Balancing Act or Policy Pitfall? The Effects of Central Bank Dual Mandates

Garriga, Ana Carolina and Rodriguez, Cesar M.

University of Essex, Portland State University

22 August 2025

Balancing Act or Policy Pitfall? The Effects of Central Bank Dual Mandates*

Ana Carolina Garriga† University of Essex

Cesar M. Rodriguez‡ Portland State University

August 22, 2025

Abstract

Central banks are often tasked with steering economies toward goals that exceed price stability, but the consequences of broader mandates are understudied. This paper focuses the case of central banks that have the explicit mandate of promoting both price stability and full employment ("dual mandates"). We explain how dual mandate adoption generates institutional constraints that increase inflation without delivering meaningful gains in employment. We test our theory using original data on central bank mandates in 176 countries from 1985 to 2023. The empirical analysis addresses challenges of staggered adoption and treatment heterogeneity through entropy balancing, and generalized synthetic control approaches focusing on countries with clean adoption patterns. We find that dual mandate adoption raises inflation by about eight percentage points relative to inflation-only mandates, with effects persisting over time. In contrast, we do not find systematic long-term employment benefits. These results suggest that broader central bank mandates may weaken the effectiveness of monetary policy and increase the risk of politicization. This has implications for debates over institutional design, delegation, and the limits of technocratic governance.

JEL classification: E31, E52, E58
Keywords: Mandates, central bank independence, inflation, employment

*Data on mandates come from the project "A servant of many masters: What are the consequences of assigning multiple mandates to central banks?" (British Academy BA/Leverhulme Small Research Grant SRG1991271). Garriga thanks Tatiana Gelvez Rubio, Vimbainashe Mufunde, Anis Rezai, Thomas Romano and Laura Saavedra Lux for their assistance in the coding of the first wave of data. Sayak Khatua, PhD candidate at Oregon State University, provided outstanding research assistance and support in this project. This paper was presented at the 2025 WEIA annual conference. We are grateful to Carola Binder, Vito Cormun, Barry Eichengreen, Zadia Feliciano, Jeffry Frieden, and Bilin Neyapti for their constructive comments and suggestions.

†Department of Government, University of Essex. Email: carolina.garriga@essex.ac.uk
‡Department of Economics, Portland State University. Email: cesar.rodriguez@pdx.edu

1 Introduction

Central banks play a key role in the economy by steering monetary policy to promote macroeconomic stability. A rich literature studies the connection between central bank governance and economic outcomes (Alesina and Summers, 1993; Bodea and Hicks, 2015*b*; Cukierman, Web and Neyapti, 1992; Garriga and Rodriguez, 2020). Especially since the 1980s, central bank independence (CBI) has been seen as the institutional solution to the time-inconsistency problem of monetary commitments: central bankers should be able to deliver price stability as long as monetary policy decisions are insulated from electoral pressures (Kydland and Prescott, 1977; Barro and Gordon, 1983). This idea —and justification for a widespread policy prescription-– assumes that central bankers' preferences over inflation are more conservative than those of the government. It also assumes that the main purpose of central banks is price stability. However, many central banks have dual mandates; that is, the goal of the central bank is to promote both price stability and full or maximum employment. Both objectives can be in tension, at least in the short term (Phillips, 1958), and this tension may challenge the work of the central bank, as the Chairman of the Federal Reserve has recently warned.[1]

Despite this potential tension, many countries include dual mandates in their central bank statutes to press for the assessment of broader considerations when deciding monetary policy. Especially after the Global Financial Crisis, many called for expanding central banks' narrow focus on inflation and including dual mandates in central banks' regulatory frameworks (Debortoli, Kim, Lindé and Nunes, 2019; Friedman, 2008; Kostanyan and Laxton, 2020; Rosengren, 2014). However, there is no systematic evidence of the effect of dual mandates on central bankers' behavior or on macroeconomic outcomes. How have central banks with dual mandates performed, both in terms of inflation control and unemployment, compared with those that focus on price stability alone? Although some cases seem to suggest that achieving both objectives is possible, like the Federal Reserve during the Great Moderation (Bernanke, 2013), there is no systematic evidence of the performance of central banks with dual mandates. This paper aims to fill this lacuna.

We theorize that delegation of monetary policy to independent central banks is more effective in delivering low inflation in the presence of a narrow mandate. By definition, dual mandates imply increased weigh on employment considerations when deciding monetary policy. This leads to small accommodations in policy that result in higher inflation the long run. Therefore, we expect that the documented curbing effect of central bank independence on inflation (Alesina and Summers, 1993; Bodea

[1] "We may find ourselves in the challenging scenario in which our dual-mandate goals are in tension," Jerome Powell said in prepared remarks, Economic Club of Chicago, April 16, 2025. https://www.cnbc.com/2025/04/16/powell-indicates-tariffs-could-pose-a-two-pronged-policy-challenge-for-the-fed-.html.

and Hicks, 2015*b*; Garriga and Rodriguez, 2020) will be weaker in the presence of dual mandates. Additionally, central banks only control monetary instruments, which are too blunt and unspecific to activate the labor market beyond short-term shocks. Thus, we expect dual mandates to not have a significant effect on employment.

We test our expectations using novel data on central bank mandates on a sample of 176 countries, between 1985 and 2023. To address potential confoundings, we employ entropy balancing to create a matched sample where treated and control observations are balanced on key pretreatment covariates. To reinforce our estimation strategy, we employ a generalized synthetic control approach, focusing exclusively on those countries with staggered adoption but without reversals to this adoption. We find that dual mandates have important effects on central banks' performance. The evidence suggests that the adoption of dual mandates leads to persistently higher inflation levels but does not result in significant gains in terms of employment.

Our findings contribute to the literature beyond central banks. Our paper illustrates how the delegation contract of non-majoritarian institutions, of which central banks are an example, may influence the institutions' performance and the basis of their legitimacy. In particular, the literature on central bank independence has not fully addressed – empirically or normatively – the issue of independence *for what*. Empirically, we show that introducing dual mandates results in higher average inflation and not clear improvements in unemployment in the long term. Therefore, our research sheds light on the question on whether the traditional justification for central bank independence —- rooted in conservatism and technical expertise -— holds under a broader mandate. Our results suggest that expanding mandates may expose central banks to reputational risks if they are perceived as failing to meet both inflation and employment targets, even when some of those goals may be outside their direct control. This, in turn, can undermine their credibility, politicize their actions, and ultimately threaten their institutional legitimacy. By providing systematic evidence on the impact of dual mandates, this research contributes valuable insights into the trade-offs and institutional risks involved in broadening central bank mandates.

2 Central banks' mandates in context

Our argument is framed within the traditional model of delegation of policy to an agent (Bendor, Glazer and Hammond, 2001; Miller, 2005; Thatcher and Sweet, 2002). As in the case of other non-majoritarian institutions, governments delegate some authority to conduct monetary policy to central banks for them to pursue some objective(s) stated in the delegation contract. The central bank's *mandate* is the set of objectives that define their substantive scope of the delegation within which central banks can legally and legitimately work.

Delegation of monetary policy to central banks is justified on the grounds of both technical expertise, the traditional rationale for delegation (Bawn, 1995), and the particular need to enhance the credibility of monetary commitments (Barro and Gordon, 1983; Kydland and Prescott, 1977). Governments' commitments to price stability are time-inconsistent because electoral or other considerations may subordinate politicians' preferences over inflation control to other goals (Nordhaus, 1975; MacRae, 1977). In the short term, politicians may prefer inflationary shocks to create temporary economic boosts or support political agendas,[2] but these decisions will result in higher levels of inflation and reduced welfare in the longer term. An institutional solution to enhance the credibility of the price stability commitment is to delegate monetary policy to a *conservative* central banker – that is, a central banker with stronger preferences over price stability than the government. To pursue low inflation, the conservative central banker needs some degree of independence to resist pressures to adapt to the preferences of the government. This institutional separation or independence should lead to lower average inflation and help stabilize inflation and employment (Rogoff, 1985).[3]

2.1 Narrow versus broad mandates and central bank performance

Typically, non-majoritarian institutions have narrow mandates (Koop and Scotto di Vettimo, 2024; Thatcher and Sweet, 2002; Tesche, 2023), and operate under the principle that "everything not authorized is prohibited" (Eriksen, 2021). Therefore, a broader mandate may suggest the expansion of the agent's powers (Gutner, 2005; Helleiner, 2009; Mailhot, 2025). We argue that for central banks, a broader mandate may challenge the effectiveness and the legitimacy of the delegation of monetary policy.

For central banks, a narrow mandate normally centers around pursuing price stability. Broader mandates include additional objectives such as financial stability or full employment.[4] Although central bankers have deemed these additional objectives "consistent with our ultimate purpose of fostering economic prosperity and social welfare" (Mishkin, 2007), we argue that a broader mandate entails potential risks for central banks performance and, ultimately, legitimacy.

First, regarding performance, monetary policy is a very powerful, yet blunt, instrument (Bernanke, 2010). With a broader mandate, central banks find themselves with fewer policy levers than goals. For example, addressing an economic slowdown that results in higher unemployment, or financial stress that requires central banks to

[2] See for example the case of US tariffs increase in 2025 (https://www.theguardian.com/us-news/2025/apr/04/trump-tariffs-higher-inflation-slower-growth-fed-chair).

[3] Rogoff also warns that this "comes at the cost of distorting the central bank's responses to unanticipated disturbances, especially supply shocks" (Rogoff, 1985).

[4] Other objectives included in some central banks' mandates are exchange rate stability, growth, sustainability, and prevention of illegal activities such as terrorism financing or money laundering (Garriga, 2025*a*).

act as lender of last resort, may require the use of the monetary policy in inflationary ways. In absence of a clear rule, conflicting demands complicates the decision-making process and may entail delayed decisions that, by definition, sacrifice one of the goals at least temporarily.[5] Therefore, central banks' broad mandates are likely to result in *antinomic delegation*, described as "conflicting or complex tasks that are difficult to institutionalize and implement" (Gutner, 2005).

Antinomic delegation is likely to result in poor(er) performance, as observed in the case of delegation to international institutions. This concern has been reflected among top central bankers.[6] Furthermore, research illustrates signs of antinomic delegation, reporting internal disagreements around conflicting goals even when countries are not facing very high levels of inflation or unemployment. Thornton and Wheelock (2014) show that dissent in the Federal Reserve's Federal Open Market Committee (FOMC) often reflect disagreement about how to achieve the FOMC's conflicting macroeconomic objectives .[7] Van't Klooseter and De Boer report similar tensions when the European Central Bank (ECB) has "wrestled with new choices that go beyond the trade-off between output and inflation [...] The price stability objective no longer prescribes a clear course of action..." (van 't Klooster and De Boer, 2023).

Second, beyond actual decisions over interest rates, an important mechanism to deliver price stability is through anchoring expectations (Coibion, Gorodnichenko, Kumar and Pedemonte, 2020). A conditional commitment to price stability may not be efficient at anchoring inflation expectations. Either doubts regarding the central bank's commitment to price stability (Blejer, 1998, 106) or perceived failure to stabilize prices in a timely manner,[8] may affect the central bank credibility (Bordo and Siklos, 2015) and affect inflation through another, parallel channel.[9]

Third, regarding the additional objectives, there is some agreement regarding the un-specificity of monetary policy tools alone to address financial stability, employment or growth without high level coordination with the government (van 't Klooster and De Boer, 2023). Without (and even with) said coordination, it is unlikely that central banks can claim success in achieving other goals included in their mandate. Not achieving goals that exceed price stability has also the potential to further hurt the reputation –and credibility– of central banks (Garriga, 2023). Altogether, the inability to

[5] We assume that even if such a rule existed in the form of guiding criteria, it should allow for significant flexibility in its application (Lohmann, 1992, 2003).

[6] "Fed should ditch current policy framework, group of former top central bankers says," *Reuters* April 30, 2025 https://www.reuters.com/business/finance/fed-should-ditch-current-policy-framework-group-former-top-central-bankers-says-2025-04-30.

[7] Thornton (2012) theorizes that despite the agreement between the Fed's policymakers regarding the direct effect of their decisions on economic growth, "there may be less agreement on how the effect of policy actions on economic growth translates into employment growth or the unemployment rate."

[8] https://www.nytimes.com/2022/05/10/business/economy/federal-reserve-inflation.html.

[9] Bordo and Siklos (2015) show that credibility shocks depend on the type of monetary policy regime in place and that credibility is especially affected if a shock can be associated with policy errors.

achieve conflicting goals can open central banks to criticisms and potential politicization or even threats to reverse their independence (Bodea and Garriga, 2023; Binder, 2021; Binder and Skinner, 2023; Moschella, 2024).

Finally, broader mandates may challenge the legitimacy of independent central banks. Normatively, the justification of central bank independence relies both on central bankers' technical *expertise* and *conservatism* to pursue price stability. Regarding expertise, central banks' "undisputed" competence is restricted to monetary policy. Their superior technocratic expertise is not undisputed for other domains involved in a broader mandate (Moschella, 2024). For example, although many central banks have incorporated financial policy committees to their structures, whether central banks should be the main responsible for financial stability is still in dispute (Klomp and De Haan, 2009; Masciandaro, Quintyn and Taylor, 2008; Masciandaro and Quintyn, 2016). Central banks' expertise and instruments to affect the labor market are even more indirect to achieve full employment than to pursue financial stability. Although central banks can significantly influence employment levels by affecting money supply and the cost of credit in the short term, they lack the ability to achieve maximum employment. Regarding central bankers' preferences, although conservatism is a reasonable safeguard for to correct inflationary bias in politicians' choices, it is less clear as a desirable attribute to achieve full employment (or financial stability). Thus, a broader mandate may not be consistent with the same degree of independence considered "optimal" to pursue price stability, potentially challenging the legitimacy of independent central banks.[10]

2.2 The case of "dual" mandates

Despite the challenges mentioned above, the mandates of many central banks include other objectives beyond price stability, requiring that central bankers assess broader considerations when deciding monetary policy. In this paper, we focus on *dual mandates* defined as cases in which the central bank statutes include (at least) two objectives as part of the bank's mandate: to promote both price stability and employment.[11]

[10]This last point echoes Klooster and De Boer's concern regarding the ECB: "As a non-elected and independent institution, the ECB was historically meant to have a narrow mandate to accompany its strict independence. Legitimacy, on this account, results from the legal mandate, which authorizes the central bank to use a well-defined set of powers subject to clearly specified conditions for their use. In the absence of clear instructions on what to do, there are serious democratic concerns over monetary policy objectives selected by the ECB alone" (van 't Klooster and De Boer, 2023). These democratic concerns about expanded mandates are part of the broader challenges facing central banks in maintaining legitimacy amid populist pressures (Binder, 2023).

[11]Although the use of "dual mandate" is widespread, we acknowledge that this label is imprecise for two reasons. First, strictly speaking, central banks have one mandate, stated in law, that may include one or multiple objectives. "Dual mandate" refers to the inclusion of two statutory objectives in a single mandate. Second, "dual mandate" may mask the fact that often central banks' mandates that include goals regarding inflation and employment also include additional objectives such as financial or exchange rate stability.

In practice, dual mandates exhibit some variance in how they are stated. In particular, both objectives may include qualifications. For example, the employment goal may be stated simply as "employment", or qualified as achieving "full" or maximum employment (e.g, New Zealand 2018-2022; Brazil 2012-present). Similarly, price stability sometimes is defined as the "primary" objective of the central bank. The qualification of "primary," "main," or similar phrasing introduces an explicit hierarchy among the goals included in the mandate. Therefore, the two objectives may be listed without explicit ranking or status, as in the case of the Federal Reserve, or they can be stated in a hierarchical manner, as in the statutes of the Bank of England or the European Central Bank (ECB). Figure 1 illustrates the number of central banks in our data that have dual mandates. In our country-year sample, between 15 and 20% of central banks have dual mandates – either hierarchical, non-hierarchical, and non-hierarchical stating "full" employment – in contrast with central bank mandates including price stability (without employment), and monetary authorities without price stability or employment goals in their mandates.

In the presence of a hierarchical mandate, price stability is stated as the principal objective, and other objectives subordinated to achieving the low, stable inflation goal. In theory, without explicit hierarchies, "the two objectives are sought at the same time [and their] relative weights are left to the discretion of the central bank" (Meyer, 2001). In practice, the experience of the U.S. during the Great Moderation suggests that achieving both goals is possible (Bernanke, 2013). However, central banks have interpreted non-hierarchical dual mandates as giving a higher weight to price stability. A former Governor of the Federal Reserve stated, "We presume that the Congress did not intend to give us contradictory objectives, so we interpret the objectives as price stability and maximum sustainable employment. Maximum sustainable employment is also sometimes referred to as full employment, the maximum level of employment *sustainable without upward pressure on inflation*" (Meyer, 2001, emphasis added).[12] In fact, research shows that Federal Reserve officials in their internal communications and in testimonies in front of Congress "chose not to state their policy objective in terms of employment growth or the unemployment rate despite their awareness that this objective was part of their legal mandate" (Thornton, 2012).

This discussion raises a puzzle: What are the macroeconomic effects of dual mandates if they are explicitly stated (or, *de facto*, interpreted) as the need to prioritize price stability?

[12]Similarly, Bernanke describes the Federal Reserve's policy framework as including "*the emphasis on preserving the Fed's inflation credibility, which is critical for anchoring inflation expectations*, and a *balanced approach* in pursuing both parts of the Fed's dual mandate in the medium term." (Bernanke, 2013, emphasis added).

3 Dual mandates and price stability: A stylized model

In this section, we propose a stylized model to illustrate how adopting a dual mandates leads to systematically higher inflation through institutional constraints rather than policy choice *in the long run*. We build on the theoretical framework of Debortoli et al. (2019), who argue that dual mandates with substantial weight on employment stabilization are welfare-optimal in New-Keynesian (NK) models, but reinterpret their findings through an institutional lens. While their analysis focuses on welfare-optimal policy weights, we examine how dual mandate institutions constrain central bank behavior regardless of policymakers' preferences. Political actors adopt dual mandates expecting to achieve both price stability and employment goals, but institutional design creates systematic accommodation behavior that produces unintended inflationary consequences. Here, we extend their framework to analyze how institutional constraints generate the empirical patterns we expect.

We begin by establishing the basic NK economic structure that characterizes the relationship between inflation, employment, and monetary policy. We then specify how institutional mandates constrain central banks, with dual mandates forcing higher employment weights regardless of their welfare properties. Our analysis examines how these institutional constraints translate into distinct policy responses when the economy faces supply shocks. We formally show that while inflation-focused mandates allow aggressive inflation control, dual mandates systematically constrain central banks to accommodate higher inflation to meet employment objectives. This mechanism generates our key result: dual mandate adoption leads to persistently higher inflation levels through the interaction of shock persistence, "institutionally imposed" employment preferences, and economic volatility. The framework shows that higher inflation under dual mandates reflects institutional constraints that create unintended consequences rather than optimal policy choice.

3.1 Basic Setup

Following the standard NK framework from Clarida, Gali and Gertler (1999) and Woodford (2003), used by Debortoli et al. (2019) and others, we consider an economy characterized by:

$$\pi_t = \beta E_t \pi_{t+1} + \kappa y_t^{gap} + \varepsilon_t^p \tag{1}$$

$$y_t^{gap} = E_t y_{t+1}^{gap} - \sigma(i_t - E_t \pi_{t+1} - r^*) + \varepsilon_t^y \tag{2}$$

where π_t denotes inflation, y_t^{gap} is the output gap, i_t is the nominal policy rate, and ε_t^p, ε_t^y represent supply and demand disturbances. The parameters $\kappa > 0$ and $\sigma > 0$ capture the slopes of the Phillips curve and the IS curve, respectively.

We adapt the loss function framework from Debortoli et al. (2019) to analyze how institutional mandates constrain monetary policy objectives. Rather than viewing these as chosen loss functions, we interpret them as institutional constraints imposed by mandate design. Central banks operating under different mandate structures face different institutionally-determined objective functions:

$$L_t^a = (\pi_t^a - \pi^a)^2 + \lambda^a (x_t)^2 \tag{3}$$

where π_t^a is annualized inflation, π^a is the inflation target, x_t is a measure of economic activity, and λ^a represents the employment weight institutionally imposed by the mandate structure. Following this approach, we model dual mandate adoption as an institutional shift in policy constraints. Prior to adoption, central banks pursue what Svensson (2010) defines as "flexible inflation targeting":

$$\mathcal{L}_{pre} = E_0 \sum_{t=0}^{\infty} \beta^t \left[(\pi_t^a - \pi^a)^2 + \lambda_{low} (y_t^{gap})^2 \right] \tag{4}$$

Following a dual mandate adoption, the central bank's objective shifts to:

$$\mathcal{L}_{post} = E_0 \sum_{t=0}^{\infty} \beta^t \left[(\pi_t^a - \pi^a)^2 + \lambda_{high} (y_t^{gap})^2 \right] \tag{5}$$

The institutional difference between mandate types lies in the employment weight that each structure imposes on central bank decision-making. Debortoli et al. (2019) identify $\lambda_{low} = 0.048$ as representing traditional "flexible inflation targeting" approaches (consistent with Woodford 2003), while $\lambda_{high} = 1.042$ reflects the employment weight that dual mandate institutions typically require. Crucially, these weights are not chosen by central banks but are institutionally determined by mandate design.

The institutional difference between mandate types lies in the employment weight that each structure imposes on central bank decision-making. Debortoli et al. (2019) identify $\lambda_{low} = 0.048$ as representing traditional "flexible inflation targeting" approaches (consistent with Woodford 2003), while $\lambda_{high} = 1.042$ reflects the employment weight that dual mandate institutions typically require.[13] Crucially, these weights are not chosen by central banks but are institutionally determined by mandate design.

To show how dual mandates lead to higher inflation, we analyze how institutional

[13]This empirical support for this parameterization is based on Debortoli et al. (2019), who estimate optimal loss function weights using the medium-scale Smets and Wouters (2007) model. They find that the welfare-maximizing weight on economic activity is $\lambda = 1.042$—over 20 times higher than the flexible inflation targeting baseline of $\lambda = 0.048$. Notably, their analysis shows this result holds across different measures of economic activity (output gap, output level, and output growth) and remains robust to various model perturbations, validating our assumption that dual mandate institutions correspond to systematically higher employment weights.

constraints shape policy responses to supply shocks. When the central bank faces a persistent supply shock $\varepsilon_t^p = \rho\varepsilon_{t-1}^p + u_t$, the institutionally-constrained response differs across mandate types.

3.2 The Inflation Mechanism

While Debortoli et al. (2019) focus on the welfare properties of different policy weights, we extend their analysis to examine how institutional mandate constraints affect inflation dynamics. The key mechanism operates through how different mandate structures constrain central banks' inflation-employment trade-offs when facing supply shocks.

Consider a persistent supply shock $\varepsilon_t^p = \rho\varepsilon_{t-1}^p + u_t$ where $0 < \rho < 1$. Such shocks create a fundamental trade-off: central banks can either fight inflation aggressively (causing employment losses) or accommodate some inflation (protecting employment).

The institutional balance imposed by the design of the mandate determines the accommodation behavior. Dual mandate institutions require higher employment weights ($\lambda_{high} > \lambda_{low}$), systematically constraining central banks to accommodate more inflation. This accommodation translates into systematically different inflation responses that are institutionally determined rather than discretionary. We derive the inflation response by solving the central bank's institutionally-constrained optimization problem.[14] When facing supply shocks, the inflation response under each institutional regime is:

Pre-dual mandate:

$$\pi_t^{pre} = \frac{\varepsilon_t^p}{1+\theta_{low}} \quad \text{where} \quad \theta_{low} = \frac{\lambda_{low}\kappa}{\sigma} \tag{6}$$

This result follows from standard NK optimization under institutional constraints, where θ captures the accommodation behavior imposed by the mandate design on central banks.

Post-dual mandate - Inflation Accommodation:

$$\pi_t^{post} = \frac{\varepsilon_t^p}{1+\theta_{high}} \quad \text{where} \quad \theta_{high} = \frac{\lambda_{high}\kappa}{\sigma} \tag{7}$$

Since $\lambda_{high} > \lambda_{low}$, we have $\theta_{high} > \theta_{low}$, meaning the denominators differ and post-dual mandate inflation responses are larger.

[14] Substituting the IS curve (2) into the Phillips curve (1) and minimizing the simplified loss function $\mathcal{L} = \pi_t^2 + \lambda(y_t^{gap})^2$ with respect to the policy rate i_t yields the first-order condition $\pi_t + \lambda\sigma\kappa y_t^{gap} = 0$. Solving this system gives $\pi_t = \frac{\varepsilon_t^p}{1+\lambda\kappa/\sigma}$.

3.3 Long-Run Inflation Effects

Our key contribution is to show how institutional mandate constraints affect average inflation levels over time. The mechanism operates through how different mandate structures constrain central bank responses to persistent supply shocks. When supply shocks are persistent ($\rho > 0$), today's institutionally-required accommodation influences tomorrow's inflation through the shock process $\varepsilon_t^p = \rho\varepsilon_{t-1}^p + u_t$. Central banks with dual mandates face systematic institutional pressure to accommodate more inflation in each period, and this accommodation compounds over time.

In any given period, the inflation responses are:

Pre-dual mandate:

$$\pi_t^{pre} = \frac{\varepsilon_t^p}{1 + \theta_{low}} \quad \text{where} \quad \theta_{low} = \frac{\lambda_{low}\kappa^2}{1 + \lambda_{low}} \tag{8}$$

Post-dual mandate:

$$\pi_t^{post} = \frac{\varepsilon_t^p}{1 + \theta_{high}} \quad \text{where} \quad \theta_{high} = \frac{\lambda_{high}\kappa^2}{1 + \lambda_{high}} \tag{9}$$

Here, θ represents the "accommodation parameter" that captures how much the central bank is willing to tolerate inflation to protect employment.[15] Since $\lambda_{high} > \lambda_{low}$, we have $\theta_{high} > \theta_{low}$, but the denominators converge as λ increases.

The long-run difference in inflation levels emerges from the interaction of shock persistence and policy accommodation. In particular, when shocks are persistent, the difference in accommodation behavior compounds over time. The long-run difference in average inflation levels becomes:

$$E[\pi_{post}] - E[\pi_{pre}] = \frac{\rho}{1 - \rho} \cdot \frac{\lambda_{high} - \lambda_{low}}{\kappa} \cdot \sigma_{\varepsilon^p}^2 > 0 \tag{10}$$

This result shows that higher inflation under dual mandates arises from three interacting factors: persistent economic shocks that keep recurring ($\rho > 0$), institutionally imposed employment weights that constrain accommodation behavior ($\lambda_{high} > \lambda_{low}$), and the underlying volatility of the economic environment ($\sigma_{\varepsilon^p}^2 > 0$). Each time a supply shock hits, dual mandate institutions systematically constrain central banks to accommodate slightly more inflation than inflation-focused mandates would allow. With persistent shocks, these institutionally-required accommodations accumulate into

[15] The parameter θ differs from the previous section as it incorporates the full dynamic equilibrium effects of institutional constraints rather than just the immediate policy response.

substantially higher average inflation over time. This is the result of an institutional design rather than a deliberate policy choice.

3.4 The Commitment Problem

Dual mandate adoption creates a "commitment problem" that prevents strategic manipulation of the accommodation mechanism. Once embedded in central bank statutes, the accommodation parameter θ becomes institutionally fixed rather than discretionally chosen. Political actors cannot easily reverse mandate changes due to the political costs of abandoning employment goals, legal inertia surrounding institutional reform, and reputational concerns about frequent policy switches.

This commitment problem helps explain the relative scarcity of mandate reversals in our data. Countries that adopt dual mandates generally stick with them, even when inflationary consequences become apparent. Political actors may eventually recognize these costs, but face genuine constraints in acting on this knowledge. The institutional stickiness of mandate design prevents strategic cycling between mandate types – resulting in antinomic delegation – and supports our empirical identification strategy. The persistence of dual mandates reflects institutional inertia and political constraints, rather than satisfaction with their performance.

3.5 Hypotheses

Based on the discussion above, we argue that dual mandates, a special case of broad mandates, are likely to result in higher inflation. Thus, we test the following hypotheses:

H1: Dual mandates result in higher average inflation levels than price stability mandates.

Our discussion also leads to the intuition suggesting that dual mandates are not likely to result in lower unemployment in the long run. This expectation is consistent with the idea that inflation and unemployment dynamics are related in the short term, but not necessarily in the long run (Blanchflower and Posen, 2014; Blanchflower and Levin, 2015). Beyond the inflation channel, through which central banks accommodate inflation to levels that imply a smaller sacrifice in terms of employment, the monetary tool alone is too blunt and unspecific to activate the labor market -– beyond short-term shocks (Parkin, 1998; Solow and Taylor, 1998). Finally, descriptive evidence suggest that central bankers, when independent from the government, tend to have conservative preferences that do not match the strong weight on welfare assumed in Debortoli et al. (2019). In fact, even in the presence of non-hierarchical dual mandates, central bankers seem to still give primacy to the price stability objective over maximum employment (Meyer, 2001).

H2: Dual mandates do not have a significant long-term effect on unemployment levels.

4 Data and methods

4.1 Our Measure of Dual Mandate

For this paper, we use data from Garriga (2025*a*) on central banks mandates. This dataset is based on human coding of formal, explicit mandates, that is, the objectives of the central banks as stated in the legislation that create and frame their institutional design. We use four variables for our analysis: *Inflation* is coded as 1 if the central bank statute mentions price stability or inflation control as one of the goals of the central bank, and zero otherwise. Inflation primary is coded 1 when the price stability objective is mentioned as the main (or one of the main) or primary goals of the central bank. All observations coded 1 for *Inflation (primary)* are also coded 1 for *Inflation*. A similar strategy is used to code the variables *Employment* and *Full employment*. Finally, countries that have other objectives in their mandate that are neither Inflation nor Employment are coded as *Other goals*.

Dual mandate, our main independent variable, is coded 1 when both Inflation and Employment are coded 1. Therefore, *Dual mandate* includes three cases: Inflation and Employment, Inflation (primary) and Employment, Inflation and Full Employment. *Inflation mandate* refers to cases in which the statute has a price stability goal (either primary or not) and does not have employment as a goal, regardless of whether other, additional goals are mentioned. Table 1 shows the distribution of these variables in our sample, while Figure 1 shows the evolution of their adoption over the past four decades. We observe a clear shift towards incorporating price stability as a primary objective, while the use of "other types of goals" has declined substantially since the early 1980s, when they made up nearly a third of our sample. Interestingly enough, the proportion of central banks operating with employment considerations has slightly increased. By 2023, dual mandates with inflation as the primary objective had become a much more common feature of institutional frameworks.

Figure 2 plots countries that have adopted either inflation mandates or dual mandates. The number of countries operating under inflation mandates grew quite steadily from the early 1990s through the mid-2000s, reaching a peak of roughly 160 countries by 2010. This expansion captures the shift toward price stability during this period. Dual mandate adoption follows a rather different trajectory —- it has been more recent and gradual, with most of the growth occurring after 2010. The number of countries with explicit dual mandates has grown from less than 5 in 2000 to nearly 15 by 2023, which points to a more recent shift in how central bankers think about

their policy objectives. The contrasting patterns suggest that while inflation-focused mandates represented the dominant reform paradigm of the 1990s and early 2000s, dual mandates have become increasingly attractive, as policymakers have found it difficult to ignore employment concerns in their monetary policy frameworks.

To better understand this adoption pattern, Figure 3 shows the dual mandate adoption in more detail. Rather than simple, permanent transitions, we see considerable variation in timing and persistence across countries. Some countries like the United States have maintained dual mandate arrangements throughout our sample period. Others show more dynamic behavior, adopting dual mandates only to later modify or abandon them –what we call "reversal" cases. A group that includes Sweden and the United Kingdom started with different mandate structures (not inflation) before transitioning to dual mandates and sticking with them. In contrast, other countries like the Dominican Republic and Iceland started with dual mandates and later narrowed their mandates removing employment considerations.

4.2 Additional Variables

Our main dependent variable is *Inflation*, measured as the log of the inflation rate for several methodological reasons. First, countries with extremely high inflation rates would otherwise exert a disproportionate influence on our estimates (Klomp and De Haan, 2010). Second, Klomp and De Haan (2010)'s meta-analysis demonstrates that using the logarithmic transformation instead of levels in the context of central bank reforms does not affect the significance of coefficients while simultaneously addressing issues of heteroscedasticity and outliers.[16] The inflation data come from the IMF's *International Financial Statistics*.

Our controls include a measure of *legal* central bank independence (CBI) using country-year data from Garriga (2025*b*). This indicator follows the criteria defined by Cukierman et al. (1992) to develop an index that ranges from 0 (minimum, dependence) to 1 (maximum, independence).[17] The index weighs four components, also measured from 0 to 1: protections to central bank's chief executive officer, the bank's policy formulation, its objectives, and the limitations on lending to the public sector -or the fiscal powers of the central bank. Since this paper analyzes the independent effect of the mandate, we modify (Garriga, 2025*b*)'s index by removing the "objective" component and re-estimating it using the average of the other three components, as in the unweighed

[16]This transformation proves particularly important given that some countries in our sample experience hyperinflationary episodes that could otherwise drive our results.

[17]This indicator of legal CBI allows us to compare central banks' features across countries and time. Although *de jure* indicators cannot reflect behavior that deviates from the rules Garriga (2016), they reflect comparable measures of policy decisions —in this case, the delegation of monetary policy to an autonomous central bank. Furthermore, legal independence works in practice as a necessary condition for *de facto* independence (Freedman and Öther-Robe, 2010).

CBI index. Rescaling the index using the original weights produces similar results.

We include several control variables motivated by theoretical and empirical work on inflation. Capital account openness affects how monetary policy influences inflation through exchange rate and interest rate channels (Mundell, 1961; Fleming, 1962). Thus, we include Chinn and Ito (2008)'s index of *capital account openness*. We control for exchange rate regimes using a binary *Peg* variable based on Reinhart and Rogoff (2004)'s *de facto* classification system.[18] Finally, we include standard macroeconomic controls that previous research identifies as important inflation determinants. These include *real GDP per capita* to capture development levels, *trade openness* (exports plus imports as a share of GDP) following Daniels, Nourzad and VanHoose (2005), and *world inflation* to account for global price pressures (Bodea and Hicks, 2015*a*; Neely and Rapach, 2011).[19] These variables come from the World Bank's *World Development Indicators* (World Bank, 2024).

Our second dependent variable is the unemployment rate, measured as the percentage of the labor force that is unemployed but actively seeking employment, obtained from the World Bank's *World Development Indicators* (World Bank, 2024). We use unemployment rate rather than employment levels because it provides a standardized measure that accounts for cross-country differences in labor force participation and demographic structure, offering a more comparable indicator of labor market slack that central banks can realistically influence through monetary policy.

To identify the potential effect of dual mandate adoption on unemployment, we control for several macroeconomic and institutional variables that the literature suggests matter for labor market outcomes. We first include lagged GDP per capita to capture the level of economic development, as more developed economies typically exhibit different unemployment dynamics due to superior social safety nets and labor market institutions (Blanchard and Wolfers, 2000). Lagged inflation captures monetary conditions that can directly affect employment through nominal wage rigidities and how firms set prices (Ball, 2014). Trade openness affects unemployment through its impact on labor demand, as increased international competition can lead to job displacement in import-competing sectors while potentially creating opportunities in export industries (Dutt, Mitra and Ranjan, 2009). We also control for world inflation to account for global economic conditions that influence domestic labor markets through commodity prices and external demand (Borio and Filardo, 2007). Population growth captures demographic pressures on labor markets, since faster-growing populations need more rapid job creation to keep unemployment stable (Krugman, 1994). The exchange rate peg dummy is important because fixed exchange rates can limit how much central banks

[18] *Peg* equals 1 for arrangements with no separate legal tender, pre-announced pegs or currency boards, pre-announced horizontal bands $\leq \pm 2\%$, or *de facto* pegs.

[19] World inflation represents the median annual consumer price index change across all World Bank reporting countries.

can respond to unemployment shocks, while capital account openness affects labor markets through capital flows and foreign investment patterns (Obstfeld, 2009). Finally, we include a democracy measure because democratic institutions tend to influence labor market policies and social protection systems in ways that affect unemployment outcomes (Rodrik, 1999).

4.3 Estimation Strategy

We employ two complementary approaches to identify the causal effects of dual mandate adoption on inflation in our sample of 170 countries, between 1990 and 2023. However, conventional panel methods face substantial limitations in this context. Standard two-way fixed effects estimators struggle with the staggered timing of dual mandate adoption, treatment reversals, and heterogeneous effects across countries and time periods. These challenges, combined with limited treatment variation, render traditional difference-in-differences approaches inadequate for our research question. We present these preliminary analyses in Appendix I to illustrate these methodological challenges.

These limitations arise for several reasons. First, dual mandate adoption follows a staggered pattern across countries, with implementation dates spanning multiple decades and institutional contexts (see Figure 3). Second, we observe treatment reversals in several cases where countries subsequently modified their mandate structures. Third, only five countries represent "clean" adopters without subsequent reversals or modifications, providing limited identifying variation for a global monetary policy phenomenon.[20] These characteristics generate treatment effect heterogeneity that standard panel methods cannot adequately address. Therefore, we turn to other methods, specifically designed to accommodate staggered adoption, treatment reversals, and heterogeneous treatment effects.

First, let us keep in mind that the decision to adopt a dual mandate is not randomly assigned between countries. This raises concerns about selection bias that could confound our estimates. Countries that choose to implement dual mandates may differ systematically from those that do not along dimensions that also affect inflation outcomes. For instance, countries facing specific macroeconomic challenges might be more likely to adopt dual mandates, while simultaneously exhibiting different inflation dynamics for reasons unrelated to the mandate change itself. To address this potential confounding, we employ entropy balancing to create a matched sample where treated and control observations are balanced on key pre-treatment covariates.

Following the methodology by Hainmueller (2012), we use *entropy balancing*

[20] In this list, we include the cases of New Zealand and Argentina since the shown reversal occurred in the 1980s under very different conditions.

to generate the observation-level weights. Entropy balancing can be viewed as a generalization of the commonly used propensity score weighting methods. However, compared to the propensity score matching, where weights are estimated first, followed by balance checks second, the entropy balancing algorithm works as a reweighting scheme. This ensures that reweighted samples achieve exact balance on specified moments in finite samples, rather than relying on asymptotic approximations that may perform poorly with limited treatment variation. In entropy balancing, the weights are derived from the imposed balance constraints. This implies that in finite samples, the sample moments in the reweighted control group match exactly the corresponding moments in the treatment group.[21]

Ultimately, this reweighting procedure ensures that our treatment and control groups are comparable along observable dimensions that theory suggests could influence both mandate choice and inflation outcomes. These weights are computed by minimizing a loss function under predetermined balance constraints imposed on a set of control variables' moments. In this way, the treatment and control groups have the same mean and variance. We follow the literature on central bank independence in selecting variables that determine whether a country adopts a specific type of mandate. In particular, we achieve balance in the following covariates: lagged inflation, GDP per capita, trade openness, central bank independence, and exchange rate arrangements.

The method proves particularly valuable in our context because it can accommodate multiple balance constraints simultaneously while maintaining intuitive interpretation. This reweighting strategy complements rather than duplicates the identifying assumptions of our subsequent estimators. While our two approaches, described below, address treatment effect heterogeneity and unobserved confounding, entropy balancing ensures that our treatment and control groups are comparable on observable characteristics that could confound these relationships. This layered approach strengthens identification by eliminating multiple potential sources of bias through methods targeting different threats to causal inference.

Specifically, our primary estimation strategy relies on two approaches that accommodate the institutional complexity of dual mandate reforms. The staggered timing and treatment reversals in our data violate the assumptions of two-way fixed effects estimators. These violations are problematic in our setting because conventional fixed effects implicitly use already-treated units as controls for later-treated units, creating contaminated comparison groups that bias treatment effect estimates. Therefore, we adopt the approach of de Chaisemartin and d'Haultfoeuille (2020), which addresses several limitations of standard panel methods. First, their estimator allows for heterogeneous treatment effects across countries and time periods, recognizing that the impact

[21] Hainmueller and Xu (2011) shows that entropy balancing outperforms conventional matching and does not discard units from the treatment or the control groups.

of dual mandate adoption may vary depending on country-specific factors. Second, it properly handles staggered treatment adoption by constructing valid counterfactuals for each treated unit at each point in time, rather than using already treated units as controls. Third, their methodology accommodates treatment reversals by allowing units to move in and out of treatment status without biasing the estimates.

The estimator constructs treatment effects by comparing units that switch treatment status (switchers) to units that remain in the same treatment state (non-switchers) over specific time periods. Formally, the estimator computes:

$$\hat{\tau}(t) = \sum_{g,\ell} w_{g,\ell} \left[\left(\bar{Y}_{g,g+t} - \bar{Y}_{g,g-1} \right) - \left(\bar{Y}_{\ell,g+t} - \bar{Y}_{\ell,g-1} \right) \right] \tag{11}$$

where $\bar{Y}_{g,s}$ represents the average outcome for group g in period s (conditional on the control variables), g indexes treatment groups by adoption year, ℓ indexes control groups, and $w_{g,\ell}$ are weights that ensure valid comparisons between treated and control units. The estimator incorporates control variables by conditioning all comparisons on the observed covariates, ensuring that treatment effects are estimated net of differences in observable characteristics between switchers and non-switchers. We apply this estimator to our entropy-balanced sample, using the reweighting method described previously to ensure comparability between treatment and control observations. The baseline specification includes time-varying controls for central bank independence (excluding the mandate component), GDP per capita, trade openness, capital account openness, exchange rate regime, and world inflation. All control variables are lagged one period to avoid potential endogeneity concerns. We cluster standard errors at the country level to account for serial correlation within countries over time.

To reinforce our estimation strategy, we also apply generalized synthetic control methods to analyze the inflation and unemployment effects of dual mandate adoption. This approach builds on the synthetic control framework by Abadie and Gardeazabal (2003) and Abadie, Diamond and Hainmueller (2010), but extends it to handle the complexities of multiple treated units and staggered adoption timing. The generalized version developed by Xu (2017) is relevant for our empirical context when we restrict the dual mandate adoption across the five countries without subsequent reversals.

Focusing on countries with clean adoption patterns (those implementing dual mandates without subsequent reversals) offers several analytical advantages beyond merely reducing sample size. First, clean cases eliminate the confounding effects of policy uncertainty and institutional instability that accompany frequent mandate changes. Countries that reverse dual mandate adoptions likely face different economic pressures and political constraints than those maintaining consistent institutional frameworks, creating unobserved heterogeneity that contaminates treatment effect estimates. Second, clean adoption patterns provide more credible identification of long-run effects. The

persistent nature of institutional reforms means their full impact may take years to materialize; analyzing countries that maintain dual mandates allows us to observe these longer-term dynamics without the noise introduced by policy reversals. Third, clean cases better reflect the policy-relevant counterfactual. Policymakers considering dual mandate adoption are primarily interested in the effects of sustained institutional change, not temporary policy experiments. By concentrating on countries that demonstrate commitment to their institutional choices, we provide more actionable evidence for policy design.

The generalized synthetic control method constructs synthetic counterfactuals using interactive fixed effects that allow for time-varying unobserved heterogeneity. The approach estimates the model:

$$Y_{it} = \delta_{it} D_{it} + \lambda_i f_t + \xi_{it} \tag{12}$$

where Y_{it} is the outcome for country i at time t, D_{it} is the treatment indicator (that equals 1 when country i has adopted a dual mandate at time t; 0 if country i has an inflation mandate), δ_{it} represents time-varying treatment effects, λ_i are country-specific factor loadings, f_t are common time factors, and ξ_{it} is the error term. The interactive fixed effects $\lambda_i f_t$ capture unobserved heterogeneity that varies across both countries and time, providing more flexibility than standard two-way fixed effects. We include the same control variables used in de Chaisemartin and d'Haultfoeuille (2020) approach: central bank independence (excluding the mandate component), GDP per capita, trade openness, capital account openness, exchange rate regime, and world inflation, all lagged one period.

Unlike traditional synthetic control that requires manual donor pool selection, this approach automatically reweights all control units based on their pre-treatment similarity to treated countries. The method uses cross-validation to select the optimal number of factors and constructs weights that minimize the mean squared prediction error in the pre-treatment period. Importantly, the procedure incorporates our entropy-balanced weights as baseline weights, ensuring that the synthetic control construction occurs within our already-balanced sample rather than starting from the raw data. We focus exclusively on the five countries with staggered adoption but without reversals (Argentina, Brazil, New Zealand, Sweden, and the United Kingdom), eliminating contamination from policy uncertainty and institutional instability.

Operationally, this implies that rather than requiring a single treatment period like traditional synthetic control methods, this approach can accommodate our staggered treatment cohorts while constructing synthetic counterfactuals for each treated unit. The method reweights control units to match pre-treatment characteristics and trends, incorporating interactive fixed effects that help capture unobserved time-varying

confounders that might otherwise bias our estimates. Given that central bank reforms occur in different economic environments and time periods, this flexibility becomes essential to account for heterogeneous treatment effects while preserving the intuitive approach of synthetic control methods.

Xu (2017)'s generalized approach using a factor model framework allows for interactive fixed effects, which provides much more flexibility for controlling unobserved heterogeneity than we could achieve with conventional two-way fixed effects. This matters in our setting, where we have limited treatment variation spread across different decades and face potential time-varying confounding that coincides with mandate adoption decisions. The method tackles these challenges by learning about the relationship between treated and control units throughout the entire pre-treatment period, rather than simply assuming parallel trends hold. Liu, Wang and Xu (2024) show that this approach can accommodate time-varying treatment effects while maintaining inference procedures, an important feature since dual mandate impacts likely evolve as central banks adjust their operational frameworks and economic conditions shift. The interactive fixed effects structure also helps control for global macroeconomic developments that might affect countries differently based on their underlying economic characteristics, providing a more credible identification strategy than conventional panel approaches (Xu, 2017).

5 Main Findings

5.1 Descriptive data and preliminary analyses

Before estimating models, it is useful to describe the patterns the raw data show. Descriptively, the distributional differences between mandate types become apparent when we examine the two key variables of interest: inflation and unemployment. Figure 4 shows that countries with dual mandates exhibit higher average inflation rates compared to those operating under non-dual, inflation-focused mandates. The median inflation rate for dual mandate countries is approximately 6%, compared to about 3% for inflation mandate countries, with dual mandate countries also showing greater variability (interquartile range of roughly 2-10% versus 1-7%). This pattern give some descriptive evidence that central banks balancing multiple objectives may have to accept higher inflation as they pursue employment goals alongside price stability.

Disaggregated data of inflation over time in Figure 5 reveal a persistent pattern where countries whose central banks have dual mandates tend to experience higher inflation rates than their inflation-focused counterparts. The gray shaded areas in the figure highlight periods when dual mandate countries experienced higher inflation, and these periods dominate the figure, particularly from the 1990s onward. This persistent

differential suggests that the inflationary effect we observe might not be the result of temporary adjustments but rather reflect systematic differences in how central banks conduct monetary policy.

Figure 6 tells a different story. While there are some differences in the distribution of unemployment rates across mandate types, these distinctions are considerably less pronounced than those for inflation. The median unemployment rates are quite similar between the two groups (approximately 6% for inflation mandate countries versus 7% for dual mandate countries), and there is substantial overlap in the interquartile ranges (4-10% versus 5-8.5%, respectively). This suggests that employment rates may be less directly influenced by central bank mandate design than inflation rates, potentially reflecting policy options.

The unemployment rate across time in Figure 7 presents a different picture compared to inflation. Rather than showing the clear separation we see with inflation, the unemployment trajectories for the two mandate types intersect frequently throughout the sample period. The lines cross each other multiple times, indicating that neither mandate type consistently delivers superior employment outcomes. This pattern reinforces our observation that employment outcomes appear less systematically related to mandate structure than inflation. This could be the result of labor markets that depend on factors outside the direct control of the central bank.

Also, to illustrate the challenges that complexity of dual mandate adoption patterns presents for standard panel regression approaches, we perform standard difference-in-differences analyses. Conventional two-way fixed effects estimators fail to detect statistically significant effects of dual mandate adoption on inflation – the dual mandate coefficient remains insignificant across specifications (see Table (I.1) in the appendix).[22] To address concerns about treatment reversals contaminating our estimates, we further restrict our analysis to "clean" dual mandate adopters – countries that implement dual mandates without subsequent reversals. This leaves us with only five treated countries, but provides a more precise test of our identification strategy by eliminating the confounding effects of mandate switches. Results reveal that even this cleaner treatment definition fails to yield statistically significant effects using standard panel methods (see Table (I.2) in the appendix). This apparent lack of identifying power reflects fundamental violations of the assumptions underlying standard difference-in-differences frameworks, particularly the assumption of treatment effect homogeneity across countries and time periods and highlights the limitations of standard difference-in-differences methods when applied to central bank reforms with limited treatment variation.[23]

[22]Employing Driscoll-Kraay standard errors to address potential spatial and temporal correlation in the error terms does not resolve the fundamental identification problems either (see Columns 3 and 4, Table (I.1) in the appendix).

[23]With only five treated units spread across different time periods, conventional panel estimators strug-

5.2 Addressing treatment effect heterogeneity

We utilize different methods that can manage staggered treatment implementation and heterogeneous effects without relying on strong homogeneity assumptions. Specifically, we implement the de Chaisemartin and d'Haultfoeuille (2020) estimator, including time-varying controls for central bank independence (excluding the mandate component), GDP per capita, trade openness, capital account openness, exchange rate regime, and world inflation.

Figure 8 presents dynamic treatment effect estimates showing the impact of dual mandate adoption on inflation over time. The horizontal axis shows relative time to adoption ($t = 0$), while the vertical axis measures treatment effects where positive values indicate higher post-adoption inflation. The pre-treatment period ($t < 0$) serves as a test of the parallel trends assumption, showing generally small and statistically insignificant effects in the years leading up to adoption, with point estimates around zero. This pattern supports the validity of our identification strategy by suggesting that treated and control countries followed similar inflation trajectories prior to mandate changes.

The post-treatment effects reveal a clear shift in inflation dynamics following dual mandate adoption. Beginning around $t = 1$, we observe positive effects that persist throughout the post-treatment period. The magnitude of effects suggests that the dual mandate adoption is associated with inflation rates that are roughly 2.7 to 18.1 percentage points higher than they would have been under an inflation mandate regime, depending on the specific year examined.[24] The average cumulative effect over the post-treatment period is approximately 7.6 percentage points, which is statistically and economically significant.[25] The confidence intervals indicate statistical significance for most post-treatment periods, although the precision varies somewhat

gle to separate the mandate effect from country-specific trends and global macroeconomic developments that coincide with adoption timing. The staggered nature of adoption compounds this challenge, as different countries implement dual mandates in different economic environments. This creates treatment effect heterogeneity that fixed effects methods cannot adequately capture.

[24]These percentage point calculations are derived from the log-transformed treatment effects using the median inflation rate in our sample (5.2%) as the baseline. For example, a treatment effect of 0.5 log points represents approximately a 65% increase, which translates to an inflation rate of 8.6% (5.2% × 1.65), or a difference of 3.4 percentage points. Similarly, a 1.5 log point effect represents a 348% increase, yielding an inflation rate of 23.3% (5.2% × 4.48), or an 18.1 percentage point difference. The average post-treatment effect of approximately 0.9 log points corresponds to a 146% increase, resulting in an inflation rate of 12.8% and a difference of 7.6 percentage points relative to the median baseline.

[25]To put this magnitude in perspective, a 7.6 percentage point increase represents a substantial macroeconomic impact. For a country starting with the sample median inflation rate of 5.2%, this effect would push inflation to nearly 13%—a level that crosses the threshold from moderate to high inflation in most macroeconomic frameworks. This magnitude is comparable to major monetary policy regime changes documented in the literature and exceeds the inflation volatility typically associated with business cycle fluctuations. Moreover, the persistence of these effects suggests that dual mandate adoption creates a permanent upward shift in the inflation process rather than a temporary adjustment period.

across time horizons. The pattern of effects aligns with our main argument: central banks operating under dual mandates appear willing to tolerate higher inflation in pursuit of employment objectives, resulting in a sustained upward shift in inflation levels rather than a temporary adjustment.

This analysis revealed an important pattern with implications for interpreting our results. Virtually all countries with dual mandates have central bank independence levels above 0.48, with most above 0.5. This seems to reflect something systematic about which countries actually adopt dual mandates. In fact, this pattern suggests that dual mandate adoption might require countries to already have reasonably independent central banks in place, which has two clear implications for our findings. First, it indicates that the inflationary effects we observe cannot be attributed to weak institutional frameworks or lack of central bank credibility, since these are occurring in countries with relatively strong monetary institutions. Second, this pattern strengthens the causal interpretation of our results by suggesting that dual mandate adoption represents a deliberate institutional choice rather than a response to poor macroeconomic performance or weak governance. The fact that even independent central banks experience higher inflation under dual mandates supports our theoretical argument that this reflects optimal accommodation behavior rather than institutional failure.

Our analysis of dual mandate effects on unemployment looks quite different. Figure 9 shows treatment effects that remain close to zero throughout most of the post-adoption period, with confidence intervals that include zero for nearly all time horizons. We do observe statistically significant decreases in unemployment around years 2-3 post-adoption (reaching approximately -1.5 to -2 percentage points), suggesting some short-term employment benefits. However, these effects do not persist beyond the initial adjustment period, with point estimates returning to insignificant levels near zero in subsequent years. The overall magnitudes are economically small (ranging from about -2 to +1 percentage points) and the average cumulative effect over the post-treatment period is -0.40 percentage points, which is statistically indistinguishable from zero. Although the pre-treatment period shows some minor variation, particularly in the first placebo, the remaining pre-treatment effects cross zero, supporting the parallel trends assumption. This pattern suggests that while dual mandate adoption may generate temporary employment benefits in the immediate aftermath of adoption, it does not systematically alter unemployment outcomes over the longer term, supporting our theoretical argument that central bank mandates primarily influence nominal rather than real variables over extended periods.

5.3 Generalized synthetic control

Our synthetic control analysis, focusing on the five countries with clean dual mandate adoption patterns, provides additional confirmation of our main findings while offering

intuitive visualization of the treatment effects.

Figure 10a shows a clear pattern of inflation increases following the adoption of dual mandates. The pre-treatment period exhibits small, statistically insignificant effects hovering near zero, providing support for the parallel trends assumption underlying our identification strategy. This pattern suggests similar inflation trajectories prior to mandate changes, lending credibility to our synthetic control comparisons. Interestingly, post-treatment effects tell a different story, with consistently positive treatment effects emerging in the first year following the adoption and persisting throughout the observation window, with the largest effects occurring around years 7-10 after adoption. Quantitatively, the synthetic control estimates suggest treatment effects of similar magnitude to our de Chaisemartin and d'Haultfoeuille (2020) results, with post-treatment inflation averaging approximately 3.5-4.0 percentage points higher than the synthetic counterfactual.[26]

Figure 10b illustrates the synthetic control methodology by showing the observed inflation trajectory for the treated countries (solid line) compared to their synthetic counterfactual (dashed line). The pre-treatment period reveals close alignment between observed and synthetic trends, suggesting that our reweighting procedure successfully identifies appropriate control units that can serve as valid counterfactuals. The divergence that begins around the treatment period ($t = 0$) shows that countries adopting a dual mandate experience higher inflation than their synthetic counterparts would predict, with the gap widening over time. This pattern provides intuitive evidence for the treatment effect, as the observed inflation path increasingly deviates from what we would have expected based on the pre-treatment relationship with control countries.

The synthetic control results for unemployment tell a different story entirely. Figure 12 shows treatment effects that fluctuate around zero with no clear pattern. While we observe some apparent reductions in unemployment in certain periods, these effects lack persistence and statistical significance. The more serious concern appears in Figure 13, where the observed unemployment trajectory (solid line) and synthetic counterfactual (dashed line) cross repeatedly throughout the post-treatment period. This crossing pattern indicates that our synthetic control struggles to construct valid counterfactuals for unemployment. Although the pretreatment alignment appears reasonable, the posttreatment instability, with lines converging and diverging repeatedly, suggests that factors affecting unemployment are not adequately captured by our approach. These

[26]This is the result from converting the log-transformed treatment effects using our sample median inflation rate of 5.2% as the baseline. The average post-treatment effect of approximately 0.65 log points represents a 92% increase ($e^{0.65} - 1 = 0.92$), which translates to an inflation rate of 10.0% (5.2% × 1.92), yielding a difference of 4.8 percentage points. The range of 3.5-4.0 percentage points reflects variation in the post-treatment estimates, which vary from approximately 0.5 to 0.8 log points across different time horizons.

results reinforce our conclusion that dual mandates do not systematically influence employment outcomes and highlight the challenges of using monetary policy tools to affect labor market dynamics.

5.4 Robustness

Two further analyses are crucial to validate our identification strategy. First, we use placebo tests, which examine whether we observe similar treatment effects when we artificially assign treatment to pre-treatment periods. The placebo tests in Figures II.1 and II.3 indicate that we cannot reject the null hypothesis of no pre-treatment effects. This provides evidence that our estimated post-treatment effects are not driven by pre-existing differences between treated and control countries, but rather reflect genuine causal impacts of dual mandate adoption. The blue dots in the placebo period show effects that are both smaller in magnitude and statistically indistinguishable from zero, contrasting with the positive and often significant effects observed in the true post-treatment period. Second, Figures II.2 and II.4 present results from the equivalence test, which examines the plausibility of our treatment effect estimates by testing whether pre-treatment periods show systematic differences between treated and control units. The F-test from this diagnostic yields an extremely low p-value, which provides evidence that our identification strategy successfully isolates genuine treatment effects rather than picking up pre-existing differences between countries that adopt dual mandates and those that maintain inflation mandates. This equivalence in pre-treatment trends strengthens confidence that the positive post-treatment effects we observe reflect actual causal impacts of institutional reform.

The temporal pattern we observe –gradual increases rather than immediate jumps-—makes economic sense for institutional reforms of this type. The adoption of a dual mandate involves fundamental changes to central bank objectives that likely take time to work through the system as policymakers adjust their frameworks and markets recalibrate expectations. This gradual buildup, combined with our placebo tests showing no pre-treatment effects, gives us reasonable confidence that we are capturing actual policy impacts rather than coincidental timing or methodological anomalies.

6 Concluding Remarks

In this paper, we analyze the effect of adopting dual mandates, understood as the simultaneous pursuit of price stability and full employment. Drawing on a novel dataset covering 176 countries from 1985 to 2023, and employing a combination of entropy balancing, generalized synthetic control, and treatment effect heterogeneity methods, we reach three main conclusions.

First, the adoption of dual mandates is associated with a persistent and statistically significant increase in inflation – relative to central banks without dual mandates. We formally show that dual mandate adoption creates a "commitment problem" that prevents strategic manipulation of the accommodation mechanism when facing persistent economic shocks. We speculate that this may translate into antinomic dynamics caused by conflicting objectives that demand the use of monetary policy in different directions, and a reduced ability to anchor inflation expectations with a conditional commitment to price stability. The study of both channels require further research on internal dynamics in monetary policy committees, and of the sentiment of firms and households regarding dual mandates, which exceed the goal of this study.

Second, and in contrast with the intentions behind adopting broader mandates, we find no significant improvements in unemployment outcomes over the long run following the adoption of dual mandates. This suggests that monetary policy alone may be too blunt a tool to sustainably influence labor market outcomes, and may require coordination with other policies to contribute to achieving full employment. This is in line with other scholars suggestion fo the need of high-level coordination between monetary and other political institutions (van 't Klooster and De Boer, 2023).

Third, our findings raise some questions regarding how to integrate broader mandates for independent central banks. While dual mandates reflect socially desirable goals, they may complicate policy implementation and effectiveness, create reputational risks, and undermine the credibility of central banks, especially if they create expectations that exceed what central banks alone can realistically deliver.

Our findings are significant for both scholars and policymakers. Our data and methodological treatment can help further research on the effects of different mandates on other macroeconomic outcomes. More importantly, they pave the way to analyze whether dual mandates expose central banks to higher contestation and politicization. By offering evidence of the long term trade-offs of dual mandates, we contribute to policy debates regarding expanding the mandate of central banks. Our theoretical framework suggests that clarity in mandates priorities and targets, and policy coordination beyond monetary institutions, may mitigate the channels through which dual mandates may result in poorer economic performance.

References

Abadie, A., Diamond, A. and Hainmueller, J. (2010), 'Synthetic control methods for comparative case studies: Estimating the effect of california's tobacco control program', *Journal of the American statistical Association* **105**(490), 493–505.

Abadie, A. and Gardeazabal, J. (2003), 'The economic costs of conflict: A case study of the basque country', *American economic review* **93**(1), 113–132.

Alesina, A. and Summers, L. H. (1993), 'Central bank independence and macroeconomic performance: some comparative evidence', *Journal of Money, credit and Banking* **25**(2), 151–162.

Ball, L. (2014), 'Long-term damage from the great recession in oecd countries', *European Journal of Economics and Economic Policies: Intervention* **11**(2), 149–160.

Barro, R. J. and Gordon, D. B. (1983), 'Rules, discretion and reputation in a model of monetary policy', *Journal of Monetary Economics* **12**(1), 101–121.

Bawn, K. (1995), 'Political control versus expertise: Congressional choices about administrative procedures', *American Political Science Review* **89**(1), 62–73.

Bendor, J., Glazer, A. and Hammond, T. (2001), 'Theories of delegation', *Annual review of political science* **4**(1), 235–269.

Bernanke, B. S. (2010), 'Monetary policy and the housing bubble'. Remarks by Chairman Ben S. Bernanke At the Annual Meeting of the American Economic Association, Atlanta, Georgia [Accessed: 2025 05 02].
URL: *https://www.federalreserve.gov/newsevents/speech/bernanke20100103a.htm*

Bernanke, B. S. (2013), 'A century of us central banking: Goals, frameworks, accountability', *Journal of Economic Perspectives* **27**(4), 3–16.

Binder, C. (2021), 'Political pressure on central banks', *Journal of Money, Credit and Banking* **53**(4), 715–744.

Binder, C. (2023), Technopopulism and central banks, Center for Monetary and Financial Alternatives Working Paper 4, Cato Institute.
URL: *https://www.cato.org/sites/cato.org/files/2023-03/cmfa-working-paper-4.pdf*

Binder, C. and Skinner, K. (2023), 'The legitimacy of the federal reserve', *Stanford Journal of Law, Business & Finance* **28**(1), 1–47.

Blanchard, O. and Wolfers, J. (2000), 'The role of shocks and institutions in the rise of european unemployment: the aggregate evidence', *The Economic Journal* **110**(462), C1–C33.

Blanchflower, D. G. and Levin, A. T. (2015), Labor market slack and monetary policy, Technical report, National Bureau of Economic Research.

Blanchflower, D. G. and Posen, A. S. (2014), 'Wages and labor market slack: making the dual mandate operational', *Peterson Institute for International Economics Working Paper* (14-6).

Blejer, M. I. (1998), 'Central banks and price stability: Is a single objective enough?', *Journal of Applied Economics* **1**(1), 105–122.

Bodea, C. and Garriga, A. C. (2023), 'Central bank independence in latin america: Politicization and de-delegation', *Governance* **36**(1), 59–80.

Bodea, C. and Hicks, R. (2015*a*), 'From elections to equilibrium: How electoral incentives shape central bank independence', *Journal of Politics* **77**(1), 251–266.

Bodea, C. and Hicks, R. (2015*b*), 'Price stability and central bank independence: Discipline, credibility, and democratic institutions', *International Organization* **69**(1), 35–61. Publisher: Cambridge University Press.
URL: *https://www.cambridge.org/core/journals/international-organization/article/price-stability-and-central-bank-independence-discipline-credibility-and-democratic-institutions/605F4E0E40C7366B2B9413103B409BFA*

Bordo, M. D. and Siklos, P. L. (2015), Central bank credibility: an historical and quantitative exploration, Technical report, National Bureau of Economic Research.

Borio, C. E. and Filardo, A. (2007), Globalisation and inflation: New cross-country evidence on the global determinants of domestic inflation, Working Papers 227, Bank for International Settlements.

Chinn, M. D. and Ito, H. (2008), 'A new measure of financial openness', *Journal of Comparative Policy Analysis* **10**(3), 309–322.

Clarida, R., Gali, J. and Gertler, M. (1999), 'The science of monetary policy: a new keynesian perspective', *Journal of economic literature* **37**(4), 1661–1707.

Coibion, O., Gorodnichenko, Y., Kumar, S. and Pedemonte, M. (2020), 'Inflation expectations as a policy tool?', *Journal of International Economics* **124**, 103297.

Cukierman, A., Web, S. B. and Neyapti, B. (1992), 'Measuring the independence of central banks and its effect on policy outcomes', *The world bank economic review* **6**(3), 353–398. Publisher: Oxford University Press.

Daniels, J. P., Nourzad, F. and VanHoose, D. D. (2005), 'Central bank independence, economic freedom, and inflation rates', *Journal of Macroeconomics* **27**(1), 1–9.

de Chaisemartin, C. and d'Haultfoeuille, X. (2020), 'Two-way fixed effects estimators with heterogeneous treatment effects', *American economic review* **110**(9), 2964–2996.

Debortoli, D., Kim, J., Lindé, J. and Nunes, R. (2019), 'Designing a simple loss function for central banks: Does a dual mandate make sense?', *The Economic Journal* **129**(621), 2010–2038.

Dutt, P., Mitra, D. and Ranjan, P. (2009), 'International trade and unemployment: Theory and cross-national evidence', *Journal of International Economics* **78**(1), 32–44.

Eriksen, A. (2021), 'Accountability and the multidimensional mandate', *Political Research Quarterly* **74**(2), 364–376.

Fleming, J. M. (1962), 'Domestic financial policies under fixed and under floating exchange rates', *Staff Papers* **9**(3), 369–380.

Freedman, C. and Öther-Robe, I. (2010), Important elements for inflation targeting for emerging markets, Technical report, IMF Working Papers.

Friedman, B. M. (2008), 'Why a dual mandate is right for monetary policy', *International Finance* **11**(2), 153–165.

Garriga, A. C. (2016), 'Central bank independence in the world: A new data set', *International Interactions* **42**(5), 849–868. Publisher: Taylor & Francis.

Garriga, A. C. (2023), 'Written evidence ibe0019-inquiry on the bank of england: How is independence working?', *Economic Affairs Commiteee, UK Parliament* .
URL: *https://committees.parliament.uk/writtenevidence/120739/html/*

Garriga, A. C. (2025*a*), 'How much power do central banks (really) have? an analysis of central bank mandates', *working paper* .

Garriga, A. C. (2025*b*), 'Revisiting central bank independence in the world: An extended dataset', *International Studies Quarterly* **69**(2), sqaf024.

Garriga, A. C. and Rodriguez, C. M. (2020), 'More effective than we thought: Central bank independence and inflation in developing countries', *Economic Modelling* **85**, 87–105. Publisher: Elsevier.
URL: *https://www.sciencedirect.com/science/article/pii/S0264999317318266*

Gutner, T. (2005), 'Explaining the gaps between mandate and performance: agency theory and world bank environmental reform', *Global Environmental Politics* **5**(2), 10–37.

Hainmueller, J. (2012), 'Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies', *Political Analysis* **20**(1), 25–46. Publisher: SPM-PMSAPSA.

Hainmueller, J. and Xu, Y. (2011), 'Ebalance: A Stata package for entropy balancing', *Journal of Statistical* .

Heckman, J. J., Ichimura, H. and Todd, P. E. (1997), 'Matching as an econometric evaluation estimator: Evidence from evaluating a job training programme', *The review of economic studies* **64**(4), 605–654. Publisher: Oxford University Press.

Helleiner, E. (2009), 'The development mandate of international institutions: where did it come from?', *Studies in Comparative International Development* **44**, 189–211.

Klomp, J. and De Haan, J. (2009), 'Central bank independence and financial instability', *Journal of Financial Stability* **5**(4), 321–338.

Klomp, J. and De Haan, J. (2010), 'Inflation and central bank independence: a meta-regression analysis', *Journal of Economic Surveys* **24**(4), 593–621.

Koop, C. and Scotto di Vettimo, M. (2024), 'Non-majoritarian institutions, media coverage, and "reinforced accountability"', *Governance* **37**(2), 599–617.

Kostanyan, A. and Laxton, D. (2020), *Time to Change the Bank of Canada's Mandate*, London School of Economics and Political Science, Institute of Global Affairs.

Krugman, P. (1994), 'Past and prospective causes of high unemployment', *Economic Review* **79**(4), 23–43.

Kydland, F. E. and Prescott, E. C. (1977), 'Rules rather than discretion: The inconsistency of optimal plans', *Journal of political economy* **85**(3), 473–491.

Liu, L., Wang, Y. and Xu, Y. (2024), 'A practical guide to counterfactual estimators for causal inference with time-series cross-sectional data', *American Journal of Political Science* **68**(1), 160–176.

Lohmann, S. (1992), 'Optimal commitment in monetary policy: credibility versus flexibility', *The American Economic Review* **82**(1), 273–286.

Lohmann, S. (2003), 'Why do institutions matter? an audience–cost theory of institutional commitment', *Governance* **16**(1), 95–110.

MacRae, C. D. (1977), 'A political model of the business cycle', *Journal of political economy* **85**(2), 239–263.

Mailhot, C. (2025), 'Introducing the mandates of international organizations' missions (miom) dataset: Comprehensive data on the mandates of un and regional organizations' missions, 1989–2020', *International Studies Quarterly* **69**(2), sqaf027.

Marcus, J. (2013), 'The effect of unemployment on the mental health of spouses–Evidence from plant closures in Germany', *Journal of Health Economics* **32**(3), 546–558. Publisher: Elsevier.

Masciandaro, D. and Quintyn, M. (2016), 'The governance of financial supervision: recent developments', *Journal of Economic Surveys* **30**(5), 982–1006.

Masciandaro, D., Quintyn, M. and Taylor, M. W. (2008), 'Inside and outside the central bank: Independence and accountability in financial supervision: Trends and determinants', *European Journal of Political Economy* **24**(4), 833–848.

Meyer, L. H. (2001), 'Comparative central banking and the politics of monetary policy'. Remarks by Mr Laurence H Meyer, Member of the Board of Governors of the US Federal Reserve System, at the National Association for Business Economics Seminar on Monetary Policy and the Markets, Washington, DC, 21 May 2001. [Accessed: 2025 05 02].
URL: *https://www.bis.org/review/r010523b.pdf*

Miller, G. J. (2005), 'The political evolution of principal-agent models', *Annu. Rev. Polit. Sci.* **8**(1), 203–225.

Mishkin, F. S. (2007), Monetary policy and the dual mandate: a speech at bridgewater college, bridgewater, virginia, april 10, 2007, Technical report, Board of Governors of the Federal Reserve System.
URL: *https://www.federalreserve.gov/newsevents/speech/mishkin20070410a.htm*

Moschella, M. (2024), *Unexpected revolutionaries: How central banks made and unmade economic orthodoxy*, Cornell University Press.

Mundell, R. A. (1961), 'A theory of optimum currency areas', *The American Economic Review* **51**(4), 657–665.

Neely, C. J. and Rapach, D. E. (2011), 'International comovements in inflation rates and country characteristics', *Journal of International Money and Finance* **30**(7), 1471–1490.

Nickell, S. (1981), 'Biases in dynamic models with fixed effects', *Econometrica: Journal of the econometric society* pp. 1417–1426.

Nordhaus, W. D. (1975), 'The political business cycle', *The review of economic studies* **42**(2), 169–190.

Obstfeld, M. (2009), 'International finance and growth in developing countries: what have we learned?', *IMF Staff Papers* **56**(1), 63–111.

Parkin, M. (1998), 'Unemployment, inflation, and monetary policy', *The Canadian Journal of Economics/Revue canadienne d'Economique* **31**(5), 1003–1032.

Phillips, A. W. (1958), 'The relation between unemployment and the rate of change of money wage rates in the united kingdom, 1861-1957', *Economica* **25**(100), 283–299.

Reinhart, C. M. and Rogoff, K. S. (2004), 'The modern history of exchange rate arrangements: a reinterpretation', *The Quarterly Journal of Economics* **119**(1), 1–48.

Rodrik, D. (1999), 'Democracies pay higher wages', *The Quarterly Journal of Economics* **114**(3), 707–738.

Rogoff, K. (1985), 'The optimal degree of commitment to an intermediate monetary target', *The quarterly journal of economics* **100**(4), 1169–1189.

Rosengren, E. S. (2014), 'Should full employment be a mandate for central banks? remarks at the federal reserve bank of boston's 57th economic conference', *Journal of Money, Credit and Banking* **46**, 169–182.

Smets, F. and Wouters, R. (2007), 'Shocks and frictions in US business cycles: a Bayesian DSGE approach', *American Economic Review* **97**(3), 586–606.

Solow, R. M. and Taylor, J. B. (1998), *Inflation, unemployment, and monetary policy*, MIT press.

Svensson, L. E. (2010), Inflation targeting, *in* 'Handbook of monetary economics', Vol. 3, Elsevier, pp. 1237–1302.

Tesche, T. (2023), 'Trustee strategies, politicization and de-delegation: The case of the european central bank', *Governance* **36**(1), 125–140.

Thatcher, M. and Sweet, A. S. (2002), 'Theory and practice of delegation to non-majoritarian institutions', *West European Politics* **25**(1), 1–22.

Thornton, D. L. (2012), 'The dual mandate: Has the fed changed its objective?', *Federal Reserve Bank of St. Louis Review* **94**(2), 117–133.

Thornton, D. L. and Wheelock, D. C. (2014), 'Making sense of dissents: A history of fomc dissents.', *Review (00149187)* **96**(3).

van 't Klooster, J. and De Boer, N. (2023), 'What to do with the ecb's secondary mandate', *JCMS: Journal of Common Market Studies* **61**(3), 730–746.

Woodford, M. (2003), *Interest and Prices: Foundations of a Theory of Monetary Policy*, Princeton University Press, Princeton, NJ.

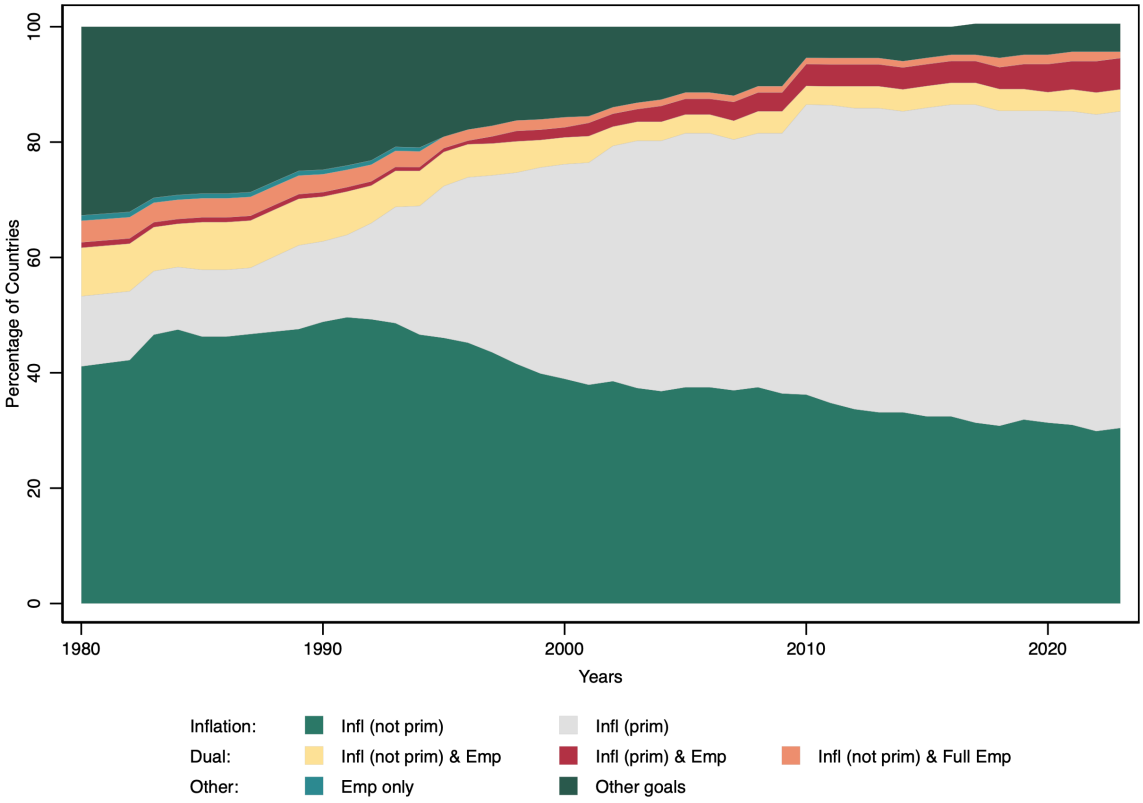
Wooldridge, J. M. (2010), *Econometric analysis of cross section and panel data*, MIT press.

World Bank (2024), 'World development indicators'.
URL: *https://databank.worldbank.org/source/world-development-indicators*

Xu, Y. (2017), 'Generalized synthetic control method: Causal inference with interactive fixed effects models', *Political Analysis* **25**(1), 57–76.

Figures

Figure 1: Evolution of Dual Mandates, 1980-2023



Note: Share of central banks whose mandates include price stability (as primary goal or not), employment (as full employment or not), the combination of these objectives, or other objectives that do not include price stability or employment.
"Inflation mandate" includes the following categories: inflation (not as primary), inflation (primary). "Dual mandate" includes the following categories: inflation (primary) and employment; inflation (not as primary) and employment; and inflation (not as primary) and full employment.

Figure 2: Countries by Type of Mandate, 1980-2023

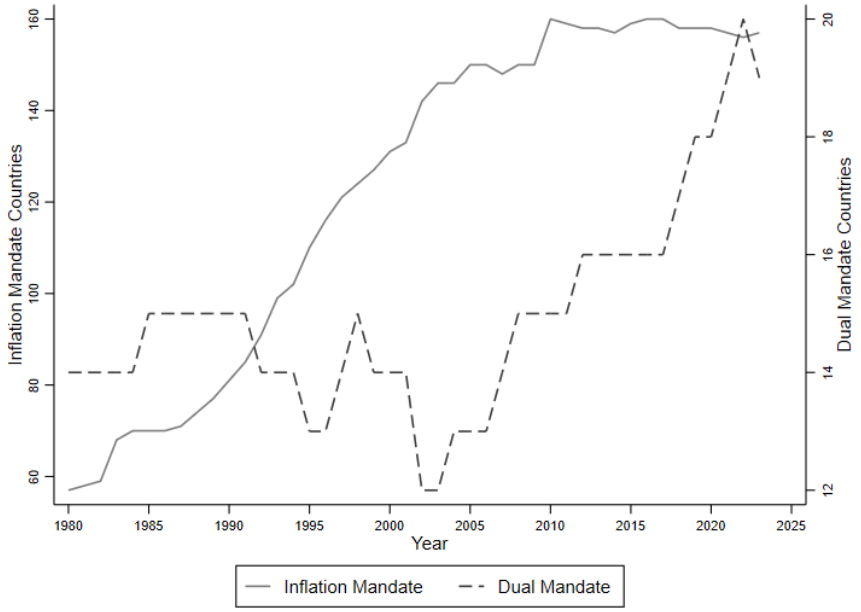


Figure 3: Dual Mandate Adoption, 1980-2023

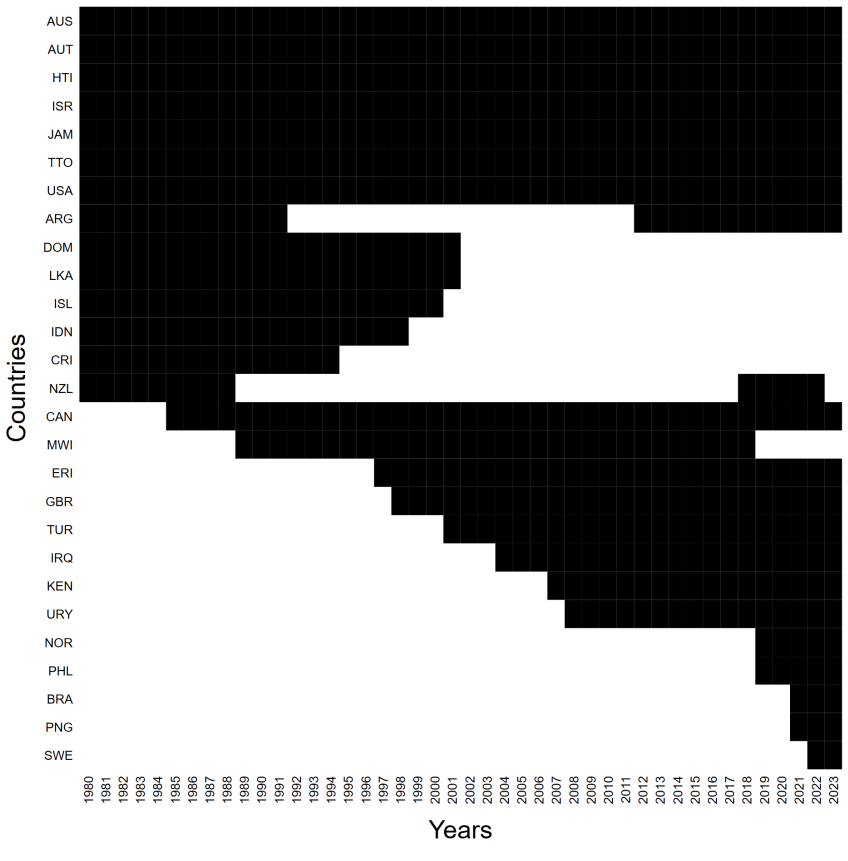


Figure 4: Inflation by Type of Mandate, 1980-2023

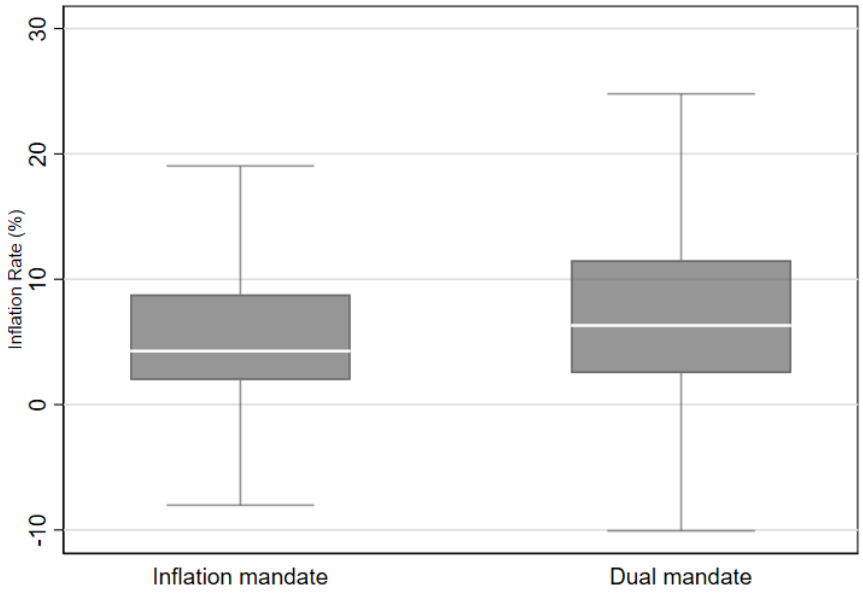


Figure 5: Inflation by Type of Mandate, 1980-2023

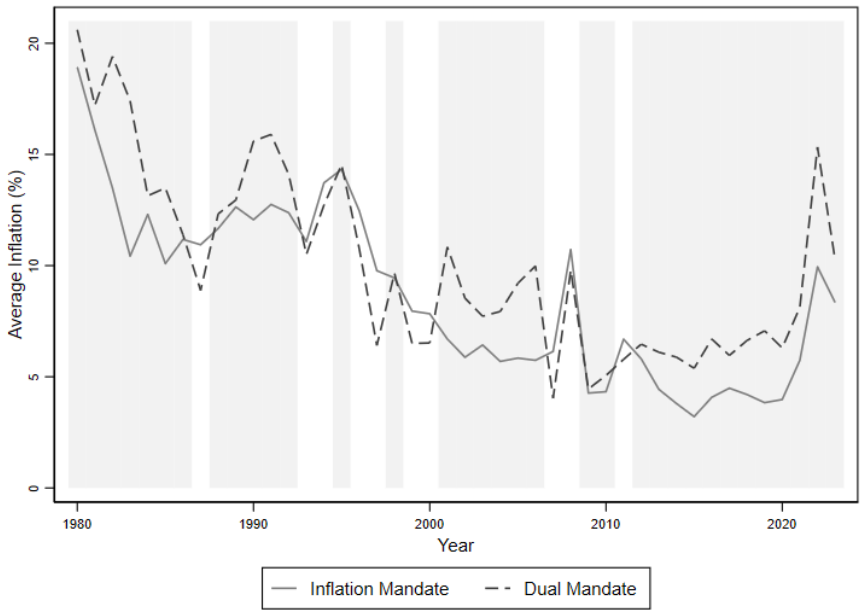


Figure 6: Unemployment by Type of Mandate, 1980-2023

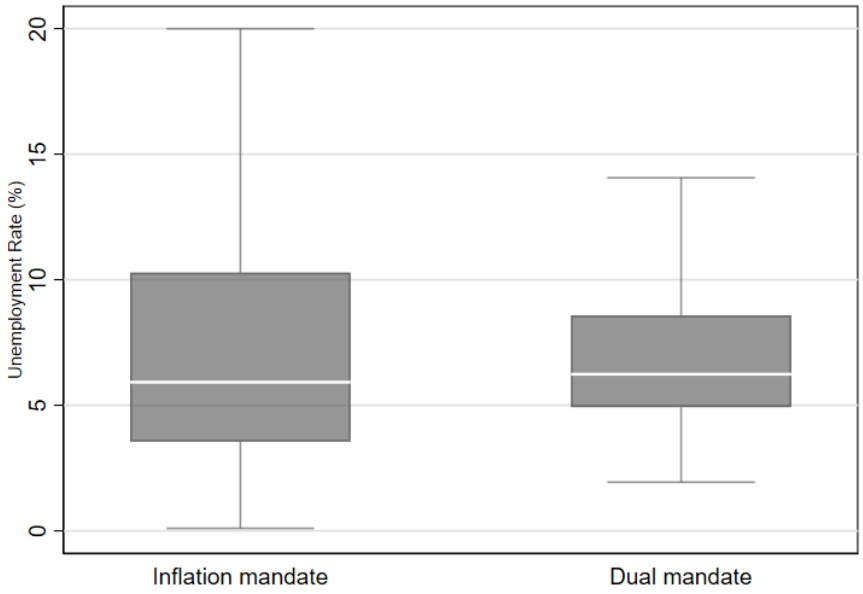


Figure 7: Unemployment by Type of Mandate, 1980-2023

Figure 8: Effect of Dual Mandate on Inflation (with staggered and reversals)

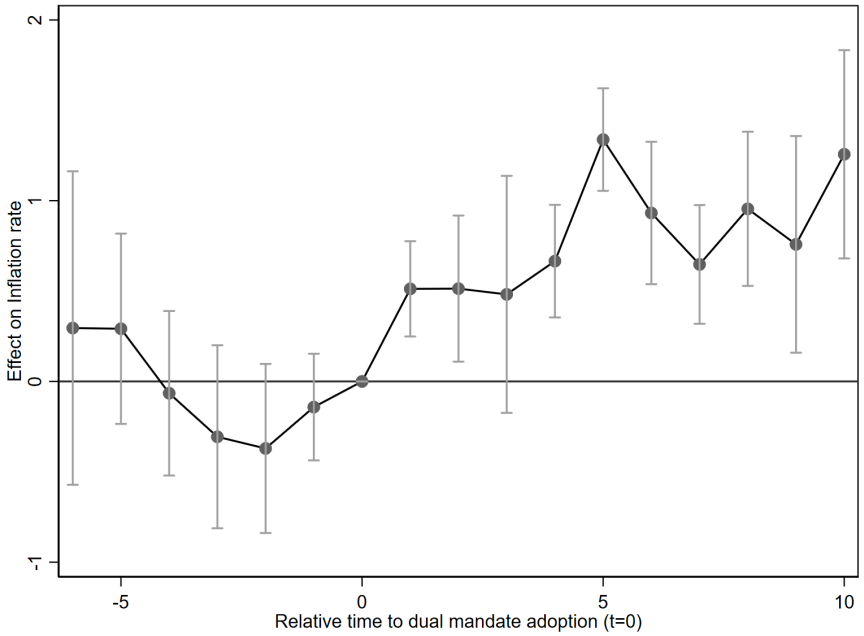


Figure 9: Effect of Dual Mandate on Unemployment (with staggered and reversals)

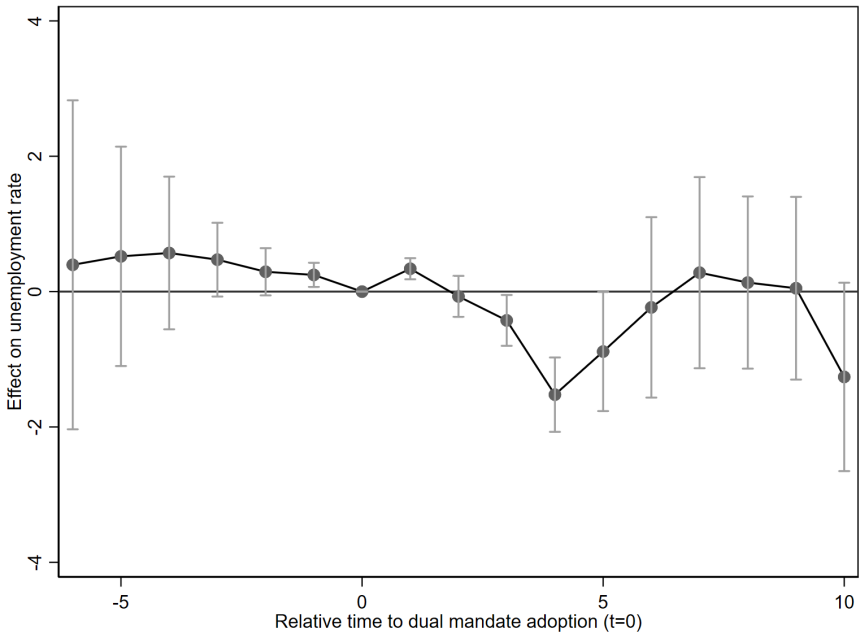


Figure 10: Effect of Dual Mandate on Inflation (with staggered but no reversals)

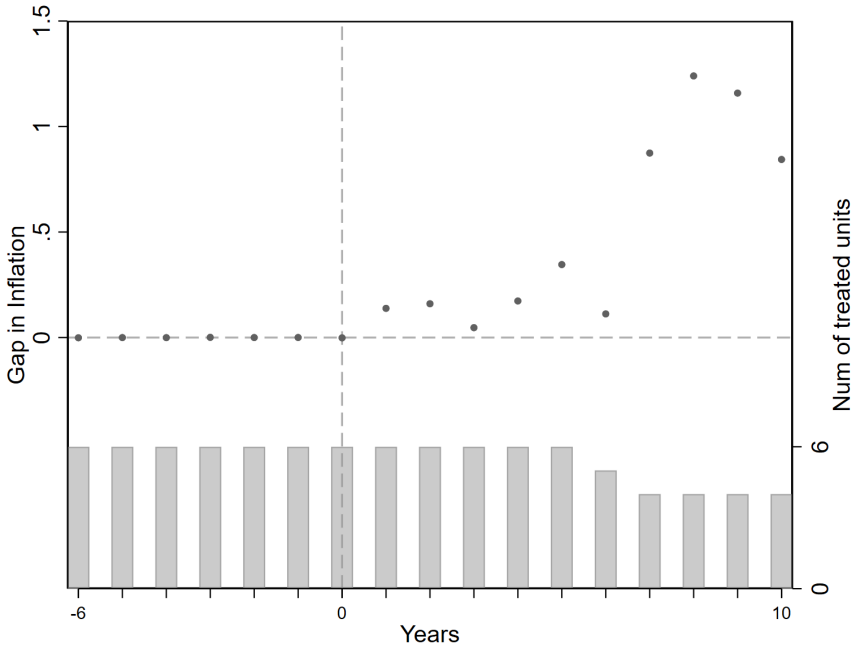


Figure 11: Effect of Dual Mandate on Inflation (with staggered but no reversals)

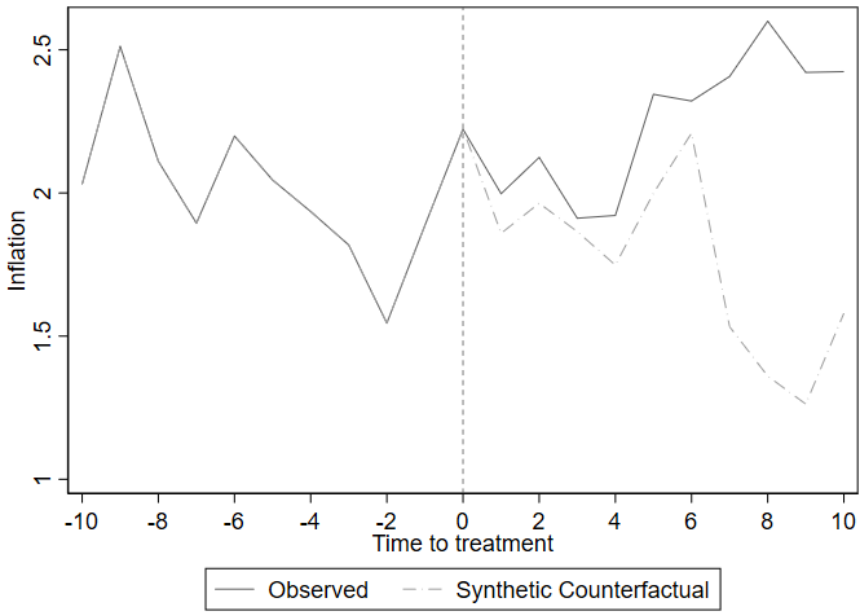
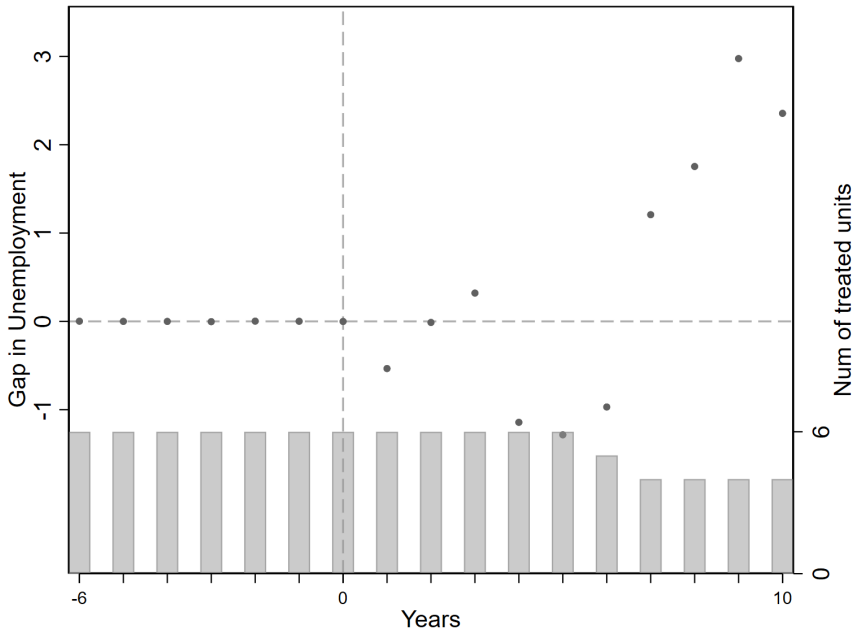
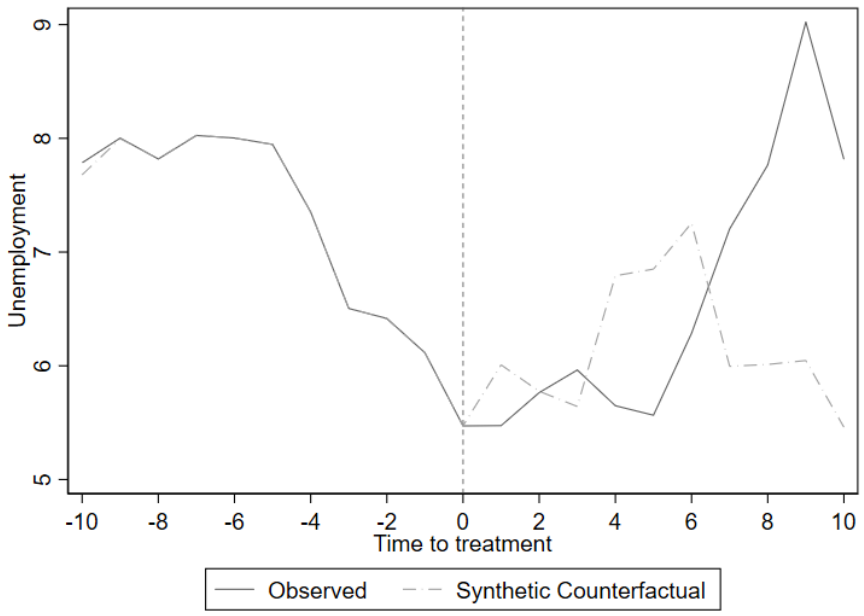


Figure 12: Effect of Dual Mandate on Unemployment (with staggered but no reversals)



Note: XX.

Figure 13: Effect of Dual Mandate on Unemployment (with staggered but no reversals)



Tables

Table 1: Frequency of Central Bank Mandate Types

Mandate Type	Frequency	Percentage
Inflation	2731	38.67%
Inflation (primary)	2653	37.56%
Inflation & Employment	347	4.91%
Inflation (primary) & Employment	182	2.57%
Inflation & Full Employment	129	1.83%
Employment only	15	0.21%
Other goals*	1006	14.24%

Notes: :(*) no inflation or employment.

Appendix I - Regression Analysis

As a preliminary step, we analyze the relationship between dual mandates and inflation in our sample of 170 countries, between 1990 and 2023. To focus our analysis at the country level, we exclude observations pertaining to regional central banks (Bodea and Hicks, 2015*b*; Garriga and Rodriguez, 2020). Our simple baseline specification can be represented as follows.

$$y_{it} = \alpha_1 y_{it-1} + \alpha_2 Dual_{it} + \beta X_{it-1} + \gamma_t + \eta_i + \varepsilon_{it} \tag{13}$$

where y_{it} and y_{it-1} are inflation for country i at time t and time $t-1$, respectively; $Dual_t$ is our dummy variable of dual mandate adoption that takes the value of 1 when a central bank adopts a dual mandate, or 0 when inflation mandate. X_{it-1} is a vector of time-varying control variables commonly used in the literature, including CBI; γ_t is a period-specific constant to control for common shocks; η_i is an unobserved country-specific effect that captures all time-invariant factors that affect the outcome; and ε_{it} is the error term.

From this initial specification, we also consider the extent of influence of CBI with a simple extension

$$y_{it} = \alpha_1 y_{it} + \alpha_2 Dual_{it} + \alpha_3 CBI_{it} + \alpha_4 Dual_{it} \cdot CBI_{it} + \beta X_{it-1} + \gamma_t + \eta_i + \varepsilon_{it} \tag{14}$$

The inclusion of the interaction term will idealy enable us to understand both the direct and indirect effects of CBI and dual mandate adoption on the inflation rate.

Additionally, the decision to adopt a dual mandate is not randomly assigned across countries. To address this potential confounding, we employ entropy balancing to create a matched sample where treated and control observations are balanced on key pre-treatment covariates. We then use those weights to estimate equation (13). Following the methodology by Hainmueller (2012), we use *entropy balancing* to generate the observation-level weights. Entropy balancing can be viewed as a generalization of the commonly used propensity score weighting methods.

For this first analysis, we use the generated weights to estimate a dynamic panel model with fixed effects to account for the serial correlation in the idiosyncratic error term.[27] The inclusion of a lagged dependent variable in this type of setup may introduce a bias (Nickell, 1981), especially when the number of time-series observations T is small (Wooldridge, 2010). However, given the number of time-series and cross-sectional units in our panel, the Nickell bias is significantly reduced and small (Beck and Katz 2011; Beck, Katz, and Mignozzetti 2014). However, this is not the main concern that we face

[27] Marcus (2013) explains that this methodology is similar to Heckman, Ichimura and Todd (1997)'s strategy of using matching with difference-in-differences.

with this estimation strategy. The institutional complexity surrounding dual mandate reforms creates substantial econometric challenges that become apparent when we apply standard panel methods to our data. The source of these difficulties lies in the messy reality of how countries actually implement dual mandates.

Table I.1: Inflation Dynamics under Dual Mandates. Baseline. 1990-2023

	(1) FE	(2) FE	(3) D-K	(4) D-K
Inflation, t-1	0.465***	0.464***	0.465***	0.464***
	(0.101)	(0.101)	(0.074)	(0.073)
Dual mandate=1		0.386		0.375**
		(0.346)		(0.152)
CBI (no obj), t-1	-1.121***	-0.945**	-1.122***	-0.953***
	(0.415)	(0.398)	(0.221)	(0.192)
Dual mandate=1 × CBI (no obj), t-1		-0.697		-0.675**
		(0.477)		(0.306)
GDPpc,t-1	0.165	0.165	0.162	0.160
	(0.222)	(0.225)	(0.214)	(0.214)
Trade Openness,t-1	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)
World Inflation,t-1	-0.012	-0.013	-0.012	-0.013
	(0.015)	(0.015)	(0.027)	(0.027)
Peg	-0.345***	-0.354***	-0.345***	-0.353***
	(0.124)	(0.127)	(0.064)	(0.064)
Cap Account Openness	-0.950***	-0.951***	-0.951***	-0.952***
	(0.269)	(0.276)	(0.137)	(0.142)
Observations	2566	2566	2566	2566
No. of Countries	97	97	97	97
FE	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table I.2: Inflation Dynamics under Dual Mandates. No Reversals. 1990-2023

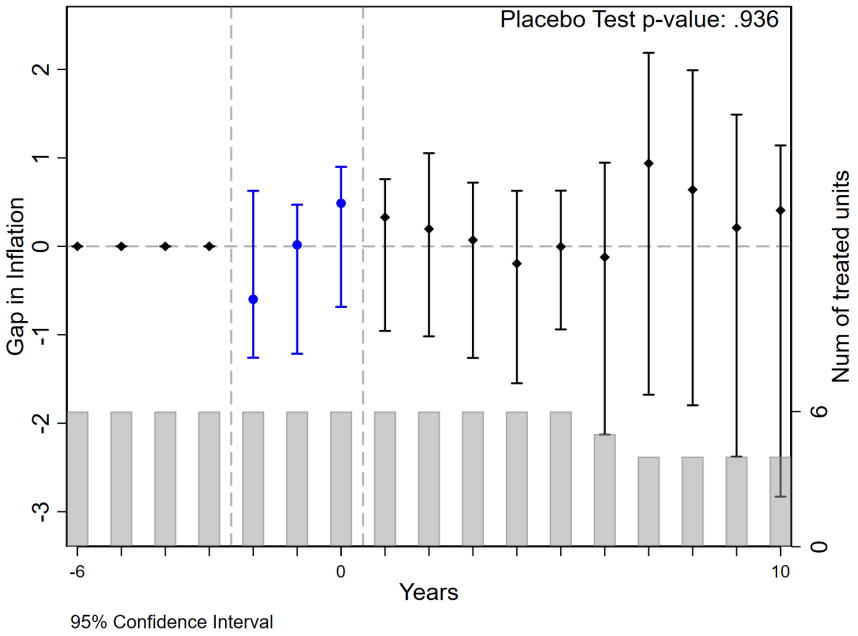
	(1) FE	(2) FE	(3) D-K	(4) D-K
Inflation, t-1	0.463***	0.463***	0.463***	0.463***
	(0.097)	(0.098)	(0.062)	(0.062)
Dual mandate (clean)=1		0.194		0.194
		(0.295)		(0.309)
CBI (no obj), t-1	-1.124**	-0.961**	-1.124***	-0.961***
	(0.430)	(0.439)	(0.268)	(0.295)
Dual mandate (clean)=1 × CBI (no obj), t-1		-0.620		-0.620
		(0.485)		(0.539)
GDPpc,t-1	-0.142	-0.082	-0.142	-0.082
	(0.306)	(0.315)	(0.239)	(0.261)
Trade Openness,t-1	0.001	0.001	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.003)
World Inflation,t-1	-0.029	-0.031	-0.029	-0.031
	(0.021)	(0.021)	(0.022)	(0.023)
Peg	-0.707***	-0.724***	-0.707***	-0.724***
	(0.264)	(0.265)	(0.155)	(0.160)
Cap Account Openness	-1.447***	-1.493***	-1.447***	-1.493***
	(0.321)	(0.303)	(0.227)	(0.239)
Observations	2261	2261	2261	2261
No. of Countries	97	97	97	97
FE	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

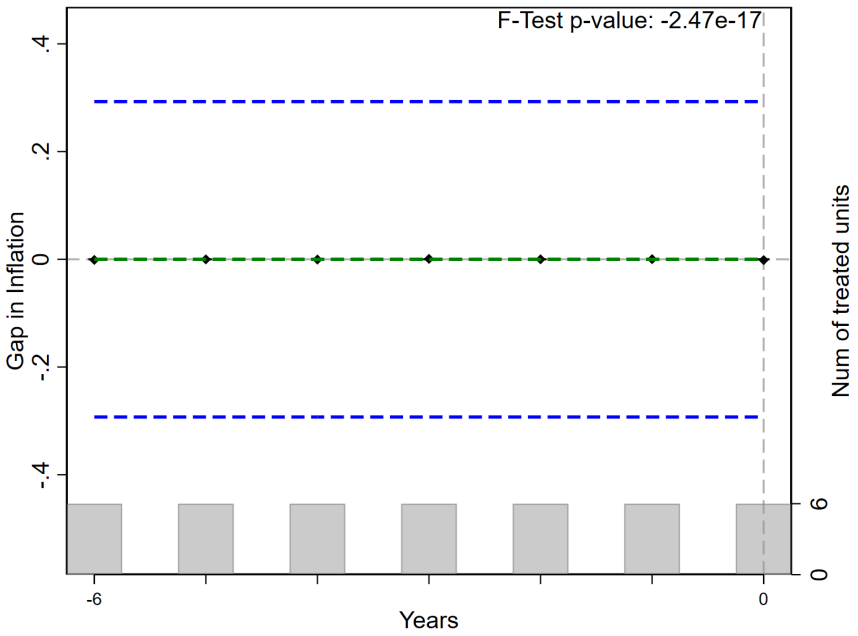
Appendix II - Robustness Analysis

Figure II.1: Placebo Test for the Effect on Inflation



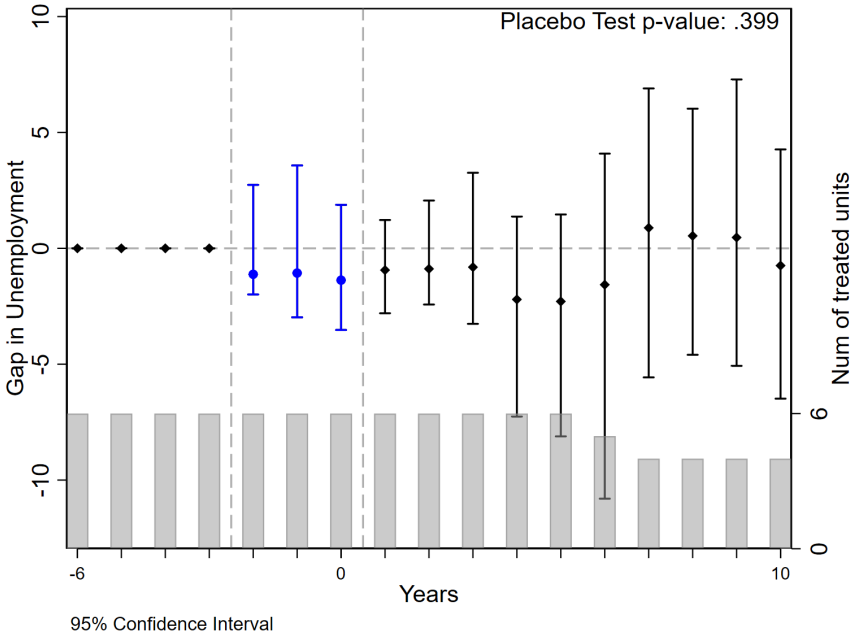
Note: XX.

Figure II.2: Parallel Trends for the Effect on Inflation



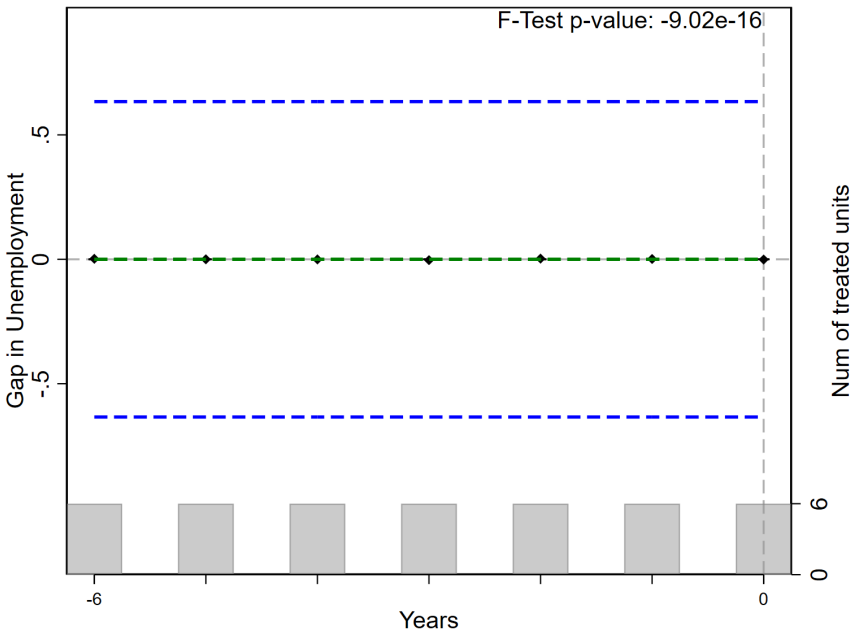
Note: XX.

Figure II.3: Placebo Test for the Effect on Unemployment



Note: XX.

Figure II.4: Equivalence Test for the Effect on Unemployment



Note: XX.