

They Could Have Been Contenders: A Power-Sharing Explanation for Central Bank Independence in Transition Countries

Nicole Rae Baerg
University of Essex & University of Mannheim
nicole.baerg@essex.ac.uk

&

Julia Gray
University of Pennsylvania
jcgray@sas.upenn.edu

&

Jakob Willisch
University of Mannheim
jakob.willisch@gess.uni-mannheim.de

Abstract

In new democracies, where political participation has long been suppressed and party identities are fluid, many potential candidates can emerge to challenge incumbents. How do political leaders deal with challengers in environments where their appeal and ambitions are unknown? We argue that incumbents can use greater policy discretion to tease out different types of actors, revealing their aspirations for holding political office. We show how our theory helps explain patterns of central bank independence after countries transitioned from communism. We test our argument using new biographical data of policymakers and an index of central bank independence on a sample of 29 post-communist transition countries between 1990 and 2012. We find evidence that higher levels of CBI co-occur with the appointment of politically experienced central bank governors as electoral competition increases.¹

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Introduction

Countries emerging from authoritarian regimes often experience a heightened environment of political competition. Because authoritarian leaders suppress political competition and exercise control over political institutions, and because the flow of information is often stifled, the post-democratization political landscape is uncertain. Many individuals who may be interested in and qualified for political office have not previously been tested. Given these informational challenges, how do incumbents assess and deal with potential challengers to office? What role, if any, does delegation play in solving domestic political contests for power?

This paper argues that political competition can help explain patterns of delegation and discretion over policy in young democracies. We argue that, in environments where information about the quality and intentions of possible contenders for office is unclear, incumbent politicians have an incentive to grant more discretion to contenders thought to be electorally more competitive. The theoretical mechanism that we focus on is one where incumbents face a trade-off between choosing an optimal campaign strategy and giving up as little influence over policy as possible. Although granting more influence over meaningful policies is costly, it can help incumbents identify a potential challenger as they value the influence over policy from an appointed office over winning an election. We show that incumbents will use this difference in incentives and offer relatively more discretionary powers to politically experienced individuals as electoral threats loom larger. While many autonomous institutions can play such a role, in this paper we focus specifically on central banks. In recent decades, countries have adopted reforms that make their central banks more autonomous from direct political control by the government. While a large literature focuses on the sources of that policy choice, in this paper we focus on the role that granting more central bank autonomy can play in mitigating domestic political competition in nascent democracies.

Based on a single-agent screening model, we develop a formal theory of political appointments in settings where a leader and a challenger compete for the same political office. Information in our

model is asymmetric, as market liberalization during regime transition requires leaders to balance two goals. One goal is to appoint individuals who are motivated by successfully implementing policy. The other goal is to prevent politically inclined individuals from unseating them in elections. In countries with a recent experience of regime change, those who care about specific policy areas or outcomes are often indistinguishable from those who seek government office. Because leaders need to make costly precautionary plans for this contingency, such as gathering politically charged information or organizing media campaigns, they value information on the motives of viable candidates. We show how leaders can effectively screen policy-seeking from office-seeking candidates by offering potential challengers with more or less discretion over policy.

We derive two key results from our model. First, since we assume that granting autonomy over an important area of politics reduces an individual's value of holding elected office, leaders favor more control over policy-making institutions if they fear that appointees turn out to be strong potential challengers. Therefore, appointments of politically experienced individuals will feature less policy-discretion than appointments of politically inexperienced ones. Second, we argue that in part this effect results from the leader's concern over the motives of potential challengers and the electoral threat they pose. As leaders become less reliant on knowing these political motives, they expend less effort in preparation to be challenged while granting more policy discretion to their appointees. Our main contribution, therefore, is that we provide a theoretical explanation not only for why we observe lower levels of central bank independence in countries with political appointments but also show why this relationship attenuates as the level of domestic political competition grows.

Our logic generalizes to many country settings, but our empirical section focuses on the post-communist countries. After the fall of the Berlin Wall, individuals in the post-communist countries were in a unique position with respect to political competition. The breakdown of the Soviet Union left its successor states to develop political institutions and markets simultaneously. We test our argument using original data on central bank appointments from 29 post-communist countries

between 1990 to 2012. Consistent with our argument and the previous literature, we find an overall negative association between appointments of governors with prior political experience and CBI. However, we also find that in political environments that are increasingly more competitive, the relationship attenuates. Specifically, we find that in years after an election that resulted in higher vote-shares for the second largest party, political appointments to the central bank are associated with higher levels of monetary policy autonomy.

Our findings demonstrate that extant arguments about domestic hand-tying and/or international credibility signaling might be insufficient — if necessary — conditions for the emergence of CBI in countries transitioning to democracy. While previous explanations for a government’s commitment to CBI may hold in certain circumstances, such as in stable and consolidated political regimes, in contrast, our explanation helps account for important country and over time variation in the politics of monetary appointments in nascent and new democracies. More broadly, our results speak to growing literature in the study of political institutions, illustrating how important political institutions, such as central banks, might be designed such that leaders can better inform themselves about potential contests to their power, by rival, and often powerful, elites. We also tie together the extant research on CBI with the literature on political delegation.

The Political Origins of Autonomous Institutions

A slew of recent research in comparative politics shows how elites in new and non-democracies use domestic political institutions as instruments for their own gains. Formal political institutions such as legislatures, elections, political parties, and a free media help aggregate information for those in power (Gandhi and Lust-Okar, 2009; Lorentzen, 2014) as well as help solve commitment problems by reducing information asymmetries among members of the ruling coalition (Boix and Svobik, 2013). The information gathering mechanism of political institutions alone is especially useful in new and non-democracies, where political uncertainty is high, and programmatic party

linkages and partisanship are not well developed.

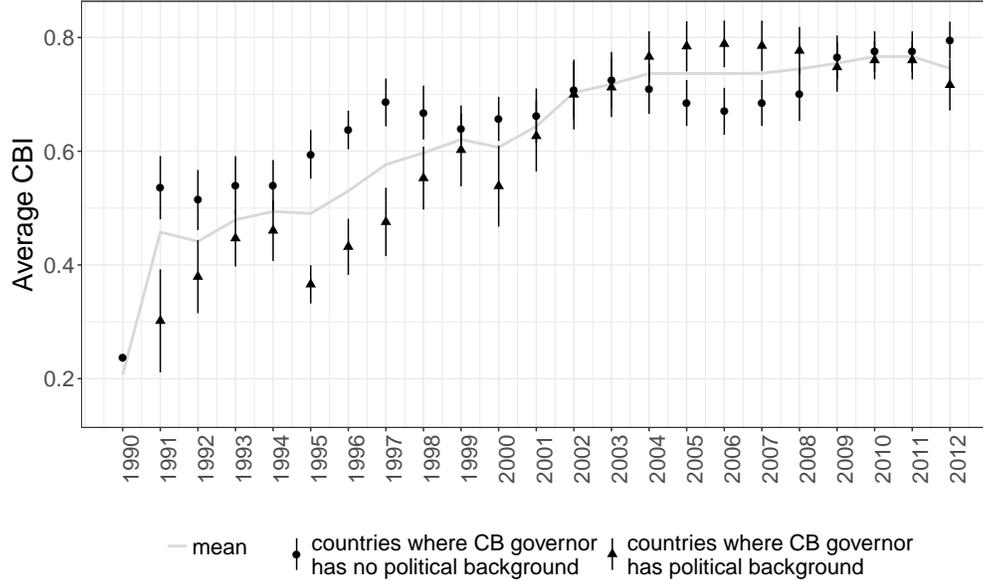
Similarly, the literature on delegation to agencies discusses the ways in which governments in advanced democracies can structure autonomous appointments (Balla, 1998; Calvert, McCubbins, and Weingast, 1989; Huber and Shipan, 2002). This literature highlights how bureaucratic agencies in general may acquire good reputations for competence (Carpenter, 2001; McCarty, 2004), and indeed how individual bureaucrats may gain utility from their posts (Gailmard and Patty, 2007).

However, although those theories are generalizable to many types of agencies (Moe, 1984) the literature cited above has tended to overlook the parallel role that central banks might play in this process.² Some scholars have applied principal agent theories to the functioning of the Federal Reserve Bank (Weintraub, 1978; Wagner, 1986; Munger and Roberts, 1993), but these theories have infrequently been applied to contexts outside of the United States. This unfortunate trend is reflected more generally in the bureaucracy literature, which tends to focus on the U.S. (Krause, Lewis, and Douglas, 2006) or other consolidated democracies (Arel-Bundock, Atkinson, and Potter, 2015), without examining the distinct role that autonomous agencies such as central banks might play in newer or transitioning democracies.

Outside of the OECD, the empirical pattern of autonomous agencies such as central bank presents a conundrum. While it is certainly true that countries on average pursued greater levels of central bank independence in post-transition countries, there remain important puzzles about the composition of central bank appointments as well as their timing. Consider one example where we observe central bank governors functioning as political party leaders. In 2012, Jorgovanka Tabakovic was, until her appointment to the National Bank of Serbia, deputy leader of President Nikolić's Progressive party, the largest grouping in parliament and government, and a long-term ally of the president. In Romania, Mugur Isarescu, who has been governor of the central bank since 1990, even served as Prime Minister for eleven months starting in 1999. Leonid Talmaci, the governor of Moldova's central bank from the country's independence until 2009, went on to run

²For exceptions, see Ainsley, 2016; Johnson, 2016; Shih, 2008.

Figure 1: CBI and Political Appointments



for president in 2011.

Such examples are surprisingly common. Looking at the biographies of central bank governors in the post-communist countries between 1989 and 2014, we find that 76 out of 160 (47%) central bankers were politicians before taking the helm of the country’s central bank. Also puzzling is that while we observe a strong correlation between central bank independence and technocratic rather than political appointments leading up to 2000, political appointments out-pace technocrats and are associated with higher levels of CBI after 2000. Figure 1 shows both the increase in CBI and also variation in the proportion of technocrats versus politicians appointed over time in post-communist countries. Such variation is particularly puzzling as researchers have generally associated increases in technocrats with a rises in CBI and there is no reason to suspect that after 2000, countries cared less about the credibility of their appointments.

Previous explanations of CBI include domestic political explanations, such as partisanship and delegation, and the role of democracy and democratic institutions (Alesina, Roubini, and Cohen, 1997; Shih, 2008; Adolph, 2013). Such arguments suggest that CBI results from contests over power between political groups, such as left and right parties or domestic political factions,

shadow agents, as well as the solving of time-inconsistency problems that arise from the government's incentives to renege on its commitments (Kydland and Prescott, 1977; Barro and Gordon, 1983). The median voter in a democracy is expected to prefer CBI over fixed exchange rate regimes (Broz, 2002; Bearce and Hallerberg, 2011) and freedom of the press and executive constraints is expected to encourage the effectiveness of CBI (Keefer and Stasavage, 2003; Bodea, 2013; Bodea and Hicks, 2015). Another strand of the literature considers international explanations based on signaling, and credibility arguments. International explanations find that higher levels of CBI results from pressures by external actors, such as international organizations (IOs), private capital markets, and pressures for reforms by internationally linked epistemic communities (Gray, 2009; Johnson, 2016; Maxfield, 1998; Santiso, 2013). These explanations focus on signaling the government's credibility to outside foreign audiences with "good" domestic institutions.

In addition to reducing expectations-driven inflation, the literature also shows that central bank delegation helps keep coalitions with diverse policy-preferences stable (Crowe, 2008); can restrain deficit spending (Bodea and Higashijima, 2015); and finally, can reduce information asymmetries between legislators, coalition partners, and government officials. Such latter achievements are also associated with the quelling of costly domestic conflicts between factions or rivals (Bernhard, 1998; Treisman, 2000). Countries that have stronger socioeconomic cleavages are also expected to delay costly inflation reforms, leading to higher costs of reforms (Alesina and Drazen, 1991).

Policy Discretion as a Screening Device to Thwart Political Competition

One shortcoming of previous arguments is that they focus on the mechanism of democracy that guarantee CBI, such as free media, checks and balances, etc., rather than exploring how delegating greater central bank autonomy may mitigate important political challenges for incumbents. In other words, previous literature treats central banks that are not backed by established democratic

institutions as “insufficient” and mere “window dressing” for foreign-backed interests or as career-advancement for politically detached technocrats.

We argue that political contests for positions in the new regime involve opposition actors seeking their own independent domains of influence and incumbents seeking to consolidate power while catering to a multitude of internal and external pressures. Put simply, autonomous central banks can give potential challengers their own independent realm of policymaking. For incumbents, CBI can have the added advantage of political expediency: it can expose political contenders seeking higher office and make them easier targets for future political campaigns.

To model this game more formally, we appeal to the screening literature. One central concern of a screening model is to derive the conditions that lead actors of different motivations to truthfully reveal information, in this case about their “type”. Our model has two actors: one challenger, denoted C and a leader, denoted L . We start out by assuming that there are differences across challengers and refer to those candidates that have a stronger interest in policy as “policy-motivated” and those that have a stronger interest in electoral success as “electorally-motivated.” More formally, the challenger, C is of two types $\theta \in \{\underline{\theta}, \bar{\theta}\}$ with $0 < \underline{\theta} < \bar{\theta}$ that refer to the relative valuation of influencing policy over holding the leader’s, L ’s, office. We assume that this office valuation is private information to the challenger whereas the leader’s valuation of holding office, o , is common knowledge across the actors. For simplicity we assume $\bar{\theta} < o$ so that the leader’s office value always exceeds that of the challenger. Finally, let Φ denote the prior probability that the challenger is of type $\underline{\theta}$. The leader’s motivation is to stay in power.

In this game, the leader makes a political appointment offer to the challenger, which comprises two dimensions. Firstly, the leader can grant more or less policy discretion to the challenger. For example, in the case of CBI, this means that the leader offers greater policy autonomy from the government. Offering more discretion comes at the expense of the leader’s own influence on policy, however. Secondly, the leader can also credibly commit to a certain level of campaign efforts he will exert in order to win the election.

The game sequence is as follows: First, the leader chooses a message space M from which the challenger, C , chooses a costless message $\mu \in M$. Having observed C 's message, L makes C a message-contingent offer to become head of some agency, consisting of a level of policy discretion $d(\mu) \in [0, 1]$ and campaign effort $e(\mu) \in [0, 1]$. We assume that higher campaign effort linearly increases the leader's chance of winning the election and decreases the challenger's chance to replace the leader. The challenger then accepts or rejects the leader's offer. In the latter case where he rejects, he has a expected reservation utility, which we denote r .

We formalize all of this such that the challenger's utility function is of the form

$$u_C(d(\mu), e(\mu), \theta) = \begin{cases} (1 - e(\mu))\theta + e(\mu)d(\mu) & \text{if C accepts} \\ r & \text{if C rejects.} \end{cases} \quad (1)$$

Thus, the higher the leader's effort level e , the higher his re-election chances and the lower the challenger's election chances. Further, the more policy discretion the leader gives up, the lower his payoff from being re-elected and the higher the challenger's payoff in case of defeat.

Similarly, the leader's utility function is of the form

$$u_L(d(\mu), e(\mu), \theta) = \begin{cases} e(\mu)(\theta - d(\mu)) - e(\mu)^2 & \text{if C accepts} \\ 0 & \text{if C rejects} \end{cases} \quad (2)$$

In order to simplify the exposition, we normalize L 's reservation utility in case C rejects his offer to zero. This can be interpreted as a base-loss from leaving the post un-appointed or from having to appoint a less able individual. We assume that campaign effort is quadratic and that granting policy discretion has linear costs to the leader.³

Lastly, we assume that the vote-share of the challenger is a continuous function of the leader's

³Although not innocent this choice of functional forms mainly serves the purpose of simplification. Choosing other cost functions for campaign effort do not change results substantially as long as they are strictly concave in effort. Choosing other cost functions for policy discretion as long as they ensure that u_l is strictly decreasing and u_c is strictly decreasing in d .

campaign effort $v : e \rightarrow [0, 1]$ with $v(e)' < 0$. In other words, we assume that independently of her type, the challenger's vote share decreases as the leader's campaign efforts increase.

In the following sections, we present propositions about the offer that the leader makes in equilibrium. We organize them into the two cases that the leader must consider in his offer: one offer targeted at a challenger who claims to be policy-seeking and one targeted at a challenger who claims to be office-seeking. Importantly, we show how, assuming that a policy-seeker's office valuation is larger than her reservation value, the leader grants more policy discretion to an office-seeking candidate compared to the level of discretion offered to a policy-seeking candidate. We also show that the ability for the office-seeking candidate to extract more discretion from the leader decreases the higher the level of effort and correspondingly higher amount of support the leader enjoys. We solve the game for perfect Bayesian equilibria in pure strategies and refer to this solution concept when using the term *equilibrium* from now on.

Equilibrium Characterization

It is useful to note that both office- and policy-seeking challengers could have an advantage from reporting their type untruthfully. In our case, misreporting benefits only office-seeking challengers, i.e. those of type $\bar{\theta}$ and not policy-seeking challengers, $\underline{\theta}$. More technically, only office-seeking challengers have an incentive to pool in our model. The reasoning is as follows. Office-seeking challengers might benefit from falsely reporting that they are policy-seeking because, if the leader believes that the challenger is policy-seeking, he might exert less campaign effort, thereby increasing the advantage for the challenger. Thus, if the challenger is actually office seeking, lying about his type might yield an advantage. The reverse is not the case, however. Policy-seeking challengers cannot gain by pretending to be office-seeking. The reason here is that pretending to be office seeking would lower the office-seeker's influence on policy as well as make them the target of more campaign efforts. Because the office-seeking challenger puts more weight on policy rather than winning the election, misreporting his type is unappealing.

In the appendix we show how the leader always gains from preventing the challenger from reporting untruthfully. Therefore our analysis focuses on separating, or “truth-telling” equilibria. Further, following the revelation principle (Myerson, 1979), we restrict our analysis to direct offers, i.e. offers depending on messages chosen from the type-space θ .

The challenger reports truthfully as long as the leader’s offer satisfies

$$u_C(d(\bar{\theta}), e(\bar{\theta}), \bar{\theta}) > u_C(d(\underline{\theta}), e(\underline{\theta}), \bar{\theta}) \quad (\underline{IC})$$

$$u_C(d(\underline{\theta}), e(\underline{\theta}), \underline{\theta}) > u_C(d(\bar{\theta}), e(\bar{\theta}), \underline{\theta}) \quad (\bar{IC})$$

Policy-Seeker

We first establish L’s equilibrium offer if C reports to be policy-seeking. Since L always prefers that C accepts, his offer needs to satisfy

$$(1 - e(\underline{\theta}))\underline{\theta} + e(\underline{\theta})d(\underline{\theta}) \geq r \quad (\underline{P})$$

In conjunction with \bar{IC} this implies

$$(1 - e(\bar{\theta}))\bar{\theta} + e(\bar{\theta})d(\bar{\theta}) \geq r + (1 - e(\underline{\theta}))(\bar{\theta} - \underline{\theta}) \quad (3)$$

Two implications follow from (3). First, if \underline{P} and \bar{IC} are satisfied, an office-seeking challenger will always participate since $(1 - e(\bar{\theta}))\bar{\theta} + e(\bar{\theta})d(\bar{\theta}) \geq r$. Second, if $e(\underline{\theta}) < 1$, \underline{P} is the only binding participation constraint. If this was not the case, the leader could reduce the level of policy-discretion granted to the policy-seeker, while still satisfying all other constraints. Thus, a policy-seeker always receives exactly their reservation utility in form of some combination of campaign effort and policy-discretion. How campaign effort and policy-discretion relate in equilibrium depends on the relative size of the policy-seeker’s reservation utility and office valuation.

Proposition 1

Let $e^*(\underline{\theta}), d^*(\underline{\theta})$ be the leader's equilibrium choice of effort and discretion for the case that the challenger reports to be policy-seeking. As long as the policy-seeker's office valuation is strictly larger than her reservation utility, policy-discretion increases in the leader's campaign effort.

$$d^*(\underline{\theta}) = \frac{r - \underline{\theta}(1 - e^*(\underline{\theta}))}{e^*(\underline{\theta})} \quad \& \text{ if } r < \underline{\theta}, \quad \frac{\partial d^*(\underline{\theta})}{\partial e^*(\underline{\theta})} > 0$$

Proposition 1 demonstrates a positive relationship between discretion and campaign effort so long as the challenger's reservation utility is lower than her "elected office" valuation. What this implies is that, to a policy-seeking challenger, the leader always cedes more policy discretion as his campaign efforts increase under the condition that the challenger's expected gain from rejecting the leader's offer is lower than her valuation of winning the election.

Office-Seeker

Let us now consider the leader's equilibrium offer if the challenger reports to be office-seeking. From (3), we know that the office-seeking challenger's participation constraint is satisfied by implication of \underline{IR} and \overline{IC} and is not binding as long as the policy-seeker has some positive chance of winning the election, $e^*(\underline{\theta}) < 1$. Further, in equilibrium \overline{IC} is always binding. If this was not the case and the leader would offer a combination of effort and discretion that satisfies \overline{IC} by strict inequality, he could increase his utility by decreasing the amount of discretion granted while keeping all constraints satisfied.

The resulting constraints on the leader's choice imply that if we assume that the relationship between campaign efforts and policy discretion is positive for policy-seekers, it is also positive for office-seekers.

Proposition 2

Let $e^*(\bar{\theta}), d^*(\bar{\theta})$ be the leader's equilibrium choice of effort and discretion if the challenger reports

to be office-seeking. If policy-discretion increases in campaign efforts targeted at policy-seekers, it also increases in efforts targeted at office-seekers.

$$d^*(\bar{\theta}) = \frac{r - \underline{\theta}(1 - e^*(\underline{\theta})) + \bar{\theta}(e^*(\bar{\theta}) - e^*(\underline{\theta}))}{e^*(\bar{\theta})} \text{ \& if } \frac{\partial d^*(\underline{\theta})}{\partial e^*(\underline{\theta})} > 0 \text{ then } \frac{\partial d^*(\bar{\theta})}{\partial e^*(\bar{\theta})} > 0$$

The intuition behind Proposition 2 is that there are two mechanisms that determine how campaign effort affects policy discretion. First, the leader extracts the utility that an office-seeking challenger could gain by pretending to be policy-seeking. L exerts more campaign efforts against the policy-seeker in order to make it less attractive for an office-seeker to cheat. However, the leader needs to compensate the policy-seeker to ensure her participation by offering more policy-discretion. This makes it less attractive for an office-seeker to claim to be policy-seeking and enables the leader to grant less policy-discretion to the challenger. Second, as the leader exerts more effort to win the election, he needs to compensate the office-seeker with more policy-discretion to ensure her acceptance. As long as, $r < \underline{\theta}$ the leader grants more policy-discretion to an office-seeker as his campaign efforts increase.

Challenger Vote-Share and Policy-Discretion

Given the leader's offers in equilibrium we can compare the two types of challengers regarding their relationship between vote-shares and policy-discretion. Our model makes two key predictions. First, if the policy-seeker's office valuation is larger than her reservation utility, the leader always grants more discretion to a policy-seeking than to an office-seeking challenger. Second, given the leader's office valuation is large and the challenger's reservation utility is small enough, the leader grants more policy-discretion to the office-seeker vis-à-vis the policy-seeker as the challenger's vote-share increases.

Proposition 3

Let $e^(\theta), d^*(\theta)$ be the leader's message dependent equilibrium choice of effort and discretion.*

1. If $r < \underline{\theta}$, the leader grants more policy-discretion to a policy-seeking than to an office-seeking challenger independent of the challenger's vote-share.

$$d^*(\underline{\theta}) > d^*(\bar{\theta}) \forall e^*(\mu) \in (0, 1]$$

2. If $\frac{\phi(\underline{\theta}(-o+\bar{\theta}+2)+\bar{\theta}(o-\bar{\theta}))+(\underline{\theta}-\bar{\theta})^2}{2\phi} \leq r < \underline{\theta}$ & $o < \frac{\underline{\theta}-\bar{\theta}(1-\phi)}{\phi}$, for every percentage point increase in the challenger's vote share the leader grants more policy-discretion to the office-seeker than to the policy-seeker.

$$\frac{\partial d^*(\bar{\theta})}{\partial v(e^*(\bar{\theta}))} > \frac{\partial d^*(\underline{\theta})}{\partial v(e^*(\underline{\theta}))}$$

The leader compensates the policy-seeker for exerting higher campaign efforts in order to reduce the policy-discretion granted to the office-seeker. Thus, even if the leader exerts only minimal effort to campaign against the challenger, he will grant more policy discretion to a policy-seeking challenger than to an office-seeker. Further, the difference in discretion between policy- and office-seekers diminishes as the leader's campaign effort decreases, i.e. the opposition vote-share increases. Consider the case in which both types of challengers receive a small vote-share as the leader exerts a lot of campaign effort. This implies that the leader's incentive to extract the office-seeking type's potential utility from cheating is high, leading him to grant less policy-discretion to an office-seeking challenger. Compare this to the case in which both types of challenger's have large vote-shares as the leader exerts little campaign effort. This case will arise if an office-seeker's gains from reporting a false type are relatively low and the leader has little incentive to extract this information utility. Therefore, the leader has little incentive to exert more effort and offer more discretion to the policy-seeker. The negative screening effect on the amount of discretion granted to the office-seeker is smaller while the office-seeker receives or loses the same amount of discretion for every unit increase or decrease of the leader's effort. Thus, a higher vote-share for the challenger attenuates the negative association between appointing an office- over a policy seeker and granting policy-discretion.

From these three propositions, we derive the following empirical hypotheses:

H1: Outsiders/Insiders and Policy Discretion: *On average, appointees that have political experience will be associated with less policy discretion (less autonomy) than appointees without such political experience.*

Importantly, this hypothesis is consistent with previous literature on delegation and discretion. Like previous literature, our model predicts a negative independent relationship between political appointments compared to the appointment of technocrats (Rogoff, 1985; Shih, 2008).

Our second hypothesis, however, argues that the above negative relationship attenuates as the political environment becomes more competitive.

H2: Political Competition and Policy Discretion: *As the challenger's electoral support increases, there is an associated increase in the level of discretion offered to the appointee.*

The logic here is that as the electoral chances of winning decreases for the leader, this incentivises the leader to either choose to exert more campaign efforts and/or offer more policy discretion. As the electorally motivated type values holding office more so than the policy type, the leader's offer of more discretion can more effectively "buy-off" the electorally motivated contender. By contrast, the leader does not have to offer more discretion to the policy motivated type because the policy motivated type is less interested in winning the election in the first place. Thus, the leader effectively screens office-seeking from policy seeking types by offering more discretion and this screening becomes "more expensive" i.e. more policy autonomy is granted, the more the leader faces a formidable contender.

Data and Methodology

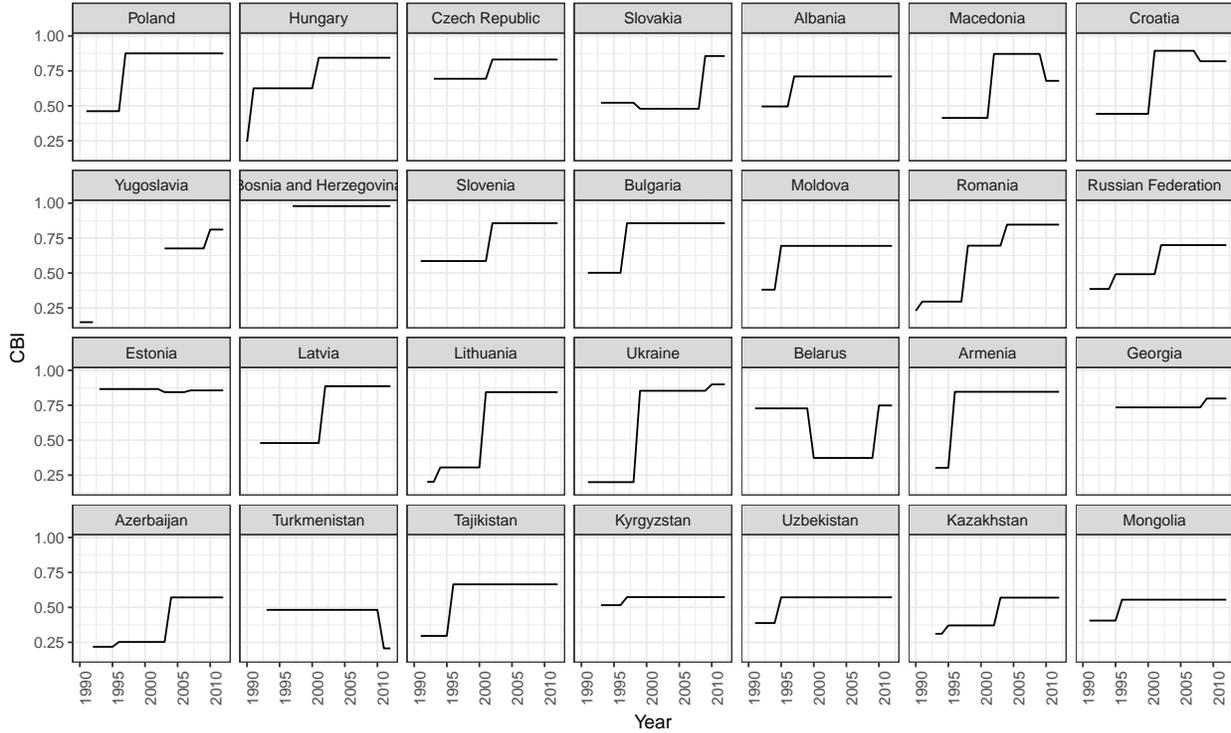
Sample and Data

The post-communist countries are a good test case for examining the influence of domestic political competition on policy autonomy and central bank policy discretion in particular. First, despite their varying levels of wealth and economic conditions, all faced a need to undertake similar policy reforms at around the same time. This alone makes understanding the ways in which their trajectories diverged particularly interesting. Second, despite these similarities, the paths for reforming their central banks varies significantly over time as well as across countries, offering important variation to work with. As shown by Figure 2, some countries, such as Azerbaijan, Kazakhstan, Hungary and Romania experienced three periods of central bank reform, increasing their independence at each stage in the reform process. Not all countries implemented such a pattern of reforms, however. Countries such as Belarus and Macedonia also reversed policies, restricting rather than granting central bank independence. Further, some other countries implemented dramatic increases in their central bank independence, such as Lithuania and the Ukraine, when compared to other countries, such as Moldova and Albania, that show positive although more modest reforms.

In order to test the relationship between political appointments, electoral competition, and CBI, we collect new data on CB governor appointments across time and in 29 countries for the universe of cases in our sample.⁴ This new dataset includes biographical information on all central bank governor appointments between 1988/1989 and 2014/2015 for those countries that were either Soviet republics, members of the Warsaw Pact, or held very close ties to the Soviet Union such as the Balkan states and Mongolia. In order to construct our sample, we first collected the names of all the CB governors appointed during this period, using information from two periodicals, the Central Bank Directory (Pringle, 1994) and the Annual Reports of The World's Central Banks (Joint Bank-Fund Library, 1984). We then confirmed our list of names with a list of names compiled by other

⁴We consider Czechoslovakia as a separate country but refrain from listing it in 2.

Figure 2: CBI by Country



scholars working on the topic.⁵ To be consistent with previous literature, we follow the efforts of Hallerberg and Wehner (2012) who also code biographical information for political actors (CB Governors, Prime Ministers, Presidents, and Finance Ministers), although their sample considers the biographies of political actors in OECD countries.

Our main dependent variable is a index of *de jure* central bank independence in country i in year t . We use the weighted additive index initially proposed by Cukierman, Webb, and Neyapti (1992) and recently expanded by Garriga (2016). The index ranges from 0 (completely dependent) to 1 (completely independent) with a sample mean of 0.64 and a standard error of 0.21 (0.2 for the imputed dataset). It is the sum of three dimensions of CBI, personnel, objectives and policy tools, weighted according to the judgment of the initial authors. The personnel dimension of the index

⁵Unfortunately, we do not have a list of all possible individuals considered for the appointment only those that are actually appointed. For those cases where there was mistakes in the periodicals, we went with the information on the CB's official website and cross-checked our name with data graciously supplied by Bodea and Hicks.

concerns the governors term length, the appointing and dismissing body and whether governors can hold parallel public offices. Since information on the previous career of the governor does not enter the index, we are confident that this index is not systematically related to our explanatory variables because of how it is measured.

Our main explanatory variables are whether or not the appointed central bank governor has political experience. This variable, *political appointment*, is coded 1 if the answer is yes and 0 if the answer is no. Political career includes a career as a party official, campaigning or holding an office via direct or indirect (via representatives) election, or holding an appointed office in one of the three branches of the government. In addition to *political appointment*, we also code whether or not the appointed central bank governor has vocational experience working in a international organization. As above, *IO appointment* is coded 1 if yes and 0 if no. Importantly, these two characteristics are not mutually exclusive. In terms of our sample, approximately half of the individuals we coded who had a previous career in politics also had experience working in an IO (52%). These individuals, however, held office for relatively short periods. Only in 5% of country-years with politically appointments, the governor also had experience in an IO.

Our other main explanatory variable is *% vote of the second largest party*. In order to measure this, we use the runner up party's share of the popular vote in the last lower chamber national parliamentary election.⁶(Coppedge et al., 2016)

As for our controls, we include the country's inflation rate as measured by the *gdp deflator*. We expect this variable to be negative or unrelated to CBI.⁷ It is important to note that during this period, some countries had very high inflation, which would make the demand for greater

⁶As reported in the appendix our findings hold if we use an alternative measure of electoral coverage, with the expectation that as parties grow from being regionally competitive to nationally competitive in elections, electoral competition increases. Our measure relies on expert codings of country-years(Coppedge et al., 2016). The original ordinal scale codes least competitive to most competitive country-years, judging the regional support of major parties in partisan elections. It is then converted to an interval scale by a item-response model (IRT) and where any differences in scores assigned by the coders are aggregated across coders (Pemstein et al., 2015).

⁷We use this measure because the more direct *consumer price index* (CPI) is missing for three countries between 1990 and 1999. Using multiply imputed values of CPI or dropping the variable entirely in our models does not change our results substantially.

CBI particularly salient on purely economic grounds. Second, in order to control for the level of development of a country’s financial system and the associated level of trust, which also likely matters for monetary policy’s control of the economy, we account for a country’s *contract intensive money* (CIM). CIM reflects the proportion of money that is held in banking institutions derived from a measure of the money supply (M2). Finally, in order to account for important measure of democratization and political institutions that the previous literature found was essential to the proper workings of CBI in democracies, we also include a measure of *executive constraints* from the Polity IV dataset and a measure of the population share living in urban areas in order to account for urban density, which is expected to be positively associated with CBI.

As indicated in Table 2 in the Appendix, the variables we use are between 0 and 19 % missing, which would lead to the listwise deletion of 386 country-years. For our analysis we impute the missing data 10 times using a prediction model featuring a wide array of predictors.⁸

Empirical Strategy

In order to test our hypotheses, we estimate a number of models. In the main specification, we include country- and time fixed effects to capture unobservable or omitted, time-invariant country-level confounders and common shocks to all countries. The model is specified as:

$$y_{i,t} = p_{i,t}\psi + c_{i,t}\phi + p_{i,t} * c_{i,t}\beta + o_{i,t}\eta + \mathbf{x}_{i,t}\boldsymbol{\gamma} + \theta_i + \tau_t + \epsilon_{i,t}$$

Our dependent variable $y_{i,t}$ is a index of *de jure* central bank independence in country i in year t . The first variable $p_{i,t}$ indicates whether the sitting central bank governor has a political background as defined in the previous section. The second variable, $c_{i,t}$, denotes the vote-share of the second largest party from the last lower-house election. We include an interaction term of these two explanatory variable. As discussed previously, judging from existing theoretical accounts we

⁸The exact specification of the imputation model is available upon request. All imputations were performed using the AMELIA II package (Honaker et al., 2011).

expect the effect of a political appointee in office ψ to be negative but have no prediction how this relationship changes over increasing levels of party competition. Our theoretical argument, on the other hand, predicts that a higher vote-share of the runner-up party attenuates the negative effect of political appointments to the office of central bank governor. Thus, we expect $\frac{\partial y_{i,t}}{\partial p_{i,t}}(c_{i,t})$ to be increasing in $c_{i,t}$. According to H2, we also expect the variable $o_{i,t}$, whether or not the governor worked in international organization or not, to be negatively associated with the dependent variable.

In order to capture time-constant country-level characteristics, we include country fixed effects θ_i . By including time-fixed effects, τ_t , we capture shocks to all countries in the same year, such as the collapse of the Rubel Zone 1993 or the Rubel Crisis in 1998. All reported specifications include a vector of time-varying country characteristics $\mathbf{x}_{i,t}$. These include all our control variables listed above: the inflation rate, the share of capital held outside banks (CIM), an index of executive constraints from the Polity IV project, and the population share living in urban areas.

Results

We present the results from three model specifications in Table 1. The first specification is a simple linear probability model (pooled) that includes our main explanatory variables. Because we suspect from the pattern of our dependent variable shown in Figure 1 and 2, we report Newey-West autocorrelation robust standard errors. Because there is a considerable difference between robust and OLS standard errors, we suspect that the simple pooling model is misspecified. Our point estimates suggests a significant negative association between political background of the central bank's governor and its bank independence. Model (1) also indicates a tendency that CBI increases with a larger vote share for the runner up party but confidence intervals enclose zero. Once we include country- and time fixed effects in model (2), we still estimate a statistically significant negative effect of political appointments on CBI. Figure 3 shows that holding all covariates at their respective means (modes for dichotomous variables), including the vote share of the second largest

Table 1: Effects of Political Appointments and Electoral Competition on CBI

	<i>Dependent variable:</i>		
	CBI		
	(1)	(2)	(3)
Political Appointment	-0.136** (0.060)	-0.130*** (0.047)	-0.060** (0.025)
Political Appoitment*			
Second Party Vote Share	0.584** (0.249)	0.398** (0.179)	0.164 (0.105)
Second Party Vote Share	0.098 (0.171)	0.147 (0.128)	0.097 (0.086)
IO Experience	0.075 (0.047)	-0.018 (0.027)	-0.011 (0.023)
Inflation Rate	-0.111*** (0.025)	-0.021 (0.029)	-0.036* (0.021)
% Urban Population	0.001 (0.002)	-0.009 (0.006)	0.0002 (0.005)
CIM	0.071 (0.107)	-0.016 (0.134)	0.028 (0.094)
Executive Constraints	0.017 (0.012)	0.014 (0.009)	0.007 (0.006)
Constant	0.484*** (0.071)		
Country and Year			
Fixed Effects	No	Yes	Yes
R^2	0.325	0.97	0.808
NW	Yes	Yes	No
Error Correction	No	No	AR1
Observations	612	612	612

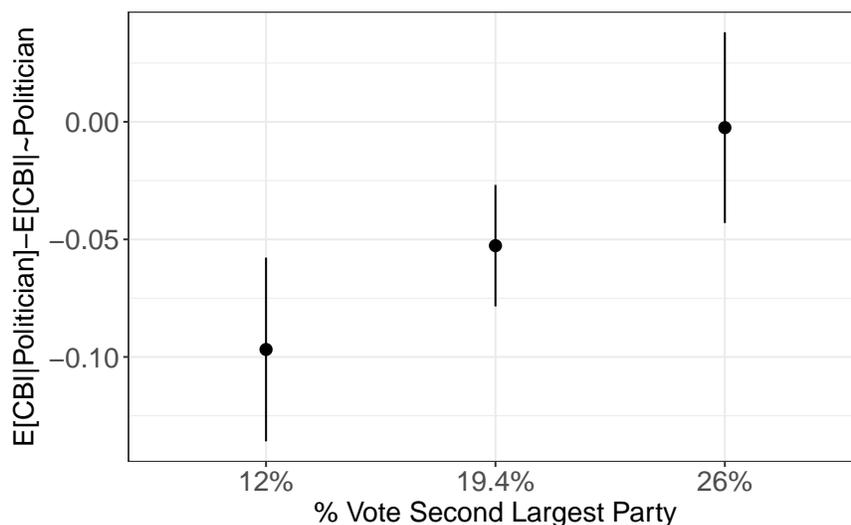
Note: *p<0.1; **p<0.05; ***p<0.01

party, model (2) implies that in a country-year where its governor had a previous political career the central bank scores between 0.08 and 0.03 points lower on the CBI index. Substantively, this effect is significant considering that in our sample the distance between the most and least independent central bank is 0.83 index points.

To put this result into perspective, we compare our estimate to changes in the substantive components of the index. An index change of 0.05 is equivalent to changing the governors term from 4 to 5 years, giving an advisory rather than no role in formulating monetary policy or establishing price stability as a single objective rather than multiple conflicting ones.⁹

⁹These estimates are based on 5000 simulations of the expected values given all covariates are held at their sample

Figure 3: Simulated First Differences of CBI for Different Runner-Up Party Vote-Shares



What about our interaction term? Are political appointments associated with an increase in CBI as electoral competition grows? Model (2) indicates a statistically significant interaction effect between the runner-up party's vote share and political appointments.¹⁰ In order to figure out how much this estimate matters, we again turn to simulating the expected values of CBI based on the estimates in model (2). We start by assuming a vote share of around 12% (10th percentile); central banks which have governors with political backgrounds score between 0.06 and 0.13 points lower on the CBI index than those who do not. In terms of substantive reforms, this lower bound amounts to reducing the governors term from between 6 and 8 to 4 years, preventing the CB's from participating in the formulation of monetary policy or diluting the CB's sole objective of price-stability to include multiple conflicting ones.

Once we assume a runner-up vote-share of about 26% (90th percentile), this effect reduces in size considerably. Central banks with politically experienced governors score between 0.04 lower and 0.03 points higher on the CBI index than those without.

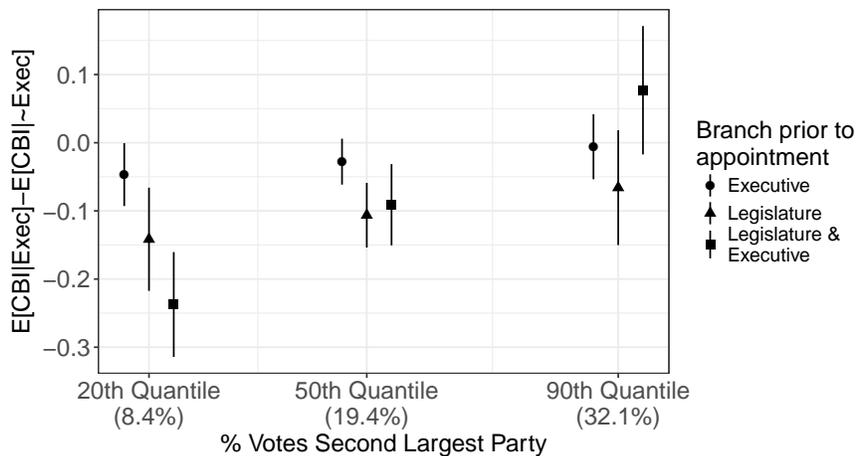
While the above treats political experience homogeneously, one thing that may matter is the

means (modes for categorical variables) except for the political appointment dummy. Standard errors are based on OLS standard errors.

¹⁰A marginal effects plot of the interactive effect can be found in the Appendix.

particular type of political experience that a Governor has. In order to investigate whether the type of political experience matters, we split our key independent variable according to the branches of government. Doing so, we find some evidence that appointments of individuals from legislatures particularly drive this results. The estimates shown in Figure 4 are based on the same specification as in model (2) except that we replace the dummy for political experience with multiple discrete variables indicating in which branch of government the individual has experience.¹¹ Our results indicate that the negative association between appointments of previous MPs and CBI is stronger than for appointments from the executive. At low levels of competition the difference in expected values of CBI with a previous MP vs. a technocrat as governor is about 0.1 index points lower than the difference in expected CBI with executive member vs. technocrat. Yet, this difference dissipates for higher vote-shares of main opposition parties and is not distinguishable at high levels of competition.

Figure 4: Simulated First Differences of CBI for Different Runner-Up Party Vote-Shares by Type of Experience



What about the results for our control variables? We find that inflation is negatively associated with CBI across all models. Similarly the CIM measure is positively (though not significantly) associated with CBI across all models.¹² The executive constraints variable is also positive, but

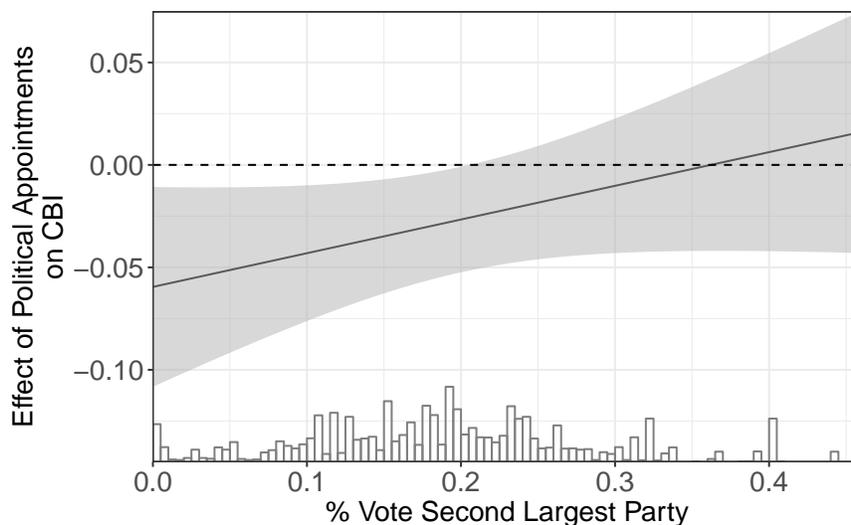
¹¹No governor in our sample had prior experience in the judiciary. For detailed results see Table 3 in the Appendix

¹²Note that dropping the inflation rate from our models due to endogeneity concerns does not change our results.

not statistically or substantively significantly, associated with CBI. Further, our results seem not to be driven by a conflation of political experience with experience at international organization. Finally, the proportion of urban dwellers is not systematically related to CBI in any of our models.

One major concern with the model specifications (1) and (2) is that there may be bias due to the violation of OLS’s zero conditional mean assumption. Specifically, as indicated by Figure 2, the dependent variable clearly follows a time-trend and the error-term $\epsilon_{i,t}$ is therefore likely to be highly serially correlated. Although, we report autocorrelation robust standard errors (Newey-West) correcting for a one-period autoregressive process (AR1), serially correlated errors indicate model misspecification and omitted variable bias.

Figure 5: Marginal Effect with AR1 Correction of Political Appointments on CBI by Runner-Up Vote Share



In order to account for this, model (3) reports a Prais-Winsten error correction model that specifies the error term as an autoregressive process with a one-period lag.¹³ As indicated in column (3) of Table 1, such an estimation lowers the effect sizes for all explanatory variables. Despite the reduction in estimate size, however, the marginal effect shown in Figure 5 remains upward sloping

¹³The exact specification is $y_{i,t} = p_{i,t}\psi + c_{i,t}\phi + p_{i,t} * c_{i,t}\beta + o_{i,t}\eta + \mathbf{x}_{i,t}\gamma + \theta_i + \tau_t + \nu_{i,t}$, with $\nu_{i,t} = \rho_i\nu_{i,t-1} + u_{i,t}$ under the assumption that $u_{i,t}$ is white noise.

and significant, both statistically and substantially. This leads to further confidence that political appointments and CBI are more positively associated as electoral competition increases.

In summary, we find some evidential support for hypotheses H1 and H2. Holding everything else constant, political appointments to the governor's office of central banks are associated with lower levels of legal central bank independence. This association still holds when controlling for various potential co-determinants of the appointment process and CBI. In line with H1, we find that this negative effect decreases in size with larger vote-shares for the second largest party in the last election.¹⁴¹⁵

Illustration: CBI in Serbia

In Eastern Europe, there is substantial overlap between politics and the allegedly apolitical central banks. Throughout Eastern Europe, smaller populations and especially a limited cadre of political actors and bureaucrats (Brown, Earle, and Gehlbach, 2009) has often meant that members of the political class have often played multiple roles over time. This is particularly true in the run-up to democratic transition, when many members of the political class must form allegiances in order to form a credible threat to the authoritarian ruler. With such allegiances often comes shifting political roles for those actors, creating the need for autonomous domains of policymaking, such as an independent central bank. This section details some of these examples, paying particular attention to the case of Serbia.

Poland has a long history of central bank governors that have rotated in and out of government. Leszek Balcerowicz, the country's first finance minister after the fall of communism and the architect of Poland's "shock therapy" approach to liberalization, was also deputy prime minister

¹⁴Despite consistent evidence in support of H3 across our model results, in order to be cautious, future iterations will also try to include possible omitted variables that could undermine our findings including bicameralism (vote district size heterogeneity), Alford Index, vote share of extremist parties, strong legislative committee systems, government coalition size (Bernhard, 1998).

¹⁵Sources and descriptives of all control variables can be found in the Appendix. Even with the inclusion of all of these additional variables, our model results still hold.

from 1989-1991 and again from 1997-2000. He subsequently served as the head of the central bank from 2001-2007. Marek Belka, who had twice served as deputy prime minister (in 1997 and then again from 2001-2002) as well as prime minister (2004-2005) took over the central bank in 2010, but stepped down in part over a leaked tape emerged in which he agreed to support the government in the event of a financial crisis in return for the firing of the finance minister.¹⁶ His successor, Adam Glapiński, had been a cofounder of the ruling Law and Justice party at the time of his appointment in 2016 and has been criticized for being too close to the government.¹⁷

In the Czech Republic, the first governor of the newly independent central bank, Josef Tošovský, also served as the country's prime minister in 1998, subsequently going back to head the central bank until 2000. The current governor of the central bank, Jiri Rusnok, acted as the country's prime minister from 2013 to 2014 and had widely been seen as an ally of the current prime minister, Miloš Zeman, since the party's beginning in the 1980s.¹⁸ In all of these cases, the central bank governor came from the ruling party, lending credence to our theory of intra-party competition creating the need for autonomous domains in the bank.

For a fuller illustration of the way in which this competition plays out, the case of Serbia is particularly illuminating. After the violent breakup of Yugoslavia that extended until the mid-1990s, the country remained under the rule of the authoritarian Slobodan Milošević until he was ousted in elections in 2000. Throughout the 1990s, the opposition to Milošević remained fragmented ideologically and ridden with personality conflicts (Bunce and Wolchik, 2011, p.94). In part because previous electoral challenges had proven unsuccessful, 19 of the country's opposition parties were finally able to form an opposition coalition called the Democratic Opposition of Serbia (DOS). Once Milošević lost the election, the new Prime Minister of Serbia, Zoran Djindjić, made it a necessary condition that Mladjan Dinkić, who in 1997 founded a think tank called the G-17 Plus, be

¹⁶"Can Belka keep his job?" *The Economist*, Jun 16th 2014.

¹⁷"Polish Central Banker Tied to Ruling Party Nominated as Governor," Bloomberg, May 6, 2016, by Marek Strzelecki and Dorota Bartyzel

¹⁸Včele České národní banky stanul Rusnok. Zemanův muž není žádný „kývač“." 25 May 2016, *Dnes*.

named governor of the National Bank of Yugoslavia.¹⁹

Dinkiic had rose to prominence in the late 1990s through publishing a series of books on the economic consequences of Milošević's regime. He was a frequent speaker at protest rallies and in 1999 put forward a proposal, called the Stability Pact for Serbia, which laid out a political and economic roadmap for Serbia, calling for a transitional government that would be made up of experts. An early newspaper article described him as "showing a surprisingly natural flair for the spotlight."²⁰

After the fall of communism, the law establishing the National Bank of the Federal Republic of Yugoslavia (then comprising Serbia and Montenegro) was passed in 1993. The bank had a high level of *de jure* independence, although in practice it collaborated closely with the government.²¹ In the 1990s, Serbia experienced some of the world's worst recorded episodes of hyperinflation.

When Dinkiic took over, many members of the DOS pushed the former CB governor, Vuk Ogjanović, to serve as deputy governor, but Dinkiic resisted. "How can I introduce a new *dinar* and full convertibility with a deputy who printed hyperinflationary money?" he was quoted as saying at the time. "It would be utterly immoral and unprofessional if I proposed a man with such credibility for my deputy. I myself would have no credibility at all," Dinkiic said.²² In the first year, a new dinar was introduced, along with price controls.²³ Thus, the *de facto* independence of the central bank rose significantly under Dinkiic's tenure. He then served as the Governor of the National Bank of Serbia for three years after Milosevic's fall.

By 2003, the Serbian president, Vojislav Koštunica, had stepped from the presidency down over his party's discontent with the extradition of Milošević to the International Criminal Tribunal

¹⁹"We will insist on it, even if the price is that this coalition is broken," said Djindjić. "Djindjić: Dinkiic guverner NBJ po cenu pada vlade," B92, 18 November 2000.

²⁰"Mladjan's Way," by Ljubica Gojgić, Central European Economic Review; September 1999

²¹As one analysis noted, "the Constitutional provisions on the central bank's independence ... are valid only inasmuch as it suits the ruling group at a given moment." "Vuk Ogjanovic: Robbers Without Cops," *Transitions Online*, 12 October 1992.

²²"New central bank governor promises comprehensive reforms," Stefan Racin, UPI, 29 November 2000.

²³"Belgrade tries to fend off economic ruin," *Le Monde*, 25 October 2000

at The Hague. At the same time, Djindjić had been assassinated by a Belgrade mafia gang. This led to a breakup of the governing coalition into three components: the Democratic Party of Serbia (the party of the former president), Djindjić's Democratic Party, and the newly formed G17 Plus, created by Dinkić.

The death of Djindjić and the resignation of Koštunica led to presidential and then parliamentary elections in 2003, which were held three times because low voter turnout meant that the results never met the legal threshold for validation. Finally, the candidate from the late Djindjić's Democratic Party, Boris Tadić, won the presidency in 2004, with Koštunica serving as prime minister. Tadić, the successor of Dinkić's former ally, removed him as CB governor.²⁴

According to Dinkić, "I created a party just to show that I could do it. I was never a politician, just a technocrat. ... It was obvious that I couldn't be a prime minister. But I was everything in politics except that. I was very conscious of this. I'm not so capable as a politician as I am as a technocrat. ... So my partners didn't see me as a competition for posts, but they saw that I can understand what they are doing, that I could say something critical if I chose."²⁵

Nonetheless, he was a political presence for 15 years in Serbia. He served as the country's finance minister (2004-2006 and again from 2012-2013), economics minister (2007-2011) as well as deputy prime minister (2008-2011). "In the third government under Tadić ... I was minister of the economy, I was much stronger than the PM ... Then Tadić and his coalition partners started to attack me." In 2011 Dinkić subsequently created a new coalition of regional parties called the United Regions of Serbia (URS). A local newspaper described the move as Dinkić "set out to conquer the electorate in the interior" by promising economic development on par with that in Belgrade. "The Government of Serbia for the third time hangs in the balance because of Mladjan

²⁴"After Djindjic was killed, the successor[Tadić] wanted to remove me, and this was supported by Djelić [the finance minister at the time]. I was too popular. It was 22 July 2003. At that time I was removed in a very strange way. According to the CB law, we were independent. So they changed the name of the bank. It had been the National Bank of Yugoslavia but they said it couldn't be called that because Montenegro wasn't part of it, they always had their own monetary authority. So they changed the name [to the National Bank of Serbia], and once they did, they said they also need now a new governor. So they changed the name and also changed me."

²⁵Interview in Belgrade, 20 July 2016.

Dinkić — again, in a conflict with the prime minister.”²⁶

Dinkić’s trajectory illustrates the political competition aspect of our story. According to the former CB governor, “I was attacked very much and hard – but always from my own coalition partners, very rarely from the opposition. ... My whole history of work in the government was combat with my own coalition partners.”²⁷ Particularly in an environment such as Serbia’s, where politics is particularly divided, individual politicians can serve as threats to those in power. Political competition can motivate politicians to create independent spheres of influence for actors who might be a political challenger.

Conclusion

In this paper, we have argued that for many governments in democratizing countries, autonomous institutions — such as appointments to an independent central bank — can serve a political purpose in that political appointments can help leaders manage domestic political rivalries. When countries endure authoritarian rule, many actors end up forming part of the opposition to the regime and, once transition occurs, such actors may arise as possible contenders for political power. In an environment of weak and shifting party structures, it is difficult to assess competitors, and the offer of an appointment to an independent and powerful institution may reveal information about — and, furthermore, appease — potential challengers.

We have shown that political competition matters in explaining the rise (and fall) of CBI in post-communist transition countries. Changes to central bank independence results from inter-elite bargaining over contests for political office. In situations where incumbents have appointment powers and potential challengers have more incentives to challenge them, leaders are more likely to grant challengers a higher degree of independence in exchange for raising the effectiveness of political campaigning. Alternatively, when political challengers have little incentive to challenge,

²⁶“Mladjan Dinkić, igrač,” B92, 19 February 2011

²⁷Interview in Belgrade, 20 July 2016.

leaders are simultaneously more likely to appoint independent technocrats but also less likely to give them independent powers. The logic is that powerful political contenders are able to extract autonomy (operationalized as greater CBI) as a concession from the government whereas weak contenders are unable to do so. The primary theoretical contribution of our argument is that higher levels of central bank independence may well result from the government's problem to commit to certain policies, such as those lowering inflation, but can also arise as selective incentives for political contenders to exit competition.

Our theory asserts that strong political contenders for office will be associated with greater central bank independence whereas weak contenders for office and appointments of technocrats will be associated with lower central bank independence. In order to test these claims, we measure CBI using a newly updated measure of CBI (Garriga, 2016). In order to measure political contenders, we collect and assemble new biographical-based information for each CB governor appointed. We then measure whether or not the CB governor has previous ties to the political establishment or whether the CB governor worked previously for an IO. By linking the development of central bank independence to possible electoral challengers, our paper contributes to the literature on central bank appointments as well as the literature on the political economy of reform-making. Further, our argument contributes to growing literature that views central bankers as political actors with vested interests (Adolph, 2013; Shih, 2008). Our argument differs from previous research in that we point out the side-effects of delegating authority in unconsolidated democracies. Central bank appointments can reflect political contests and the neutralization of possible contenders from elections rather than either delegation for output gains or coveted rewards for policy favors and patronage.

Despite these results, one outstanding concern relates to the structure of the dependent variable measure. As shown by the step-wise functions in Figure 2 our dependent variable exhibits significant time dependence. Legal reforms to a country's central bank reforms do not happen every year and in fact, change occurs only zero to three times per country across our sample. One possi-

ble problem with our dependent variable, therefore, is that as a slow moving variable, the *de jure* measure of central bank independence is too invariant to really capture the expected relationships; that is our dependent variable is too blunt of a measure. Further, as changing a country's legal level of independence is only one way, and certainly not the most convenient way of curbing a central bank's independence, we might also want to think of non-legal ways to reform a country's central bank. Thus, future research may do well in examining whether or not our key independent variables are associated with *de facto* rather than *de jure* central bank independence. Such a measure would circumvent a number of theoretical and methodological issues associated with using a slowly moving, highly trend ridden measure of *de jure* CBI in this context.

Appendix

Proofs

The leader's problem is

$$\begin{aligned} & \max_{d(\underline{\theta}), e(\underline{\theta})} \Phi u_l(d(\underline{\theta}), e(\underline{\theta}), \underline{\theta}) + (1 - \Phi)u_l(d(\bar{\theta}), e(\bar{\theta}), \bar{\theta}) \\ & \text{subject to } \underline{P}, \bar{P}, \underline{IC}, \bar{IC}, d(\theta) \in [0, 1], e(\theta) \in [0, 1] \end{aligned}$$

Note that in the following proofs I assume $e^*(\theta) > 0$ and establish that given our assumptions this conditions holds after the proofs.

Proposition 1: $d^*(\underline{\theta}) = \frac{r - \theta(1 - e^*(\underline{\theta}))}{e^*(\underline{\theta})}$ & $\frac{\partial d^*(\underline{\theta})}{\partial e^*(\underline{\theta})} > 0$ if $r < \underline{\theta}$.

Since L's objective function is continuous in $d(\theta)$ and $e(\theta)$ the extreme value theorem applies and there exists at least one maximum. Because u_l is strictly decreasing in $d(\theta)$, \underline{P} is always binding.

Thus, the solution to the problem satisfies $d^*(\underline{\theta}) = \frac{r - \theta(1 - e^*(\underline{\theta}))}{e^*(\underline{\theta})}$. The first derivative, $\frac{\partial d^*(\underline{\theta})}{\partial e^*(\underline{\theta})} = \frac{\theta - r}{e^*(\underline{\theta})}$ is strictly positive if $r < \underline{\theta}$ & $e(\underline{\theta}) \in (0, 1]$. \square

Proposition 2: $d^*(\bar{\theta}) = \frac{r - \theta(1 - e^*(\bar{\theta})) + \bar{\theta}(e^*(\bar{\theta}) - e^*(\underline{\theta}))}{e^*(\bar{\theta})}$ & if $\frac{\partial d^*(\underline{\theta})}{\partial e^*(\underline{\theta})} > 0$ then $\frac{\partial d^*(\bar{\theta})}{\partial e^*(\bar{\theta})} > 0$.

Since u_l is strictly decreasing in $d(\theta)$ and $\bar{\theta} > \underline{\theta}$, \bar{IC} is always binding. If this was not the case and L makes some offer that satisfies \bar{IC} by strict inequality, the leader could offer a lower $d(\bar{\theta})$ until \bar{IC} is satisfied by equality and keep all other constraints satisfied, thereby increasing his utility.

Thus, the solution to the problem satisfies $d^*(\bar{\theta}) = \frac{r - \theta(1 - e^*(\bar{\theta})) + \bar{\theta}(e^*(\bar{\theta}) - e^*(\underline{\theta}))}{e^*(\bar{\theta})}$. If $\frac{\partial d^*(\underline{\theta})}{\partial e^*(\underline{\theta})} > 0$ then $r < \underline{\theta}$ which together with $e^*(\bar{\theta}) > 0$ ensures that after substituting $d^*(\underline{\theta})$ from Proposition 1 into $d^*(\bar{\theta})$, $\frac{\partial d^*(\bar{\theta})}{\partial e^*(\bar{\theta})} = \frac{\theta - r + e^*(\underline{\theta})(\bar{\theta} - \underline{\theta})}{e^*(\bar{\theta})} > 0$. \square

Proposition 3.1: If $r < \underline{\theta}$ then $d^*(\underline{\theta}) > d^*(\bar{\theta}) \forall e^*(\mu) \in (0, 1]$ if $r < \underline{\theta}$.

Given that \underline{P} and \bar{IC} are binding the leader's problem is equivalent to solving

$\max_{e(\theta)} \Phi(e(\underline{\theta}) + e(\bar{\theta}) - o + \bar{\theta})(e(\bar{\theta}) - e(\underline{\theta})) + e(\underline{\theta})(\bar{\theta} - \underline{\theta}) - e(\bar{\theta})(e(\bar{\theta}) - o - \bar{\theta}) - r - \underline{\theta}$ subject to $e(\theta) \in [0, 1]$. First order conditions are $\Phi(o - 2e(\underline{\theta}) - \bar{\theta}) - \underline{\theta} + \bar{\theta} = 0$ and $(1 - \Phi)(o - 2e(\bar{\theta}) - \underline{\theta}) = 0$

which solve for $e^*(\underline{\theta}) = \frac{\Phi(o-\bar{\theta})-\underline{\theta}+\bar{\theta}}{2\Phi}$ and $e^*(\bar{\theta}) = \frac{o-\bar{\theta}}{2}$. Thus, $e^*(\underline{\theta}) > e^*(\bar{\theta})$. Given Propositions 1 & 2, $d^*(\underline{\theta}) > d^*(\bar{\theta})$ reduces to $e^*(\bar{\theta})e^*(\underline{\theta})(e^*(\underline{\theta}) - e^*(\bar{\theta}))(r - \underline{\theta} - e^*(\underline{\theta})(\bar{\theta} - \underline{\theta})) < 0$ which is satisfied if $r < \underline{\theta}$ and $e^*(\underline{\theta}) > e^*(\bar{\theta})$. \square

Proposition 3.2: If $\frac{\phi(\underline{\theta}(-o+\bar{\theta}+2)+\bar{\theta}(o-\bar{\theta}))+(\underline{\theta}-\bar{\theta})^2}{2\phi} \leq r < \underline{\theta}$ & $o < \frac{\underline{\theta}-\bar{\theta}(1-\phi)}{\phi}$ then $\frac{\partial d^*(\bar{\theta})}{\partial v(e^*(\bar{\theta}))} > \frac{\partial d^*(\underline{\theta})}{\partial v(e^*(\underline{\theta}))}$.

As we assumed $\frac{\partial v}{\partial e(\underline{\theta})} < 0$, $\frac{\partial d^*(\bar{\theta})}{\partial v(e^*(\bar{\theta}))} > \frac{\partial d^*(\underline{\theta})}{\partial v(e^*(\underline{\theta}))}$ is equivalent to $\frac{\partial d^*(\bar{\theta})}{\partial e^*(\bar{\theta})} < \frac{\partial d^*(\underline{\theta})}{\partial e^*(\underline{\theta})}$. Taking $\frac{\partial d^*(\underline{\theta})}{\partial e^*(\underline{\theta})} = \frac{\underline{\theta}-r}{e^*(\underline{\theta})}$

and $\frac{\partial d^*(\bar{\theta})}{\partial e^*(\bar{\theta})} = \frac{\underline{\theta}-r+e^*(\underline{\theta})(\bar{\theta}-\underline{\theta})}{e^*(\bar{\theta})}$ from the proofs of Propositions 1 & 2 gives $\frac{\partial d^*(\bar{\theta})}{\partial e^*(\bar{\theta})} < \frac{\partial d^*(\underline{\theta})}{\partial e^*(\underline{\theta})} \Leftrightarrow$

$\frac{\phi(\underline{\theta}(-o+\bar{\theta}+2)+\bar{\theta}(o-\bar{\theta})-2r)+(\underline{\theta}-\bar{\theta})^2}{2e^*(\bar{\theta})^2\phi} < \frac{\bar{\theta}-r}{e^*(\bar{\theta})^2}$ which is satisfied if and only if $e^*(\bar{\theta}) < e^*(\underline{\theta})$, $\frac{\phi(\underline{\theta}(-o+\bar{\theta}+2)+\bar{\theta}(o-\bar{\theta}))+(\underline{\theta}-\bar{\theta})^2}{2\phi} \leq$

$r < \underline{\theta}$ and $o < \frac{\underline{\theta}-\bar{\theta}(1-\phi)}{\phi}$. \square

Positive Effort: $e^*(\underline{\theta}) > 0$.

Given our assumption $o > \bar{\theta}$, $e^*(\underline{\theta}) > e^*(\bar{\theta}) = \frac{o-\bar{\theta}}{2} > 0$.

No Bunching: Let $\hat{d}(\underline{\theta}), \hat{e}(\underline{\theta})$ denote L's choice if C's is allowed to report a false type (i.e. no \overline{IC} and \underline{IC} constraints) then $\Phi u_l(\hat{d}(\underline{\theta}), \hat{e}(\underline{\theta})) + (1 - \Phi)u_l(\hat{d}(\bar{\theta}), \hat{e}(\bar{\theta})) < \Phi u_l(d^*(\underline{\theta}), e^*(\underline{\theta})) + (1 - \Phi)u_l(d^*(\bar{\theta}), e^*(\bar{\theta}))$

Solving the leader's problem subject only to the challenger's participation constraints is equivalent to solving $\max_e(\underline{\theta})\Phi(\underline{\theta} - \bar{\theta} - e(\underline{\theta}))(e(\underline{\theta}) + \underline{\theta} - o) + (1 - \Phi)(e(\underline{\theta})(o - \bar{\theta}) - e(\underline{\theta})^2) + \bar{\theta} - r$. First order conditions are $\Phi(o - 2e(\underline{\theta}) - \underline{\theta}) = 0$ and $(1 - \Phi)(o - 2e(\bar{\theta}) - \bar{\theta}) = 0$ leading to the solutions $\hat{d}(\underline{\theta}) = \frac{o-\underline{\theta}}{2}$ and $\hat{e}(\underline{\theta}) = \frac{2r+\underline{\theta}(o-2-\underline{\theta})}{o-\underline{\theta}}$. Given this offer, an office-seeking challenger always reports to be policy seeking as $u_c(\hat{d}(\underline{\theta}), \hat{e}(\underline{\theta}), \bar{\theta}) > u_c(\hat{d}(\bar{\theta}), \hat{e}(\bar{\theta}), \bar{\theta})$. Yet, $\Phi u_l(d^*(\underline{\theta}), e^*(\underline{\theta})) + (1 - \Phi)u_l(d^*(\bar{\theta}), e^*(\bar{\theta})) > u_l(\hat{d}(\underline{\theta}), \hat{e}(\underline{\theta}))$ for $\hat{e}(\underline{\theta}) \in [0, 1]$. \square

Figure 6: Marginal Effect: FE (Country,Year) Model with controls

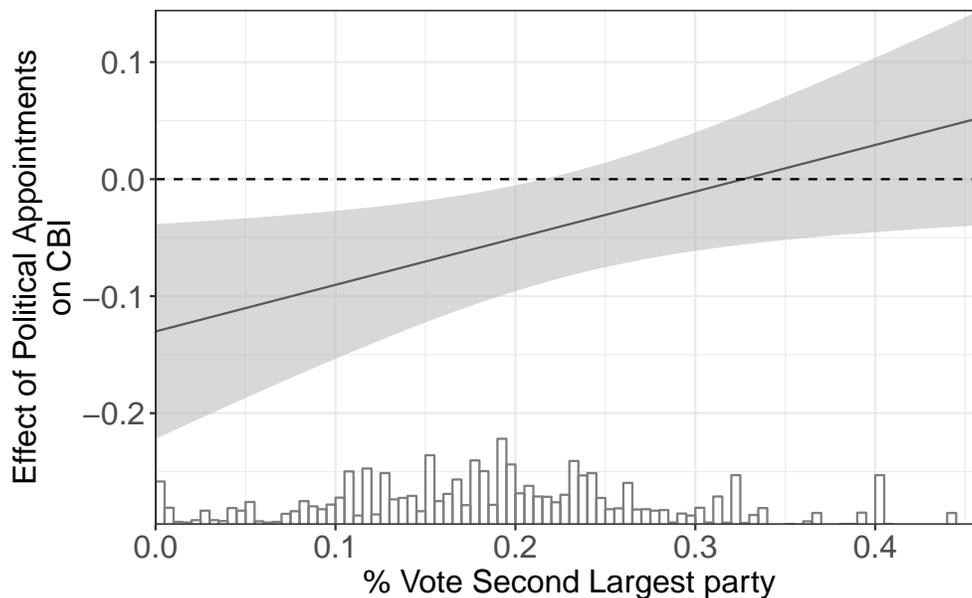


Table 2: Summary Statistics

Variable	Mean	SD	Missing (%)
Political Appointment	0.528	0.517	8.007
\% Vote Second Largest Party	0.191	0.093	15
Regional Party Competition	1.677	0.271	1.471
IO Experience	0.097	0.303	6.863
Log(Inflation Rate)	0.351	0.680	7.353
\% Urban Population	56.717	12.223	0
CIM	0.742	0.166	19.118
Executive Constraints	3.161	1.695	12.255

Table 3: Effects of Political Appointments and Electoral Competition on CBI by Type of Experience

<i>Dependent variable:</i>	
	CBI
Executive	-0.060 (0.042)
Legislature	0.169 (0.157)
Executive & Legislature	-0.169** (0.066)
Executive* Second Party Vote Share	-0.350*** (0.092)
Legislature* Second Party Vote Share	0.321 (0.295)
Executive & Legislature* Second Party Vote Share	1.333*** (0.373)
Second Party Vote Share	0.116 (0.128)
IO Experience	-0.028 (0.028)
Inflation Rate	-0.022 (0.026)
% Urban Population	-0.006 (0.005)
CIM	-0.011 (0.122)
Executive Constraints	0.012 (0.008)
Constant	1.073*** (0.320)
Country and Year	
Fixed Effects	Yes
R^2	0.697
NW	Yes
Error Correction	No
Observations	612

Note: *p<0.1; **p<0.05; ***p<0.01

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