 2017). Later in 2018, when the Federal Reserve raised interest rates, Trump repeatedly threatened to fire Powell, his own appointee, even if his legal authority to do so is not clear. In Turkey, President Erdogan's feud with the central bank about interest rate levels resulted in high central bank governor turnover; Murat Uysal's tenure lasted between July 6, 2019 and November 7, 2020 and Naci Agbal's between November 8, 2020 and March 20, 2021. Political pressure on central bank governors may also manifest itself in more indirect ways. In Greece, for example, the central bank governor's wife was prosecuted (and found not guilty after many years), a move that was widely interpreted as a way to put pressure on Governor Stournaras to resign. It is worth noting that these are all examples from countries with de jure independent central banks.

ended the depression in 1930, and with this the long drawn out world crisis that so profoundly affected the ensuing political developments" (p. 692). Benjamin Strong was the chairman of the New York Bank (the equivalent of the New York Federal Reserve Bank at the time). Given that this was the first major crisis that the recently established (1914) Federal Reserve was involved in, the importance of having someone with deep knowledge of the potential problems and solutions was extremely important, and Friedman and Schwartz emphasize essentially the importance of having the right person in charge at the right time. Recent evidence by Monnet and Puy (2020) shows that the identity and age of governors matter in the persistence of gold standard monetary practices under Bretton Woods. Mishra and Reshef (2019) also document the importance of central bank governors' personal characteristics in shaping policies. They find, for example, that governors with prior work experience in finance are associated with three times more financial deregulation than governors without such experience.

These observations give us confidence that the choice of a central bank governor is materially important. Therefore, we hand-collect systematic information on 316 central bank governor appointments in 57 countries between 1985 and 2020. To determine whether a particular appointment was politically motivated, we combine three complementary sources of information. The first involves biographical information at the time of the appointment. This includes ties with the executive branch of government through prior employment, shared ideology with the ruling party or personal links (e.g., known friendships and family ties) as well as information about the nature of succession (e.g., whether the governor replaces a governor who was forced to resign) and the formal credentials of the governor (e.g., education and prior work experience). The second source of information captures the perception of the international press on the political independence (or lack thereof) of the appointed governor. The third source of information captures the opinions of independent academic experts about the perceived political independence of a particular governor at the time of appointment in their respective countries via a large-scale survey. We sent a survey to 587 academics with expertise in macroeconomics or finance and have received responses from 289 (response rate of 49.2%). We compiled these three sources of information into an index, ranging from 0 to 1, characterizing whether, at the time of appointment, a governor was perceived as being independent from the executive and elected politicians. We, then, study how this index correlates with reforms that aim to insulate the

governor from political interference and how this relation changes after central banks are given more operational independence.

Our main empirical findings are as follows. First, we do not find support for the hypothesis that central bank governor appointments have become more independent over time, despite significant improvements in de jure CBI. There is no discernible relation between the governor independence index and measures of de jure CBI, including specific institutional reforms targeting precisely the appointment, term in office, and dismissal of central bank governors. Second, not only have central bank governor appointments not become more independent on average, but our results further show that they may have become more political as central banks are given more operational independence. The relation between the governor independence index and institutional reforms that aim to insulate the governor from political interference turns strongly negative when central banks are given more policy or financial independence and their operations become less transparent. These results indicate that governments may actively seek to undo institutional reforms and undermine de facto CBI by appointing their own people into the top job. Third, we observe, however, that the divergence between our governor independence index and de jure CBI is smaller when external constraints are imposed on a country (such as the European Union accession process or an IMF support program).

One concern with the low correlation between the de jure and de facto CBI indexes might be the presence of measurement error biasing regression coefficients towards zero. We address this concern in several ways. First, we find that the de facto CBI index based on governor appointments is positively correlated with expert opinions about independence of governors during their whole term. Second, our governor independence index correlates with central bank governor early dismissals, a measure used in the literature to proxy for lower de facto CBI (Cukierman et al., 1992). As expected, we find that a higher governor independence index is associated with fewer early dismissals. Third, we show that our results are robust to using an instrumental variables approach that uses the regional diffusion of de jure CBI as an instrument (similar to Acemoglu, Naidu, Restrepo, and Robinson, 2019). These results give us confidence that measurement error is not responsible for the lack of correlation between de jure CBI and de facto CBI.

A pressing question that arises from the finding that de facto CBI is not associated with de jure CBI is whether de jure and de facto CBI correlate with worse policy outcomes. We first

examine inflation and replicate the original Alesina and Summers (1993) analysis showing the negative relation between median inflation and measures of de jure CBI (for the original countries and time period used in that study). Extending the sample in time (and/or with the countries in our sample) makes the negative correlation close to zero. Importantly, however, the correlation between de facto CBI and inflation rates does remain negative. The results are even more stark when we restrict attention to countries with explicit inflation targets. For this sample, the mean deviation between inflation and the inflation target has a zero correlation with de jure CBI, but an economically significant negative correlation with de facto CBI. These correlations across countries and over time suggest that de facto (not de jure) CBI is an important contributor to reduced inflation bias. Furthermore, the time inconsistency problem leading to inflation bias can also be accompanied by a similar "financial instability bias" by favoring more lax banking regulation and supervision. Since many central banks have (explicit or implicit) responsibilities in the area of financial stability, a related question that arises is whether de jure and de facto CBI correlate with financial stability outcomes. Our data confirm that unlike de jure CBI, de facto CBI exhibits a negative correlation with financial instability (as captured by the likelihood of experiencing banking, currency, or inflation crises).

Our findings have important policy implications, especially as central banks are becoming increasingly more powerful. First, undue political influence on central bank appointments reduces the credibility of a central bank and therefore potentially allows the time inconsistency problem to resurface, regardless of the level of de jure central bank independence. Second, following the Global Financial Crisis and the Covid Pandemic, central bank mandates have expanded from inflation targeting to financial stability, liquidity provisions, and quantitative easing that increased central bank balance sheets to historical records. In addition to these macro-prudential and financial stability roles, central banks have been taking over new responsibilities in banking supervision and bank resolution. Their powers are only expected to expand as they are developing policies towards climate finance stress tests and digital currencies (Skinner, 2021). The design of the institutional architecture of a central bank and central bank decision making will need to be further scrutinized for political accountability and credibility in the future. Our results illustrate that legal independence is not sufficient to guarantee that the central bank is not captured by political interests. Recent evidence shows that central banks are receptive to political pressures

(Binder, 2021; Goncharov, Ioannidou, and Schmalz, 2021) and care actively about justifying their policies (Fabo, Jancokova, Kempf, and Pástor, 2021). Our results illustrate one channel through which external pressure or interference may occur. As central bank powers increase, it is likely that incentives to appoint political allies, with the explicit or implicit aim to affect future central bank policies, may increase.

The rest of the paper is organized as follows. Section 2 describes our data and their sources, including the information we collected on central bank governor appointments. Section 3 discusses how governor appointments relate to de jure CBI. Section 4 explores whether governor appointments relate to de facto CBI. Section 5 studies the relation between de jure or de facto CBI and inflation and financial stability outcomes. Section 6 summarizes our findings and discusses their implications. The Online Appendix contains additional information and results.

2 Data Description

2.1 Governor appointments

To assess whether a central bank governor appointment was politically motivated, we collect systematic biographical information, international press coverage, as well as independent expert opinions for each governor appointment in our sample. We are able to obtain this information for 316 governors' appointments in 57 countries between January 1985 and January 2020, which form our primary sample of analysis.[7] In what follows, we provide a detailed description of each of these three main data sources and how we combined them into an index that characterizes each central bank governor appointment.

Biographical information We use hand-collected information about (1) "ties" with the executive, (2) succession, (3) education, and (4) professional experience. In particular, we begin by assessing whether the appointed governor has any ties with the executive branch of government through prior employment, political ideology, or family link. We account for employment ties by investigating whether the appointed governor's most recent employment was in the executive

[7] Our initial set of countries was taken from Dreher, Sturm, and De Haan (2008, 2010). In the Online Appendix A, we report the sample countries, governor names and appointment dates.

branch of the government. A typical example is a minister in office moving to the central bank governor position.[8] For ideological ties, we examine whether the new governor's ideology aligns with the ruling party or coalition. In particular, we collect information about any political affiliation of the governor or publicly-known partisan relationship or friendship. Then, we check whether such ideological ties (if any) align with the ones of the ruling party or coalition.[9] We also track family relations between the appointee and any member of the ruling party or coalition.[10] The data are compiled and cross-checked from various sources, including central bank reports and websites of central banks, the government, and the press. When we observe discrepancies, we always side with the most official or reputable sources. We find that ideological ties are the most common at 45%, followed by employment ties at 27%, and family links at 3%.[11] As can be observed in Table 1, 44% of appointees have no ties with the executive with respect to any of these dimensions. In the construction of our index, we classify such appointments as not politically motivated based on the "executive ties" criterion.

In a similar way, we also compiled information about the nature of succession and in particular whether the appointed governor was not the "natural" successor for the position (e.g., deputy governor), whether the predecessor was forced to resign prior the end of term or was not re-appointed despite being eligible and willing to continue.[12] We find that in about 70% of the cases the appointee is not the natural successor and often the predecessor was forced to resign (37%) or was not reappointed despite being eligible and willing to continue (60%). For

[8]For example, Leszek Balcerowicz became chairman of the National Bank of Poland in 2001, while he was deputy prime minister. Similarly, in Greece Yannis Stournaras was the minister of finance (July 2012 to June 2014) and left the post, following a cabinet reshuffling, to take up the central bank governor post at the Bank of Greece.

[9]In France, for example, Francois Villeroy de Galhau was nominated governor of the Banque de France in 2015 under the presidency of Francois Hollande (socialist party). During his career in the public sector, Villeroy de Galhau served as cabinet member or advisor of socialist ministers. In Belgium, the political leaning of most central bank governors is usually public knowledge (e.g., Alfons Verplaetse, christian democrat; Guy Quaden, socialist; Luc Coene, conservative liberal; Jan Smets, christian democrat; Pierre Wunsch, liberal).

[10]For example, Miguel Angel Fernandez Ordonez was appointed governor of the Bank of Spain in July 2006. At this time, his wife (Ines Alberdi) was deputy for the Spanish social democratic party (Partido Socialista Obrero Espanol) in the Madrid Assembly.

[11]In the Online Appendix A, we provide descriptive statistics for characteristics under each criterion.

[12]For example, in 2016 Raghuram Rajan announced that he would not be staying for a second term as governor of the Reserve Bank of India (RBI) after he had previously expressed interest in staying for a second term. In a letter to colleagues, he implied that this decision was driven by the preferences of prime minister Narendra Modi's government. Despite restoring India's standing in international markets, Rajan's tenure at the central bank drew criticism from frustrated conservatives and small business owners eager for deep interest rate cuts (see, e.g., Ellen Barry, "Raghuram Rajan Says He'll Step Down as Head of India's Central Bank", *The New York Times*, June 18, 2016. Urjit Patel who succeeded him as governor of the RBI, resigned abruptly prior to the end of his term. *The Economist*, in its December 15, 2018 edition, reports: "Urjit Patel, ... has been replaced by Shaktikanta Das, a career civil servant who is thought to be an ally of Narendra Modi, the prime minister."

13% of appointments neither of these is true and we classify these as not politically-motivated appointments based on the "succession" criterion (see Table 1).

To assess the formal qualifications of the appointed governor we also collected data on education (i.e., whether the appointee has a PhD or post-graduate degree in economics or related studies) and professional experience (e.g., top-level positions in economics or finance areas at a central bank, government, international organization, university or the private sector). According to Romer and Romer (2004), such qualifications are important as central bank governor positions require a sound understanding of the economy.[13] We thus view the lack of any of these qualifications as a sign of politically-motivated appointments. Our primary source for professional experience is the database assembled by Mishra and Reshef (2019), which we supplement and extend from various online sources (e.g., central bank websites, biographies, curriculum vitas, press). We find that about 45% of appointees have a PhD degree in economics or finance and about 77% have significant professional experience in at least two top-level positions (see Table 1). In the construction of our index, we classify these appointments as not politically-motivated based on the "education" and "experience" criteria, respectively.

International press We also record whether the international press perceived an appointment as politically-motivated (i.e., whether it was received as an attempt to weaken the de facto independence of the central bank). Using Factiva, we search the digital archives of all major English-speaking newspapers in the three months surrounding each governor appointment to obtain articles that contain the last name of the governor and the terms "appointment" or "central banker" (including variants and synonyms such as "appointed", "central bank", "nomination", "chairman", "governor"). To meet our criteria, an article must contain words pertaining to appointment and central bank governor. After collecting all articles that appear related, we proceed with human readings.[14] We first read all articles and drop the ones that do not directly relate to the appointment event. We then carefully read the remaining articles and underscore any passages of the text indicating or suggesting that the appointment was driven by political

[13] Prior literature also finds that governors' professional experience and characteristics correlate with their policy-making. Chappell Jr, Havrilesky, and McGregor (1995) and Malmendier, Nagel, and Yan (2021) provide U.S. evidence and Göhlmann and Vaubel (2007) and Mishra and Reshef (2019) cross-country evidence.

[14] To maximize the quality of the Factiva search, two persons independently collected the press articles and releases that appear related to the appointment of each governor in our sample. The results of the two searches were compared by a third person and were supplemented wherever required.

motivations in an attempt to compromise the central bank independence.

One potential concern is that press coverage and views may be biased. For example, English-speaking newspapers may devote a disproportionate attention to large economies, coverage may be better in more recent years, and different press outlets may themselves adopt their own biased or partisan views. However, although a "non-political" appointment in a small economy may be less likely to receive coverage by the international press, the reverse is probably not true when salient political motivations underlie an appointment (i.e., even in small countries, the press is often more likely to cover a politically-motivated appointment rather than non-controversial appointments).[15] To partly mitigate coverage concerns, we do not impose a minimum count threshold of articles that are suggestive of political motives in order to flag an appointment as politically-motivated based on this metric. There could be only a handful of articles, but also dozens or hundreds of articles. To further mitigate concerns about biased views we rely on human judgement to determine the overall tone of the international press. This allows us to discard biased views of some (often less reputable) newspapers. We find that 63% of appointments are not politically-motivated based on the "press" criterion (see Table 1).

Concerns, however, remain as this process and the press views are clearly subjective. In the last part of our empirical analysis, we thus assess the informational content of this criterion (and all other criteria that comprise our index) by studying whether they correlate with ex post measures of de facto CBI. This includes measures used in the extant literature, such as governor dismissal prior to the end of term, as well as information we collect from our experts about the appointed governors' tenure while in office (we discuss the latter below). All else equal, we expect that if our criteria and index are not based on noise, they will correlate with measures of ex post de facto independence (i.e., countries where appointments are more likely to be politically motivated are also the ones where de facto independence is often compromised ex post).

[15] To give an example, Czech Republic is a country that typically does not receive much international coverage when a governor is appointed (only a handful of articles). However, the appointment of Zdenek Tuma in December 2000 generated a large number of articles (we identified more than 160 press articles and releases) because political disputes accompanied the nomination. *The Financial Times* (December 1, 2000) reports: "The government is fuming that the president [Mr Havel] ignored its recommendations [...]. Instead Mr Havel took advantage of the resignation of Josef Tosovsky, governor since 1990, to install his own candidate." The article goes on to emphasize: "Mr Tuma, 40, [...] is identified with the president's allies in the Four Party Coalition in parliament and the Lipa business lobby."

Independent experts Using a survey, we also collect information on the perceptions of independent academic experts about the appointment and the tenure of each governor in their respective countries of origin. We select academics specialized in macroeconomics or finance. For both fields, we identify, as much as possible, academics with expertise and interests in central banking and monetary economics. We primarily rely on the RePEc database to draw the list of academic experts, complemented by the lists of NBER and CEPR affiliates as well as affiliates from national research and policy institutions. For each country, we obtain the email address of academics specialized in those fields that are based either at leading Anglo-Saxon or national universities, national research institutes, or policy institutions. The resulting list of academics represents a blend of experts with and without "orthodox" views or Anglo-Saxon training. We exclude academics and researchers with a central bank employment contract (Fabo et al., 2021). We contacted 587 academics in total (on average 10 per country) and assured all participants that responses will only be used for an aggregate analysis and individual responses will remain confidential at all times. We sent out the initial invitation on February 7, 2020; three reminders followed approximately every two weeks thereafter. We received a total of 289 responses (between 3 to 8 per country), representing a response rate of 49.2%.[16]

The survey contained two questions related to each governor's appointment and tenure. The first question (*"In your opinion, at the time of the appointment, was [Governor's name] a politically independent central bank governor?"*) aims to assess whether at the time of appointment they perceived the appointment as politically-motivated. The second question (*"In your opinion, with the benefit of hindsight, was [Governor's name] a politically independent central bank governor?"*) aims to capture whether the governor was perceived as independent based on his or her tenure. As mentioned above, we use this second question to complement the governor turnover measure as a proxy for de facto central bank independence, based on ex post information.

For both questions, experts must answer either "yes", "no", or "I do not know", and were also given the option to give a comment on each appointment. To quantify the results of the survey, accounting for divergence of opinions and the different numbers of responses, we use the standard balance statistic (Pesaran and Weale, 2006).[17] We impose a minimum of three answers

[16] The 289 responses include 22 partial responses. The response rate is similar to Blinder, Ehrmann, De Haan, and Jansen (2017), who in 2016 surveyed academics about the practice of monetary policy in several countries.

[17] Nardo (2003), Pesaran and Weale (2006), and Greenwood and Shleifer (2014), among others, favor the

for each appointment. For each governor, we calculate the balance statistic as the share of the number of "yes" minus the number of "no" divided by the total responses. This yields a measure for every governor that varies by construction between -1 and 1, representing the opinion of the majority of respondents. "I do not know" answers are not treated as missing values, but take the (neutral) value of 0 and are counted as part of the total number of responses per governor. Hence, the higher number of "I do not know" per governor, the closer the value to zero. If the balance statistic has a value above 0, we classify that appointment as politically independent according to the experts' opinions. As can be observed in Table 1, 61% (58%) of governors were perceived by the experts as independent at the time of appointment (based on their tenure).

Governor independence index To characterize each appointment, we combine the six criteria—executive ties, succession, education, experience, press, and experts—into an overall index, which we refer to as the governor independence (GI) index, as follows:

$$\text{GI}_{i,t} = \frac{1}{n}\sum_{j=1}^{n} C_{i,t}^{j}, \tag{1}$$

where $C_{i,t}^{j}$ equals 1 if the appointment of governor i at time t is viewed as independent of political motives according to criterion j, and equals 0 otherwise. The subscript j can be $1, 2, \ldots, n$ with $n = 6$. For example, for $j = 1$ our first criterion is a dummy variable that equals 1 if the appointed governor does not have any executive ties (i.e., through past employment, ideology, or family links), and equals 0 otherwise. The overall index, $\text{GI}_{i,t}$, takes values between 0 and 1, with higher values indicating higher independence. The average value of the GI index is 0.499, with a standard deviation of 0.252 (see Table 1). The index is available for 257 out of the 316 governors in the sample as the information for the various criteria is sometimes missing for a different set of observations.[18]

2.2 De Jure CBI and other country characteristics

To measure de jure CBI we rely on indexes from the extant central banking literature. We use three such indexes: (1) Cukierman et al. (1992) (henceforth CWN); (2) Grilli et al. (1991)

"balance statistic" approach to generate quantitative measures from categorical survey data.

[18] In the Online Appendix B, we provide a visual representation of each criterion of the GI index.

(henceforth GMT); and (3) Romelli (2022) (henceforth ROM).

Each of these indexes covers many different aspects of central banks' institutional design (e.g., procedures for the appointment and dismissal of central bank governors and the central bank board, central bank policy objectives, independence in setting monetary policy, restrictions for lending to the government). The most recent index, ROM, extends the CWN and GMT indexes by covering two additional important dimensions, "financial independence" and "accountability", and adds time-variation.[19] Data for all three indexes are taken from Romelli (2022) who extends the CWN and GMT indexes until 2017, and introduces time-variation. We use this time-variation to identify the timing of the different legislative reforms introduced in each country to strengthen the institutional independence of its central bank.

For our empirical analysis, we rely on the ROM index as our baseline measure (extrapolated until 2020) and verify the robustness of our main results for the CWN and GMT indexes. All indexes take values between 0 (no independence) and 1 (fully independent). Table 1 also reports descriptive statistics for each de jure CBI index. The average value of ROM is 0.623, with values ranging from 0.136 to 0.929, indicating that de jure independence varies widely in our sample. Descriptive statistics for CWN and GMT are similar. The three indexes are also highly correlated, with pairwise correlations (untabulated) ranging between 0.87 and 0.92.

We complement the data on the institutional design of central banks with data on other country characteristics from various sources. For example, data on the broader quality of institutions in each country, such as "democratic accountability", "law and order", and "government stability", are taken from the International Country Risk Guide's (ICRG) database. As observed in Table 1, the broader quality of institutions varies significantly in the sample.[20]

Next, in Figure 1 we report the average difference ("gap") between the ROM index and the GI index for each country, along with the average values of the two respective indexes. The red bars indicate the average gap between the two indexes. Positive gaps (red bars above zero) are countries that based on the de jure index the central bank enjoys high degree of independence, while according to the GI index de facto independence is likely lower. The opposite is true

[19] Romelli (2022) provides in his Online Appendix a detailed description of all criteria and coding rules.

[20] The sample mean (standard deviation) for these indexes are 4.755 (1.293), 4.060 (1.528), and 7.134 (1.797), respectively. To put these values in perspective, the mean values for the United States are 6.0, 5.3, and 7.3, respectively.

for countries with negative gaps. Countries are sorted with respect to the size of the gap. The countries with the largest positive gaps are Bolivia and Venezuela, followed by Austria, Lithuania, Luxembourg, Cyprus, China, Romania, and Bulgaria. The countries with the largest negative gaps are the United Kingdom and Australia and Switzerland. Other countries with negative include the Japan, Italy Canada, and the United States.

3 Governor Appointments and De Jure CBI

3.1 Main results

The original motivation for granting central bank independence was to insulate central banks from political interference. If such reforms are effective, we would expect that appointments at the top position would become—and perceived to be—more politically independent as de jure CBI increases. After all, such reforms include, among other things, provisions aiming to safeguard both the appointment and the tenure of the central bank governor from political interference. This narrative predicts a positive correlation between the GI index and measures of de jure CBI. If, instead, politicians find other ways to retain control, we would expect no correlation, or even a negative correlation between the GI index and de jure CBI indexes.

The lack of unconditional correlation between the GI index and de jure CBI in Figures 2 and Table 2, suggests this second narrative fits the data better. In Figure 2, for example, we observe that while the de jure CBI indexes increase markedly after 1997 when many countries began granting more independence to their central banks, the GI index remains at around the same level and even decreases slightly until the Global Financial Crisis when it shows a temporary moderate increase. Further in Table 2, we find that the GI index and all of its components (except for education) do not enjoy strong correlations with the de jure CBI indexes, both economically and statistically. Based on these results, it does not appear that more independent governors are appointed as de jure CBI increases. As can be observed in Table 2, however, other country characteristics also correlate with both de jure CBI and the GI index. Hence, to examine this relation more formally we rely on within-country variation using the following baseline model:

$$\text{GI}_{i,k,t} = \beta \text{de jure CBI}_{i,t} + \gamma X_{i,t}^{'} + \alpha_i + \mu_t + \epsilon_{i,k,t}, \tag{2}$$

where $GI_{i,k,t}$ indicates whether the appointment in country i of governor k at time t was (perceived as) politically independent, based on the GI index or each of its six components separately. As mentioned earlier, higher GI values indicate more independent appointments. The variable, de jure $CBI_{i,t}$, measures the institutional independence of the central bank in country i at time t, as constructed by the existing indexes in the literature such as ROM, CWN, and GMT, and $X'_{i,t}$ includes other country characteristics reflecting the broader quality of institutions in a country such as democratic accountability, law and order, and government stability.[21] Importantly, in the most saturated specifications, the model includes country-fixed effects, α_i, which help to further absorb any unobserved time-invariant country characteristics not captured by the institutional controls. The coefficient of interest, β, is thus identified using within-country variation. We also include decade-fixed effects, μ_t, to further control for aggregate time trends, common across countries. The model is estimated at the governor appointment level with ordinary least squares (OLS). Standard errors are corrected for heteroskedasticity and are clustered at the country level.

The results are displayed in Table 3. We report results using ROM as our baseline de jure CBI indicator.[22] We begin in column (1) with a specification without any controls. Consistent with results in Table 2, we find that β is statistically insignificant and economically very close to zero. The point estimate is -0.031 indicating no discernible relationship between the GI index and de jure CBI. In column (2), we control for other institutional country characteristics. The coefficient of interest, β, remains virtually unchanged. Among the various control variables, democratic accountability has a positive and statistically significant coefficient, indicating that in countries where there are free and fair elections and governments are responsive to their people, central bank governor appointments are more independent. In column (3), we further include country-fixed effects, meaning that the coefficients are identified using within-country variation. The coefficient of interest, β, is economically somewhat larger (0.097), but is not statistically significant. Including decade-fixed effects in column (4) leaves these results unchanged.[23]

Further in columns (5)-(10) of Table 3, we also open up the GI index into its six components. This allows us to assess the relation between de jure CBI and each of the criteria that make up the overall GI index. This is important as the choice of the various criteria is ultimately

[21] All variable definitions and sources can be found in the Online Appendix C.
[22] In the Online Appendix D, we show that the results are robust to using CWN or GMT.
[23] In the Online Appendix E, we also report the estimated β for each country separately.

subjective and the various components, though positively related, capture different dimensions.[24] Importantly, we find again no systematic relationship with respect to any criterion.

Next, in Table 4, we estimate a similar specification to Eqn. 2 where we replace the overall de jure CBI index with its first component (i.e., the first component of ROM), which refers to institutional provisions aiming to increase personal independence by insulating the appointment, tenure, and dismissal of governors and their boards from political interference. If central bank institutional reforms are effective in reducing political appointments, we should at least observe a positive relation between the GI index and ROM governance (i.e., the first component of ROM). As can be observed in column (1), there is no such relation. The point estimate is statistically insignificant and economically very close to zero (0.002). For completeness, in the remaining columns of Table 4, we report results of corresponding specifications for each component of ROM. We find again no systematic relation between GI and each component, both individually (columns (2)-(6)) and jointly (column (7)). Our results thus far do not support the idea that central bank governor appointments become, or are perceived to be, more independent as countries pass reforms to insulate their central banks and their agents from political interference.

In fact, one could argue that politicians' incentives to appoint governors who are less likely to act independently may become stronger when the decision-making individuals are insulated from external pressure. As Aklin and Kern (2021) point out "CBI solves the time inconsistency problem faced by policy-makers with respect to monetary policy. However, it does not solve their underlying incentives to manipulate the economy for political gains [...]". To retain control, politicians' incentives to "undo" independence through political appointments may become stronger when a central bank and its agents become more independent (Adolph, 2013).

To test this second hypothesis more directly, we examine how the within-country relationship between GI and ROM governance changes after a central bank is granted policy independence

[24] As can be observed in Table 2 the pairwise correlations between the GI index and each of its six components are often positive and statistically significant, but never near 1 indicating that each component reflects different sources of information. "Executive ties" has the largest positive correlation with "press". The presence of executive ties may be an important factor behind the press' views.

by estimating the following specification:

$$\begin{aligned} \text{GI}_{i,k,t} = \beta_1 \text{ROM governance}_{i,t} + \beta_2 \text{ROM governance}_{i,t} \times \text{Main policy reform}_{i,t} \\ + \beta_3 \text{Main policy reform}_{i,t} + \gamma X_{i,t}^{'} + \alpha_i + \mu_t + \epsilon_{i,k,t}, \end{aligned} \tag{3}$$

where the variable, ROM governance$_{i,t}$, captures the first component of the ROM index. The variable, Main policy reform$_{i,t}$, is set equal to 1 after the first main legislative reform that granted the central bank in country i policy independence, and it is set equal to 0 otherwise. For the United Kingdom, for example, the variable, Main policy reform$_{i,t}$, equals 1 from 1998 onward, when the Bank of England was given policy independence in maintaining price stability.[25] A positive β_1 indicates that prior to policy independence, reforms aiming to improve the appointment and tenure of the governor and its board are also reflected in more independent governor appointments. A negative β_2 instead indicates that after a central bank is granted independence the relation weakens or even reverses if the combined coefficient, $\beta_1 + \beta_2$, becomes negative and statistically significant, consistent with our hypothesis. The other variables and parameters in Eqn. 3 are the same as in Eqn. 2.

The results are reported in Table 5. In column (1), we estimate a specification for the overall GI index. We find that β_1 is close to zero (0.051) and statistically insignificant, while β_2 is strongly negative (-1.074) and statistically significant. The combined coefficient is negative and statistically significant, indicating that as countries reform their central banks to safeguard their governors and their boards from political interference, governor appointments become less independent if the central bank enjoys independence in setting policy.

In the remaining part of Table 5, we open up the GI index into its six components. We find that the negative relation holds with respect to all criteria, except for "press" and "succession". For "press" we find no significant relation between GI and ROM governance, both before and after the policy independence. For "succession" we find that the opposite is true: β_2 is positive and statistically significant, indicating that restrictions in the dismissal of governors, which are encompassed in ROM governance, are effective in limiting "abnormal" successions in policy-independent central banks. However, as our results with respect to other dimensions of GI show,

[25] In the Online Appendix D, we report the corresponding year for each central bank in the sample.

politicians find other ways to sidestep these restrictions and limit the overall independence of appointed governors.

3.2 Additional results

Even though the variable, Main policy reform, in Table 5 is defined with respect to the timing of policy independence, this analysis should not be interpreted narrowly as referring solely to policy independence, but rather as reflective of a broader increase in de jure independence. Often when central banks are given independence in setting monetary policy, other institutional reforms are also introduced to protect and support the central bank in its policy objectives (Romelli, 2022). As these broader reforms correlate and interact with policy independence, it is virtually impossible to attribute the results to one specific reform. A broader interpretation is thus more appropriate. In Table 6 we report corresponding analysis using alternative definitions of the variable, Main policy reform, based on the timing of other related reforms. While using these alternative definitions cannot help to attribute the results to any specific reform, they can help uncover which other reforms yield similar results (i.e., contain similar explanatory power) and thus are potentially important.

We consider four additional main reforms that are typically thought to support central bank independence included in ROM. The first relates to whether the central bank's mandate includes clearly specified "policy objectives". The second refers to limits in "lending to the government". The third includes provisions to safeguard "financial independence" (e.g., conditions for the determination of the central bank's budget and the distribution of central bank profits or losses to the government). Prior literature finds that the lack of financial independence may compromise central banks' de facto independence and influence their monetary policy decisions and inflation outcomes (e.g., Goncharov et al., 2021). The fourth relates to provisions aiming to increase central bank "accountability" (e.g., regular reporting of policy targets and attainment, disclosure of audited financial statements that follow international accounting standards). To avoid multicollinearity, we consider each of these additional reforms separately. For each of these four main reforms, we construct a dummy variable defined similarly to the variable, Main policy reform$_{i,t}$, in Eqn. 3.[26] As observed in Table 6, we find that the main reforms related to policy objectives

[26] In the Online Appendix C, we provide the definitions of these dummy variables and, in the Online Appendix

and lending to the government have no explanatory power, while the main reforms related to financial independence, and to a lesser degree accountability, yield results similar to Table 5.

In addition, we study whether specific circumstances strengthen the relation between GI and ROM indexes. In particular, we examine situations where a country comes under external pressure to grant more independence to its central bank—that is, situations where the divergence between both indexes should be theoretically lower. Using similar specifications, we consider two forms of such external pressures: EU accession and IMF conditionality for financial assistance. For EU accession, we replace the dummy variable, Main policy reform$_{i,t}$, with a dummy variable equal to 1 starting from five years before a country joins the EU to capture the preparation process, and equals 0 otherwise. For IMF conditionality, we replace the dummy variable, Main policy reform$_{i,t}$, with a dummy variable equal to 1 when a country is under an IMF assistance program, and equal to 0 otherwise. As can be observed in Table 7, we find that greater de jure independence correlates positively with more independent appointments only when countries are subject to external pressures. The fact we observe significant associations between the GI and ROM indexes around external-pressure events further suggest that measurement error is not responsible for the lack of correlation between our GI index and de jure CBI documented previously.

Overall, our results show that central bank governor appointments do not become more independent as countries increase the central bank's institutional independence, even when the institutional reforms aim precisely to insulate the appointment process and the tenure of central bank governors from political interference. On the contrary, we find that the relation between independent governor appointments and institutional reforms that insulate the governor from political interference becomes strongly negative as central banks are given more policy or financial independence and their operations become more transparent. This is instead not the case when local politicians are constrained by external pressures from the EU or the IMF. In the next section, we explore measurement error issues.

D, we report the relevant year in each country for each set of additional reforms.

4 Measurement Error Concerns

4.1 Survey information

A potential concern with the above results is that the GI index has little informational content, which may explain our inability to observe a strong positive relation with de jure CBI indexes. To address this measurement error concern, we first conduct an exercise exploiting the questionnaire we sent to independent experts. While the first question is related to the appointment event itself, the second question enquires whether ex-post (i.e., with the benefit of hindsight) the governor acted in a politically independent way while in office. We create a variable based on this second question. We use the balance statistics approach described earlier to construct a variable capturing the categorical responses of experts for each country (see the Online Appendix C for the exact variable definition). Then we examine whether this variable, which we refer to as Experts (hindsight), correlates with our GI index and its components. If the GI index is informative about the de facto independence of central bank governors, then it should positively correlate with this variable, Experts (hindsight).

We thus regress the Experts (hindsight) variable on the GI index.[27] The results are presented in Table 8. As before, we start in column (1) reporting the most parsimonious specification, without control variables and fixed effects, to end in column (4), including the full set of control variables and fixed effects. As can be seen across the columns, there is a strong and positive association between the Experts (hindsight) variable and the GI index. The higher political independence of governors (as measured by the GI index) the more the governors behave independently when serving in office (according to the perception of experts).[28] From columns (5) to (10), we use the same specification as in column (4), but we look at each component of the GI index separately. We find that its components are positive and statistically significant, except the component "succession" that fails to be statistically significant at conventional levels.

This exercise shows that the GI index and its components have informational value as they

[27] In the Online Appendix E, we present their evolution across space. It shows co-movement patterns between the GI index and the Experts (hindsight) variable for each country.

[28] This positive association may be observed because the sixth component "experts" of the GI index is constructed from the same individuals' opinion. In the Online Appendix D, we exclude the component "experts" from the construction of the GI index and run the same analysis as in columns (1)-(4) of Table 8. Our results remain unchanged.

capture well the experts' opinion about the governors' perceived independence during their term. In addition, this also implies that the GI index can be used as a measure of political independence at the time of the appointment, but also as a general proxy for de facto independence.

4.2 Governor early dismissals

We run a second exercise aiming to examine governors leaving office prior to the end of their term. A commonly used measure of de facto independence is the turnover rate of the governor, with frequent turnover presumably creating dependence (Cukierman et al., 1992; Cukierman and Webb, 1995; Crowe and Meade, 2007; Dreher et al., 2008; Artha and de Haan, 2015). An important limitation of using turnover as de facto independence is that such a measure does not inform about the reasons behind the governor's dismissal (Dreher et al., 2008). Moreover, a low turnover rate may not reflect a high level of de facto independence as a subservient governor may also stay a long time in office. Our GI index captures various reasons behind an appointment and can thus provide a unique opportunity to test whether the likelihood of dismissal reflects, on average, weakened or enhanced de facto independence. However, if no correlation is observed, then this may indicate the weak informational value of the GI index.

The most appropriate approach for estimating how the timing of dismissal is related to de jure CBI and GI index is a hazard model, which is the standard procedure for dealing with data containing duration spells (Verbeek, 2021). Since we are trying to explain when dismissal happens, we can consider the period from the beginning of a governor's term in office until dismissal as the "term duration". In our model, the hazard rate, $h_k(t)$, is the likelihood that a governor k leaves office at time t, conditional on not having left office by that time.

To model the term duration, we do not impose any structure on the baseline hazard rate, $h_0(t)$, and estimate a proportional hazard specification, such that:

$$h_k(t) = h_0(t) \exp(\beta_1 \text{de jure CBI}_{i,t} + \beta_2 \text{GI}_{i,k,t} + \gamma X_{i,t}^{'} + \alpha_i + \mu_t). \tag{4}$$

In this model, $h_k(t)$ represents the hazard, or the instantaneous risk of dismissal, at time t for governor k, conditional on survival to t; $h_0(t)$ is the baseline hazard; de jure $\text{CBI}_{i,t}$, $\text{GI}_{i,k,t}$, and $X_{i,t}^{'}$ are, as before, the set of observable time-varying explanatory variables; and α_i and μ_t

denote country- and decade-fixed effects, respectively. We use the Cox (1972) partial likelihood model, which bases estimation of β_1 and β_2 (the coefficients of interest) on the ordering of the duration spells. Because the model makes no assumptions about the baseline hazard, $h_k(t)$, the Cox partial likelihood model is referred to as a "semi-parametric" model.

Table 9 displays the results of the survival analysis.[29] Each estimate represents the partial impact of a characteristic on the probability of leaving office, holding duration constant. A positive (negative) coefficient estimate means a shorter (longer) duration because duration is inversely related to the hazard rate. In the first column, the model includes the ROM index with the control variables and fixed effects. It shows no significant relationship between the ROM index and term duration. In column (2), we estimate a similar specification with the GI index instead of the ROM index. The estimate associated with the GI index is negative and statistically significant in both specifications, indicating that the conditional likelihood of prematurely leaving office decreases when central bank governor appointments are more independent. The effect is economically meaningful as the rate of dismissal increases by 42.6% for a one standard deviation (0.252) decrease of the GI index (i.e., $\exp(1.409 \times 0.252) = 1.426$, using the point estimate from column (2)). This finding is consistent with the extant literature documenting that higher turnover is associated with lower de facto independence. In column (3), we add the ROM index in the model, which continues to be insignificant and importantly does not change our conclusion on the effect of de facto independence. In column (4), we replace the GI index with its six components. The components "succession", "experience", "press", and "experts" are, as expected, negative (though not always statistically significant). The component "executive ties" is insignificant, while "education" is positive and statically significant. Interestingly, we find, across the four models, that countries endowed with good institutions as measured by our three different control variables tend to maintain their central bank governor in office.

[29] The hazard event can take place between one to 271 months after appointment. More than 25% of governors leave office prior to the end of their term. We also provide in the Online Appendix E some simple plots of the distribution of term duration. We can see that the baseline hazard function is U-shaped, meaning that as time goes on, governors are first less likely to experience a dismissal but the likelihood reverses at they approach the end of their term. We also exhibit the Kaplan-Meier survival curve. We observe that the estimates of the survivor function decreases relatively quickly over time: the estimated likelihood of a governor surviving past 12 years is 50%.

4.3 Instrumental variable approach

As a third exercise, we use an instrumental variable strategy to further test whether measurement error is responsible for the lack of correlation between the GI index and de jure CBI indexes. We employ as instrument the regional diffusion of CBI. The adoption of CBI reforms is highly clustered both temporally and spatially consistent with the idea that adoption is the result of information spreading across neighboring countries (Simmons and Elkins, 2004; Abiad and Mody, 2005). We follow Acemoglu et al. (2019) and define our instrument as the jackknife average of CBI in a region in a given year, excluding the own-country observation.[30] The instrument should satisfy the exclusion condition because de jure CBI in other countries within the same region should not be correlated with a governor appointment in the focal country for reasons other than affecting its de jure CBI reforms. Our instrumental variable approach aims to estimate a 2SLS version of our Eqn. 2 using as instrument our measure of regional CBI diffusion. This means that we impose that, conditional on controls and fixed effects, the instrument has no direct effect on governor appointments in country i in year t.

The two-stage least squares (2SLS) results are shown in Table 10. We first note at the bottom of the table that the partial R-squared of the excluded instrument explains at least 10% of the variation in the endogenous variable, while the sizeable F-statistics for the excluded instrument safely pass the "weak instrument" test. Importantly, we then observe across columns that the 2SLS estimates yield similar conclusions as the OLS estimates from Table 3.

Overall, the three exercises in this section indicate that our main findings are not an artifact of the construction of the GI index. Rather, they provide further confidence in the set of empirical regularities we uncover in the previous section that politically-motivated appointments compromise de jure independence. We now turn to assessing their consequences.

5 Inflation and Financial Stability Outcomes

As mentioned earlier, central bank independence was the classic solution to the time inconsistency problem generating inflation bias. Empirical tests followed and confirmed this hypothesis. In

[30] We identify seven regions, namely Africa, East Asia and the Pacific, Eastern Europe and Central Asia, Western Europe and other developed countries, Latin America and the Caribbean, the Middle East and the North of Africa, and South Asia.

particular, Alesina and Summers (1993) present early evidence that more independent central banks tend to be associated with lower inflation rates. However, more recent empirical evidence fails to provide further support for this hypothesis (see, e.g., Barro, 1997; Balls, Howat, and Stansbury, 2018; Haldane, 2020). One possible reason is that the earlier Alesina and Summers (1993) finding is not robust, or disappears once central banks begin targeting inflation. Another possible explanation is that de jure CBI does not reflect de facto CBI.

The question that arises is whether our GI index is better suited to test this hypothesis of a negative association between central bank independence and inflation rates. In what follows, we revisit this hypothesis. We start in Figure 3A by replicating the original Alesina and Summers (1993) graph on the relation between the degree of de jure CBI and median inflation in 16 developed countries between 1973 and 1990. To do so, we create a panel data set at the country-year level and then take for each country the median value of the CBI and inflation measures to investigate the cross-country relationship between these measures.[31] A minor difference with Alesina and Summers (1993), given the more up to date indexes of CBI, is that we replace the Grilli et al. (1991) CBI index with the one more recently constructed by Romelli (2022).[32] We can verify that a greater degree of independence is negatively related to median inflation.

We then expand the sample period to the end of 2020 (end of our sample) for the same 16 developed countries. Using this longer sample period, the correlation between legal CBI and inflation rates switches sign and becomes positive (Figure 3B). If we further expand the sample to include all available countries in our analysis, the correlation becomes negligible at 0.044 (Figure 3C). The question is thus whether the de facto CBI index generates similar results as the de jure CBI index. In the most extended sample, we replace the ROM index with our GI index. Interestingly, we can observe in Figure 3D that the correlation between the GI index and median inflation is negative (-0.215). This negative correlation between the GI index and median inflation holds regardless of the time period we select, indicating that this relation becomes more stable when we use the GI index. Further in the Online Appendix E, we also observe a similar pattern for inflation variability, consistent with the hypothesis that inflation uncertainty falls when de facto CBI is higher.

[31] We obtain the same results if we take the mean value instead of the median.

[32] Notably, we get similar results if we use the GMT index. The GMT and ROM indexes have a correlation close to 90% but the ROM index is available until more recent years.

Next, we study the relation between inflation and central bank independence for the subsample of central banks that have explicit inflation targets. Since the beginning of the 1990s, a number of central banks have adopted inflation targeting in an attempt to reduce inflation. The idea is that inflation targeting mitigates credibility problems because central banks quantify objectives in an accountable manner (Bernanke, Laubach, Mishkin, and Posen, 1999). Therefore, as a next step, we replace the level of inflation with the inflation gap since 2000 as in Haldane (2020). We follow Goncharov et al. (2021) and create the inflation gap as the level of inflation minus the central bank's stated inflation target. In our sample, we have 25 countries with stated inflation targets. As can be observed in Figures 4A and 4B, the correlation between the ROM index and the inflation gap is negligible (-0.085), while the correlation between the GI index and the inflation gap is strongly negative (-0.587) and more pronounced than in Figure 3D. Together, these findings suggest that the lack of evidence of a negative relation between central bank independence and inflation outcomes observed in more recent periods can be attributed to the fact that legal independence does not reflect well the *actual* independence of central bankers.

Given the increasing responsibilities of central banks in the area of financial stability, we also explore whether de jure and de facto CBI relate to financial stability outcomes. The importance of independence indeed resurfaced after the Global Financial Crisis (Bernanke, 2010; Fischer, 2015), as central banks expanded more actively their responsibilities (implicit or explicit) in the area of financial stability. Governments are prone to take a lax approach to banking regulation and supervision during credit booms—at the risk of greater financial instability—in order to boost their economies and election prospects (Quintyn and Taylor, 2002; Herrera, Ordonez, and Trebesch, 2020). This argument of instability bias in regulation and supervision is analogous to the time inconsistency framework generating inflation bias.

We measure financial instability as the likelihood of experiencing financial crises—being either a banking, a currency, or an inflation crisis (data on crises are retrieved from Reinhart and Rogoff, 2011). In Figure 5B, we can see that there is a negative correlation between our GI index and financial instability. However, we do not find such a negative relation when using the ROM index (Figure 5A). In Figures 6A and 6B, we obtain even starker results if we use alternative data on banking crises from Laeven and Valencia (2013): the correlation between the GI index and banking crises is negative at -0.244, whereas the correlation with the ROM index is positive

at 0.196.

Overall, we conclude that de facto CBI, as captured by our GI index, is more strongly associated with inflation and financial stability outcomes than de jure CBI. The fragility of the negative correlation between de jure CBI and inflation suggests that low inflation and financial stability cannot be attained merely by legal (institutional) changes.

6 Conclusions

Our work adds to the literature on political economy and central banking by presenting systematic evidence on central bank governor independence in a large set of countries in the past few decades. We do not find that governor appointments become more independent as the legal framework determining the degree of central bank independence improves. Moreover, we show that governor appointments are even more political following reforms granting central banks operational independence. Further results indicate that politically-motivated governor appointments are associated with lack of de facto independence and worse inflation and financial stability outcomes. All in all, our findings suggest that governments actively seek to undo the goal of these institutional reforms by using the appointment process politically.

Central banks are indeed becoming more powerful, especially after the Global Financial Crisis and Covid Pandemic. Their objectives have expanded from inflation targeting to financial stability, and their instruments now include not just overnight bank-lending interest rates but also liquidity provisions and quantitative easing that have increased their balance sheets to historical records. Central banks have also taken over new responsibilities in banking supervision and bank resolution. Therefore, the design of the institutional architecture of a central bank is becoming an even more important issue nowadays, especially as the central bank mandate is changing to include developing policies towards climate finance, stress tests, and digital currencies.

This change has recently been described as "mission creep" by Senator Toomey and is therefore controversial. Specifically, in a recent letter to Federal Reserve Bank of San Francisco (FRSBF) President Mary Daly, Senator Toomey emphasized that extending the mission of central banks to social issues like climate change will essentially endanger the independence of central

banking in the United States.[33] The letter illustrates that the selection of a central banker who will strictly follow the central bank's mandate and will not deviate to other policies outside the central bank's mandate becomes a critical issue. Equivalently, selecting a central bank governor who may deviate from the central bank's mandate in a particular political direction can be a cause for concern for legislators worried about de jure independence.

Our results indeed illustrate that legal independence is not sufficient to guarantee that the most suitable appointment will be made, or the appointment will not to be captured by political interests (a point that Senator Toomey's letter explicitly makes). As central bank power increases, and is recognized more widely to be increasing, it is likely that political pressure or political interference can occur during a governor's appointment process, with the explicit or implicit aim to affect future central bank policy. Such interference will essentially prevent de jure central bank independence from resolving any time inconsistency problems that politicians may be facing. Moreover, our results also apply to any other institution that has de jure independence; ensuring that de jure translates to de facto independence becomes an important concern in areas beyond central banking (a judge or an independent auditor general, for example).

How can societies ensure that de facto independence is safeguarded? This is not an easy question to answer. As Tucker (2018) points out, the principal (government) making the agent (governor) appointment has incentives to appoint someone loyal to the principal rather than the mandate. This automatically creates barriers to true (as opposed to legal) central bank independence. Moreover, at the same time, this structure creates an adverse selection problem where candidates who feel strongly aligned with the central bank mandate are deterred from applying for the governor job. Our results suggest that the governor appointment process and its final outcome are extremely important in selecting a candidate who will be perceived as independent from political constraints.

Given the large amount of unelected power vested to the central bank governor, it is vital to maintain some form of accountability to elected politicians. In fact, such accountability could be a way to allay the fears of elected politicians that unelected central bank governors are a threat requiring ex ante interference in the appointment process. Therefore, not only do institutions need to be created to safeguard the attraction and appointment of the most suitable candidates,

[33] See: www.banking.senate.gov/newsroom (last accessed: February 28, 2022).

societies need to simultaneously pay attention to the accountability process. Such accountability could be in the form of formally having to inform, and explain to, parliament of developments in all areas of central bank policy (Fraccaroli, Giovannini, and Jamet, 2021; Masciandaro, Ferrara, Moschella, and Romelli, 2021). Moreover, designing central banks where decisions are made by committees (Blinder et al., 2017), rather than by one individual, could improve trust between politicians and the independent central bank. Publishing verbatim transcripts or minutes of decisions, when this is legally possible, could also address trust deficits as increased transparency may have the virtue of disciplining policy decision-making (Hansen, McMahon, and Prat, 2018).

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Table 1: Descriptive statistics

	(1)	(2)	(3)	(4)	(5)	(6)
	N	Mean	SD	Min	Median	Max
Panel A: Governor appointments and GI Index						
Executive ties	292	0.442	0.497	0.000	0.000	1.000
Succession	296	0.132	0.339	0.000	0.000	1.000
Education	307	0.450	0.498	0.000	0.000	1.000
Experience	297	0.778	0.416	0.000	1.000	1.000
Press	316	0.630	0.484	0.000	1.000	1.000
Experts	293	0.611	0.488	0.000	1.000	1.000
GI index	257	0.499	0.252	0.000	0.500	1.000
Panel B: De jure CBI Index						
ROM index	292	0.623	0.197	0.146	0.617	0.929
CWN index	292	0.629	0.253	0.136	0.592	0.954
GMT index	292	0.591	0.253	0.063	0.625	1.000
Panel C: Other country characteristics						
Democratic accountability	291	4.755	1.293	1.000	5.000	6.000
Law and order	291	4.060	1.528	0.417	4.000	6.000
Government stability	291	7.134	1.797	1.000	7.000	11.000
EU accession	316	0.028	0.167	0.000	0.000	1.000
IMF program	309	0.010	0.098	0.000	0.000	1.000
Panel D: Expert opinions and Governor dismissals						
Experts (hindsight)	293	0.580	0.315	0.000	0.625	1.000
Dismissals	316	0.306	0.462	0.000	0.000	1.000
Sample period			Jan 1985 – Jan 2020			
Number of countries			57			
Number of governors			316			

Note: This table presents descriptive statistics for all variables used in the analysis. The Online Appendix C provides variable definitions and sources.

Table 2: Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) GI index	1									
(2) Executive ties	0.662***	1								
(3) Succession	0.376***	0.179***	1							
(4) Education	0.534***	0.136**	-0.133**	1						
(5) Experience	0.462***	0.062	0.100*	0.237***	1					
(6) Press	0.579***	0.359***	0.147**	0.017	0.002	1				
(7) Experts	0.642***	0.274***	0.131**	0.284***	0.108*	0.179***	1			
(8) ROM index	-0.024	-0.026	-0.013	0.066	0.053	-0.089	-0.085	1		
(9) Dismissals	-0.152**	-0.06	-0.120**	0.052	-0.101*	-0.172***	-0.097*	-0.089	1	
(10) Experts (hindsight)	0.607***	0.248***	0.09	0.275***	0.212***	0.315***	0.703***	-0.063	-0.220***	1
(11) Democratic accountability	0.277***	0.098*	0.105*	0.081	0.102*	0.125**	0.159***	0.215***	-0.266***	0.285***
(12) Law and order	0.231***	0.117*	0.169***	0.107*	0.077	0.066	0.135**	0.016	-0.210***	0.211***
(13) Government stability	0.04	-0.015	0.083	0.051	0.052	0.013	-0.005	0.058	-0.139**	0.089

Note: This table presents the correlation matrix for the key variables used in the analysis. The Online Appendix C provides variable definitions and sources. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 3: Governor appointments and de jure CBI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	GI index				Executive ties	Succession	Education	Experience	Press	Experts
De jure CBI										
ROM index	-0.031	-0.046	0.097	0.126	0.330	0.115	0.070	-0.095	0.033	0.307
	[-0.291]	[-0.505]	[0.746]	[0.900]	[1.016]	[0.579]	[0.196]	[-0.382]	[0.104]	[1.008]
Other country characteristics										
Democratic accountability		0.052**	0.006	0.007	0.089*	-0.036	0.038	0.005	0.002	-0.056
		[2.559]	[0.335]	[0.369]	[1.742]	[-0.924]	[0.825]	[0.084]	[0.039]	[-1.219]
Law and order		0.018	0.027	0.028	0.018	-0.021	0.121**	0.026	0.044	-0.021
		[1.009]	[1.342]	[1.206]	[0.264]	[-0.424]	[2.088]	[0.491]	[0.839]	[-0.484]
Government stability		-0.003	-0.001	0.001	-0.019	-0.006	0.003	0.022	0.014	-0.007
		[-0.259]	[-0.123]	[0.091]	[-0.793]	[-0.346]	[0.126]	[1.020]	[0.497]	[-0.460]
Fixed effects										
Country			YES	YES	YES	YES	YES	YES	YES	YES
Decade				YES	YES	YES	YES	YES	YES	YES
Observations	239	224	223	223	223	223	223	223	223	223
R-squared	0.001	0.0870	0.415	0.416	0.343	0.468	0.359	0.259	0.389	0.534
Clustered standard errors	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country

Note: This table presents estimates of the effect of de jure CBI on governor appointments based on the model in Eqn. 2. Columns (1)-(4) report results using the GI index as dependent variable. Columns (5)-(10) report results using a component of the GI index (specified in the column label) as dependent variable. Robust standard errors are clustered at the country level. t-statistics are in brackets. The Online Appendix C provides variable definitions and sources. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 4: Governor appointments and components of de jure CBI

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:	GI index						
De jure CBI							
ROM governance	0.002						-0.024
	[0.018]						[-0.149]
ROM policy		0.220					0.239
		[1.607]					[1.101]
ROM objectives			0.118				0.075
			[1.440]				[0.502]
ROM lending				0.053			0.121
				[0.567]			[0.792]
ROM finances					-0.120		-0.294
					[-0.634]		[-1.308]
ROM accountability						0.027	-0.210
						[0.219]	[-1.077]
Other country characteristics							
Democratic accountability	0.008	0.006	0.006	0.008	0.010	0.008	0.013
	[0.431]	[0.340]	[0.341]	[0.441]	[0.542]	[0.423]	[0.636]
Law and order	0.026	0.026	0.030	0.026	0.025	0.026	0.022
	[1.121]	[1.143]	[1.190]	[1.144]	[1.090]	[1.152]	[0.779]
Government stability	0.002	0.001	0.001	0.001	0.002	0.002	0.003
	[0.156]	[0.121]	[0.083]	[0.123]	[0.184]	[0.131]	[0.280]
Fixed effects							
Country	YES	YES	YES	YES	YES	YES	YES
Decade	YES	YES	YES	YES	YES	YES	YES
Observations	223	223	223	223	223	223	223
R-squared	0.414	0.420	0.421	0.415	0.415	0.414	0.429
Clustered standard errors	Country	Country	Country	Country	Country	Country	Country

Note: This table presents estimates of the effect of the components of de jure CBI on governor appointments based on the model in Eqn. 2. All columns report results using the GI index as dependent variable. Robust standard errors are clustered at the country level. t-statistics are in brackets. The Online Appendix C provides variable definitions and sources. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 5: Governor appointments, de jure CBI (governance), and main policy reforms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:	GI	Executive ties	Succession	Education	Experience	Press	Experts
De jure CBI							
ROM governance	0.051	0.444	0.075	0.247	-0.019	-0.077	0.197
	[0.395]	[1.594]	[0.508]	[0.824]	[-0.095]	[-0.265]	[0.717]
Main policy reform	0.636***	0.046	-0.482***	2.034***	0.986***	0.180	0.890
	[10.674]	[0.303]	[-4.236]	[9.161]	[5.111]	[1.091]	[1.083]
ROM governance × Main policy reform	-1.074***	-0.974***	0.883***	-3.056***	-1.518***	-0.058	-2.084*
	[-15.589]	[-5.941]	[8.228]	[-11.339]	[-6.704]	[-0.250]	[-1.886]
Other country characteristics							
Democratic accountability	0.005	0.053	-0.025	-0.012	0.005	-0.030	-0.070*
	[0.281]	[1.263]	[-0.830]	[-0.311]	[0.128]	[-0.558]	[-2.005]
Law and order	0.029	0.020	-0.019	0.117**	0.012	-0.004	-0.002
	[1.296]	[0.347]	[-0.499]	[2.472]	[0.251]	[-0.080]	[-0.050]
Government stability	0.003	-0.013	-0.005	0.016	0.023	0.004	0.009
	[0.269]	[-0.549]	[-0.352]	[0.658]	[1.145]	[0.176]	[0.746]
Fixed effects							
Country	YES	YES	YES	YES	YES	YES	YES
Decade	YES	YES	YES	YES	YES	YES	YES
Observations	223	250	255	265	260	270	248
R-squared	0.421	0.353	0.467	0.313	0.275	0.381	0.511
Clustered standard errors	Country	Country	Country	Country	Country	Country	Country

Note: This table presents estimates of the effect of de jure CBI (governance component) following main policy reforms on governor appointments based on the model in Eqn. 3. Column (1) report results using the GI index as dependent variable. Columns (2)-(7) report results using a component of the GI index (specified in the column label) as dependent variable. Robust standard errors are clustered at the country level. t-statistics are in brackets. The Online Appendix C provides variable definitions and sources. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 6: Governor appointments, de jure CBI (governance), and main legislative reforms

	(1)	(2)	(3)	(4)
Dependent variable:	GI index			
De jure CBI				
ROM governance	-0.027	0.036	0.076	0.046
	[-0.228]	[0.287]	[0.603]	[0.372]
Main objectives reform	-0.395			
	[-1.547]			
ROM governance × Main objectives reform	0.401			
	[1.099]			
Main lending reform		0.176		
		[0.851]		
ROM governance × Main lending reform		-0.289		
		[-1.173]		
Main finances reform			0.270***	
			[4.717]	
ROM governance × Main finances reform			-0.700***	
			[-5.698]	
Main accountability reform				0.258
				[1.395]
ROM governance × Main accountability reform				-0.400*
				[-1.809]
Other country characteristics				
Democratic accountability	0.005	0.009	0.005	0.011
	[0.260]	[0.405]	[0.281]	[0.516]
Law and order	0.039	0.024	0.029	0.023
	[1.518]	[0.972]	[1.328]	[0.977]
Government stability	0.005	0.002	0.004	0.002
	[0.363]	[0.194]	[0.297]	[0.177]
Fixed effects				
Country	YES	YES	YES	YES
Decade	YES	YES	YES	YES
Observations	222	223	223	223
R-squared	0.428	0.416	0.423	0.417
Clustered standard errors	Country	Country	Country	Country

Note: This table presents estimates of the effect of de jure CBI (governance component) following main legisltaive reforms on governor appointments based on the model in Eqn. 3. All columns report results using the GI index as dependent variable. Robust standard errors are clustered at the country level. t-statistics are in brackets. The Online Appendix C provides variable definitions and sources. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 7: Governor appointments under external pressure

	(1)	(2)
Dependent variable:	GI index	
De jure CBI		
ROM index	0.090	0.164
	[0.570]	[1.195]
EU accession	-0.366	
	[-1.353]	
ROM index × EU accession	0.736*	
	[1.891]	
IMF program		-0.288
		[-1.460]
ROM index × IMF program		0.785***
		[3.126]
Other country characteristics		
Democratic accountability	0.002	0.007
	[0.117]	[0.373]
Law and order	0.036	0.025
	[1.494]	[1.005]
Government stability	-0.001	-0.003
	[-0.065]	[-0.306]
Fixed effects		
Country	YES	YES
Decade	YES	YES
Observations	223	218
R-squared	0.431	0.432
Clustered standard errors	Country	Country

Note: This table presents estimates of the effect of de jure CBI when there are external inducements on governor appointments based on a version of the model in Eqn. 3. All columns report results using the GI index as dependent variable. Robust standard errors are clustered at the country level. t-statistics are in brackets. The Online Appendix C provides variable definitions and sources. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 8: Experts' hindsight opinion and governor appointments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	Experts (hindsight)									
Governor appointments										
GI index	0.782***	0.747***	0.617***	0.618***						
	[10.703]	[11.211]	[8.199]	[7.977]						
Executive ties					0.171***					
					[4.853]					
Succession						0.033				
						[0.782]				
Education							0.130**			
							[2.606]			
Experience								0.115**		
								[2.398]		
Press									0.139***	
									[3.406]	
Experts										0.457***
										[12.255]
Other country characteristics										
Democratic accountability		0.041	0.015	0.014	0.007	0.005	-0.003	-0.002	0.004	0.008
		[1.444]	[0.645]	[0.459]	[0.233]	[0.190]	[-0.094]	[-0.065]	[0.140]	[0.522]
Law and order		0.001	-0.009	-0.015	-0.002	0.015	-0.019	-0.008	-0.011	0.013
		[0.052]	[-0.523]	[-0.652]	[-0.085]	[0.635]	[-0.691]	[-0.327]	[-0.418]	[0.748]
Government stability		0.004	0.009	-0.001	-0.001	0.003	-0.004	-0.004	-0.001	0.002
		[0.269]	[0.806]	[-0.101]	[-0.113]	[0.331]	[-0.411]	[-0.421]	[-0.080]	[0.187]
Fixed effects										
Country			YES	YES	YES	YES	YES	YES	YES	YES
Decade				YES	YES	YES	YES	YES	YES	YES
Observations	258	242	240	240	248	252	262	256	269	269
R-squared	0.366	0.411	0.682	0.690	0.599	0.552	0.528	0.521	0.527	0.742
Clustered standard errors	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country

Note: This table presents estimates of the effect of governor appointments on experts' hindsight opinion based on a version of the model in Eqn. 2. All columns report results using Experts (hindsight) as dependent variable. Robust standard errors are clustered at the country level. t-statistics are in brackets. The Online Appendix C provides variable definitions and sources. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 9: Survival analysis

	(1)	(2)	(3)	(4)
De jure CBI				
ROM index	-0.969		-1.104	-1.483
	[-1.495]		[-1.131]	[-1.503]
Governor appointments				
GI index		-1.445***	-1.643***	
		[-3.194]	[-3.335]	
Executive ties				0.356
				[1.033]
Succession				-0.321
				[-0.690]
Education				0.707*
				[1.928]
Experience				-0.971***
				[-3.403]
Press				-0.570*
				[-1.766]
Experts				-0.913**
				[-2.325]
Other country characteristics				
Democratic accountability	-0.198	-0.231**	-0.178	-0.192
	[-1.460]	[-1.985]	[-1.219]	[-1.247]
Law and order	-0.234**	-0.214*	-0.270**	-0.308**
	[-2.131]	[-1.879]	[-2.134]	[-2.548]
Government stability	-0.147**	-0.213**	-0.226**	-0.245**
	[-2.007]	[-2.384]	[-2.255]	[-2.257]
Fixed Effects				
Country	YES	YES	YES	YES
Decade	YES	YES	YES	YES
Observations	271	241	224	241
Dismissals	74	64	55	64
Clustered standard errors	Country	Country	Country	Country

Note: This table presents estimates based on the proportional hazard model in Eqn. 4 using the Cox (1972) partial likelihood function. In all columns, the coefficients measure the partial impact of each variable on the likelihood a governor leaves office, conditional on duration. Robust standard errors are clustered at the country level. t-statistics are in brackets. The Online Appendix C provides variable definitions and sources. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table 10: Governor appointments and de jure CBI: IV estimates

Panel A: 2SLS estimates

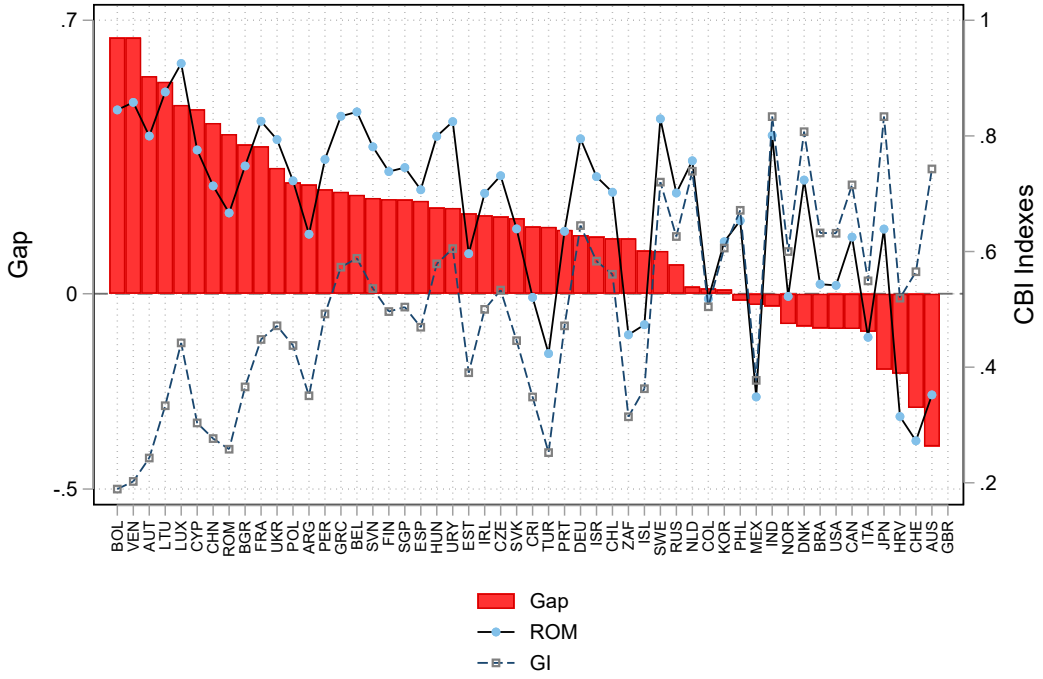
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	GI index				Executive ties	Succession	Education	Experience	Press	Experts
De jure CBI										
ROM index	0.174	-0.041	-0.033	-0.087	0.453	-0.527	-0.679	0.278	-0.556	0.506
	[0.901]	[-0.213]	[-0.151]	[-0.188]	[0.462]	[-0.860]	[-0.496]	[0.330]	[-0.572]	[0.567]
Other country characteristics										
Democratic accountability		0.052**	0.013	0.009	0.088*	-0.030	0.045	0.001	0.008	-0.058
		[2.568]	[0.658]	[0.470]	[1.755]	[-0.695]	[0.906]	[0.018]	[0.141]	[-1.302]
Law and order		0.018	0.019	0.024	0.020	-0.032	0.108	0.033	0.034	-0.018
		[1.054]	[0.851]	[1.040]	[0.313]	[-0.667]	[1.604]	[0.628]	[0.603]	[-0.422]
Government stability		-0.003	-0.000	0.002	-0.020	-0.002	0.008	0.020	0.018	-0.008
		[-0.265]	[-0.037]	[0.196]	[-0.804]	[-0.115]	[0.283]	[0.804]	[0.576]	[-0.505]
Fixed Effects										
Country			YES	YES	YES	YES	YES	YES	YES	YES
Decade				YES	YES	YES	YES	YES	YES	YES
Observations	239	224	223	223	223	223	223	223	223	223
Clustered SEs	Country	Country	Country	Country	Country	Country	Country	Country	Country	Country

Panel B: First-stage estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	ROM index				ROM index					
Instrument										
Regional CBI diffusion	0.622***	0.662***	0.649***	0.432***	0.432***	0.432***	0.432***	0.432***	0.432***	0.432***
	[5.42]	[5.69]	[6.78]	[4.36]	[4.36]	[4.36]	[4.36]	[4.36]	[4.36]	[4.36]
Partial R-squared	0.148	0.158	0.302	0.099	0.099	0.099	0.099	0.099	0.099	0.099
Excluded instruments (F-statistic)	29.418	32.355	45.944	19.043	19.043	19.043	19.043	19.043	19.043	19.043

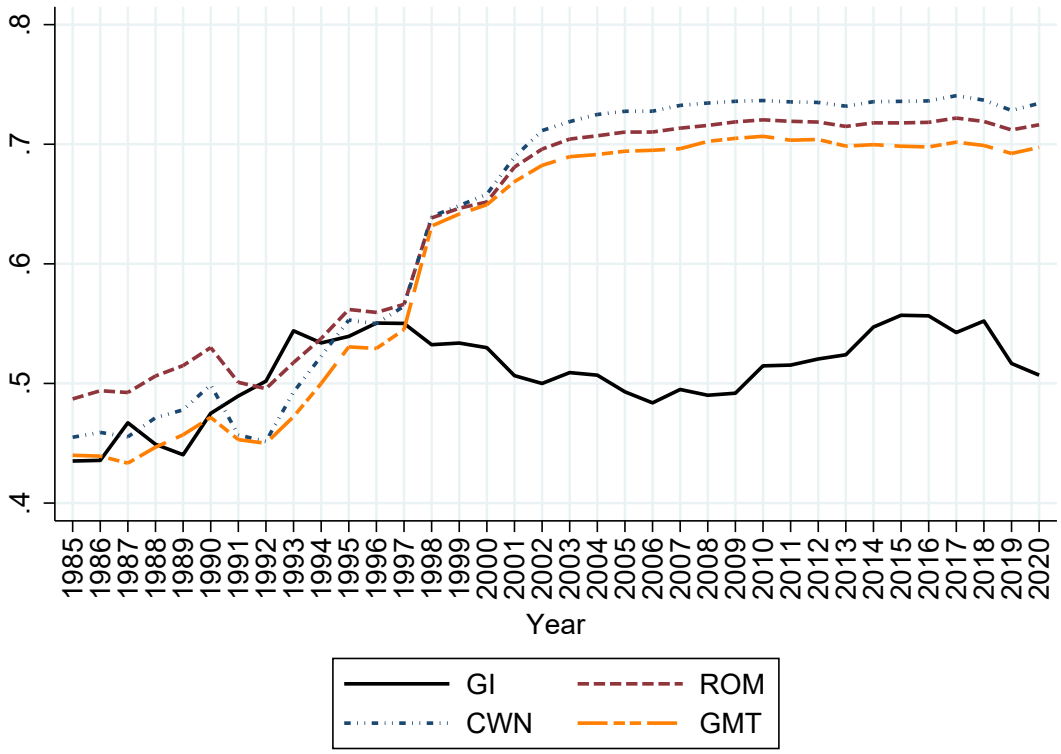
Note: This table presents 2SLS estimates of the effect of de jure CBI on governor appointments based on the model in Eqn. 2. Panel A presents 2SLS estimates instrumenting ROM index with Regional CBI diffusion. In Panel A, columns (1)-(4) report second-stage results using the GI index as dependent variable, and columns (5)-(10) report second-stage results using a component of the GI index (specified in the column label) as dependent variable. Panel B presents the corresponding first-stage results, the partial R-squared of the excluded instruments in explaining the variation in the endogenous variable, and the excluded instruments F-statistic. Robust standard errors are clustered at the country level. t-statistics are in brackets. The Online Appendix C provides variable definitions and sources. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Figure 1: GI and ROM indexes across countries



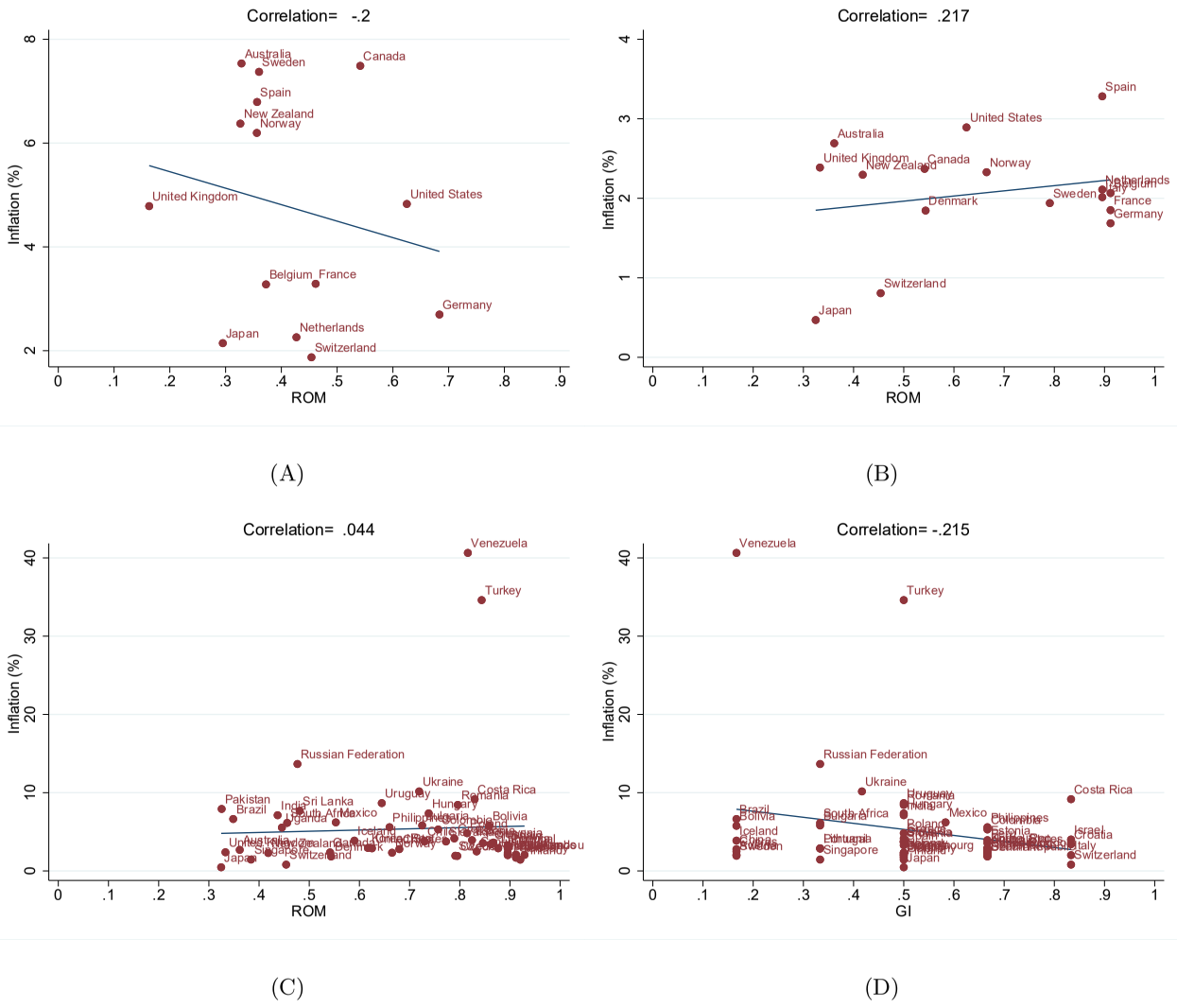
Note: This figure aggregates the data on the GI and ROM indexes at the country level. The red bars show the gap between the ROM and the GI indexes, which is calculated as the difference between the ROM and GI indexes (left y-axis). The connected dots show the mean value of the ROM index (light blue solid line) and GI index (blue dashed line) across countries (right y-axis). Larger bars above zero reflect higher gaps, with de jure independence (higher ROM index) being larger than de facto independence (higher GI index). Conversely, larger bars below zero reflect higher gaps, with de facto independence (higher GI index) being larger than de jure independence (higher ROM index). Smaller bars reflect higher convergence between de jure independence (ROM index) and de facto independence (GI index).

Figure 2: GI and de jure CBI indexes over time



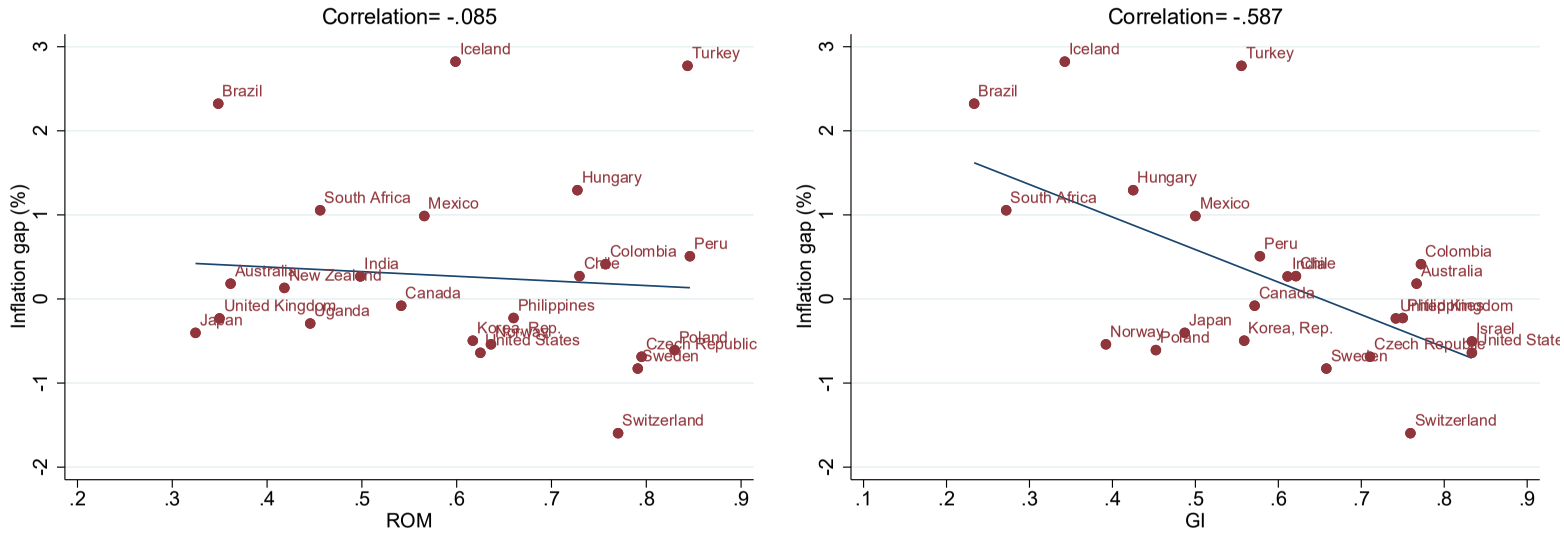
Note: This figure aggregates the data on different indexes at the year level and plots them over time. The black line shows the evolution for the GI index. The dotted red line shows the evolution for the ROM index (referring to Romelli, 2022), the scattered blue line for the CWN index (Cukierman et al., 1992), and the scattered yellow line for the GMT index (Grilli et al., 1991). Higher values for all of these indexes reflect more independence.

Figure 3: Median inflation and CBI indexes



Note: Figure 3A replicates the original graph in Alesina and Summers (1993) of the relation between median inflation and CBI using the same sample countries and time period (1973-1990) but for the ROM index as a measure of de jure CBI. Figure 3B extends their sample to 2020, while Figure 3C extends their sample to include the countries in our data set. Figure 3D plots the equivalent of Figure 3C for the GI index as a measure of de facto CBI. The Online Appendix C provides variable definitions and sources.

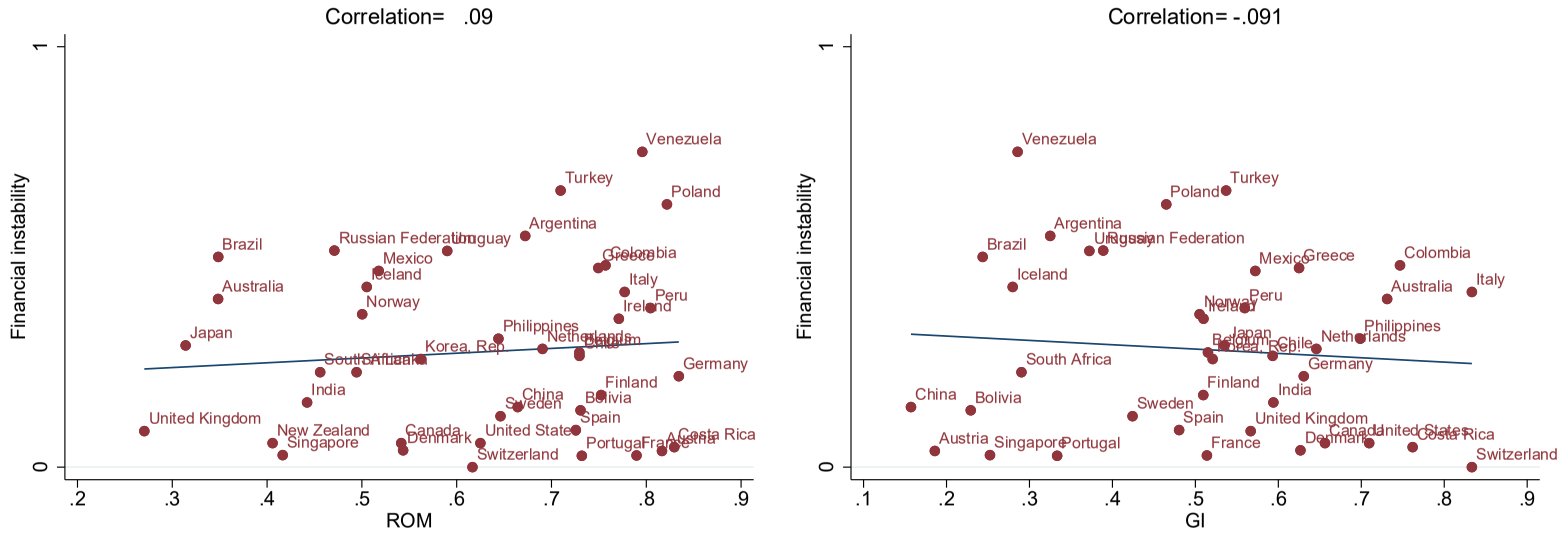
Figure 4: Inflation gap and CBI indexes



(A) (B)

Note: Figure 4A shows the relation between the median inflation gap and the ROM index as a measure of de jure CBI from 2000 (following Haldane, 2020) for all concerned countries in our data set. Figure 4B plots the equivalent of Figure 4A for the GI index as a measure of de facto CBI. The Online Appendix C provides variable definitions and sources.

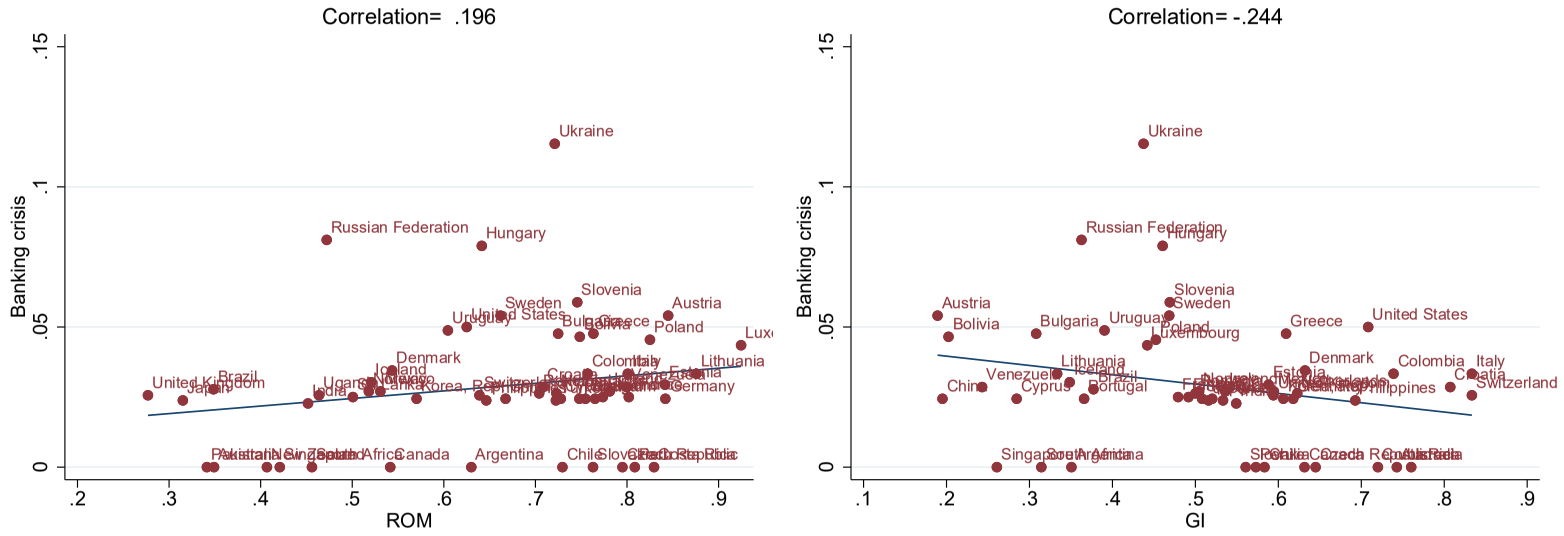
Figure 5: Financial instability and CBI indexes



(A) (B)

Note: Figure 5A shows the relation between financial instability and the ROM index as a measure of de jure CBI in 1973-2000 for all affected countries in our data set. Figure 5B plots the equivalent of Figure 5A for the GI index as a measure of de facto CBI. The Online Appendix C provides variable definitions and sources.

Figure 6: Banking crisis and CBI indexes



(A) (B)

Note: Figure 6A shows the relation between banking crisis (based on Laeven and Valencia, 2013) and the ROM index as a measure of de jure CBI in 1973-2020 for all available countries in our data set. Figure 6B plots the equivalent of Figure 6A for the GI index as a measure of de facto CBI. The Online Appendix C provides variable definitions and sources.

Online Appendix

This online appendix presents additional information and results to accompany the paper "(In)dependent Central Banks". The content is as follows:

Appendix A provides additional details and descriptive statistics on governor appointments.

Appendix B provides a visualization for each component of the GI index.

Appendix C provides variable definitions and sources.

Appendix D contains additional tables to accompany the main results.

Appendix E contains additional figures to accompany the main results.

A Governor Appointments

Table A.1: List of countries and governor appointments

Country code	Country name	Governor appointment (month-year)
ARG	Argentina	Mario Blejer (Jan. 2002), Aldo Pignanelli (Jun. 2002), Alfonso Prat-Gay (Dec. 2002), Martin Redrado (Sep. 2004), Mercedes Marcó del Pont (Feb 2010), Juan Carlos Fabrega (Nov. 2013), Alejandro Vanoli (Oct. 2014), Federico Sturzenegger (Dec. 2015), Luis Caputo (Jun. 2018), Guido Sandleris (Sep. 2018), Miguel Ángel Pesce (Dec. 2019)
AUS	Australia	Bernie Fraser (Sep. 1989), Ian Macfarlane (Sep. 1996), Glenn Stevens (Sep. 2006), Philip Lowe (Sep. 2016)
AUT	Austria	Hellmuth Klauhs (Sep. 1988), Maria Schaumayer (Jun. 1990), Klaus Liebscher (Jun. 1995), Ewald Nowotny (Sep. 2008), Robert Holzmann (Sep. 2019)
BEL	Belgium	Alfons Verplaetse (Jul. 1989), Guy Quaden (Mar. 1999), Luc Coene (Apr. 2011), Jan Smets (Mar. 2015), Pierre Wunsch (Jan. 2019)
BOL	Bolivia	Javier Nogales Iturri (Jun. 1986), Jacques Trigo Loubiere (Jun. 1988), Raúl Boada Rodríguez (Aug. 1989), Armando Méndez Morales (Jun. 1992), Fernando Candia Castillo (Aug. 1993), Juan Antonio Morales (Sep. 1995), Raúl Garrón Claure (May 2006), Gabriel Loza Tellería (Nov. 2008), Marcelo Zabalaga Estrada (Nov. 2010), Pablo Ramos Sánchez (Jan. 2017)
BRA	Brazil	Paulo César Ximenes (Mar. 1993), Pedro Sampaio Malan (Sep. 1993), Pérsio Arida (Jan. 1995), Gustavo Jorge Laboissière Loyola (Jun. 1995), Gustavo Henrique de Barroso Franco (Aug. 1997), Armínio Fraga Neto (Mar. 1999), Henrique de Campos Meirelles (Jan. 2003), Alexandre Antonio Tombini (Jan. 2011), Ilan Goldfajn (Jun. 2016), Roberto de Oliveira Campos Neto (Feb. 2019)
BGR	Bulgaria	Ivan Dragnevski (Dec. 1989), Todor Valchev (Jan. 1991), Lyubomir Filipov (Jan. 1996), Svetoslav Gavriiski (jun. 1997), Ivan Iskrov (Oct. 2003), Dimitar Radev (Jul. 2015)
CAN	Canada	John Crow (Feb. 1987), Gordon Thiessen (Feb. 1994), David A. Dodge (Feb. 2001), Mark Carney (Feb. 2008), Stephen Poloz (Jun. 2013)
CHL	Chile	Andrés Bianchi Larre (Dec. 1989), Roberto Zahler Mayanz (Dec. 1991), Carlos Massad Abud (Sept. 1996), Vittorio Corbo Lioi (Apr. 2003), José De Gregorio Rebeco (Dec. 2007), Rodrigo Vergara (Dec. 2011), Mario Marcel Cullell (Dec. 2016)
CHN	China	Chen Muhua (Mar. 1985), Li Guixian (Apr. 1988), Zhu Rongji (Jul. 1993), Dai Xianglong (Jun. 1995), Zhou Xiaochuan (Dec. 2002), Yi Gang (Mar. 2018)
COL	Colombia	Miguent Urrutia Montoya (Feb. 1993), José Darío Uribe Escobar (Jan. 2005), Juan José Echavarría Soto (Jan. 2017)
CRI	Costa Rica	Rodrigo Bolaños Zamora (Mar. 1995), Eduardo Lizano Fait (May 1998), Francisco de Paula Gutierrez G. (Nov. 2002), Rodrigo Bolaños Zamora (Jun. 2010), Olivier Castro Pérez (May 2014)

HRV	Croatia	Ante Cicin-Šain (Aug. 1990), Pero Jurkovic (Jun. 1992), Marko Škreb (Mar. 1996), Željko Rohatinski (Jul. 2000), Boris Vujčić (Jul. 2012)
CYP	Cyprus	Christodoulos Christodoulou (May 2002), Athanasios Orphanides (Apr. 2007), Panicos O. Demetriades (May 2012), Chrystalla Georghadji (Apr. 2014), Constantinos Herodotou (Mar. 2019)
CZE	Czech Republic	Zdeněk Tůma (Dec. 2000), Miroslav Singer (Jul. 2010), Jiří Rusnok (Jul. 2016)
DNK	Denmark	Bodil Nyboe Andersen (Nov. 1994), Nils Bernstein (Jun. 2005), Lars Rohde (Feb. 2013)
EST	Estonia	Siim Kallas (Sep. 1991), Vahur Kraft (Apr. 1995), Andres Lipstok (Jun. 2005), Ardo Hansson (Jun. 2012), Madis Müller (Jun. 2019)
FIN	Finland	Sirkka Hämäläinen (Apr. 1992), Matti Vanhala (Jun. 1998), Erkki Liikanen (Jul. 2004), Olli Rehn (Jul. 2018)
FRA	France	Jacques de Larosiere (Jan. 1987), Jean-Claude Trichet (Sep. 1993), Christian Noyer (Nov. 2003), Francois Villeroy de Saroy de Galhau (Nov. 2015)
DEU	Germany	Helmut Schlesinger (Aug. 1991), Hans Tietmeyer (Oct. 1993), Ernst Welteke (Sep. 1999), Axel Weber (Apr. 1994), Jens Weidmann (May 2011),
GRC	Greece	Efthymios Cristodoulou (Feb. 1992), Ioannis Boutos (Dec. 1993), Lucas Papademos (Oct. 1994), Nikolaos Garganas (Jun. 2002), Georgios Provopoulos (Jun. 2008), Yannis Stournaras (Jun. 2014)
HUN	Hungary	Ferenc Bartha (Jun. 1988), György Surányi (Jul. 1990), Péter Ákos Bod (Dec. 1991), György Surányi (Mar. 1995), Zsigmond Járai (Mar. 2001), Andras Simor (Mar. 2007), György Matolcsy (Mar. 2013)
ISL	Iceland	Birgir Ísleifur Gunnarsson (Mar. 1991), David Oddsson (Oct. 2005), Már Gudmundsson(Aug. 2009), Ásgeir Jónsson (Jul. 2019)
IND	India	Ram Narain Malhotra (Feb. 1985), S. Venkitaramanan (Dec. 1990), Chakravarthi Rangarajan (Dec. 1992), Bimal Jalan (Nov. 1997), Yaga Venugopal Reddy (Sep. 2003), Duvvuri Subbarao (Sep. 2008), Raghuram Rajan (Sep. 2013), Urjit Patel (Sep. 2016), Shaktikanta Das (Dec. 2018)
IRL	Ireland	Maurice F. Doyle (May 1987), Maurice O'Connell (May 1994), John Hurley (Mar. 2002), Patrick Honohan (Sep. 2009), Philip Lane (Nov. 2015)
ISR	Israel	Michael Bruno (Jun. 1986), Jacob A. Frenkel (Aug. 1991), David Klein (Jan. 2000), Stanley Fischer (May 2005), Karnit Flug (Nov. 2013), Amir Yaron (Dec. 2019)
ITA	Italy	Antonio Fazio (May 1993), Mario Draghi (Dec. 2005), Ignazio Visco (Nov. 2011)
JPN	Japan	Yasushi Mieno (Dec. 1989), Yasuo Matsushita (Dec. 1994), Masaru Hayami (Mar. 1998), Toshihiko Fukui (Mar. 2003), Masaaki Shirakawa (Apr. 2008), Haruhiko Kuroda (Mar. 2013)
KOR	Korea, Rep.	Kun Kim (Mar. 1988), Cho Soon (Mar. 1992), Myung Ho Kim (Mar. 1993), Kyung Shik Lee (Aug. 1995), Chol-Hwan Chon (Mar. 1998), Seung Park (Apr. 2002), Seongtae Lee (Mar. 2006), Choong-Soo Kim (Apr. 2010), Ju-Yeol Lee (Apr. 2014)
LTU	Lithuania	Kazys Ratkevicius (Nov. 1993), Reinoldijus Sarkinas (Feb. 1996), Vitas Vasiliauskas (Apr. 2011)

LUX	Luxembourg	Yves Mersch (Jun. 1998), Gaston Reinesch (Jan. 2013)
MEX	Mexico	Guillermo Ortiz Martinez (Jan. 1998), Agustin Carstens (Jan. 2010), Alejandro Díaz de León Carrillo (Dec. 2017)
NDL	Netherlands	Nout Wellink (Jul. 1997), Klaas Knot (Jul. 2011)
NZL	New Zealand	Donald Brash (Sep. 1988), Alan Bollard (Sep. 2002), Graeme Wheeler (Sep. 2012), Adrian Orr (Mar. 2018)
NOR	Norway	Hermod Skånland (Apr. 1985), Torstein Moland (Jan. 1994), Kjell Storvik (Feb. 1996), Svein Gjedrem (Jan. 1999), Oeystein Olsen (Jan. 2011)
PAK	Pakistan	Imtiaz Alam Hanfi (Aug. 1988), Muhammad Yaqub (Jul. 1993), Ishrat Husain (Dec. 1999), Shamshad Akhtar (Jan. 2006), Syed Salim Raza (Feb. 2009), Shahid Hafeez Kardar (Sep. 2010), Yaseen Anwar (Jul. 2011), Ashraf Mahmood Wathra (Apr. 2014), Tariq Bajwa (Jul. 2017), Reza Baqir (May 2019)
PER	Peru	Pedro Coronado Labo (Dec. 1987), Carlos Capunay Mimbela (Aug. 1989), Jorge Chavez Alvarez (Sep. 1990), Germán Suárez Chávez (Apr. 1992), Richard Webb Duarte (Sep. 2001), Sivla Ruete (Jul. 2003), Julio Velarde Flores (Oct. 2006)
PHL	Philippines	Jose L. Cuisa Jr. (Feb. 1990), Gabriel Singson (Jul. 1993), Rafael Buenaventura (Jul. 1999), Amando Tetangco Jr. (Jul. 2005), Nestor Espenilla Jr. (Jul. 2017), Benjamin Diokno (Mar. 2019)
POL	Poland	Wladyslaw Baka (Nov. 1985), Zdzislaw Pakula (Jul. 1988), Wladyslaw Baka (Sep. 1989), Grzegorz Wojtowicz (Jan. 1991), Andrzej Topinski (Aug. 1991), Hanna Gronkiewicz-Waltz (Mar. 1992), Leszek Balcerowicz (Jan. 2001), Slawomir Skrzypek (Jan. 2007), Marek Belka (Jun. 2010), Adam Glapinski (Jun. 2016)
PTR	Portugal	Vítor Manuel Ribeiro Constâncio (Apr. 1985), Jose Alberto Tavares Moreira (May 1986), Luis Miguel Couceiro Pizarro Beleza (May 1992), Antonio Jose Fernandes de Sousa (Jun. 1994), Vítor Manuel Ribeiro Constâncio (Feb 2000), Carlos da Silva Costa (Jun. 2010)
ROM	Romania	Decebal Urdea (Mar. 1989), Mugur Constantin Isărescu (Sep. 1990)
RUS	Russian Federation	Georgy Matyukhin (Jan. 1990), Viktor Gerashchenko (Jul. 1992), Tatyana Paramonova (Oct. 1994), Sergei Dubinin (Nov. 1995), Viktor Gerashchenko (Sept. 1998), Sergei Ignatyev (Mar. 2002), Elvira Nabiullina (Jun. 2013)
SGP	Singapore	Richard Hu (Jan. 1985), Lee Hsien Loong (Jan. 1998), Goh Chok Tong (Aug. 2004), Tharman Shanmugaratnam (May 2011)
SVK	Slovakia	Marian Tkac (Jan. 1993), Vladimir Masar (Jul. 1993), Marian Jusko (Jul. 1999), Ivan Sramko (Jan. 2005), Jozef Makuch (Jan. 2010), Peter Kazimír (Jun. 2019)
SVN	Slovenia	France Arhar (Jun. 1991), Mitja Gaspari (Apr. 2001), Marko Kranjec (Jun. 2007), Boštjan Jazbec (Jul. 2013), Boštjan Vasle (Dec. 2018)
ZAF	South Africa	Chris Stals (Aug. 1989), Tito Mboweni (Aug. 1999), Gill Marcus (Nov. 2009), Lesetja Kganyago (Nov. 2014)
ESP	Spain	Luis Ángel Rojo Duque (Jul. 1992), Jaime Caruana Lacorte (Jul. 2000), Miguel Ángel Fernández Ordóñez (Jul. 2006), Luis Maria Linde de Castro (Jun. 2012), Pablo Hernández de Cos (Jun. 2018)

LKA	Sri Lanka	Neville Sepala Karunatilake (Nov. 1988), Heen Banda Disanayaka (Jul. 1992), Amarananda Somasiri Jayawardena (Nov. 1995), Sunil Mendis (Jul. 2004), Ajith Nivard Cabraal (Jul. 2006), Arjuna Mahendran (Jan. 2015), Indrajit Coomaraswamy (Jul. 2016), Weligamage Don Lakshman (Dec. 2019)
SWE	Sweden	Urban Bäckström (Jan. 1994), Lars Heikensten (Jan. 2003), Stefan Ingves (Jan. 2006)
CHE	Switzerland	Pierre Languetin (Jan. 1985), Markus Lusser (May 1988), Hans Meyer (May 1996), Jean-Pierre Roth (Jan. 2001), Philipp Hildebrand (Jan. 2010), Thomas J. Jordan (Apr. 2012)
TUR	Turkey	Rüşdü Saracoğlu (Jul. 1987), Nihat Bülent Gültekin (Sep. 1993), Yaman Törüner (Feb. 1994), Süleyman Gazi Erçel (Apr. 1996), Süreyya Serdengecti (Mar. 2001), Durmus Yilmaz (Apr. 2006), Erdem Başçı (Apr. 2011), Murat Çetinkaya (Apr. 2016)
UGA	Uganda	Suleiman Kiggundu (Dec. 1986), Charles Kikonyogo (May 1990), Emmanuel Tumusiime Mutebire (Dec. 2000)
UKR	Ukraine	Volodymyr S. Stelmakh (Jan. 2000), Sergei Tigipko (Dec. 2002), Volodymyr S. Stelmakh (Dec. 2004), Sergiy Arbuzov (Dec. 2010), Ivor Sorkin (Jan. 2013), Valeriia O. Gontareva (Jun. 2014), Yakiv Smolii (May 2017)
GBR	United Kingdom	Edward Alan John George (Jul. 1993), Mervyn Allister King (Jul. 2003), Mark Carney (Jul. 2013)
USA	United States	Alan Greenspan (Aug. 1987), Ben Bernanke (Feb. 2006), Janet Yellen (Feb. 2014), Jerome Powell (Feb. 2018)
URY	Uruguay	Ramón P. Diaz (Apr. 1990), Enrique Braga (Oct. 1993), Ricardo Pascale (Apr. 1995), Humberto Capote (Apr. 1996), César Rodríguez (Apr. 2000), Julio de Brun (Jul. 2002), Walter Cancela (Mar. 2005), Mario Bergara Duque (Nov. 2008), Alberto Graña (Jan. 2014), Mario Bergara Duque (Nov. 2015), Alberto Graña (Nov. 2018), Diego Labat (Mar. 2020)
VEN	Venezuela	Antonio Casas Gonzalez (Apr. 1994), Diego Luis Castellanos (Jan. 2000), Gastón Parra Luzardo (Jan. 2005), Nelson José Merentes Diaz (Apr. 2009), Edmée Betancourt (Apr. 2013), Eudomar Tovar (Aug. 2013), Nelson José Merentes Diaz (Dec. 2014), Ricardo Sanguino (Jan. 2017), Ramon Agusto Lobo Moreno (Nov. 2017), Calixto Ortega Sánchez (Jun. 2018)

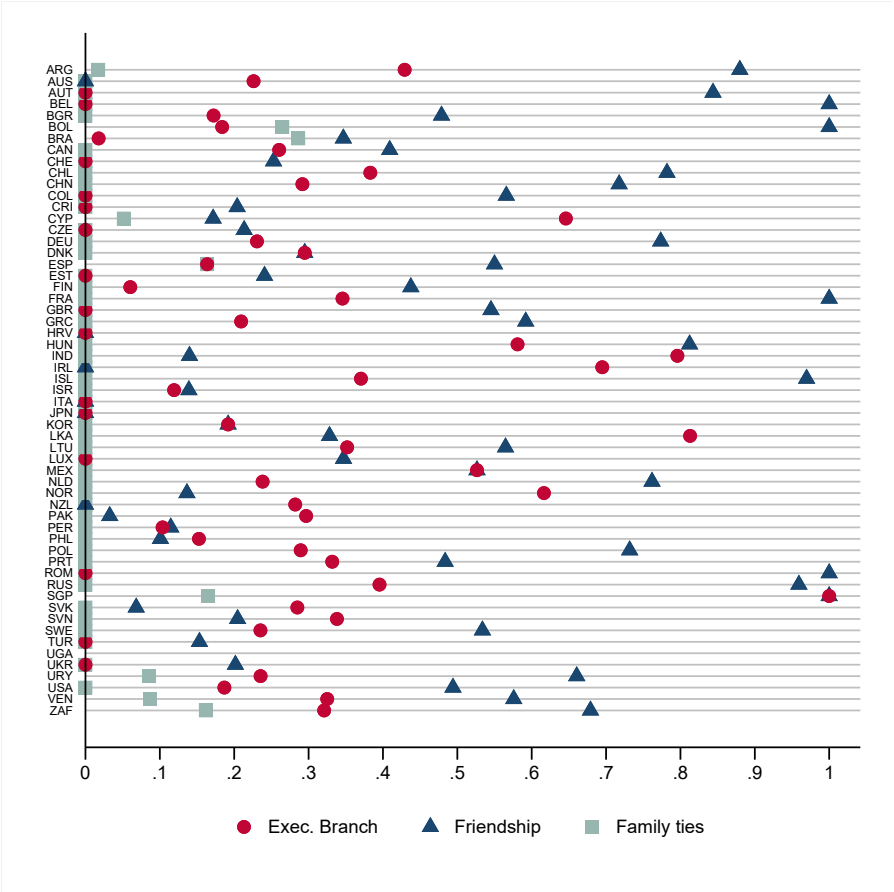
Table A.2: Descriptive statistics for all subcomponents of GI index

	N	Mean	SD
Executive ties			
Employment tie	297	0.269	0.444
Ideological tie	294	0.446	0.498
Family tie	299	0.030	0.171
Succession			
Natural successor	298	0.295	0.457
Forced resignation	297	0.370	0.484
No reappointment	297	0.599	0.491
Education			
PhD in Economics or Finance	307	0.453	0.499
Postgraduate degree in a related discipline	307	0.691	0.463
Experience			
Top-level position at a central bank	306	0.461	0.499
Top-level position in an international organization	297	0.215	0.412
Top-level position in branches of the government	299	0.575	0.495
High-level position at an academic institution	299	0.455	0.499
Member of the council of economic advisors	297	0.111	0.315
Top management position in the private financial sector	297	0.293	0.456
Top-level position at a central bank (other than deputy or member of the board)	297	0.303	0.460

Note: This table presents descriptive statistics for the four subcomponents using biographical information that enter in the construction of the GI index.

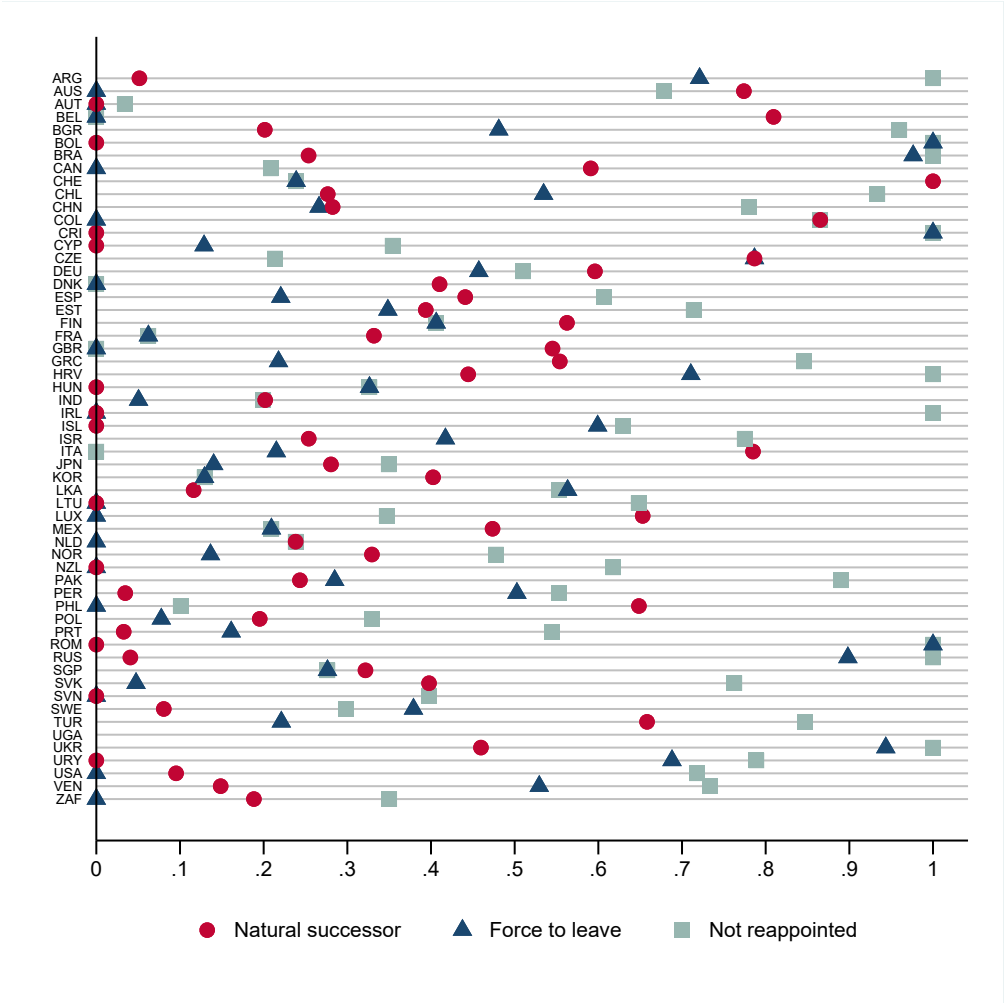
B Visualization of the GI Index

Figure B.1: Executive ties



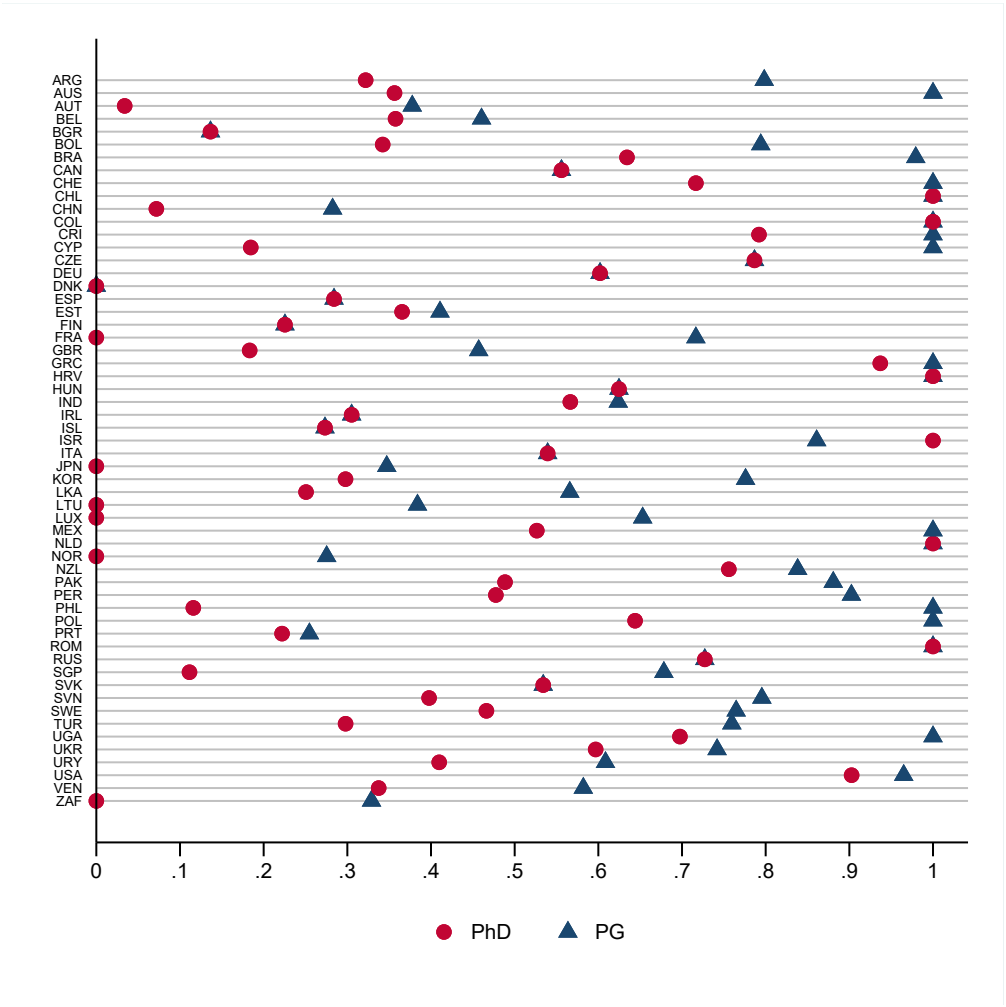
Note: This figure shows data aggregated at the country level and compares cross-country patterns. *Executive ties* relate to the ties governors may have with the executive at the time of their appointment. There are 3 dimensions of ties: (1) employment ties; (2) ideological ties; and (3) family ties. For instance, in the United States (USA) roughly 20% of the newly appointed governors worked in the executive branch of the government right before being appointed. Also, in Austria (AUT) all newly appointed governors had an ideological link to the ruling political party (or coalition). Family ties are extremely rare.

Figure B.2: Succession



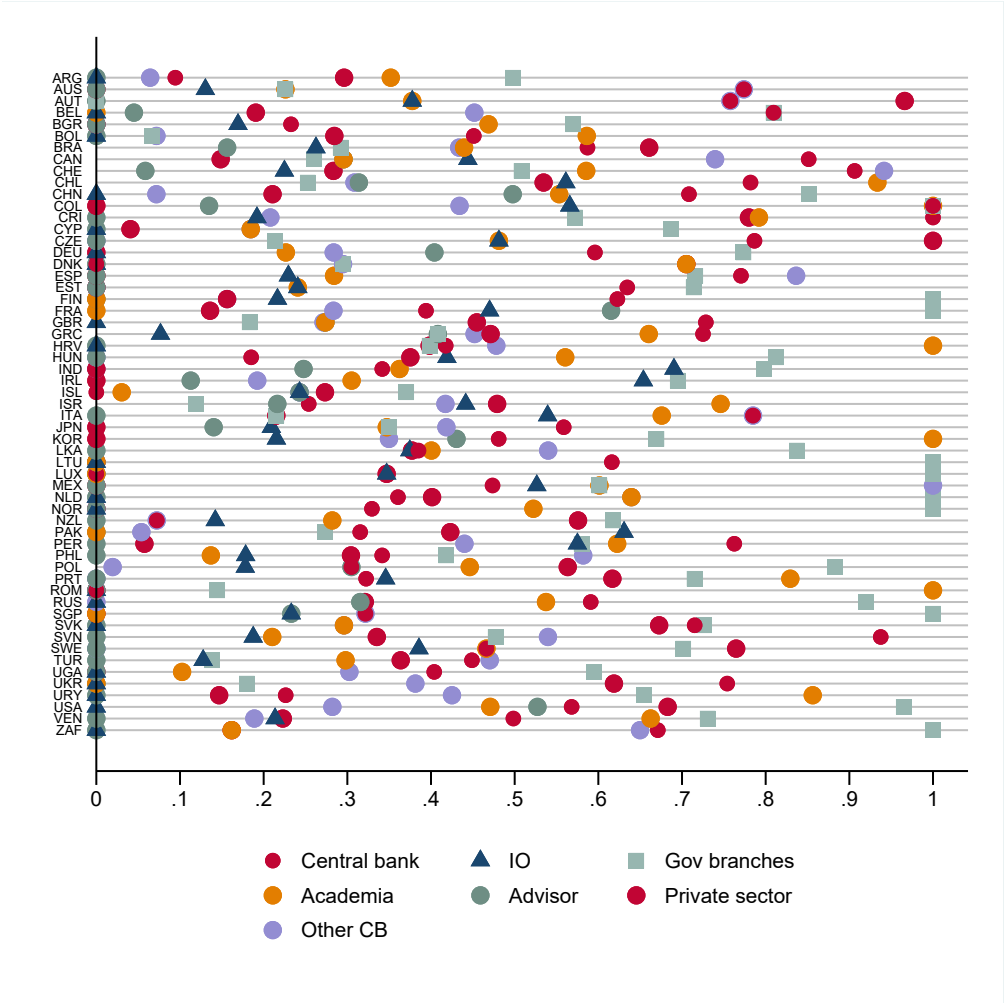
Note: This figure shows data aggregated at the country level and compares cross-country patterns. *Succession* is related on the nature of the succession. There are 3 dimensions of succession: (1) being the natural successor (deputy governor); (2) predecessor being forced to resign prior the end of term; and (3) predecessor being not re-appointed despite being eligible and willing to continue. For instance, in Australia (AUS) almost 80% of the newly appointed governors were deputy governors ("natural" successors) at the central bank. In Romania (ROM) almost all governors replace a governor who was "forced" to quit prior to the end of the term. In Denmark (DNK) all governors are reappointed.

Figure B.3: Education



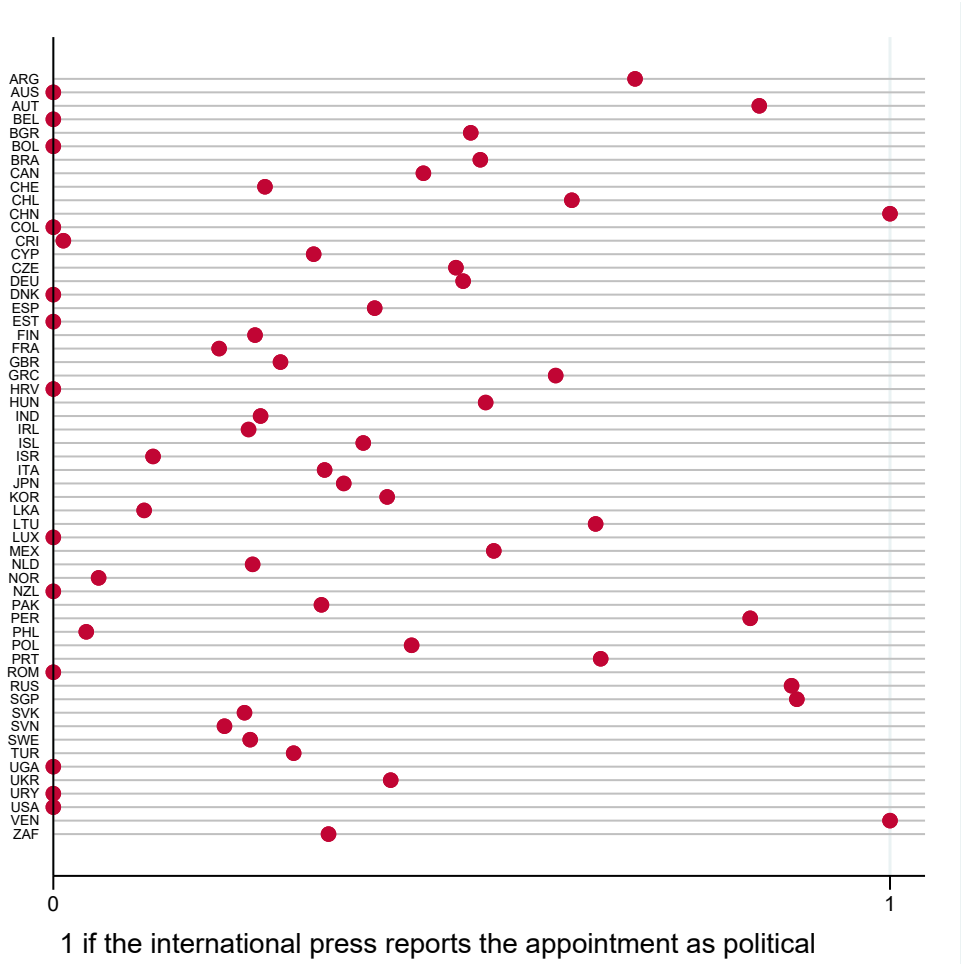
Note: This figure shows data aggregated at the country level and compares cross-country patterns. There are 2 dimensions of *education*: (1) Phd degree in a relevant discipline; and (2) post-graduate degree in a relevant discipline. For instance, in the United States (USA) 90% of governors hold a PhD in Economics or Finance, but none in France (FRA). In France 70% have a post-graduate degree.

Figure B.4: Experience



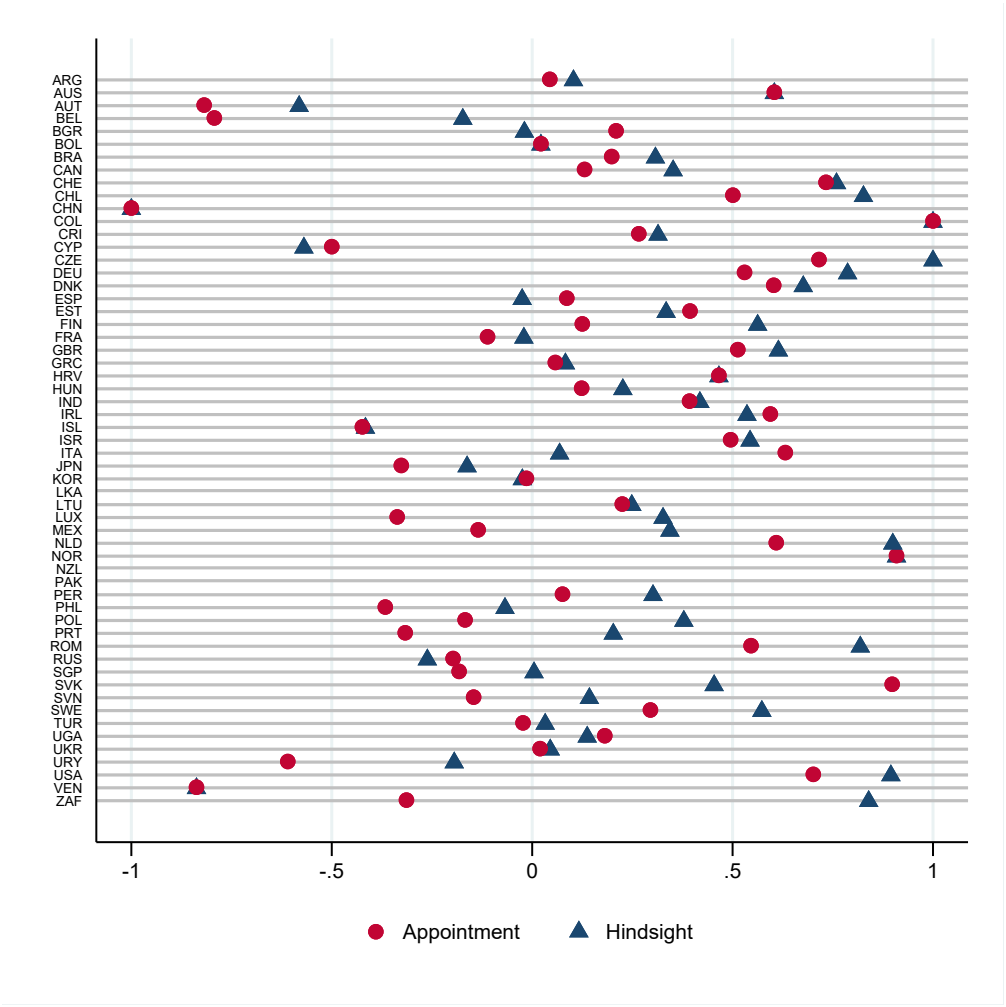
Note: This figure shows data aggregated at the country level and compares cross-country patterns. *Experience* is the professional experience of governors. There are 7 types of experiences: (1) central banks (deputy governor or board member); (2) international organizations; (3) branches of the government in charge of economic affairs; (4) academic institution; (5) council of economic advisors or an equivalent body providing independent advice to the government; (6) private financial sector; and (7) central banks (other positions than deputy governor or board member). For instance, in Austria (AUT) almost 90% of the newly appointed governors had a top management position in the private financial sector, while in Korea (KOR) all governors had a position in the academia.

Figure B.5: Press



Note: This figure shows data aggregated at the country level and compares cross-country patterns. *Media* captures whether the international (English-speaking) press reports the appointment as politically-motivated. For instance, in China (CHN) the international press report political interference in all governor appointments, while in Estonia (EST), Luxembourg (LUX), among others, the press does not report any political influence in the appointment process.

Figure B.6: Experts



Note: This figure shows data aggregated at the country level and compares cross-country patterns. The survey includes two questions inquiring about: (1) political independence during the appointment event; and (2) political independence during the whole term in office. Higher (positive) values reflect political independence and vice versa. For instance, in China (CHN) the experts indicate significant political interference during the appointment and the term in office. In Belgium (BEL) the experts suggest political intervention for the appointment of governors, but less so while in office.

C Variable Definitions and Sources

Table C.1: Variable definitions and sources

Variable	Definition	Sources
Panel A: Governor appointments		
GI index	Index of independence of central bank governor appointments, ranging between 0 (no independence) and 1 (full independence) and varying at the governor-appointment year level. The index consists of six components: (1) executive ties; (2) succession; (3) education; (4) experience; (5) press; and (6) experts.	Authors
Executive ties	Dummy variable that takes the value of 1 if the governor has neither an employment tie, an ideological tie, nor a family tie with the executive branch of the government at the time of her or his appointment, and 0 otherwise.	Authors
Succession	Dummy variable that takes the value of 1 if the governor is the natural successor (deputy governor) and if the predecessor was not forced to resign prior the end of term or not re-appointed despite being eligible and willing to continue, and 0 otherwise.	Authors
Education	Dummy variable that takes the value of 1 if the governor has either a PhD or post-graduate degree in economics or related studies (e.g., MPhil/MA degree in Economics, Finance, other business related studies, MBA, LLM, CFA), and 0 otherwise.	Authors
Experience	Dummy variable that takes the value of 1 if the governor has significant and relevant professional experience, and 0 otherwise. A significant and relevant professional experience is defined as having held at least two of the following positions: (1) deputy governor, executive or non-executive member of the board of directors at a central bank; (2) a top-level position in international organizations promoting economic, monetary, and financial stability (e.g., IMF, WB, BIS, OECD, EBRD, EIB, IDB); (3) a top-level position in branches of the government in charge of economic affairs (e.g., treasury, ministry of finance, ministry of economic affairs, central planning bureau); (4) a high-level position in a related discipline at an academic institution (e.g., University Professor in Economics, Finance, Law or other related discipline); (5) member of the council of economic advisors or an equivalent body providing independent advice to the government; (6) a top management position in the private financial sector; and (7) a position other than deputy governor or member of the board of directors of a central bank.	Authors

Press	Dummy variable that takes the value of 1 if the international press (English-speaking) does not explicitly report the governor appointment as politically-motivated, and 0 otherwise.	Authors
Experts	Dummy variable that takes the value of 1 if the surveyed experts do not perceive the governor appointment as politically-motivated, and 0 otherwise. To quantify the results of the survey accounting for divergence of opinions and the different numbers of responses, the standard balance statistic is calculated (Pesaran and Weale, 2006). A balance statistic greater (smaller) than 0 means a non-politically-motivated (a politically-motivated) appointment according to the experts. This variable is based on the first question of the survey: *"In your opinion, at the time of the appointment, was [Governor's name] a politically independent central bank governor?"*.	Authors
Panel B: De jure CBI		
ROM index	Index of central bank independence and accountability, ranging between 0 (no independence) and 1 (full independence) and varying at the country-year level. The index follows codification strategy of Cukierman et al. (1992) and provides information on 42 criteria of central bank institutional design across six subcategories: (1) governor and central bank board; (2) monetary policy and conflict resolution; (3) objectives; (4) limitations on lending to the government; (5) financial independence; and (6) reporting and disclosure.	Romelli (2022)
CWN index	Index of central bank independence, ranging between 0 (no independence) and 1 (full independence) and varying at the country-year level. The index provides information on 16 criteria of central bank institutional design across four subcategories: (1) governor and central bank board; (2) monetary policy and conflict resolution; (3) objectives; and (4) limitations on lending to the government.	Cukierman et al. (1992); Romelli (2022)
GMT index	Index of central bank independence, ranging between 0 (no independence) and 1 (full independence) and varying at the country-year level. The index provides information on 15 criteria of central bank institutional design across four subcategories: (1) governor and central bank board; (2) monetary policy and conflict resolution; (3) objectives; and (4) limitations on lending to the government.	Grilli et al. (1991); Romelli (2022)

ROM governance	Index of independence in central bank governance (subcategory (1) "governor and central bank board" of the ROM index), ranging between 0 (no independence) and 1 (full independence) and varying at the country-year level.	Romelli (2022)
ROM policy	Index of central bank independence in determining and implementing monetary policy (subcategory (2) "monetary policy and conflict resolution" of the ROM index), ranging between 0 (no independence) and 1 (full independence) and varying at the country-year level.	Romelli (2022)
ROM objectives	Index on the definitions and ordering of the central bank policy objectives as embedded in the law (subcategory (3) "objectives" of the ROM index), ranging between 0 (no independence) and 1 (full independence) and varying at the country-year level.	Romelli (2022)
ROM lending	Index of independence and limits in lending to the public sector (subcategory (4) "limitations on lending to the government" of the ROM index), ranging between 0 (no independence) and 1 (full independence) and varying at the country-year level.	Romelli (2022)
ROM finances	Index of central bank financial independence (subcategory (5) "financial independence" of the ROM index), ranging between 0 (no independence) and 1 (full independence) and varying at the country-year level.	Romelli (2022)
ROM accountability	Index of central bank policy and financial reporting (subcategory (6) "reporting and disclosure" of the ROM index), ranging between 0 (no independence) and 1 (full independence) and varying at the country-year level.	Romelli (2022)
Main "legislative" reform	Dummy variable that takes the value of 1 in the years following the most significant change to central bank legislation related to the subcategory of the ROM index specified in place of the term "legislative" in the variable name (i.e., policy, objectives, lending, finances, accountability), and 0 otherwise. A significant reform corresponds to a positive change of approximately 2 standard deviations in the subcategory of the ROM index (Table D.2 reports the reform years).	Authors following Romelli (2022)
Panel C: Other country characteristics		
Democratic accountability	Index measuring government's responsiveness to its people, ranging between 0 and 6 and varying at the country-year level. The less responsive government will fall peacefully in a democratic society and possibly violently in a nondemocratic society. A high score indicates higher democratic accountability and vice versa.	ICRG

Law and order	Index measuring two risk components, ranging between 0 and 6 and varying at the country-year level. The "law" component assesses the strength and impartiality of the legal system, and the "order" component assesses popular observance of the law.	ICRG
Government stability	Index measuring both the government's ability to carry out its declared program(s), and its ability to stay in office. The index consists of three components: (1) government unity; (2) legislative strength; and (3) popular support. The index ranges between 0 and 12 and varies at the country-year level.	ICRG
EU accession	Dummy variable that takes the value of 1 in the five years prior to joining the European Union, and 0 otherwise.	Authors following Romelli (2022)
IMF program	Dummy variable that takes the value of 1 in the years following an IMF assistance program (Flexible Credit Line Arrangement), and 0 otherwise.	Authors following Dreher (2006)
Panel D: De facto CBI		
Experts (hindsight)	Dummy variable that takes the value of 1 if the surveyed experts perceive the governor as having acted independently during her or his whole term in office, and 0 otherwise. To quantify the results of the survey accounting for divergence of opinions and the different numbers of responses, the standard balance statistic is calculated (Pesaran and Weale, 2006). A balance statistic greater (smaller) than 0 means a politically independent (a politically dependent) term in office according to the experts. This variable is based on the second question of the survey: *"In your opinion, with the benefit of hindsight, was [Governor's name] a politically independent central bank governor?"*.	Authors
Dismissals	Dummy variable that takes the value of 1 if the governor leaves office prior to the end of term, and 0 otherwise.	Authors
Panel E: Instrument		
Regional CBI diffusion	The jackknife average of CBI (as measured by the ROM index) in a region in a given year, excluding the own-country observation. There are seven regions: Africa, East Asia and the Pacific, Eastern Europe and Central Asia, Western Europe and other developed countries, Latin America and the Caribbean, the Middle East and the North of Africa, and South Asia.	Authors following Romelli (2022)
Panel F: Outcomes		
Median inflation	The median rate of consumer price inflation over the sample period.	World Bank
Inflation gap	The rate of inflation minus the central bank's stated inflation target over the sample period.	Goncharov et al. (2021)

Variance inflation	The standard deviation of consumer price inflation over the sample period.	World Bank
Financial instability	Dummy variable that takes the value of 1 if there is either a banking, a currency, or an inflation crisis, and 0 otherwise.	Reinhart and Rogoff (2011)
Banking crisis	Dummy variable that takes the value of 1 if there is a banking crisis, and 0 otherwise.	Laeven and Valencia (2013)

D Additional Tables

Table D.1: Governor appointments and de Jure CBI: Alternative de jure CBI index definitions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	GI index							
De jure CBI								
CWN index	-0.031	-0.046	0.097	0.126				
	[-0.291]	[-0.505]	[0.746]	[0.900]				
GMT index					-0.031	-0.046	0.097	0.126
					[-0.291]	[-0.505]	[0.746]	[0.900]
Other country characteristics								
Democratic accountability		0.052**	0.006	0.007		0.052**	0.006	0.007
		[2.559]	[0.335]	[0.369]		[2.559]	[0.335]	[0.369]
Law and order		0.018	0.027	0.028		0.018	0.027	0.028
		[1.009]	[1.342]	[1.206]		[1.009]	[1.342]	[1.206]
Government stability		-0.003	-0.001	0.001		-0.003	-0.001	0.001
		[-0.259]	[-0.123]	[0.091]		[-0.259]	[-0.123]	[0.091]
Fixed effects								
Country			YES	YES			YES	YES
Decade				YES				YES
Observations	239	224	223	223	239	224	223	223
R-squared	0.001	0.0870	0.415	0.416	0.001	0.0870	0.415	0.416
Clustered standard errors	Country	Country	Country	Country				

Note: This table presents estimates of the effect of de jure CBI on governor appointments based on the model in Eqn. 2 and alternative indexes of de jure CBI. All columns report results using the GI index as dependent variable. Columns (1)-(4) includes the CWN index as independent variable of interest, and columns (5)-(8) includes the GMT index as independent variable of interest. Robust standard errors are clustered at the country level. t-statistics are in brackets. The Online Appendix C provides variable definitions and sources. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

Table D.2: Main legislative reforms

	Policy	Objectives	Lending	Finance	Report
Bolivia	1995	1995	1995		1995
Bulgaria			1997	1997	1997
Chile	1989	1989		1989	
Costa Rica	1995				
Cyprus	2002	2002	2002	2002	2002
Czech Republic			2000		2000
Denmark					2005
Finland	1998	1998	1998	1998	1998
France	1993	1993	1993		1993
Greece			1994		1994
Hungary	2001	2001	2001	2001	2001
India		2016			
Korea, Rep.	1998	1998			
Lithuania				1996	
Luxembourg	1998	1998		1998	
Peru		1992	1992	1992	1992
Mexico	2010				
Norway	1985				
Philippines		1993	1993		
Russian Federation				2002	
South Africa	1989	1989			
Sri Lanka		2006			
Turkey	2001	2001	1994		2001
United Kingdom	1998				
Uruguay	1995	1995	1995	1995	

Note: This table reports the year for the sample countries having undertaken a significant change to their central bank legislation, with reforms in the form of complete changes of statutes or reprints of central bank charters, and legislative amendments. The years reported are the most significant changes per country over the sample period for the subcategory of the ROM index (specified in the column label). If a sample country is not reported, it means that the changes to its central bank legislation, if any, are not significant enough ('significant' is defined as a positive change of approximately 2 standard deviations of the (sub)index sample mean).

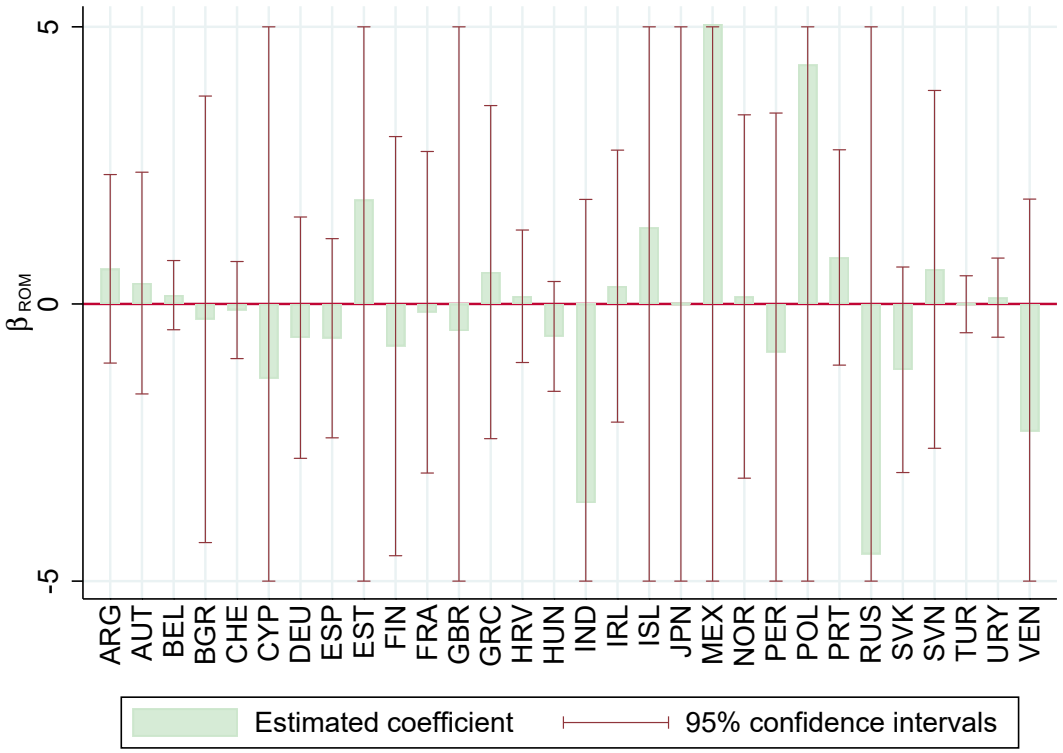
Table D.3: Experts' hindsight opinion and governor appointments: Alternative GI index definition

	(1)	(2)	(3)	(4)
Dependent variable:	Experts (hindsight)			
Governor appointments				
GI index (excluding "experts")	0.583***	0.529***	0.435***	0.445***
	[7.137]	[7.021]	[5.532]	[5.428]
Other country characteristics				
Democratic accountability		0.055*	0.014	0.012
		[1.751]	[0.517]	[0.366]
Law and order		0.006	-0.009	-0.016
		[0.256]	[-0.435]	[-0.618]
Government stability		0.001	0.010	-0.002
		[0.079]	[0.855]	[-0.143]
Fixed effects				
Country			YES	YES
Decade				YES
Observations	258	242	240	240
R-squared	0.201	0.260	0.621	0.631
Clustered standard errors	Country	Country	Country	Country

Note: This table presents estimates of the effect of governor appointments on experts' hindsight opinion based on a version of the model in Eqn. 2 and an alternative definition of the GI index. All columns report results using Experts (hindsight) as dependent variable, and the GI index excluding its component "experts" as independent variable of interest. Robust standard errors are clustered at the country level. *t*-statistics are in brackets. The Online Appendix C provides variable definitions and sources. ***, **, and * indicate statistical significance at 1%, 5% and 10% levels, respectively.

E Additional Figures

Figure E.1: Between country correlations

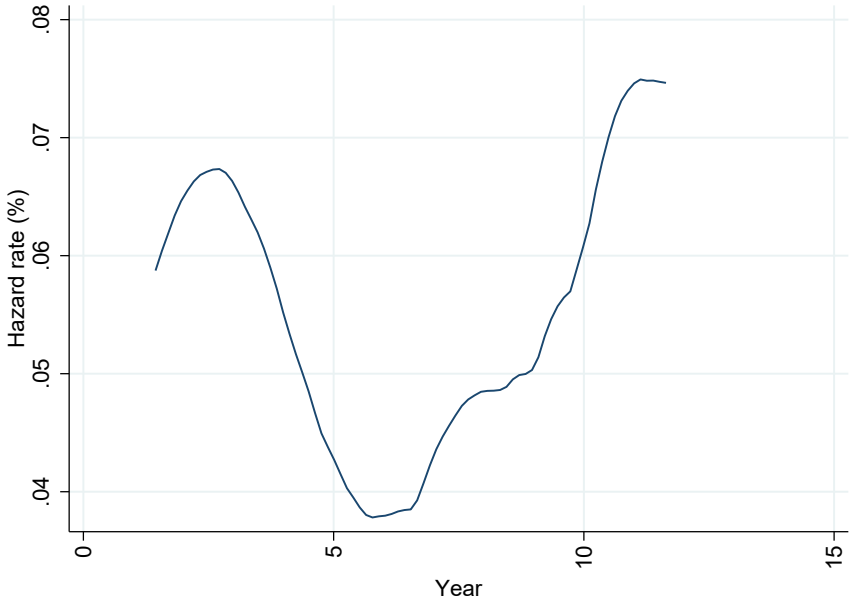


Note: This figure compares cross-country patterns between GI index and ROM index. The green bars represent the estimated coefficient, β_1, of Eqn. 2 for each sample country. The vertical blue lines are 95% confidence intervals.

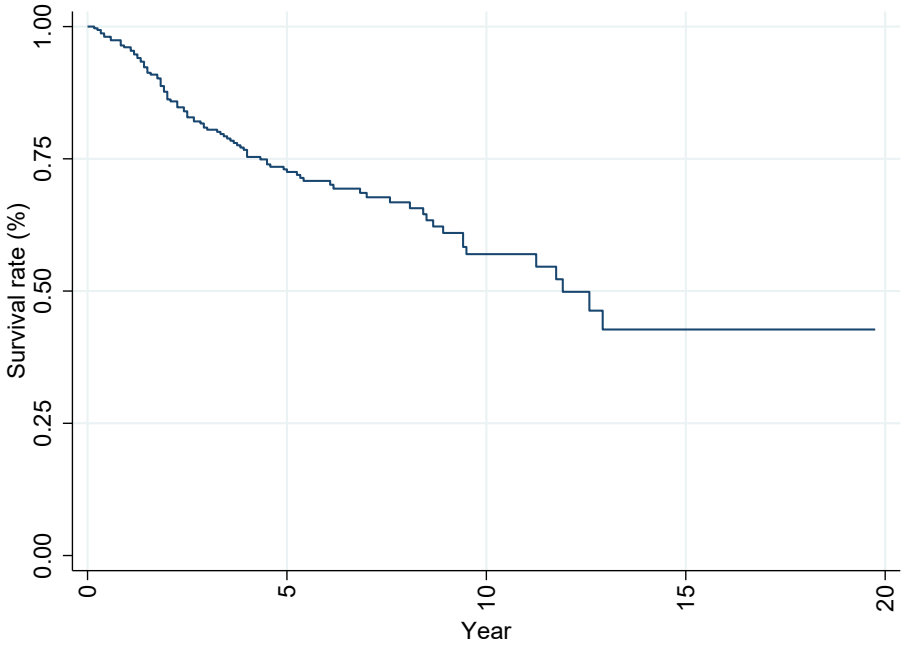
Figure E.2: Experts' hindsight opinion and governor appointments: cross-country plot

Note: This figure shows the mean value of GI index (black line) and the Experts (hindsight) variable (maroon dashed line) across countries.

Figure E.3: Non-parametrically estimated survivor functions



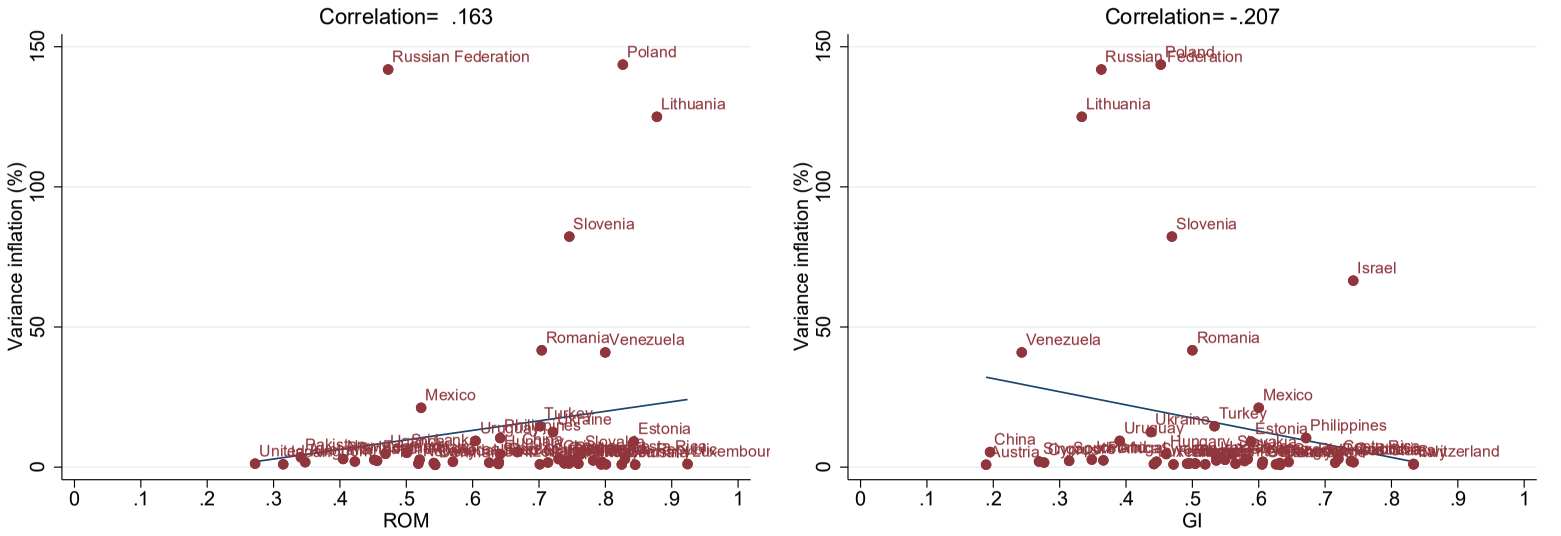
(A) Hazard ratio



(B) Kaplan-Meier survival curve

Note: Figure E.3A shows the smoothed hazard estimate, while Figure E.3B shows the Kaplan-Meier survival estimate with respect to time.

Figure E.4: Inflation variability and CBI indexes



(A) (B)

Note: Figure E.4A shows the relation between inflation variability and the ROM index as a measure of de jure CBI in 1973-2020 for all available countries in our data set. Figure E.4B plots the equivalent of Figure E.4A for the GI index as a measure of de facto CBI. The Online Appendix C provides variable definitions and sources.