Central Bank Independence and Fiscal Policy: Can the Central Bank Restrain Deficit Spending?

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Independent central banks prefer balanced budgets due to the long-run connection between deficits and inflation, and can enforce their preference through interest rate increases and denial of credit to the government. This article argues that legal central bank independence (CBI) deters fiscal deficits predominantly in countries with rule of law and impartial contract enforcement, a free press and constraints on executive power. It further suggests that CBI may not affect fiscal deficits in a counter-cyclical fashion, but instead depending on the electoral calendar and government partisanship. The article also tests the novel hypotheses using new yearly data on legal CBI for seventy-eight countries from 1970 to 2007. The results show that CBI restrains deficits only in democracies, during non-election years and under left government tenures.

In the 1990s countries worldwide reformed their central bank laws, removing monetary policy from government control. The newly independent central banks can change interest rates and target the exchange rate or money supply to ensure price stability or low inflation[1] without regard to incumbent approval ratings. Because central bank independence (CBI) has been designed as an institutional mechanism for keeping a check on inflation, most analyses focus on the effect of such independence on inflation and its potential trade-off with economic growth.[2]

This article analyzes the effect of the independent status of the central bank on countries' budget deficits or surpluses, with a focus on the preferences of independent central banks vis-à-vis fiscal policy and the bank's ability and willingness to enforce such preferences. The consequence of the trend toward CBI is that governments lose an important means of influencing the economy and thus rely increasingly on their remaining policies, especially fiscal spending. Still, time and again, independent central bankers respond to governments' budget plans with public statements urging them to limit spending to available taxes and avoid deficits. For example, the European Central Bank's introductory statement to its president's monthly press conference habitually asks for euro-area fiscal restraint. Alan Greenspan, the former chairman of the US Federal Reserve, also pleaded with Congress in 2002 to control spending: 'The budget

[1] Central banks have other legal tasks, including balanced economic growth and financial stability. More independent banks are tasked exclusively with price stability.

[2] Broz 2002; Crowe and Meade 2008; Cukierman, Webb, and Neyapti 1992; Franzese 1999, 2002a; Grilli, Masciandaro, and Tabellini 1991; Keefer and Stasavage 2003.

enforcement rules are set to expire.[3] Failing to preserve them would be a grave mistake. For without clear direction and constructive goals, the inbuilt political bias in favor of budget deficits likely will again become entrenched.'[4] Anecdotal evidence also shows more direct threats of tight monetary policy in response to fiscal deficits. In 2010, Axel Weber, then German Bundesbank president, warned that 'excessive deficits can cause tensions with monetary policy and may require higher interest rates if not corrected' and Mervyn King, at the time the Bank of England governor, noted that 'uncertainty about how and when fiscal policy will respond has a direct bearing on monetary policy'.[5] Why do central bankers venture into a clear domain of political choice like fiscal policy, and does it affect fiscal discipline?

Independent central banks prefer budget discipline because of the long-run connection between deficits and inflation, and can pursue their fiscal policy preferences through interest rate hikes and by refusing to lend to the government. CBI is, however, generally granted via regular legislation and there are risks to bank independence that come from implicit or explicit threats to amend the law. We argue therefore that legal CBI has a deterrent effect on fiscal deficits that is conditioned by domestic political institutions. Democracies with strong rule of law have overlapping mechanisms that increase the chance that the central bank can de facto deter the government in fiscal spending. We suggest that political constraints and transparency are prominent among such mechanisms. We further argue that, even in democracies, central banks will pragmatically guard their formal, de jure, independence by accommodating deficits under conditions related to the electoral calendar and government partisanship. The central bank will thus avoid pushing for lower deficits when the government has an intense distaste for fiscal consolidation or is ideologically close to the central bank.

Legal CBI has been adopted in countries with a wide range of political institutions. We test our argument on a sample of seventy-eight democracies, mixed regimes and dictatorships from 1970 to 2007. We use an author-coded central bank independence index that is an important empirical improvement over existing data sources. Previous CBI data is aggregated to decade averages[6] or focuses on single regions,[7] two points in time[8] or on a particular decade.[9] Our index is based on the popular Cukierman, Webb and Neyapti criteria, but it covers a large number of countries annually and captures the legal reforms of the past twenty years.[10] The precise identification of central bank legislation reform years is crucial for our own research design and is more broadly important for testing hypotheses about the strategic behavior of central bankers or government motivation to reform the central bank. Our estimations strongly support the argument. Democracies with independent central banks have lower fiscal deficits, and this effect is driven by both constraints on the executive and media freedom. In democracies, CBI is also more likely to reduce fiscal deficits in non-election years and during the tenure of left-wing executives. In contrast to this politically non-neutral behavior, we find no evidence that bank independence improves fiscal balance in an optimal, counter-cyclical fashion during periods of economic growth. These results are robust to different estimation methods, the exclusion of outliers and the inclusion of numerous controls.

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[3] Greenspan refers to the expiration of the Budget Enforcement Act of 1990.
[4] Greenspan 2008, 235.
[5] *The Wall Street Journal Europe*, 20 January 2010, 'Weber Seen in ECB Race'; 'King Warns On Deficit'.
[6] Cukierman, Webb, and Neyapti 1992; Grilli, Masciandaro, and Tabellini 1991.
[7] Bodea 2013; Cukierman, Miller, and Neyapti 2002; Jacome and Vasquez 2008.
[8] Crowe and Meade 2008.
[9] Eichengreen and Dincer 2010; Polillo and Guillen 2005.
[10] Cukierman, Webb, and Neyapti 1992. The data are available on the journal's website and the authors' websites.

The article makes important contributions to extant research. First, it provides a unifying theoretical framework linking institutional CBI to fiscal performance across political regimes and extends the empirical tests of this relationship beyond the research in developed countries.[11] Secondly, the literature already suggests ways to reform the budget process to mitigate deficit spending, including through budget transparency, centralization of fiscal decisions, budget targets or balanced budget provisions.[12] We add to this literature by showing that legal CBI (conditioned by political institutions) does not only contribute to low inflation but also deters fiscal deficits.

We proceed as follows. The next section reviews the causes of fiscal deficits. We then explain how independent central banks can pursue their fiscal policy preferences, identify the political conditions that allow a de facto influence of the central bank and derive testable hypotheses. The empirical sections describe the research design and discuss the results. The final section concludes.

FISCAL POLICY AND CENTRAL BANK PREFERENCES

Fiscal Deficits

Fiscal policy, including temporary deficits that result from counter-cyclical government policy,[13] can be a powerful contributor to investment in human and physical capital or risk sharing. A significant body of empirical research shows, however, that there are important benefits to sound public finance.[14] This work shows that fiscal deficits and high debt reduce economic growth, increase its volatility and increase long-term interest rates. Also, there are immediate and long-term declines of growth around episodes of default on national debt.[15]

Much deficit spending defies the economic cycle and can be traced to political conditions that drive countries to accumulate excessive debt.[16] For example, the common pool resource problem generates deficits because benefits are targeted at specific groups, while revenues come from general taxation. According to this logic, more spending occurs when politicians appeal directly to voters rather than to party bosses,[17] in proportional electoral systems[18] or in democracies.[19] Partisanship is argued to be another source of spending beyond available taxes: deficits may occur under the left[20] due to constituency pressures or under conservative governments that aim to constrain the future choices of the left.[21] Deficits can also be the result of electoral cycles,[22] with some of the literature finding such cycles exclusively in new democracies or less developed countries,[23] while other research identifies circumstances that alter the benefits of electoral fiscal cycles even in developed countries.[24]

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[11] Franzese 2002a; Grilli, Masciandaro, and Tabellini 1991; Jonsson 1995.

[12] Alesina et al. 1999; Alt and Lassen 2006; Alt and Lawry 1994; Hallerberg and Marier 2004; Vlaicu et al. 2014.

[13] Alt and Lowry 1994; Grilli, Masciandaro, and Tabellini 1991.

[14] Ardagna, Caselli, and Lane 2007; Easterly, Rodriguez, and Schmidt-Hebbel 1994; Fatas and Mihov 2003.

[15] Borensztein and Panizza 2009; Furceri and Zdzienicka 2012.

[16] Eslava 2011 and Franzese 2002b survey the politics of fiscal deficits.

[17] Hallerberg and Marier 2004.

[18] Milesi-Ferretti, Perotti, and Rostagno 2002.

[19] Gasiorowski 2000.

[20] Hibbs 1987.

[21] Persson and Svensson 1989. The evidence on partisan budget cycles is mixed (Franzese 2002b), reflecting ambiguous theoretical predictions.

[22] Nordhaus 1975.

[23] Brender and Drazen 2005; Hallerberg, de Souza, and Clark 2002; Schuknecht 1996.

[24] Such conditions include budget transparency (Alt and Lassen 2006) or the exchange rate regime, trade and capital account openness (Clark and Hallerberg 2000; O'Mahony 2011).

Because of the negative consequences of debt, and given the political roots of deficits, policymakers have turned to institutional designs to tie their own hands. Several institutions are shown to limit deficit spending, including balanced budget laws,[25] delegation of agenda power and monitoring over the budget to the executive,[26] contracts among key veto players for multi-annual fiscal programs and spending targets,[27] and limits on parliamentary budget amendments.[28]

We argue that an additional constraint on fiscal deficits comes from the interaction between fiscal and monetary authorities, i.e., the government and the central bank. The link between fiscal deficits and CBI is an important potential effect of CBI. The early research thought that an autonomous central bank could be an institutional solution for low inflation, which would also lower the cost of capital and improve fiscal performance without jeopardizing economic growth.[29] The direct connection from CBI to fiscal deficits has been tested, yet it resulted in mixed findings for both developed countries[30] and developing nations.[31]

The mixed results have remained unreconciled for several reasons: First, as discussed above, extant research has made little progress in consistently covering the central bank reforms of the last two decades. This has limited not just work on the interaction of fiscal and monetary policy, which is at the heart of this article, but also research on the posited key effect of CBI on inflation.[32] In addition, CBI should deter deficits only if the bank's concern with inflation is credible. Political economy research has made strides in understanding when legal CBI is most likely to be credible.[33] Yet these theoretical innovations have lagged application to the interaction between central banks and fiscal policy. Instead, recent work based on the open economy Mundell-Fleming framework has downplayed the role of central banks in fiscal policy.[34] In this work, independent central banks are argued to lack control over interest rates under fixed exchange rates and mobile international capital because of an assumption that the central bank is tied to defending the fixed rate. Alternatively, CBI is argued to be superfluous, because fiscal policy itself cannot stimulate demand under flexible exchange rates and internationally mobile capital, and will thus not be used by governments.

The assumptions of the Mundell-Fleming framework[35] can be countered theoretically, however, leaving room for exploring CBI influence. First, it is governments and not central banks that make exchange rate commitments. Independent banks focus on inflation rather than exchange rate stability, so they will not necessarily accommodate expansionary fiscal policy. The consequence is that fiscally irresponsible governments with CBI may have to adjust their exchange rate regimes, as seen in increased exchange rate volatility[36] or less cooperation in the

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[25] Alt and Lawry 1994.

[26] Alesina et al. 1999; Hallerberg and Marier 2004; Vlaicu et al. 2014; Von Hagen 2002.

[27] Hallerberg 2004.

[28] Wehner 2010.

[29] Alesina and Summers 1993; Grilli, Masciandaro and Tabellini 1991.

[30] Barnhart and Darrat 1988; Burdekin and Laney 1988; Franseze 2002a; Grilli, Masciandaro, and Tabellini 1991; Jonsson 1995; Leone 1991.

[31] Bodea 2013; Sikken and de Haan 1998.

[32] Bodea and Hicks 2015(a).

[33] Broz 2002; Keefer and Stasavage 2003.

[34] Clark 2003; Clark and Hallerberg 2000; Oatley 1999. The Mundell-Fleming model expects that the government's use of macroeconomic policy instruments (monetary and fiscal) depends on the international mobility of capital and the choice of exchange rates. With increased capital mobility characterizing the time after the Bretton-Woods period, under a fixed exchange rate, monetary policy is expected to lose autonomy, while under a floating exchange rate fiscal policy is expected to be ineffective in stimulating demand and economic growth.

[35] We empirically test these assumptions in the robustness section.

[36] Bearce 2008.

gold standard.[37] Secondly, O'Mahony points out that rigidities in international asset markets and consumers' failure to anticipate higher future taxes may explain why more government spending (surprisingly) generates output and consumption growth even under flexible exchange rates.[38] This implies that governments still have incentives to use fiscal deficits even under flexible exchange rates.

It therefore remains a theoretical and empirical question whether and when central banks influence fiscal deficits. We tease out an independent central bank's fiscal policy preferences and explain how deterring fiscal deficits may work. In the next step we tie the successful deterrence of deficits to conditions when central banks can credibly pursue an independent monetary policy.

Central Bank Preferences

CBI has long been linked to low inflation.[39] Central bankers are, on average, more conservative with regards to price stability than elected politicians, and legal independence can insulate monetary policy from political cycles, thus moving it closer to the central banker's preferences.[40] Central bankers also have conservative preferences over fiscal policy, reflecting the idea that, over the long term, one way to deal with persistent budget deficits is to allow inflation to diminish the value of debt. Recent research substantiates the link convincingly: developed countries with large debt or fiscal deficits pay a premium on long-term interest rates, reflecting bond markets' higher inflationary expectations.[41] There is also evidence that deficits contribute to inflation when the central bank lacks independence.[42] Thus recurring fiscal deficits breed the specter of political pressure to accommodate future inflation.

Yet the central bank, if independent, can deter deficits by raising government borrowing costs through short-term interest rate increases and by refusing to lend directly to the government. Higher short-term interest rates affect long-term bond rates, thus raising the costs of government financing debt. That is, a combination of fiscal deficits and retaliatory tight monetary policy is likely to increase the interest rates at which markets are willing to finance fiscal deficits. Also, while the central bank is not intent on provoking recessions, higher short-term interest rates also reduce economic growth.

Real-world examples of central bank statements or retaliatory increases of short-term interest rates are rare, both because interactions between the central bank and the government are not public[43] and because central bank retaliation need not materialize if the bank is successful at

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[37] Simmons 1996.

[38] O'Mahony 2011.

[39] Early work includes Cukierman, Webb, and Neyapti 1992, Grilli, Masciandaro, and Tabellini 1991, Alesina and Summers 1993.

[40] Blinder 1998; Lohmann 1992; Rogoff 1985.

[41] Ardagna, Caselli, and Lane 2007; Baldacci and Kumar 2010; Laubach 2009. Default risk associated with high debt may be another cause for interest rate increases. However, Laubach (2009) shows that, even for the US, a 1 percentage point rise in the projected deficit raises long-term interest rates by twenty-five basis points.

[42] Neyapti 2003; Treisman 2000.

[43] Lohmann (1998) notes that even the archetypal independent German Bundesbank was aware it could endanger its independence by quarrelling in public with a popular government. Still, surveys show that in industrial countries fiscal policy is the topic of 40 per cent of high-level talks between the central bank and the government (Moser-Boehm 2006). Also, central bank official communication on fiscal policy increases as a reaction to fiscal deficits, showing a clear concern for fiscal policy (Allard et al. 2013). More directly, in 2011 the European Central Bank (ECB) used secret correspondence (that leaked to the press) to demand sweeping deficit cuts from Italy, Ireland and Spain. These and additional measures were required as a condition for ECB buying Italian and Spanish bonds from the market to try to reduce the high interest rates that markets demanded of these countries.

deterring fiscal deficits. Still, one clear example comes from the German Bundesbank. In January 1955 the German central bank warned the government not to turn to fiscal deficits while the economy was experiencing economic growth. The initial admonitions were followed by the 'highly visible warning signal of a higher discount rate in August 1955'[44] and by two additional interest rate increases in 1956, both linked very publicly by the central bank's council to the government's fiscal policy. In another example, Beck shows that the US Federal Reserve responded with interest rate increases to fiscal deficits starting in the 1970s, which he attributes to the Fed's newly found independence.[45]

Besides interest rate retaliation, central bank laws limit a bank's ability to provide funds directly to governments or give it more control over the financing conditions, including the maturity and cost of lending. Losing access to cheap money provided by the central bank increases the costs of fiscal deficits that need to be financed by markets. Franzese, for example, argues that CBI may dissuade debt accumulation because governments anticipate a future inability to inflate debt.[46] Tabellini suggests that this was precisely the interaction between the Italian Treasury and the Bank of Italy in 1981, after the Bank stopped having a legal obligation to purchase any public debt unsold directly to investors.[47] Central bank financing of budget deficits is likely a larger problem in developing countries with weak financial markets.[48] Still, even industrial countries derive utility from access to borrowing from their central bank. For example, the British government maintains its ability to borrow directly from the Bank of England and has used it in the most recent financial crisis.

WHEN DO CENTRAL BANKS PURSUE THEIR FISCAL POLICY PREFERENCES?

As explained above, the legal, institutional independence of monetary policy has the potential to influence fiscal deficits. Yet politicians have incentives to subvert the institutional independence of the central bank. The central bank law is inherently incomplete and can be changed (or threatened to be changed) by politicians in order to make central bankers more subservient. Central bank governors can also be fired prematurely, and their appointment may be conditioned by a subservient monetary policy. Therefore, rather than the legal independence codified in central bank law, some of the economics literature looks at central bank governor tenure or expert surveys to distinguish de facto bank autonomy.[49] Long tenures, however, may be a result of both autonomy and the lack of it. Dreher, Sturm and de Haan, for example, show that central bankers lose their jobs for high inflation, which makes turnover a poor indicator of de facto CBI.[50] Also, surveys are limited to small samples and could be biased as they are filled out by central bank experts.

We favor a political economy approach that emphasizes legal rules and the conditions under which such rules have practical effects on behavior. Extant work shows that political institutions determine the degree to which central bank law is enforceable and, thus, when the de facto

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[44] Berger 1997, 440.

[45] Beck 1984. See Canzoneri, Cumby, and Diba 2002 and Melitz 2002 for more evidence of interest rate retaliation.

[46] Franzese's (2002a) argument also suggests that, alternatively, fiscally 'imprudent or recalcitrant' governments with massive debt when facing CBI may see higher fiscal deficits because debt inflation is not an option. Empirically, we find the opposite: high debt levels are associated with lower fiscal deficits.

[47] Tabellini 1987.

[48] Fry 1998.

[49] E.g., Cukierman, Webb, and Neyapti 1992.

[50] Dreher, Sturm, and de Haan 2008.

behavior of the central bank reflects its aversion to inflation.[51] Democracies have an advantage over autocracies in the application of the rule of law due to stronger *ex post* constraints and more transparency. This advantage increases the credibility of monetary policy delegation to an independent central bank and, we argue, raises the likelihood of retaliatory monetary policy in response to fiscal policy, which can deter fiscal deficits.

Yet even if we uncover an average CBI effect on fiscal deficits in countries with rule of law and impartial contract enforcement, this effect may come from fundamentally different central bank behaviors. On the one hand, the central bank may prompt governments to adopt a fiscal policy countering the macro-economic cycle, incentivizing surpluses or balanced budgets in good times. On the other hand, as we argue, the alternation of surpluses and deficits can emerge when the central bank pragmatically guards its formal, de jure, independence by accommodating politicians under circumstances related to the electoral calendar or government partisanship. Below we detail our argument and derive testable hypotheses.

Broadly, a lasting democracy is linked to secure property rights and contract enforcement, and both are premised on the judiciary's independence and respect for the rule of law and individual rights.[52] This means that, in dictatorships, the enforcement of legislation aimed to tie the hands of government is highly uncertain. A first condition that helps the broad rule of law prevail in democracies is the strength of constraints on government power. Very directly, the political opposition has an interest in guarding the independence of the central bank because independence denies the incumbent the opportunistic use of monetary policy and limits the use of fiscal policy. Coalition partners in the executive and the opposition also have reasons to protect the independence of the central bank, because it provides information about government policy choices.[53] Indeed, the presence of two or more veto players reduces the probability that the central bank will be overridden on decisions regarding inflation or that the central bank law will be amended. This in turn increases the credibility of independent central banks in pursuing the mandated task of maintaining price stability and results in lower inflation.[54]

A second condition that helps the broad rule of law is the transparency of political decisions. Relatively more transparent political systems like democracies impose costs against opportunistic behavior by the government.[55] Since central banks are opaque in their decision making, the 'true' independence of some of their actions is difficult to monitor.[56] In democracies, the political opposition can denounce transgressions against CBI and the voters can punish transgressions at the ballot box. Such actions from domestic political actors and the public are more likely when the press is free to report, and when elections are free and competitive.[57] Following the theoretical discussion, a first testable hypothesis links deterrence of fiscal deficits to credible institutional CBI:[58]

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[51] Bernhard 1998; Bodea and Hicks 2015(a); Broz 2002; Hallerberg 2002; Keefer and Stasavage 2003; Moser 1999.

[52] Olson 1993.

[53] Bernhard 1998; Crowe 2008.

[54] Keefer and Stasavage 2003; Moser 1999.

[55] Broz 2002.

[56] Bodea 2010; Broz 2002.

[57] Evidence on this causal chain comes from the literature on political business cycles: electoral fiscal cycles are smaller when the local press is developed (Akhmedov and Zhuravskaya 2004), where voters have access to information via a free press (Shi and Svensson 2006) or when the transparency of fiscal policy is high (Alt and Lassen 2006).

[58] A similar hypothesis is derived in Bodea (2013) and tested using a much smaller sample of post-communist states (1990–2002).

HYPOTHESIS 1: Central bank independence reduces fiscal deficits predominantly in democracies, and countries with strong rule of law, political constraints on the executive and a transparent political system.

The features of democracy described above should help legal CBI deter fiscal deficits. Yet even in countries with strong rule of law and contract enforcement, it is not necessary for the bank to use political capital to oppose deficits in every budget. First, this is the case because deficits are not consistently bad for inflation and macroeconomic stability if fiscal consolidation follows. More important, however, fiscal policy is not part of the legal mandate of an independent central bank, even if, in the long run, debt accumulation through deficit spending affects inflation expectations and inflation, which are of direct concern to the bank. As long as they are market financed, fiscal deficits are not the formal domain of central banks. There is little dispute that CBI remains contested in the political arena.[59] As we note above, politicians can threaten to change the law, and can circumvent the law through the process of appointment and dismissal of central bank governors and boards. Our argument is that the central bank needs to be selective in choosing fights related to policies outside its direct mandate, like fiscal policy.

We use Lohmann's framework to identify conditions under which the central bank voluntarily backs down.[60] In her model, the central bank is independent, but, reflecting reality, the government retains the flexibility to override the bank at some cost.[61] In this interaction, Lohmann shows that it is optimal for the central bank to accommodate the government's demands in extreme situations for fear of being overridden. Thus in normal times, the central bank decides on monetary policy. When facing large negative shocks to economic growth, however, the bank adopts politicians' preferences since the government's utility loss from low growth is higher than the cost of overriding the central bank. We would expect a similar situation for office-seeking politicians when they bid for re-election: large losses to government utility will result from a conservative monetary policy response to fiscal policy around election times, prompting the central bank to accommodate the government.[62]

Therefore, even if the central bank prefers fiscal balance, it may be reluctant to pursue it when the government has little appetite for fiscal consolidation and, consequently, the risk of backlash against independence is higher. Recent work indicates that electoral cycles continue to exist in less-developed countries and new democracies.[63] So, particularly in such countries, election years entail strong incentives for incumbents to manipulate the economy and are therefore not ideal for the central bank to press for budget surpluses. This discussion leads to the following hypothesis:

HYPOTHESIS 1a: Especially in new democracies, central bank independence is more likely to contribute to fiscal consolidation outside the electoral cycle.

Moreover, the central bank may find it preferable to push the political costs of expenditure cuts or tax increases on particular political actors. A key premise in the CBI literature is that the

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[59] Beck 1984; Franzese 1999; Lohmann 1992, 1998.

[60] Lohmann 1992.

[61] Being overridden may mean losing one's job or facing changes in the central bank law or the bank's governance structure, or hostile appointments to the bank's governing bodies. Costs entail the reaction of financial markets, political opposition and the press.

[62] Future work could consider the credibility of threats to amend central bank law in election years by considering the cost of electoral defeat (Bernhard and Leblang 1999) and the size of the government's parliamentary majority.

[63] Brender and Drazen 2005; Shi and Svensson 2006. Alt and Lassen (2006) find fiscal cycles even in developed democracies with low fiscal transparency. Consequently, there may be more countries in which incumbents are hard to deter from fiscal deficits in election years.

bank has more conservative preferences than politicians and the public at large.[64] The assumption is needed to derive the result that the delegation of monetary policy leads to lower inflation. This conservatism is generally argued not to have a partisan element but to be an objective preference.[65] Others, however, argue that there is a political bias in how independent central banks set interest rates.[66] The non-neutrality of interest rates arises, according to this view, because the preferences of independent and conservative central banks are a natural fit with the agendas of right-wing governments, as evidenced by central bankers' backgrounds, financial markets constraining their appointment and the professional socialization of bankers. This fit between independent central bankers and the political right is reflected in the co-ordination of fiscal and monetary policies or monetary policy aimed at keeping the right in office.[67]

For us, the potential bias – and the fact that left-wing parties may see higher central bank interest rates – implies that the left has incentives to reduce fiscal deficits. This is because high interest rates imply additional costs for financing debt and, more importantly, because recessions induced by such high rates tend to disproportionally hurt those with lower skills and income, which are the left's constituency.[68] In addition to the non-neutrality of central banks, there may be other reasons for CBI to have more influence on fiscal policy when the left is in power. The left may simply be more receptive to prods for fiscal discipline due to higher expectations of inflation under left-wing governments[69] and thus higher market interest rates on government debt. The central bank's push for fiscal balance then usefully serves to placate the left's own constituency and supply information on the likely capital market reaction to budget plans, as well as provide focal point estimates on amounts of deficit cutting and time horizons for the cuts.[70] Thus independent central banks can be expected to contribute differently to fiscal consolidation during the tenure of left- versus right-wing governments.

HYPOTHESIS 1b: In democracies, central bank independence is more likely to lead to budget surpluses/lower deficits under left-wing governments.

DATA AND METHODOLOGY

We use an annual dataset covering seventy-eight countries from 1970 to 2007. The core dependent variable is the budget deficit or surplus relative to GDP. This data is based on Brender and Drazen,[71] updated and expanded for non-democracies using the International Monetary Fund (IMF) International Financial Statistics (IFS 2002), the IMF Government Financial Statistics (GFS 2010), and the

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[64] Rogoff 1985.

[65] Bernhard 1998; Bernhard and Leblang 2002; Blinder 1998; Crowe 2008. CBI is, rather, supposed to generate sustainable economic growth in the absence of inflation (Blinder 1998). An independent central bank is also argued to be a reliable source of information about the government's policies and a reason for legislators and coalition partners with diverse preferences to favor delegation in the first place (Bernhard 1998; Crowe 2008), or an aid to cabinet longevity (Bernhard and Leblang 2002). CBI may additionally depend on whether incumbents can win elections given party and federal veto players (Hallerberg 2002), or whether the executive is also considering fixed exchange rates (Bodea 2010; Clark 2002).

[66] Clark and Arel-Bundock 2013; Cusack 2001.

[67] Cusack (2001) shows that, in OECD countries, the central bank has a retaliatory monetary policy reaction (higher discount rates) only to left-wing government induced deficits. For the United States, Clark and Arel-Bundock (2013) find that interest rates decline in election years when Republicans control the White House.

[68] Cusak 2001; Hibbs 1987.

[69] Hibbs 1987.

[70] The description matches well Alan Greenspan's role in President Clinton's 1993 budget proposal.

[71] Brender and Drazen 2005.

European Bank for Reconstruction and Development (EBRD) transition reports (2011). Fiscal balance is computed as revenue minus expenditure.[72] The central bank may care more about other operationalizations of fiscal policy, like the primary deficit (interest payments are excluded). Yet this variable is not available for large samples that include developed and developing countries.

The key explanatory variables operationalize the independence of a country's central bank, the features of its political regime, the rule of law, as well as election years and government partisanship. A country's CBI level is based on the seminal work of Cukierman, Webb and Neyapti.[73] Their article covers seventy-two countries with decade indicators for 1950–89. Here we use an original dataset that codes independence annually, directly identifies reform years and extends the well-known Cukierman, Webb and Neyapti coding to cover reforms in the last twenty years.[74] The CBI index is based on a weighted aggregation of sixteen legal indicators in four categories regarding the tenure of the bank's governor, policy formation, objectives and limitations on lending to the government, using the criteria and weights in Cukierman, Webb and Neyapti. The index varies between 0 and 1, with larger values indicating independence.[75] A central bank is legally more independent when the governor's term in office is longer, the appointment and dismissal procedures are more insulated from the government, the mandate is more focused on price stability, the formulation of monetary policy lies squarely with the central bank and the provisions on direct central bank lending are restrictive.

To measure democracy we use Polity IV scores. We add 10 to the Polity IV score and convert the range to a scale from 0 to 20, with high scores indicating democracies. We supplement Polity scores with Freedom House data, which is the sum of a country's political rights (1–7) and civil liberties (1–7). We rescale the original data, so that lower scores correspond to autocratic regimes and high scores denote democracies, ranging from 0 to 12. In addition, we use Linzer and Staton for a measure of latent judicial independence that varies between 0 and 1.[76] They use eight distinct sources of data that code various aspects of de facto judicial independence, and their measure aims to capture the commonality of coding across the different data sources.[77] We also test the specific mechanisms that should aid democracies with legal CBI lower fiscal deficits. We use three available measures that maximize the sample size: political constraints,[78] the executive constraints component of the Polity IV democracy score (xconst) and press freedom (Freedom House). Henisz's political constraints index aggregates constraints over three veto points (the executive, the lower and the upper houses of the legislature) and ranges from 0 (low constraints) to 1 (high constraints). The Polity IV executive constraints measure shows the degree to which the executive considers the preferences of other societal

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[72] Expenditure is total central government expenditure relative to GDP. Revenue is central governments' total revenue plus grants to GDP. For some of the countries, consistent historical information is not available for more recent years (Appendix Table A6). We do not include the euro-area countries because our argument that the central bank deters the fiscal authority to overspend has little traction with the ECB focusing on price stability in the euro area and fiscal policy being decided at the national level.

[73] Cukierman, Webb, and Neyapti 1992.

[74] The coding uses central bank laws and publications, as well as Hicks (2004), Jacome and Vazquez (2008) and Bodea (2013). Appendix A 6 and 7 show the criteria and weights in the Cukierman, Webb, and Neyapti index and the years of central bank reform.

[75] The average legal CBI level is 0.42 for developed nations and, owing to the reforms in the last twenty years, 0.46 for developing countries. We also use an indicator variable, coded 1 for CBI levels above the mean and 0 for levels below the mean. This transformation does not affect our findings.

[76] Linzer and Staton 2012.

[77] Among these data sources, the best coverage is for: political constraints (Polity IV), law and order (Political Risk Service) and judicial independence (Cingranelli and Richards-CIRI).
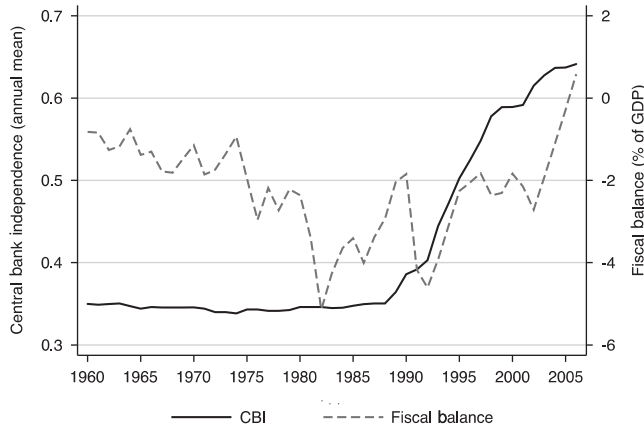
[78] Henisz (2002), 2010 data.

Fig. 1. Fiscal balance and central bank independence (1960–2007)
Note: solid line = yearly average CBI; dotted line = yearly average of fiscal deficit/surplus.

actors when making decisions, ranging from unlimited authority (0) to strong opposition (7). Freedom House provides press freedom scores starting in 1980, ranging from 0 (not free) to 1 (partially free) and 2 (free), with missing data coded as 0. For elections, we use Hein Goemans' election dates dataset,[79] NELDA (v3) and author corrections (Appendix Table A2). The election variable is a dummy with a value of 1 for presidential and parliamentary elections and 0 otherwise. Also, from the Database of Political Institutions[80] we use the partisanship of the executive (execrlc) to create a dummy variable taking a value of 1 for left executives.

Figure 1 shows the average level of CBI and fiscal balance in our sample from 1960 to 2007. Fiscal balance has a remarkable time variation, with two periods of large fiscal deficits in the early 1980s and middle 1990s and a fiscal improvement from around 1995 to 2007. Yet legal CBI dramatically increases after the Cold War, after a stable average (still, with a large variance) during the 1970s and 1980s. Figure 1 suggests that the legal CBI index on its own is not strongly associated with fiscal balance over time, perhaps because central bank laws have a conditional effect on fiscal discipline, as we argue.

In addition to the core variables, we use the following standard controls based on the literature: GDP per capita,[81] GDP growth (World Development Indicators, WDI), inflation (GDP deflator, WDI), capital controls,[82] trade openness (WDI), the de facto exchange rate regime,[83] the proportion of the population aged over sixty-five (WDI), oil and gas value per capita,[84] and strikes (Cross-National Time-Series Data Archive). To control for time- and regional-specific factors, we include five-year time interval dummies and region dummies. To mitigate endogeneity concerns,[85] all economic variables are lagged one year. The empirical

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[79] http://www.rochester.edu/college/faculty/hgoemans/data.htm, accessed 6 February 2013.
[80] Beck et al. 2001.
[81] Maddison 2012.
[82] Chinn and Ito 2008.
[83] We recode a standard measure (Ilzetzki, Reinhart, and Rogoff 2008; Reinhart and Rogoff 2004) such that 1 stands for de facto pegs and crawls (Ilzetzki, Reinhart, and Rogoff coarse coding 1, 2, 3). Empirical results are similar when the exchange rate regime and inflation are excluded, or when we only code de facto pegs.
[84] Ross 2012.
[85] While our specifications, including the choice of exogenous variables, are supported by the standard tests associated with the generalized method of moments (GMM) estimation, other issues may be important.

model takes the following form, where fiscal balance is positive for surpluses and negative for deficits:[86]

$$Fiscal\,Balance_{i,t} = \alpha_1 + \alpha_2\,Fiscal\,Balance_{i,t-1} + \alpha_3\,CBI_{i,t}$$

$$+ \alpha_4\,Polity_{i,t} + \alpha_5\,CBI_{i,t}*Polity_{i,t} + [Controls] + \varepsilon_{i,t}$$

The basic regressions are ordinary least squares (OLS) estimations, with panel-corrected standard errors (PCSEs) to correct for potential group-wise heteroscedasticity and contemporaneous correlation of errors[87] and lagged dependent variables to capture the sluggish dynamics of government fiscal choices.[88] Using Madalla and Wu and Pesaran panel unit root tests, we find no evidence of unit root in the fiscal balance dependent variable. We expect that α^5 is positive, indicating that as countries become more democratic (Polity IV increases), CBI should work to reduce fiscal deficits or generate surpluses. We do not have a clear expectation regarding the effect of CBI on the fiscal balance in undemocratic countries (α_3). However, based on Gasiorowski,[89] we expect that democracies with dependent central banks will tend to incur deficits or have lower surpluses (α_4 is negative).

While we control for regional effects and other specific factors like oil rents and strikes, we are still concerned about time-invariant country characteristics that are not captured by our dependent variables and could therefore lead to potentially biased estimates. However, fixed-effects estimation is not optimal in our case. First, using country-fixed effects in an OLS regression with lagged dependent variables also introduces bias, a problem aggravated by the relatively small time duration for many countries in our data set. For example, post-communist countries are in the sample for nine to fifteen years, which does not allow shocks to fixed effects to diminish over time (the Nickell bias).[90] Secondly, the CBI index and Polity IV scores vary little within countries, and fixed-effects models lead to greatly inefficient estimations.[91] To address these problems, we present system GMM models.[92] The GMM estimation deals with several shortcomings in the data, including the short time span in the sample, fixed individual effects, and potential heteroscedasticity and auto-correlation within countries.[93] In the GMM regressions, we only use up to the second lag of the variables for the regression in levels, in order to reduce the number of instruments and the risk of over-fitting the data. Also, we report two standard specification tests. First, the Hansen test of over-identifying restrictions tests the overall validity of the instruments, and failure to reject the null hypothesis gives support for the model, including our choice of endogenous variables. Secondly, the Arellano–Bond test for AR(2) in first differences tests whether the residuals from the regression in differences is second-order serially correlated; again, the failure to reject the null hypothesis supports the model specification.

In particular, both CBI and fiscal deficits may be driven by a country's culture and aversion to macro-economic instability. Our results are robust to including a country's inflation history to proxy for such aversion, which helps mitigate this concern.

[86] This research design does not capture the strategic interaction between governments and central banks, but instead the outcome of equilibrium behavior.

[87] Beck and Katz 1995.

[88] The lagged dependent variable also addresses potential autocorrelation (Beck and Katz 2004).

[89] Gasiorowski 2000.

[90] Beck and Katz 2004; Wooldridge 2002.

[91] Plümper and Troeger 2007.

[92] Arellano and Bover 1995; Blundell and Bond 1998.

[93] Roodman 2009. We use the orthogonal deviations transformation that preserves sample size in panels with gaps (Arellano and Bover 1995).

RESULTS AND DISCUSSION

Table 1 shows the results of our statistical analysis. Model 1 investigates whether legal CBI alone affects fiscal balance regardless of the political regime. Using the CBI index and Polity IV scores individually in the model, we find that the coefficient of the CBI index is positive but statistically insignificant. While not reported, this result is maintained when we use different estimation methods (fixed effects or system GMM). Polity IV scores negatively impact fiscal balance, which is consistent with extant work,[94] but, again, the variable is not statistically significant.

Next, Models 2–6 test Hypothesis 1 by considering the conditional effect of the CBI index on fiscal deficits. To estimate the impact of legal CBI conditional on a country's level of democracy, we introduce an interaction term between the CBI index and the Polity IV score. Models 2 and 3 use the statistical methodologies described earlier (OLS with PCSEs and system GMM), and, as predicted, the interaction terms in the models are positive and statistically significant at the 5 per cent confidence level.[95] The CBI coefficient is negative, implying that, given the positive interaction term, higher legal CBI improves fiscal balance only at high values of the rescaled Polity IV, or in democracies.

Moreover, absent an independent central bank, the fiscal performance of democracies is worse than that of autocracies (the coefficient on the Polity IV score is negative and statistically significant).[96] As expected, using the fixed-effects estimation (Model 4) reduces the efficiency of our estimates. The coefficient of the Polity IV score remains statistically significant, while the coefficient of the interaction term between the CBI index and the Polity IV score goes below the usual threshold for statistical significance. However, graphing the marginal effect of CBI from the fixed-effects model shows a significant effect for high levels of Polity IV scores (Appendix Figure A1), similar to the figures based on system GMM models shown below.[97] Model 5 shows that the results are robust to using the Freedom House index: the interaction of the CBI index with the democracy measure is positive and statistically significant. Finally, Model 6 uses the Staton and Linzer measure of judicial independence, which shows (as expected) a positive and highly statistically significant interaction effect between CBI and judicial independence.[98]

More than just examining multiplicative interaction terms for direction and statistical significance, Brambor, Clark and Golder prescribe that inference should be done with meaningful marginal effects and standard errors to determine the conditions under which the variable of interest has a statistically significant effect.[99] Figure 2(a) uses our preferred-system GMM Model 3 and shows the marginal effect of the CBI index on fiscal balance at all levels of the Polity IV score (Figure 2(b) uses Freedom House scores). The solid line is the marginal effect and the dotted lines show the 90 per cent confidence interval. The marginal effect is upward sloping, as expected, and the CBI index has a positive impact on fiscal balance when the Polity IV score exceeds 14, and becomes statistically significant when the score is greater than

[94] Gasiorowski 2000.

[95] For the system GMM model (Model 3), both the Hansen test of over-identifying restrictions and the Arellano–Bond test for AR(2) support our specification and choice of instruments.

[96] This result suggests that as the CBI index goes up, the impact of Polity IV on fiscal balance will change from large fiscal deficits to smaller deficits or surpluses.

[97] The Hausman test for fixed vs. random effects rejects random-effects specifications. Using the fixed-effects vector decomposition estimation (Plümper and Troeger 2007) supports our first hypothesis.

[98] In addition to the Linzer and Staton measure, we also use a binary variable that takes a value of 1 for countries with high constraints (xtconst = 7); high Political Risk Service rule of law (PRS = 6) and high Cingranelli-Richards judicial independence (CIRI = 2). The results continue to support our hypothesis.

[99] Brambor, Clark, and Golder 2006.

TABLE 1   *Determinants of Fiscal Balance*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	OLS-PCSEs	OLS-PCSEs	System GMM	FE	System GMM	System GMM
Central Bank Independence (CBI)	0.202	−2.050*	−2.070**	−0.636	−1.504*	−1.392**
	(0.363)	(1.148)	(0.987)	(1.289)	(0.912)	(0.667)
Polity IV	0.002	−0.049*	−0.067**	−0.071*		
	(0.016)	(0.028)	(0.027)	(0.038)		
CBI×Polity IV		0.135**	0.136**	0.099		
		(0.062)	(0.056)	(0.077)		
Freedom House Index (FHI)					−0.082	
					(0.052)	
CBI × FHI					0.183*	
					(0.094)	
Judicial Independence						−0.964*
						(0.555)
CBI×Judicial Independence						2.467***
						(0.911)
Fiscal Balance (t−1)	0.738***	0.736***	0.845***	0.600***	0.854***	0.849***
	(0.031)	(0.031)	(0.044)	(0.029)	(0.044)	(0.043)
Elections	−0.202	−0.202	−0.187	−0.257*	−0.193	−0.193
	(0.134)	(0.134)	(0.128)	(0.129)	(0.128)	(0.128)
GDP Growth (t−1)	0.039**	0.041**	0.019	0.061***	0.017	0.018
	(0.016)	(0.017)	(0.024)	(0.018)	(0.025)	(0.024)
GDP per capita (t−1)	0.322*	0.313*	−0.040	0.086	−0.111	−0.110
	(0.188)	(0.188)	(0.140)	(0.510)	(0.135)	(0.140)
Trade Openness (t−1)	0.005**	0.005**	0.003**	0.003	0.003**	0.003**
	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.001)
Capital Controls (t−1)	0.036	0.029	0.057	0.099	0.064	0.056
	(0.053)	(0.054)	(0.042)	(0.085)	(0.040)	(0.042)
Fixed Exchange Rate Regime	0.042	0.047	0.053	0.457*	0.019	0.030
	(0.120)	(0.119)	(0.137)	(0.258)	(0.135)	(0.135)
Population over 65	0.005	−0.010	0.002	−0.068	0.004	−0.001
	(0.029)	(0.029)	(0.020)	(0.078)	(0.021)	(0.021)
GDP Deflator (t−1)	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Oil-Gas Rent (t−1)	0.035***	0.037***	0.023***	0.036***	0.022***	0.023***
	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Number of Strikes (t−1)	−0.061	−0.050	−0.022	0.027	−0.016	−0.025
	(0.094)	(0.093)	(0.117)	(0.130)	(0.128)	(0.116)
Constant	−4.119**	−3.157*	1.457	−0.744	1.394	1.092
	(1.623)	(1.702)	(1.155)	(4.118)	(1.110)	(1.124)
Observations	1,968	1,968	1,968	1,968	1,929	1,950
R^2	0.69	0.69		0.51		
Countries	78	78	78	78	78	78
Wald χ^2	1,998.81***	2,104.31***	6,482.81***	142.11***(a)	6,525.77***	5,692.50***
		GMM specification tests (p values)				
The Arellano-Bond test for AR(2) in first differences		0.352			0.343	0.354
The Hansen test of overidentifying restrictions		0.348			0.303	0.323

Note: the dependent variable is fiscal balance (positive values for surpluses; negative values for deficits). ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$, robust standard errors in parentheses. All models include half-decade period dummies. Models 1 and 2 include region dummies. (a) F values.
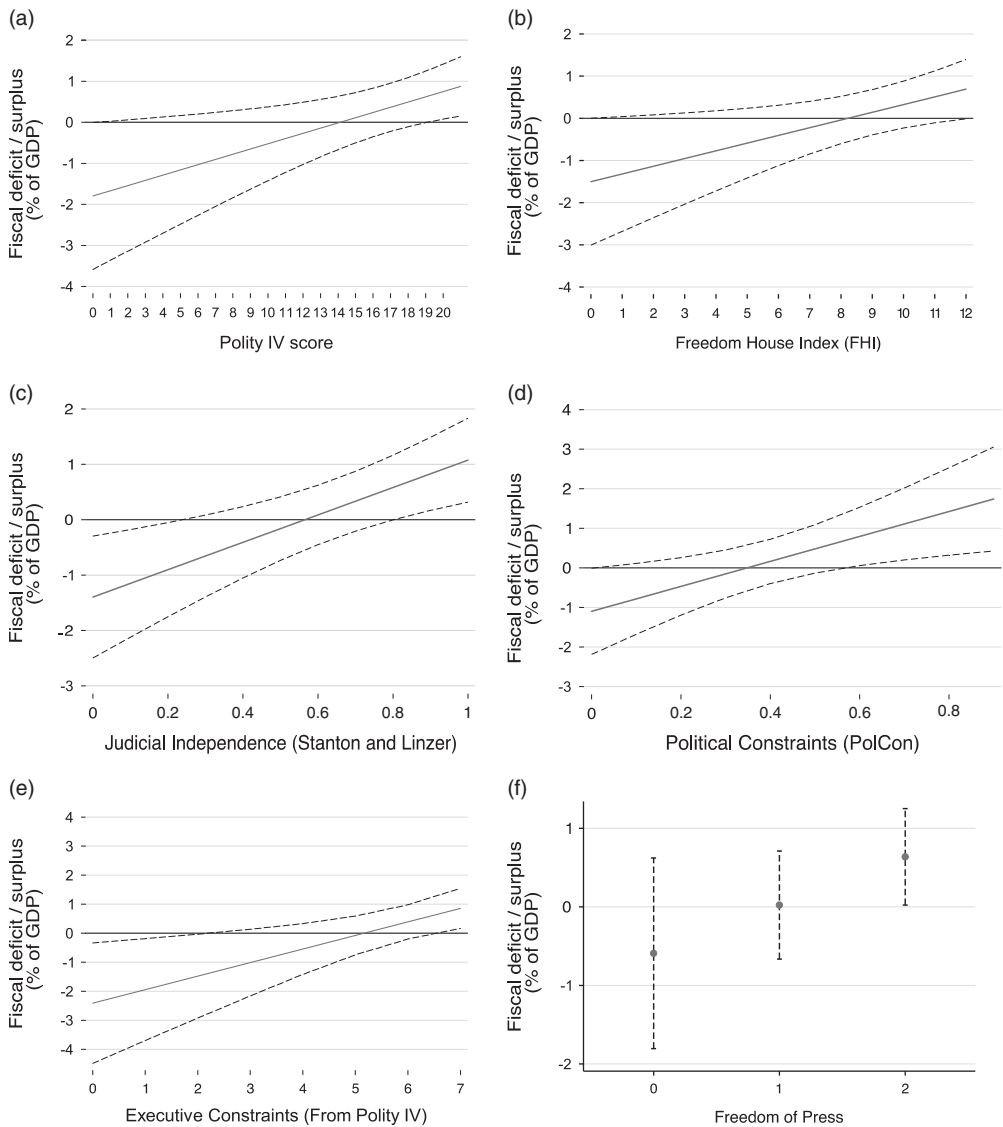
Fig. 2. Conditional effects: marginal effect of central bank independence
Note: solid line = marginal effect of CBI on fiscal deficit/surplus to GDP; dotted lines = 90% confidence intervals.

about 18. Similarly, Figure 2(c) shows a positive marginal effect of CBI when judicial independence is high (above 0.8). These findings support our Hypothesis 1: strong democracies and rule of law and impartial contract enforcement enable independent central bankers to deter fiscal deficits. The marginal effect shows an improvement in the fiscal deficit of about 0.7 percentage points in democracies. Given that the average fiscal deficit for democracies in the sample is −1.6 per cent of GDP, the marginal effect of CBI is quite large.

In Latin America, Chile and Uruguay provide an illustration of the results. Chile started off the continent-wide reform of central bank legislation. That is, in 1989 Chile both transitioned to

democracy and reformed the institutional foundations of its central bank, making it one of the most independent in the world (CBI index = 0.89). Uruguay returned to democracy in 1985, yet failed to reform its central bank until 1995/1997; even then, its legislation was far from that passed in Chile (CBI index = 0.49). The fiscal performance of the two countries between 1989 and 2007 plausibly reflects the difference in central bank legislation, with Uruguay having an average deficit of −1.2 per cent of GDP and Chile an average surplus of 1.5 per cent of GDP. While we control here for other factors that affect fiscal balance, Hallerberg and Marier support our comparison as they rank the two countries closely on both executive strength and incentives for personal vote in the legislature, two key features they show are strongly related to fiscal indiscipline.[100]

Regarding our controls, only the oil and gas rents per capita variable, trade openness and inflation have a statistically significant effect across the models. Intuitively, higher oil revenue leads to fiscal surpluses. Also, high-inflation countries and trade-open countries have surpluses. For other variables, the coefficients go in the expected direction, but many do not achieve statistical significance. Both better economic growth and higher GDP per capita tend to improve fiscal performance, but are not consistently significant; election years worsen the fiscal balance, but the variable is significant in only some of the specifications. On the other hand, de facto fixed exchange rates, capital controls, old-age population and strikes do not appear to significantly affect our results.

To test the hypothesized causal mechanisms, we use interactions of the CBI index with two measures of constraints on the power of the executive and one measure of press freedom. Overall, the results indicate that CBI improves fiscal balance only in countries with political constraints and where the press can report on government actions. Appendix Table A3 shows the estimated coefficients and Figure 2 (d–f) graphs the marginal effect of CBI on fiscal balance. Hypothesis 1 continues to be supported: Model 7 uses Henisz's political constraints (PolCon III), and the coefficients show a positive and statistically significant interaction effect. In Figure 2(d) the marginal effect of CBI turns positive where PolCon III is about 0.35 and becomes statistically significant when it is more than around 0.5. Model 8 uses the executive constraints component of the Polity IV score with similar estimates. Figure 2(e) graphs the marginal effect of the CBI index using Model 7, and shows that the effect of CBI turns positive when the *xconst* variable goes above 5 and becomes statistically significant when *xconst* is above 6.5. Model 9 includes an interaction between the CBI index and the press freedom indicator. The interaction term is positive, as expected, but is short of statistical significance at the 10 per cent level. Still, Figure 2(e) shows that while the marginal effect of the CBI index is insignificant when the press is not free or only partly free, the same marginal effect becomes significant when the press is fully free.

We verify the robustness of Table 1 findings in multiple ways. These results are described in detail in the Online Appendix (Supporting information 1). The key results maintain when additional potentially relevant variables are added, when the sample is altered to address concerns that influential observations drive our results and when we consider country inflation aversion. Also, we do not find that CBI's effect on fiscal deficit is conditioned by the exchange rate regime or the mobility of capital, as predicted by the Mundell-Fleming framework. In addition, we investigate whether CBI affects fiscal deficits by increasing revenue or reducing the spending side of the budget.

Elections and Partisanship

Central banks may react to deficits in an optimal counter-cyclical fashion, allowing fiscal policy to respond to recessions with additional spending and opposing deficits during good times. We find, however, no evidence that the effect of CBI is conditioned by economic growth, and this

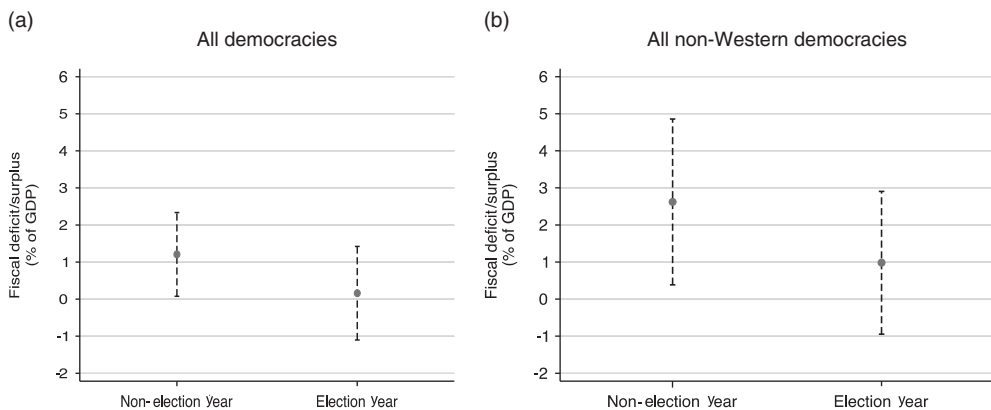---

[100] Hallerberg and Marier 2004.

Fig. 3. CBI and fiscal balance in democracies: elections
Note: points = marginal effect of CBI; dotted lines = 90% confidence intervals.

holds in both our full sample and only in democracies, with a continuous measure of economic growth or cut-offs for various levels of positive growth. To test Hypotheses 1a and 1b and our own view of a strategic central bank that guards its legal independence, we limit our sample to democracies.[101] We then first re-estimate the system GMM model of fiscal balance to include an interaction of the CBI index with the indicator variable for elections. Coefficients are in Appendix Table A5 (Models 12 and 13). Figure 3a shows the marginal effect of the CBI index in election years versus non-election years for all democracies: in non-election years, the marginal effect of CBI is 1.2 per cent (statistically significant at the 90 per cent confidence level). In contrast, in election years, the CBI marginal effect is on average 0 and statistically insignificant. Next, we exclude from the sample Western democracies (Figure 3b). For new (non-Western) democracies, the effects are larger, but similar in terms of statistical significance: in non-election years, the marginal effect of the CBI index is 2.6 per cent and statistically significant (90 per cent confidence level), while the marginal effect in election years is about 1 per cent but statistically insignificant. This evidence indicates that the effect of CBI on fiscal consolidation is likely to come from non-election years, and the average effect appears to be larger in new democracies.[102] We also use our whole sample (both democracies and dictatorships) to estimate a model that includes an interaction between the CBI index and the indicator for election years. The estimations yield no statistically significant result: CBI does not improve fiscal balance, even outside election years. The lack of findings in the broader sample supports our argument that legal CBI needs rule of law and impartial contract enforcement in order to have a de facto deterrent effect.

To test Hypothesis 1b, we again use only democracies and re-estimate system GMM models of fiscal balance to include an interaction between the CBI index and the indicator variable for left governments.[103] The results indicate that CBI is more effective in deterring fiscal deficits during the tenure of left-wing executives. Estimates are shown in Appendix Table A5 (Models 14 and 15), while Figure 4 shows the marginal effect of CBI for executives who are on the left

[101] We use the range for which CBI was found to affect budget balance (a cut-off of 8 on the original Polity IV scale). Using the smallest cut-off possible is preferable to increase the sample size. We collapse the GMM instruments (Roodman 2009) and control for regions for these smaller country samples.
[102] The findings hold if we look at legislative or presidential elections only. Confidence intervals for the marginal effect of CBI in presidential election years are large.
[103] Results also hold if we use a dummy variable for center and left governments together.

(a)
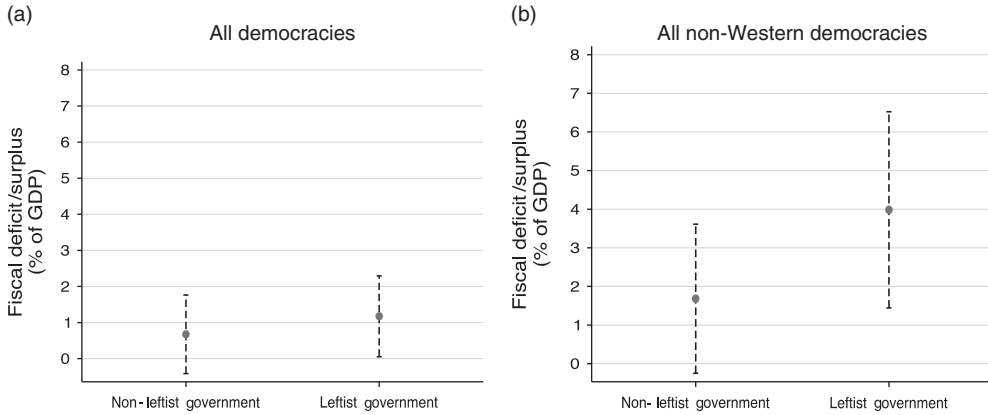## All democracies

(b)
All non-Western democracies

Fig. 4. CBI and fiscal balance in democracies: partisanship
Note: points = marginal effect of CBI; dotted lines = 90% confidence intervals.

and center-right of the partisanship spectrum, respectively. For all democracies (Figure 4a), the marginal effect of CBI is about 1.2 per cent and statistically significant (90 per cent confidence level) for left-wing executives, while it is about 0.6 per cent and statistically insignificant for the right. The same holds for the sample of non-Western democracies: the marginal effect of CBI for left-wing executives is large, at about 4 per cent and statistically significant (90 per cent confidence). The marginal effect is statistically insignificant for the right.

As explained earlier, two different mechanisms could drive this finding, and we find support for both. It may be the case that the left takes advantage of a nominally independent central bank to counter spending demands by its own constituency. We test this explanation by using our whole sample (democracies and dictatorships) to estimate a model that includes an interaction between CBI and the indicator for left-wing governments. The whole-sample results closely resemble the estimates from using just democratic countries, indicating fiscal consolidation under the left even with a central bank that is nominally independent but virtually under the thumb of the government. The alternative explanation is that the independent central bank is more eager to prevent spending by the left, due to an ideological proximity to the political right. If the central bank is successful at deterrence, we need not observe actual reactions of monetary policy to fiscal deficits. Still, we follow earlier work and look at the reaction of deposit rates (WDI) and changes in money supply (M2 change, IFS and WDI)[104] in models that include a triple interaction of the fiscal deficit, CBI and the indicator for left-wing governments as independent variables.[105] The results show no conditional effect of CBI on deposit rates. However, there is support for non-neutral central banks coming from the M2 change models. Similar to Cusack, we find that the central bank accommodates the right.[106] For large fiscal deficits of the left (greater than about 5 per cent of GDP), the central bank reduces rates of money growth, responding with contractionary monetary policy to fiscal stimulus. However, central banks do not appear to reduce the rates of money growth in response to right-wing fiscal deficits.

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[104] Cusack (2001) and Clark and Arel-Bundock (2013) use central bank discount rates. Clark and Hallerberg (2000) use both M1 and M2 changes.
[105] Estimations are fixed-effects models with lagged dependent variable and standard errors clustered on countries. We use the log of the dependent variables. Control variables include the election year, the de facto exchange rate and lagged GDP per capita, GDP growth, capital controls and trade openness. Deposit rate models include lagged inflation.
[106] Cusack 2001.

CONCLUSION

Our argument is that legal CBI is an important deterrent of fiscal deficits, and that this effect is conditioned by a country's political institutions. The estimation results using data from seventy-eight countries (1970–2007) are robust and strongly support our theory: CBI reduces fiscal deficits in democracies and countries with rule of law, high constraints on the executive and a free press. Reforming a country's central bank and granting it more legal independence have been clear trends in the past two decades. Following the trend, non-democracies like Venezuela, Belarus, Kazakhstan and Russia have central banks with great nominal independence. However, extant research finds that the anti-inflationary effect of CBI is conditioned on political institutions.[107] Our research shows that CBI is also unlikely to affect the fiscal balance of autocratic countries. Given this inability to improve outcomes such as inflation or fiscal deficits, why do non-democracies delegate in the first place? Using our new data, future work on institutional authoritarianism can provide answers to this question, expanding extant explanations related to countries' perceived higher need for investment[108] or diffusion.[109]

Yet several democracies in our sample have either been late to give more independence to their central bank (Turkey, Thailand) or have delegated only partially (Uruguay, South Africa, Mongolia, South Korea, Israel). For such countries we show that fiscal discipline can be strengthened by further reforming the central bank. Since the 2007 economic crisis, CBI has again become a hotly debated issue, with many arguing that politicians should be more active in monetary policy and that central banks should be more responsive to recessions.[110] Globally, inflation is currently not a great concern, so political interference in monetary policy may seem inconsequential. Our research suggests, however, that fiscal deficits are a likely consequence of curtailed CBI.

Yet we also provide evidence that, when pressing for fiscal consolidation, legally independent central banks may be political and non-neutral. In democracies, where legal CBI is credible, we find no evidence that, on average, central banks have an interest in using fiscal policy in a counter-cyclical fashion. Rather, our results show that the central bank is more likely to contribute to fiscal surpluses outside election years. Thus even if CBI can contribute to fiscal consolidation, it is unlikely to reduce political business cycles the way that increased transparency of budgets[111] or a better-informed electorate do.[112] Fiscal institutions have been shown to mitigate the common-pool resource problem in fiscal policy.[113] However, future work can investigate whether such budgetary institutions, similar to CBI, are more (or less) effective in reducing deficits, depending on the electoral cycle. Moreover, an independent central bank appears more likely to contribute to a balanced budget under left-wing governments. We find mixed reasons for this behavior, and future work can further investigate the reasons why CBI is more successful at deterring the deficits of the left.

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