

Fear of Inflation and Gender Representation in Central Banking

Cristina Bodea
Michigan State University

Andrew Kerner
Michigan State University

Abstract

Women held only 11% of seats on global central bank boards between 2000 and 2015, with significant variation across countries. What explains women's under-representation in central banking? We link these patterns to gender's impact on central bankers' ability to signal commitments to price stability. Governments that are concerned with inflation often want central bankers that can anchor inflationary expectations by credibly committing to being a "hawk," i.e., prioritizing low inflation over other plausible priorities. We suggest that hawkishness is a stereotypically "male" quality, and that women are consequently under-represented where the need for bankers to project hawkishness is largest. That need is greatest, and female central bankers scarcest, in countries with histories of inflation, and institutional governance that highlight central bankers' personal reputations - independent central banks and flexible exchange rates. We test our theory using a new dataset on the gender composition of central bank boards in 114 countries for years 1998-2015. We find strong support for our hypotheses, particularly as determinants of longer-term trends.

Section 1: Introduction

Central banking is overwhelmingly male. Women held only 11% of seats on global central bank boards between 2000 and 2015, and fewer than that prior to 2000. That is low in real terms, and it lags women's representation in national cabinets (16% for the same period) and in national parliaments (17%).¹ This underrepresentation is also marked by wide variation across countries,² and by the fact that several countries with few female central bankers, including New Zealand, Austria, Mexico or Switzerland, have substantial female representation elsewhere in economics and in politics.³ Central banking's male dominance thus invites a variety of questions: Why are there so few women in leadership posts, and why is the distribution of that male dominance so weakly correlated with women's representation in other positions of power?

We argue that women's absence from central banking is well-explained by central banks' typical emphasis on price stability, and the extent to which credible commitments to the end are "male-coded." Central banking's emphasis on credibly projecting commitments to price stability follows closely from the literature⁴: Private sector inflationary expectations inform wage setting, spending, and pricing decisions. Expectations of future inflation create pressures that manifest as inflation or are addressed, at a cost to the economy, with disinflationary policies. Successful central bankers avoid those inflationary expectations in the first place by projecting a commitment to price stability. It is therefore not enough for central bankers to *be* hawkish, they must also project that

¹ Nyrup and Bramwell (2020), World Development Indicators.

² Norway, Kyrgyzstan, Thailand, Serbia and El Salvador all had at greater than 40% female representation on their central bank boards between 2000 and 2015. Many others had fewer than 5% and 20 countries in our sample have never had a woman serve on a central bank board.

³In the United States 26% of Federal Reserve board seats over this time were held by women, and Janet Yellen has been the only female chair in its history. Switzerland appointed its first woman to the Swiss National Bank's Governing Board in 2015.

⁴ Barro and Gordon 1983, Rogoff 1986.

preference to an audience with limited information about the central banker's "true" type. A successful inflation hawk must *appear* to be an inflation hawk.

Appearances of hawkishness can come from a variety of sources including, we theorize, gender. Inflation hawkishness is male-coded, and men will be favored in public facing central bank positions to the extent that the projection of a hawkish identity is important. Our premise is consistent with a variety of work in this area. Istrefi (2018), for example, shows that the financial media portrays female members of the US Federal Reserve as less inflation averse. Work by Scheve (2004), Jayadev (2006) shows that women in general tend to be less animated than men by inflationary fears when the tradeoff with unemployment is made explicit. Experimental work by Bodea et al. (2021) also shows that central bankers' gender influences the efficacy of their communication. They find that when central bankers are not introduced with their credentials, messages delivered by women are less capable of eliciting optimism or faith in the central bank's abilities to balance employment and inflation. Even when introduced with the proper credentials, Bodea et al.'s findings suggest that efficacy is gender informed, and that credentialed women are especially effective in communicating dovish commitments to fuller employment.⁵

There is thus reason for political leaders to expect that central bankers' abilities to establish expectations will be informed by central bankers' gender. To the extent that leaders anticipate the public equating femaleness with dovishness, women should be underrepresented where inflation fighting has been important to the central bank, and where individual central bankers bear the weight of projecting credibility to that end. This leads us to expect fewer women where historical

⁵ Indeed, among male survey respondents in that experiment credentialed women were the *only* type of speaker capable of doing so.

inflation has been high, where central banks have a tradition of political independence, and where the lack of an external exchange rate commitment increases the central bankers' policy discretion.

We test our theory using an original dataset of central bank leadership positions across 114 countries between 1998 and 2015. We focus on female representation in the institutional body responsible for monetary policy, which as a shorthand we refer to as the "board."⁶ It is the most comprehensive dataset of its kind, and uniquely useful for testing our theory. We use two measures of female representation in central banking: an indicator of the prevalence of all-male boards, as well as the percentage of women on central bank boards. The former is most often picked up by the media and, thus, represents the most politically salient aspect of gender representation, while the latter is a more substantive indicator of gender diversity. We consider these measures of female representation and their relationship to our independent variables in the long and short run, estimating a series of cross-sectional models, as well as Bell and Jones (2015) random effect models that use the time variation in our data and allow the estimation of both the within and between effects of our variables of interest.

The analyses support our hypotheses, primarily in the context of long-run, cross-national differences. In virtually every specification and sample permutation we find that higher inflation in the past yields fewer women central bankers today. The substantive effects associate with these findings are large. A standard deviation increase in a country's average inflation rate between 1960 and 2004 increases the percentage of subsequent years with all-male central bank boards by 0.31 standard deviations and reduces the average percentage of women on the board over this time by 0.26 standard deviations. We also find that women are less represented in central banking in

⁶While the central bank board and the group of people responsible for monetary policy are often the same, that is not always the case. At different points in time, for different countries this may include the central bank governor and the deputy governors; the governor and the board of directors; the management; or the monetary policy committee or board.

countries with institutional designs and monetary rules that heighten the need for the bankers themselves to be credible inflation hawks. Moving from a dependent to an independent central bank decrease subsequent levels of gender diversity in central banking, and there is some (albeit less consistent) evidence that moving from a fixed to a floating exchange rate regime does as well.

Most of the variation in our data is cross-sectional, and most of that is accounted for by histories of inflation and central bank independence. But we also model recent, annual changes in women's representation in central banking and find that they are sensitive to patterns of regional diffusion and, especially in the Eurozone, to year-to-year changes in female representation in parliament. The tighter relationship between women's representation in politics and women's representation in central banking inside of the Eurozone suggests that shedding monetary authority reduced perceived gender-based male advantage, and allowed national central banks to "catch up" with gender representation trends in other areas.⁷ The relatively muted impact of annual changes in inflation to year-on-year changes in gender equity in central banking permits a variety of explanations. Among the most notable, it may speak to an inherent aspect of inflation. Experimental and observational studies about inflation's political and psychological consequences are long lived, such that memories of inflation in the more distant past remain relevant even as more recent levels of inflation changes.⁸ Or it may be more prosaically that the historically low levels of inflation over our observation period are simply too low for year-on-year changes to have a systematic impact.

Regardless our data tell a very consistent story: Women's prominence in central banking today is substantially linked to inflation in the past and, outside of recent trends in the Eurpzone

⁷ Barnes and O'Brien (2018). As discussed later, it is consistent with experimental findings from Bodea et al. (2021) showing that women are especially pessimistic about women-led banks' ability to command authority.

⁸ Perotti and Schwienbacher 2009, Ehrmann and Tzamourani 2012, Malmendier and Nagel 2016.

there is little evidence linking it to gender equity in other areas of political life. As such our findings strike an ominous note. As inflation and inflation management returns to the fore of global central banking even those modest gains may be in jeopardy, regardless of the progress in made in gender equity elsewhere in politics.

Our paper speaks to a variety of literatures. It most clearly complements the well-established academic literature on gender and cabinet appointments.⁹ Extending that discussion to central banking is natural given monetary policy's significant impacts on social and economic outcomes. Gender equity in central banking is an important aspect of women's influence generally. Moreover, there is good reason to believe that women's role in central banking matters beyond gender equity for its own sake. Women in general, and female economists in particular, favor a greater role for the government in the economy,¹⁰ and prioritize full employment over monetary stability when presented with the trade-off.¹¹ To the extent that those differences manifest in central banking, the drivers of women's representation could have profound and, to this point, poorly understood, impacts on social outcomes.

This research also points at fruitful question for future research, including whether popular reactions to women's appointments validate the perception of gendered policy preferences. Those concerns are partially addressed in experimental data collected by Bodea et al. (2021) showing that Europeans (France, Germany, Spain, Italy and Netherlands), and especially European women, are less confident that the European Central Bank will be perceived as competent when it is represented by a woman. But while perceptions that society discounts women's authority in monetary affairs is sufficient to motivate the patterns that we reveal in our analysis, more research

⁹ Davis (1997), Reynolds (1999), Escobar-Lemmon and Taylor-Robinson (2005); Krook and O'Brien (2012); Barnes and O'Brien (2018), Armstrong et al. (forthcoming).

¹⁰ May et al. 2014

¹¹ Scheve 2004, Jayadev 2006

on the real-world consequences of gender on credibility is an important next step.¹² Future work might consider how these biases shape women's actions on central banks¹³, including on voting or policy deliberations and how the women that did find roles on central bank boards were able to overcome the liability gendered perceptions.

SECTION 2: GENDER DIVERSITY AND CENTRAL BANKING

Central banking is male-dominated. This is not universally true — several banks, including the Bank of Thailand or Sweden's Riksbank, have had a significant number of women in their bank boards—but the general patterns are striking. Figure 1a shows the number of female governors in the 114 central banks we surveyed between 1998 and 2015. That number only recently breaks 10 and is closer to 5 for most of that range, putting female representation in the top post well below 10%. Figure 1b shows that women hold roughly 10-15% of board positions in those central banks. That number steadily increases over the observation period, but it is still remarkably low. In raw terms, the number of women increased from 33 in 24 countries in 1998 (9 countries with 2 or more) to 118 women in 85 countries in 2015 (33 countries with 2 or more). The lack of gender diversity is notable from an academic standpoint, and it is often recognized as politically suboptimal.¹⁴

[Figures 1(a-b) here]

Why are public facing central banking positions male-dominated? One possibility is that there are too few plausible female candidates. We do not dismiss that argument out of

¹² See, for example, Binder 2020, Candia et al. 2020.

¹³ Masciandaro et al. 2020.

¹⁴ In 2012 observers denounced the European Central Bank (ECB)'s all-male (six member) Executive Board, and those objections were followed by a gender diversity action plan to double the share of women in high ranking administrative positions. Similar outcries occurred in the UK when its nine-member Monetary Policy Committee of the Bank of England turned entirely male between 2010 and 2014.

hand, but it seems miscast in this context. That is in part because of the very small number of central banking seats available, and the variety of professional backgrounds from which central bankers can be plausibly tapped from. In the absence of women academic economists, central bankers often come from finance, law, government, and, in some cases, labor.¹⁵ And even if there were too few plausible female candidates in a country, central bankers can be recruited from abroad.¹⁶ Tellingly, when women’s absence from central banking becomes a political liability—at the ECB (2012) or in the UK (2010-2014)—governments are able to find female candidates for their subsequent appointment.

Even more damaging to supply-side explanations is the extent of gender parity among senior but behind-the-scenes staff. Figure 2 shows for seven major central banks between 1999 and 2016 the percentage of women in senior management positions, generally and in “core-business”—i.e., monetary policy, research, statistics, financial stability, payment systems.¹⁷ Women typically make up roughly 20% of senior personnel at the Bank of England, the ECB and the Danish central bank¹⁸, and around 40-50% at the US Federal Reserve, the Bank of Canada and the Swedish Riksbank. There is, at least in these senior staff positions, no obvious shortage of women working in central banking.

[Figure 2 here]

¹⁵ Of the 175 monetary policy-makers they survey between 1999 and 2008 for advanced OECD countries, Farvaque et al. (2011) find that about 43 percent still held only bachelors or master degrees. Adolph (2013) also shows that, for rich countries in the period 1950-2000, the average percent of central bank board members with advanced economics degrees (master and PhD) was only 30%, and varied vastly from Norway (100%), the Netherlands (80%) and Switzerland (75%) to Sweden (15%), Finland (14%), Austria (12%) and Japan (6%).

¹⁶ Stanley’s Fischer’s career in both the Bank of Israel and the Federal Reserve, and Mark Carney’s career at both the Bank of England and Bank of Canada are recent examples.

¹⁷ These are support departments, like human resources, legal affairs, communication or technology services.

¹⁸ Japan is at zero.

A more likely explanation is that staffing for public-facing central banking reflects society-wide biases against women in positions of power.¹⁹ A common articulation of this view found in the “feminization” of politics literature interprets a gender deficit in one area of government as a product of gender deficits elsewhere.²⁰ Understood in these terms, “feminized” politics increase the demand for women in central bank leadership by eroding norms about who fits the profile for high-powered positions, and by empowering female decision makers to act on preferences for more gender representation.²¹ These arguments are common in studies of the gender composition of government cabinets, including Escobar-Lemmon and Taylor-Robinson’s (2005) finding that women’s representation in Latin American presidential cabinets correlates with women’s representation in national legislatures; Krook and O’Brien’s (2012) finding that female representation elsewhere in politics drives female representation in cabinet positions, and Barnes and O’Brien’s (2018) work showing similar trends in the appointment of female defense ministers. Among work that considers central banking, Masciandaro et al. (2015) links women’s central bank presence to female representation in other areas of government²² and Diouf and Pepin (2017: 21) links the gender gap in central banking to “tradition, religion and to the inequality gap with men.”²³

¹⁹ Norris and Lovenduski 1993, Terjesen et al. 2009, Paxton et al. 2007, Hudy and Terkildsen 1993, Inglehart and Norris 2003, Kunovich and Paxton 2005.

²⁰ See, for example, Escobar-Lemmon and Taylor-Robinson 2005, Krook and O’Brien 2012, Barnes and O’Brien 2018.

²¹ In the US, female Democratic Senators and other women groups voiced strong support in favor of Janet Yellen for the position of Chair of the US Federal Reserve. See, e.g. “Women's groups push Yellen for Fed”, Politico August 28 2013; “Yellen as America’s Favorite Shows Fed Captured by Democracy”, Bloomberg October 9 2013. More women in political power may also help generate a supply of suitable female candidates or may help establish professional networks whose importance in other area is well known. See, for example, Niven 1998, Sanbonmatsu 2006, Lawless and Fox 2010, Windett 2014. In central banking, a lack of political connections is often discussed as a reason for the lack of women appointed to leadership positions. Park et al. (2018) note that Japanese central bankers consider their institution an “old boys’ club”, where recruitment to the Monetary Policy Board occurs by tapping the male dominated Ministry of Finance.

²² While not theorized in that paper, Masciandaro et al.’s one-year cross-sectional data (2015) finds that female representation in central banking falls in political independence, consistent with our theoretical claims.

²³ Charlety et al. (2017) show that women central bankers in 26 OECD countries tend to replace other women and are more likely when the share of females in the board is low, suggesting that female representation in central banking responds to broader norms about gender.

As an empirical matter we consider whether women's representation in central banking is well explained by its co-movement with women's political representation generally. We find the explanation lacking, however, especially where central banks retain monetary authority. Instead, we show that the gender imbalance in central banking has more to do with the specifics of monetary policy than to more general issues of women in political and economic power.

SECTION 3: THEORETICAL EXPECTATIONS

Our theory is built on three premises. First, central bank board seats are high-stakes positions and understood as such by appointing governments.²⁴ Monetary policy is important to the economy and, thus, crucial to political fortunes. That link is very well understood,²⁵ and we expect that perceived efficacy guides these appointments. Governments nominate specific people to leadership posts in central banks, in part, because they think those central bankers will deliver outcomes that serve political interests.

Second, efficacy and perceived efficacy in central banking are intertwined.²⁶ Maintaining price stability is aided by popular perceptions of being so committed. This is in part because central bankers must react to events in the economy, and their underlying commitment to price stability may not be entirely discernable from their actions. It is difficult to know whether observed deviations from monetary orthodoxy are temporary accommodations of economic conditions, or more enduring repudiations of orthodoxy. If the private sector believes the former—that the central bank remains essentially committed to price stability—then long run inflationary expectations can remain stable even as policy turns dovish in the short run. On the other hand, if the private sector

²⁴ Blinder 2007.

²⁵ See, for example Hibbs (1987), or very directly Abrams and Butkiewicz (2012).

²⁶ Blinder 2000.

does not trust central bankers' essential commitment to price stability it will more readily adjust inflationary expectations with observed deviations from policy orthodoxy. Those expectations can manifest as inflation. And while these perceptions can be avoided by adhering to orthodoxy regardless of economic conditions, doing so is costly and needlessly so if a more intrinsically credible central banker would have room to attend to shocks without triggering doubts about underlying commitments. A credible central banker can keep inflation stable and lower the costs of doing so,²⁷ which is a benefit to any appointing government.²⁸

Third, the credibility that allows central bankers to establish expectations of low inflation is likely gendered. There are several reasons for this. The most immediate is that a broadly applicable form of gender bias in competence persists, even today. Maintaining low inflation can be difficult and men are often believed to be more competent generally,²⁹ and more adept at economic management in particular³⁰. Even aside from those more general forms of gender-bias, femaleness may be a heuristic for dovish preferences. And indeed, the average female's economic preferences do tend to collide with the image of a conservative central banker's over-riding commitment to price stability. Women in surveys are less likely to consider inflation as a problem relative to unemployment³¹, and, even among American economics PhDs, women tend to be less concerned with increasing the minimum wage or excessive regulation, and more concerned with

²⁷ Adolph 2013.

²⁸ Or, as Federal Reserve chair Jerome Powell recently put it, "well-anchored inflation expectations are critical for giving the Fed the latitude to support employment when necessary without destabilizing inflation." <https://www.federalreserve.gov/newsevents/speech/powell20200827a.htm>

²⁹ Koenig and Eagly 2014; Correll and Ridgeway 2006, Fiske et al. 2002.

³⁰ Alexander and Andersen 1993, Huddy and Terkildsen 1993, Sanbonmatsu 2002

³¹ Scheve 2004, Jayadev 2006. When the trade-off between inflation and unemployment is not explicit in the survey question, Ehrmann and Tzamourani (2012) find that women are more likely to list "fighting rising prices" as a priority. These World Value Survey responses about combating price increases are put in a completely policy irrelevant context, alongside maintain order in the nation, giving people more to say in government decisions and protecting freedom of speech. In the absence of a clear trade-off with employment, these higher inflation expectations may not be intrinsically about gender but, at least in the US, about exposure to the variability of prices involved in grocery shopping (D'Acunto et al. 2021).

income inequality³². These preferences are mirrored in outcomes: Enfranchising women has led to more public spending³³, social spending³⁴, and family benefits³⁵. Gender quotas, greater female participation in parliaments and in political parties' leadership are all associated with parties' emphasis on social justice, welfare expansion and higher health spending.³⁶ Recent survey data also suggests that public reactions to central banking communications *is* sensitive to the gender of the speaker. Beyond the Bodea et al. (2021) experiment noted in the introduction, D'Acunto et al.'s (2021) randomized control trial finds that central bankers' gender (and race) influence the efficacy of their communication, particularly when it comes to unemployment.³⁷ This combination of evidence that women are associated with dovish attitudes and outcomes, and newer evidence that this association is reflected in how the public (D'Acunto et al. 2021, Bodea et al. 2021) and the media (Istrefi 2018) perceive female central bankers provide a strong foundation for our theorizing.

Empirical work on whether female central bankers are, in fact, more dovish than their male counterparts is inconclusive. Studies have alternatively found that women are more dovish,³⁸ similar³⁹ or more hawkish than their male colleagues,⁴⁰ though that latter characterization is also consistent with women taking excessively conservative stances knowing that they must work

³² May et al. 2013. Similar differences appear in female legislators' preferences in the US (Poggione 2004, Svers 2013).

³³ Lott and Kenny 1999.

³⁴ Aidt and Dallal 2008.

³⁵ Enns-Jedenastic 2017.

³⁶ Kittilson 2011, Clayton and Zetterberg 2018.

³⁷ Given the persistently low inflation up to the time of the survey experiments and thus the low salience of inflation concerns, neither study is able to directly test the ability of women versus men speakers to anchor inflation expectations.

³⁸ Chappell and McGregor 2000, Malmendier et al. 2020, Gardner and Wolley 2016, Gerlach-Kristen 2009. Ainsley (2020) finds that women address employment and output (rather than inflation) more frequently than their male colleagues in board deliberations.

³⁹ Ainsley 2020, Amand et al. 2018, Harris et al. 2011.

⁴⁰ Eichler and Lahner 2017. For the same level of inflation, Masciandaro et al. (2020) show higher interest rates in countries with more women in central bank boards.

harder to build their reputations.⁴¹ Importantly, however, our theory does not actually require that female central bankers be more dovish. Our argument only requires that governments consider that women are likely to be perceived as more dovish. The mere fact that academics and the media so frequently consider that women, especially women central bankers, might be more dovish than men suggests that this possibility has likely not escaped governments' consideration either.

Combined, our premises—1) central bank board seats are important; 2) central bankers' success often requires clear commitments to inflation aversion; and 3) a perception that women may be seen as less inflation averse than men—suggest that women will be under-represented in central banking positions when inflation-fighting is a primary consideration. Below we discuss three factors that plausibly heighten the centrality of inflation fighting in central banking, and which allow us to formulate falsifiable hypotheses that plausibly identify our theory.

The most direct application of our theory is to countries' history with inflation. Some countries have experienced high inflation and others have not. We expect fewer women central bankers in the former. Examples of inflation's long-lasting shadow abound. Memories of Weimar hyperinflation are often invoked to explain the German monetary conservatism decades later⁴², and lessons from the inflationary 1970s often loom large in contemporary policy debates in the United States, despite decades of low inflation in the intervening period. More systematic studies

⁴¹ Ainsley 2020, Lahner 2018. Similarly, our argument does not require that female representation is inherently inflationary. Beyond the potential that female central bankers may adopt stances that anticipate presumptions of female dovishness, our theory suggests that a central bank's gender makeup is itself endogenous to inflationary outlooks. Women may be over-represented in eras of low inflation precisely because the leaders who picked them were not at the time overly worried about projecting anti-inflationary hawkishness. One particularly notable case is Janet Yellen, who was appointed as Federal Reserve Chair under President Obama. Despite her not-entirely-dovish tenure, Istrefi's 2018 work on media perception of American central bankers squarely puts Yellen into the category of "perceived dove" joining a perceived "already dovish FOMC". The media articles portraying Janet Yellen as a dove at the time of her appointment as the Fed Chair abound. While perceptions of Yellen as a dove are perhaps over-identified (she was also a democrat president appointed professor from UC Berkeley) they are consistent with our theory of gender and perceptions. That Yellen remains embraced as a credible dove by the Biden administration despite having pushed interest rate hikes in 2014-2015 that are now widely understood to be overly concerned with inflation also seem consistent with the power of gender as a communicator of dovish intent.

⁴² E.g. Beyer et al. 2013.

confirm that memories of inflation shape individuals' assessment of current inflation and inflationary expectations and increase the importance they attach to price stability as a policy outcome.⁴³ For that reason, a history of high inflation should elevate inflation control as a guiding principle of central banking (and of economic policymaking generally). Governments in countries with histories of high inflation should be especially sensitive to an appointee's capacity to generate a reputation for inflation aversion. We expect that any extra priority placed on central bankers' ability to be credibly seen as inflation averse works against gender representation. Hence our first hypothesis:

H1: Women should be underrepresented on central bank boards in countries with histories of high inflation.

Central bank independence also shapes individual bankers' need for inflation averse reputations. Central banks independence shift monetary policy decision-making, and thus the source of anti-inflationary credibility, away from politicians and towards central bankers.⁴⁴ That shift is a substantial part of independent central banking's appeal. A central bank independent from electoral politics would not have the same electoral incentives to expand the money supply prior to election and should therefore be more able to commit to a low inflation policy path. Importantly, central bank independence works to the extent that the market attaches their expectations to the banker's presumably more hawkish preferences.⁴⁵ Central bank independence works best if, as Rogoff puts it, government selects "an agent to head the independent central bank who is known

⁴³ E.g., Malmendier and Nagel 2016, Ehrmann and Tzamourani 2012, Central bankers themselves are shown to be influenced by lived inflation experiences (Bordo and Istrefi 2019). Perotti and Schweinbacher (2001) also tie inflationary histories to discrepancies in governments' embrace of financialization.

⁴⁴ Garriga 2016, Bodea and Hicks 2015, Bodea 2010, Broz 2002, Alesina and Summers 1993, Cukierman, Webb, and Neyapti 1992, Grilli, Masciandaro and Tabellini 1991.

⁴⁵ Rogoff (1986), Ainsley 2017.

to place a greater weight on inflation stabilization (relative to unemployment stabilization) than is embodied in the social loss function” (Rogoff 1985: 1179).

A history of depoliticizing central banking to take advantage of central bankers’ inflation fighting *bona fides* may in that way dissuade female appointments. Politically dependent central banks put less weight on the anti-inflationary commitments of central bankers who are, in the end, subject to politicians with known incentives to favor other policy targets. With less need for bankers to personally project anti-inflationary credibility, there is less reason to buck broader social trends towards gender equity. This leads to our second hypothesis⁴⁶:

H2: Countries with more independent central banks should have fewer women on central bank boards.

Fixed exchange rate regimes that limit monetary autonomy should for similar reasons promote women in central banking.⁴⁷ Fixed exchange rates tie the hands of domestic monetary policy. Fixed exchange rate commitments (given capital mobility) reduce the scope of monetary policy by eliminating central banker’s capacity to prioritize alternative economic goals or monetary targets. By limiting the room to deviate in the short run, fixed exchange rates reduce the need to “trust” central bankers.⁴⁸

That reduction in policy discretion substantially lowers the relevance of the person occupying the seat to inflation expectations. Adherence to an exchange rate target is easily

⁴⁶ An alternative view is that moving monetary policy out of governments’ control, incentivizes the appointment of bankers who care more about employment than price stability. This view—which puts the Rogoff model on its head—suggests that central bank independence may be an opportunity for women, for the precise reason that they are assumed to be less hawkish in monetary and fiscal policies. This possibility is tested in our empirical models and may hold for more recently independent central banks, whose independence results from the global diffusion of the practice.

⁴⁷ Under mobile capital, fixed exchange rates limit monetary authorities’ capacity to engage in independent policies (Giavazzi and Pagano 1988, Bodea 2010). This is not to say that fixed exchange rates last in perpetuity, but rather than, on a day-to-day basis, they place more constraints on inflationary policies.

⁴⁸ As Broz (2002) argues, it is precisely the inherent visibility of an exchange rate target that makes them a useful technology for governments under political conditions that undermine credible delegation to independent central banks. See also Bodea (2010).

observable, minimizing the importance of the banker's credibility. Banker-specific credibility is more important under floating exchange rates. Floating exchange rates allow bankers to target output goals and asks that the market trust their willingness to balance those goals with commitments to price stability. That freedom to pursue output stabilization can breed skepticism of the central bankers underlying aversion to inflation. Keeping inflationary expectation anchored with floating exchange rates requires trust in the banker's "type." And because market actors act in anticipation of others' actions, those actors must not only trust a central banker's commitment to inflation goals, but believe that such trust is widespread. If, as we argued, it is more difficult for women to generate those perceptions of trust, flexible exchange rate regimes should undermine women's appointments to public facing roles in central banking. That leads to our third hypothesis:

H3: Countries that operate flexible exchange rate regimes should have fewer women on central bank boards.

Finally, we consider that observed patterns of gender representation on bank boards may, in the end, be tied to broader trends in the "feminization" of politics, as argued by the leading scholars studying cabinet appointments (Escobar-Lemmon and Taylor- Robinson 2005, Krook and O'Brien 2012, Barnes and O'Brien 2018). In this sense, female representation in central banking may have less to do with central banking, as we argued, than it does with gender representation more in politics broadly. The "feminization of politics" hypothesis permits several causal channels, including the establishment of female-friendly professional networks⁴⁹, and the psychological effect to women of seeing other women in elite positions, or, by increasing the demand for women in central bank board though the erosion of norms about who is fits the profile

⁴⁹ For example, Park et al. (2018) note that Japanese central bankers consider their institution an "old boys' club", where recruitment to the Monetary Policy Board occurs by tapping the male dominated Ministry of Finance.

to serve in high value seats and, by providing a network to lobby for the advancement of other women in central bank board.⁵⁰ Our empirical specifications, thus consider the possibility that more female representation in politics corelates with more women on central bank boards.

SECTION 4: DATA, RESEARCH DESIGN AND RESULTS

Dependent Variables

Our dependent variables come from an original dataset of leadership positions in global central banks. The main data sources are the Central Bank Directories 1999-2016⁵¹, supplemented, when available, by central bank websites.⁵² These data record the gender balance on central bank boards between 1998 and 2015 in 114 countries.

Our main models use two measures of gender representation. The first is a dichotomous indicator that distinguishes countries with all-male central bank boards from countries with at least some female representation. About 51% of the country-years in our sample have no women in their central bank board; 20 countries have no women at any point for the period coded. The second measure indicates the percentage of women serving on central bank boards. The average

⁵⁰ Measuring the role of women in political networks is difficult. However, a large literature shows that female elites support female candidates by influencing list placement or party financial contributions and by further increasing women internal party representation (Caul 1999, Kittilson 2006, Kunivitch and Paxton 2005). Similarly, more women parliamentarians could support the appointment or elevation within the central bank of female candidates. In the US, for example, female Democratic Senators and other women groups voiced strong support in favor of Janet Yellen for the position of Chair of the US Federal Reserve. See, e.g. “Women's groups push Yellen for Fed”, Politico August 28 2013; “Yellen as America’s Favorite Shows Fed Captured by Democracy”, Bloomberg October 9 2013.

⁵¹ <https://www.centralbanking.com/central-banking-directory>

⁵² We code each directory listing as the central bank personnel from the preceding year. While we refer generically to a *central bank board*, these boards go by a variety of names. In all cases we aim to identify the body conducting monetary policy, regardless of its name. This includes, for example, the governor and the bank directors in Argentina; the Reserve Board in Australia; the governor and deputy governors in Brazil; the Monetary Policy Board in Hungary; the governor, senior deputy governor and deputy governors in Indonesia; the governor and deputy governors in France; the Executive Board in Germany; the Monetary Council in Greece; or the Executive Board in Sweden.

proportion of women on central bank boards is 13% overall, and 16% when excluding countries with no female representation at any time.

These measures showcase distinct perspectives on gender representation. Focusing on a dichotomous indicator of minimal representation suggests that the primary gender-related puzzle in central banking is the persistence of all male central bank boards in an era where at least token efforts at gender representation are the norm. But a desire to abide by emerging norms requiring female presence, while notable, is not the same as substantial levels of representation. Such representation is important for women's voice and authority⁵³, particularly in monetary policy where women have been notably absent.

Considering all-male boards and more substantive levels of gender representation separately also allows us to consider they may be driven by distinct socio-political processes. Casual observation suggests that the absence of any women on a central bank board raise political alarms more than male dominance. That could be because all male board are especially offensive to emerging norms about gender and political power, or because it is only in extreme cases that the gender makeup of the central bank gets widely noticed. We would expect, then, that arguments about social demand for gender representation are more relevant to the case of all male boards than to gender representation measured more broadly.

Independent Variables

The independent variables we use to measure hypotheses 1-3 are: the inflation rate, central bank independence and the exchange rate regime. We measure of inflation with the GDP deflator from the World Bank World Development Indicators (WDI).⁵⁴ Absent a strong theoretical expectation

⁵³ Karpowitz et al. 2012; Gardner and Woolley 2016.

⁵⁴ For negative inflation we take the log of the absolute value of the GDP deflator plus 1, and then reintroduce the original sign.

around functional form we use several operationalizations of these data to help ensure that our results are not driven by modeling choice. Those include measuring inflation in its continuous (logged) form, as a dichotomous variable coded 1 if a country is experiencing annual inflation greater than 20%,⁵⁵ and as the maximum observed level of inflation over the relevant observation period.

We measure central bank independence with the index of central bank independence based on Cukierman et al. (1992) and expanded by Garriga (2016).⁵⁶ We code exchange rate regimes using Ilzetzki et al. (2017) and define a dichotomous indicator of floating exchange rates for any regime coded greater or equal to 2 in their “coarse” ratings, excepting currencies that are coded as being in “free fall.” That coding limits our definition of “fixed” to systems that either lack a separate currency or operate a pre-announced peg or currency board. In reverse, it defines as “not fixed” as any other arrangement, including *de facto* pegs or crawling pegs. While many of those later arrangements can in practice be quite stable, their stability is to a greater degree dependent on perceptions of central banker’s commitments to them.

We proxy the “feminization of politics” with the proportion of seats held by women in national legislatures (World Development Indicators - WDI), and by the gender of the chief executive (one if female, zero otherwise)⁵⁷. If our data are better understood as the product of a feminization of politics dynamic, we would expect that these leading indicators of women in politics should correlate positively with our measures of women in central banking.

We present our models with and without control variables. When included, those control variables are: the Freedom House democracy score, the log of GDP per capita and its rate of growth

⁵⁵ See Reinhart and Rogoff 2009 for a similar formulation

⁵⁶ For euro zone countries the value of the CBI index codes the European Central Bank. We use a version of Garriga (2016) updated until 2014.

⁵⁷ We code the gender of the executive (president or head of government) using Archigos (Goemans et al. 2009).

(WDI), trade as a percentage of GDP (WDI), capital account openness (2019 update to Chin and Ito 2006) and the presence of an active IMF program (Dreher 2006), the latter three of which are meant to capture the possibility the gender representation in central banking follows from an orientation towards globalized finance and the need to conform to best practices to remain competitive. We also include controls for women's rights to own property (VDEM)⁵⁸ and female labor force participation (WDI). These variables speak to the relationship between women's role in the economy, which is plausibly relevant to women's presence in central banking and, additionally, help us separate socio-economic dynamics from those that are specific to a feminization of politics-based explanation. We also control for whether a country has a majority Muslim population (CIA World Fact Book, measured in 1990) to capture cultural factors identified as relevant in the literature. Finally, we control for the number of seats on the central bank board. Larger boards provide more frequent opportunities to address potentially low numbers of female-occupied board seats and more seats may also dilute the consequence of any specific appointment.⁵⁹ To the extent that board size is politically determined it poses as a potential confounder.

Research Design

We use two estimation strategies to test our hypotheses. Our first set of tests rely on cross-sectional variation to describe the relationship between inflation in the past and women's presence in central

⁵⁸ We use the v2clprptyw measure.

⁵⁹ We use our own coding of the number of members serving in the central bank leadership. This number equals the statutory number of board members when politicians fill the empty seats promptly, but, at times, the legal size of the central bank board is not reached because politicians postpone appointments. The average size of the central bank board is close to 5 members, with a minimum of 1 and a maximum of 16. Not all statutory seats are filled at all times, and in many cases, board members do not end their terms. The length of appointment also varies significantly, with some countries having 3-year terms (external members of the Bank of England's MPC) or 5 year terms (Japan's Policy Board members), while other countries have significantly longer terms (14 years for the US' Fed Board of Governors). There is also significant variation in who makes nominations and appointments for posts in the central bank boards. Depending on the country and time period, the power of appointment can rest with the executive or legislative branches, the governor of the central bank, or a combination of the three.

bank positions in the present. That focus has a lot recommending it. For one, it reflects what we know about inflation and subsequent politics. Rising prices create long-lasting aversion to inflation that studies suggest only begins to diminish after a decade for moderate levels of inflation and persists much longer for hyperinflation episodes.⁶⁰ As such, our theorized dynamics are not likely to play out on very short time scales. Research designs based on more immediate feedback between a shift in inflation and women's role in central banking risk miscasting the causal process. Furthermore, central bank board seats are not continuously available to be filled. There can be a substantial lag between a change in our independent variables and an opportunity to reflect that change in staffing decisions.⁶¹ As such we expect our theory to be supported most clearly in patterns observable over longer periods of time.

However, the results of cross-sectional models may be driven by unobserved country-specific factors not fully absorbed by the region fixed effects we use⁶² and our time-series-cross-sectional data allows us to mitigate it. Moreover, while our inflation-related hypotheses very likely play out over very long timescales, it is not clear that our other hypotheses, as well as the feminization of politics-based alternative explanation, would operate that way and a research design the captures variation within countries over time would be better suited for it. For those reasons we supplement our cross-sectional models with the random effects-based modeling strategy of Bell and Jones (2015). The Bell and Jones model estimates the within (short-term) and

⁶⁰ Ehrmann and Tzamourani 2012

⁶¹ In the United States, as recently as 2017, 3 of the 7 seats on the Board of Governors were unfilled for lack of prompt action by the Senate.

⁶² This is an issue across the literature on cabinet appointments as well. Prior work includes cross-sectional data (Krook and O'Brien 2012), or the time to a first female appointment (Barnes and O'Brien 2018).

between (long-term) variation simultaneously, which is a better match to our theory and data than a traditional country-fixed effects.⁶³

SECTION 5: EMPIRICAL RESULTS

Bivariate Correlations

Before turning to parametric models, we consider the bivariate correlation between past inflation and women's representation on central banks. That correlation is represented graphically on the left panel of Figure 3. The x-axis on Figure 3 captures the average inflation rate between 1960 and 1999, and the y-axis captures the subsequent representation of women in monetary policymaking as expressed as a percentage of women-occupied seats.⁶⁴ Each dot represents a country, and the line is a simple line of best-fit.

[Figure 3 here]

Two patterns emerge: First, the overall relationship between past inflation and contemporary women's representation in central banking is negative. More inflation in the past correlates with fewer women today. The second is that the overall negative relationship does not apply to the "0s", or countries with no women in public facing positions in monetary policy at any time between 1998 and 2015. The 0's are nearly uniformly distributed across levels of average inflation, suggesting that the political economy of never having female representation in central banking may be distinct from the more general question of women's representation in central banking, and that inflation may be more relevant to the latter.

⁶³ Many of our independent variables primarily vary between countries, rather than within countries over time. This includes central bank independence, the representation of women in national parliaments or the size of the central bank board and fixed effects estimation discards any inference on this predominant between country variation.

⁶⁴ We exclude Euro-zone countries (for which monetary policymaking over the period in question was severed from the functions of the national central bank) and countries with less than 35 years of inflation data. For comparability, we limited the right-side panel to countries for which we have data on the gender composition of the central bank.

The right-side panel of Figure 3 shows the bivariate relationship between the average past inflation and female representation in parliament over the same time periods. This panel functions as a crude placebo test. To the extent that the negative correlation in the left side panel is being driven by our theorized dynamics there is little reason to expect an analogous negative relationship between inflation and women’s representation outside of central banking. And, indeed, there is no evidence in Figure 3 of such a relationship. The lack of a relationship assuages concerns that our measure of inflation captures unmeasured aspects of a country’s political culture with broader implications for women’s access to political power.

Cross-sectional Models

Our first set of regression models ask whether countries with histories of inflation, central bank independence, and floating exchange rates appoint fewer women to their central banks over the most recent decade in our data. The following equation represents our models:

$$Y_{i,2005-2010} = \beta_0 + \frac{1}{2004 - n} * \sum_{t=n}^{2004} X_{it} + R_i + e_i$$

Y is an indicator of female representation on country i’s central bank boards over the ten years from 2005 to 2015.⁶⁵ We operationalize Y in for the period in three different way, as (1) a dichotomous variable taking the value of 1 if countries included women at any time in the period in their central bank board and zero for countries with all male boards for the whole period; (2) the percentage of years over the decade with at least one woman on the central bank board,⁶⁶ and (3) as the average percentage of central bank board seats held by women. We further accommodate

⁶⁵ We prefer to use the 10-year time span from 2005 to 2015 to take our average of our dependent variables, largely because our data on the number of board seats only extends back to 1998 so that averaging this way allows us to average that covariate over several years. Our results are not impacted by using a slightly longer time frame (1-2 years) for the dependent variables.

⁶⁶ This measure ranges from a minimum of 0, representing the complete absence of women, to a maximum of 1, representing a country with no instances of an all-male board over the observation period. The variable takes the value 0 for 22% of the data and 1 for 31%.

the possibly distinct processes behind all male boards and gender representation more generally in a fourth model that considers the percentage of women on a central bank board, conditional on there having been at least one woman on their central bank at some point during the observation period.⁶⁷ The vector X represents independent variables averaged over periods of time pre-dating the observation period for our dependent variable. R_i is a region-specific fixed effect.⁶⁸

We compute the average values of our independent variables using as much data as is available to us. That data stretched as far back as 1960 for inflation and the 1970s for central bank independence.⁶⁹ The appendix shows the date ranges for our data.

[Table 1 here]

Table 1 show the results of our four main cross-sectional regressions, with and without control variables. Models 1-3 consider the drivers of whether a country had any women serving on their central bank board at any time over the observation period. This is the minimal definition of gender representation, though a relevant one given historical patterns. Model 1 considers that outcome as a function of only our indicators of inflation history, central bank independence and exchange rate policy; Model 2 adds indicators of our “feminization of politics” variables; Model 3 includes the full set of control variables.

Beginning with the first set of three models, there is no evidence in our data that the distinction between countries that never have a woman on the central bank board and countries

⁶⁷ The approach mirrors the two-tiered approach suggested by Woolridge (2002: 536-538).

⁶⁸ These are dummy variables for Latin America, Sub-Saharan Africa, Asia, Eastern Europe, North Africa and the Middle East, and Western Europe/North American/Japan.

⁶⁹ In the robustness check section we re-estimate these models using more recent data that average over the immediately prior 20 years of data.

that have at some point had at least one woman on the central bank board is driven by inflation, institutional design, or, for that matter, the feminization of politics.⁷⁰

Models 4-6 consider the percentage of years with at least one woman represented on the central bank board between 2005-2015. This is still a minimalist notion of representation, but less so than in Model 1-3. The results of Models 4-6 suggest much more substantial support for our theory. Most notably, all three models support H1, that higher past inflation correlates with more frequent all-male boards. The coefficient on *Average Inflation* is always negative and always statistically significant. We also see consistent evidence that the presence of women is sensitive to maximum observed inflation levels, such that counties that have experienced instances of very high levels of inflation in the past have fewer women in central banking today. The statistical significance of maximum observed levels of inflation, even when controlling for average levels of prior inflation, suggests that the long-term consequences of hyperinflation operate through a separate causal channel.⁷¹ This is consistent with a literature that has noted that memories of hyperinflation can have profound impacts on public opinion (Ehrmann and Tzamourani 2012) and politics (Perotti and Schwiabacher 2009) that are separable from the impact of inflation generally.

We also find evidence to support H2, that central bank independence should decrease women's representation. The coefficients on *CBI* are negative, as expected, and statistically significant. There is no evidence here to suggest support for H3, however, that fixed exchange rates drive greater levels of female representation. The coefficient is statistically insignificant across all three models, and inconsistently signed.

⁷⁰ There is evidence of a large, but not statistically significant, relationship suggesting that Muslim majority countries are less likely to have ever had a woman on a central bank board. That finding accords with Diouf and Pepin (2017) and similar work in finance (Stulz and Williamson 2003).

⁷¹ Further indicating the separate causal channels interpretation, unreported models that exclude our indicator of maximum inflation from our regressions leave our estimate of average levels of inflation barely changed from reported estimates.

There are likewise no indications in Models 4-6 to support the alternative hypothesis that women's presence in electoral politics should lead to a presence in central banking. The coefficient on our variables measuring women in parliament and the presence of a female executive are never statistically significant and often bear the incorrect sign. A history of women's representation in politics does not suggest women's representation in central banking in the present.

Models 7-12 operationalize our dependent variable as the percentage of the central bank board that is made up of women. Models 7-9 include the full set of data available to us; Models 10-12 limit the sample to countries that at any point have a at least one woman on the central bank board. The results of these models largely mirror the results from Models 4-6. There is very strong support for H1, that past inflation reduces women's access to central bank boards. There is some additional support for the idea the central bank independence drives down women's access to central banking positions. The coefficients on *CBI* are consistently negative, as expected, but only sometimes statistically significant.⁷² Unlike previous models there is some support for H3, that countries with fixed exchange rate regimes deter female central banker board members, though here as well the coefficients are only intermittently statistically significant.

Taken as a whole, Table 1 suggests consistent support for our hypothesis that women's presence in central banking is driven by a country's history with inflation. Inflation in the past undermines women in the present. There is some evidence that central bank independence inhibits female representation on central bank boards, and some evidence that floating exchange rates act similarly. Those findings are consistent with H2 and H3, but extent of support for those hypotheses

⁷² Support in these models for H2 is strongest when we include the full set of control variables, which is consistent with the idea that central bank independence is itself so endogenous to domestic politics that its effect is only consistently observable if those political and economic variables are accounted for.

in these data is less than it is for H1. There is no evidence in these models that women's roles in central banking mirrors longer term trends in women's political representation.⁷³

Table 2 replicates Table 1 but uses an alternative indicator of inflation. The regressions in Table 2 measure inflation as a dichotomous variable coded 1 if annual inflation is at or above 20% and 0 otherwise. Thus, the transformed panel average variable that we use is *the percentage of years with at least 20% inflation*. This is arguably a better approximation of our theory because it is less sensitive to extreme values, and it properly focuses attention on episodes of high inflation. In practice using this alternative indicator produces substantially the same results. Inflation in the past is almost always negatively correlated with women in contemporary central banking. The extent of evidence for our other hypotheses remains similar to the estimates reported in Table 1.⁷⁴

[Table 2 Here]

Time-Series Cross-Sections: Between and Within Unit Variation Estimations

Our focus on cross-sectional variation reflects what we know about a plausible causal pathway between an inflationary shock and subsequent gender politics, but it ignores potentially important variation that exists within countries over time. We model within-country variation using the Bell and Jones (2015) random effects-based model. This model introduces time-varying independent variables twice, first as within unit means and, again, as observation-specific deviations from those means. The coefficient on the unit average captures the between unit effect, which, mirrors the long-term effects from the cross-sectional models and which, in a fixed effect setting, would be wholly absorbed into the fixed effect. The coefficient on the de-measured variable captures the

⁷³ The consistently positive and typically statistically significant coefficient on our measure of women's labor force participation, suggests some sort of feedback between gender representation on central banks and broader social trends, but it offers little indication that this feedback operates through the channels described in the feminization of politics literature.

⁷⁴ Our robustness checks table we include estimates of additional models that exclude Eastern European countries from the sample given their unique inflation history. The results are not meaningfully changed.

within-unit effect analogously to the coefficient estimate from a fixed effect regression. (The appendix shows the results of the analogous fixed effect regression models.) The Bell and Jones model for time series cross sectional data with i units and t time periods is below:

$$Y_{it} = \beta_0 + \beta_1(X_{it} - \bar{X}_i) + \beta_2(\bar{X}_i) + u_i + e_{it}.$$

Where X_{it} is a vector of time-varying independent and control variables, \bar{X}_i represents within unit averages of those variables, u_i is a random effect for unit i and e_{it} is the residual for unit i at time t .⁷⁵

Because Bell and Jones models lead to a proliferation of variables— with each variable entering the model twice—we report the results of smaller set of control variables.⁷⁶ In addition to our key independent variables (inflation, CBI, fixed exchange rate) and variables capturing the feminization of politics (% women in parliament and female leaders), we only include in these models an additional variable capturing the diffusion of women in central banking within regions over time. That geographic diffusion variable is calculated as the average percentage of women on central bank boards in a particular year in a particular geographic region (less the observation country’s value for the % women in central bank boards in that year). We use a more specific definition of region⁷⁷ to calculate regional diffusion, such that our measure closely captures gender dynamics within a country’s immediate geographical neighbors. Our indicator of spatial diffusion is consistent with a variety of causal processes, including norm diffusion and, potentially, a competition-based dynamic in which governments seen as being more gender equitable will be favored on capital markets. Our diffusion variable also plausibly captures transnational elements

⁷⁵ To ensure that our de-meaned variables have are mean zero for each country, and are uncorrelated with the random effect we de-mean against an average taken over our observation period (1998-2015) (Bell and Jones 2015:10). Also following Bell and Jones, our mean-signifying terms are computed for all available data, meaning that they are close to the averages used in Table 1.

⁷⁶ The results of models including all the control variables are available from the authors on request, and code to replicate them is included in the replication files.

⁷⁷ The United Nations “detailed stats” coding, applied to our data using Stata’s “kcountry” routine.

of the feminization of politics arguments that our domestic oriented variables would not otherwise capture. Regardless, it allows to help ensure that the coefficients on our de-meaned variables are not capturing unrelated diffusion patterns. We lag all the independent variables one year and include year and region fixed effects in all specifications.

[Table 3 here]

Table 3 shows our model estimates. Model 1 in Table 3 estimates the drivers of there being at least one female appointment on a central bank in a particular year. The dependent variable is dichotomous (1 if there is a female presence and 0 otherwise) and we model it using a random effects logit estimator. Model 2 considers the percentage of women on a central bank board using a random effects OLS model. Model 3 replicates Model 2 but excludes from the sample all observations from countries that never have any women on the central bank board over the period 1999-2015.

The results of these models do not suggest that our theory has much to say about within country variation over this time. Short run changes in inflation, central bank independence and exchange rate policy appear to be entirely orthogonal to short run changes in gender representation. We also find that the percentage of women on the central bank board correlates with regional diffusion trends. Changes in the gender-composition of a country's central bank is systematically presaged by similar changes in neighboring central banks.

More interesting is that year-to-year changes in women's representation in central banking correlates with the year-to-year changes in women's' representation in parliament. The coefficient on the demeaned percentage of women in parliament is statistically significant and positive in all three models. While this findings (as well as the diffusion variable) permit a variety of

explanations, they both point to the idea that year-to year changes in women’s representation in central banking can be attributed to women’s gains elsewhere in politics.

However, the explanatory power of those trends is swamped by the longer-term structural implications of a country’s history with inflation and the institutional design of its central banks. The coefficients for the panel mean of inflation and the panel mean of central bank independence are both statistically significant and negative, just as they were in the cross-section regressions described above. Moreover, the panel means have greater explanatory power than the shorter-term trends. Using Model 2 as a baseline, a standard deviation change in the panel average value of inflation corresponds with a 15% of a standard deviation reduction in percentage of women on the central bank board, but the corresponding effect sizes for the percentage women in parliament and regional diffusion are roughly half of that.⁷⁸

Gender And Central Banking in Eurozone National Banks

[Table 4 here]

One of the defining characteristics of our data is that it includes data from the eurozone, where national central banks remain but have delegated their monetary policymaking function to the ECB. These countries provide an interesting, if somewhat oblique, indication of our theories’ explanatory power. Our theory stresses the implications of gender balance on the efficacy of monetary policy, and we would expect that its explanatory power would decrease where central banks have been stripped of monetary policymaking power. Conversely, the less relevant monetary policymaking becomes to central banking, the more we would expect that gender balance in central banking should mirror gender balance elsewhere in politics. That appears to be

⁷⁸ 9% and 7% respectively

the case. These results from a Eurozone-only sample are shown in Models 1 and 2 in Table 4, which replicate Models 1 and 2 in Table 3.⁷⁹ These models exclude measures of exchange rate policy, central bank independence and regional diffusion given their limited meaning in a eurozone-only sample.

These estimates bear some similarities to those drawn from the sample as a whole. The panel mean of inflation is negative and statistically significant, as our theory predicted. The de-meaned coefficients for our measure of women in parliament is again positive and statistically significant. But there is much more and stronger support in these data for the feminization of politics hypothesis than in the sample as a whole. For one, short-term changes in the gender compositions of country's central banks positively correlates with changes with both the gender composition of executive office and parliament. More women in politics (in both the executive and the legislative bodies) are linked to more women in central banking. Those findings hold if we consider the likelihood of there being any women on the central bank board (Model 1) or the percentage of women on the central bank board (Model 2). As importantly, the feminization of politics hypotheses is a far better descriptive of dynamics in the eurozone than outside of it in terms of substantive effects. A one-standard deviation increase in (panel de-meaned) women's representation in parliament corresponds with a 0.41 standard deviation increase in women in central banking and a one standard deviation increase in (panel de-meaned) women's representation in executive office corresponds with an additional 0.16 standard deviation increase in women in central banking. Inflation's contribution is still substantial—a one standard deviation increase in (the panel average of) inflation corresponds with a 0.25 standard deviation decrease in women in central banking—but, in relative terms the contribution of inflation has gone from twice

⁷⁹ Model 3 from Table 3 is duplicative, because all Eurozone countries have had at least one woman in their central bank board.

the explanatory power of feminization of politics in the full sample, to slightly more than half the explanatory power inside of the eurozone.

The exaggerated impact of gender politics inside the Eurozone supports our contention that the gender politics of central banking is substantially rooted in monetary policy making. Eurozone central banks over our study period are notable precisely because they delegate monetary authority to the European Central Bank. When you strip monetary policy out of central banks' policy remit, appointments appear to reflect national gender politics more closely.

Robustness Checks:

Table 5 shows the results of several robustness checks. In each, we use Model 9 from Table 1—which has as its dependent variable the percentage of women on the central bank board—as the baseline model to be altered in the specified way. We take that model as representative in part because our key findings appear to be in long term differences between countries rather than short term changes within countries and in part because substantive representation is the more substantively relevant quantity to be explained. All robustness checks in Table 5 include the full set of control variables.

Model 1 in Table 5 excludes Eastern Europe and the former Soviet Union from our sample. These countries only provide data for a relatively short-time spans, and often with short periods of abnormally high inflation rates during the beginning of the transition process. These countries' experiences with inflation (and gender equity in the communist period) make them potential outliers. Excluding these countries from our sample does not meaningfully affect our main results, however. Average inflation in the past continues to be negatively correlated with gender balance in central banking, as does a history of central bank independence. The lone exception is that

maximum levels of inflation, which are no longer a statistically significant indicator of gender balance on central bank boards.

Model 2 in Table 5 excludes all Eurozone countries from the sample, which we define here as any country that any point entered the eurozone.⁸⁰ To the extent that our theories have less obvious applicability to eurozone countries, our results should be stronger in models that exclude them. For the most part these results are unaffected by excluding eurozone (or what would become eurozone) countries. Outside of the eurozone, historical inflation (measured by its average or its maximum levels) has a statistically significant and negative correlation with gender equity in central banking. Histories of central bank independence and floating exchange rates also correlate negatively with gender balance in central banking. Those findings support our hypotheses, and for the most part the estimated effect sizes associated with these findings are comparable to what was reported above. The only meaningful exception is the correlation between history of floating exchange rates and a lack of gender balance in central banking, which is appears in this sample to be a larger and more precisely estimated relationship than what was reported in Table 1.

Model 3 in Table 5 replicates the regressions from Table 1 but redefines “history” as just the 20 years between 1985 and 2004. This change is almost entirely inconsequential with respect to our main variables of interest. The coefficients for inflation and central bank independence are statistically significant and in the predicted, negative direction, and of essentially the same magnitude as in Table 1. It suggests to us, *inter alia*, that our general finding are not specific to the inflationary period of the 1970s, but that they speak to more generally applicable relationships.

[Table 5 here]

⁸⁰ Because this is a cross-sectional estimation, we cannot exclude only the country-year observations that are included in the eurozone.

SECTION 6: DISCUSSION AND CONCLUSION

Central bankers are often asked to project a credible commitment to inflation aversion. That credibility allows central banks to more easily manage inflationary expectations and provides them more leeway to deviate from monetary conservatism without undermining longer term expectations. These benefits contribute to the governments' fortunes, and, in settings where inflation aversion is a guiding concern, governments should be expected to prioritize central bankers seen as credible. We have argued that the credibility of that commitment is gendered and, for that reason, fewer women are appointed when perceptions of inflation aversion is especially important to a central banker's job.

This insight is key to understanding women's absence from public facing positions in central banking, which has some otherwise hard-to-explain characteristics. We find that women are better represented in countries without a significant inflationary history, and in countries with a historically politically dependent monetary policymaking, where the personal reputation of central banker matters less to economic outcomes. There is some evidence that broader social trends matter, but regional diffusion and the "feminization of politics" have a relatively smaller impact. Where that impact is especially large - in the eurozone - it is precisely where central banks have lost their direct monetary policy making function. The gender politics of central banking is specific to central banking as long as central banks are responsible for monetary policy.

Our research has several limitations that future work can address. One is that having gender diverse central bank boards is a recent phenomenon that overlaps with a period of generally low worldwide inflation. This means that evidence for our theory mostly derives from whether or not countries maintained male-dominated central bank boards as inflation ebbed and norms of gender balance became more entrenched. We do not observe many inflation-induced retreats from gender

equitable boards. That may change in the future as inflation rates increase post-COVID, and it will be worth revisiting these trends when they do. Future work would also be well served to consider the roles of particular board members and acknowledge that some roles - like deputy governors, vice-chairs or vice-presidents – carry more weight and visibility. The relative absence of women from these position over much of our sample makes that impractical in this paper, but those analyses might have more traction in the future.

This study has several notable implications. For one, the systematic avoidance of women may distort the sort of policies that central banks generate. Women’s systematic absence from these roles may affect financial oversight, banking regulation and other areas of central bank influence. Recognizing that the drivers of persistent barriers to gender diversity in central banking lie sometimes in decades old memories of inflation is a potentially important part of understanding systematic divergences in policymaking across a variety of financial domains.

Locating gender inequity in inflation fears resonates with the current moment, as well, and may provide a useful guidepost for gender equity in this area over the medium term. As we write this, inflation rates in the United States in December 2021 have ticked up to 6.8% - levels not seen in decades. The US Federal Reserve has adamantly indicated its belief that much of that inflation is transitory and best attributed to COVID-related supply chain shocks that will run their course, and which do not call for an immediate disinflationary monetary response. The success of that communication strategy requires trust in the Federal Reserve’s long-term commitment to inflation aversion, despite the lack of such aversion in the short run. The market’s faith in the bankers’ true “type” is quite valuable to the economy and to the Biden administration. A Federal Reserve that loses the market’s faith in its long commitments will be pushed further and more quickly towards tighter monetary policies and, likely, reduced growth trajectories. And that faith is not just being

tested against the supply chain disruptions of today, but against the remarkably durable (and still painful) memory of 1970s inflation.⁸¹

That memory sets the context in which the Biden administration - and other governments elsewhere - must weigh normative commitments to gender diversity with the practical task of maintaining perceptions of central bankers as hawks. We have argued that those two goals are in tension. If maleness remains a heuristic for hawkishness, circumstances that magnify that need to project hawkishness favors male candidates. The more persistent this inflation turns out to be, the less we should expect a commitment to gender balance to win out. If inflation or fear of inflation remains, the meager but still real gains that women made in central banking during the relatively inflation free 1990s and 2000s may turn out to be a high-water mark rather than a harbinger of an ever-more gender equitable future.

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⁸¹ The specter of the 1970s has been extraordinarily explicit in media coverage, and the resonance of that framing remarkable the more remarkable given the time lag. Even ostensibly reassuring messages, such as Bloomberg's "Yellen Says Fed Wouldn't Allow Repeat of 1970s-Level Inflation". <<https://www.bloomberg.com/news/articles/2021-11-09/yellen-says-fed-wouldn-t-allow-repeat-of-1970s-level-inflation>> or Jason Furman's commentary in the Wall Street Journal << <https://www.wsj.com/articles/biden-can-whip-inflation-and-build-back-better-stimulus-prices-infrastructure-reconciliation-11636991676>>> that "Biden and Whip Inflation and Build Back Better"—an allusion to President Ford's ill-fated "Whip Inflation Now" campaign—mark the cultural accessibility of 1970s inflation and make it an irresistible and almost inevitable touchstone.

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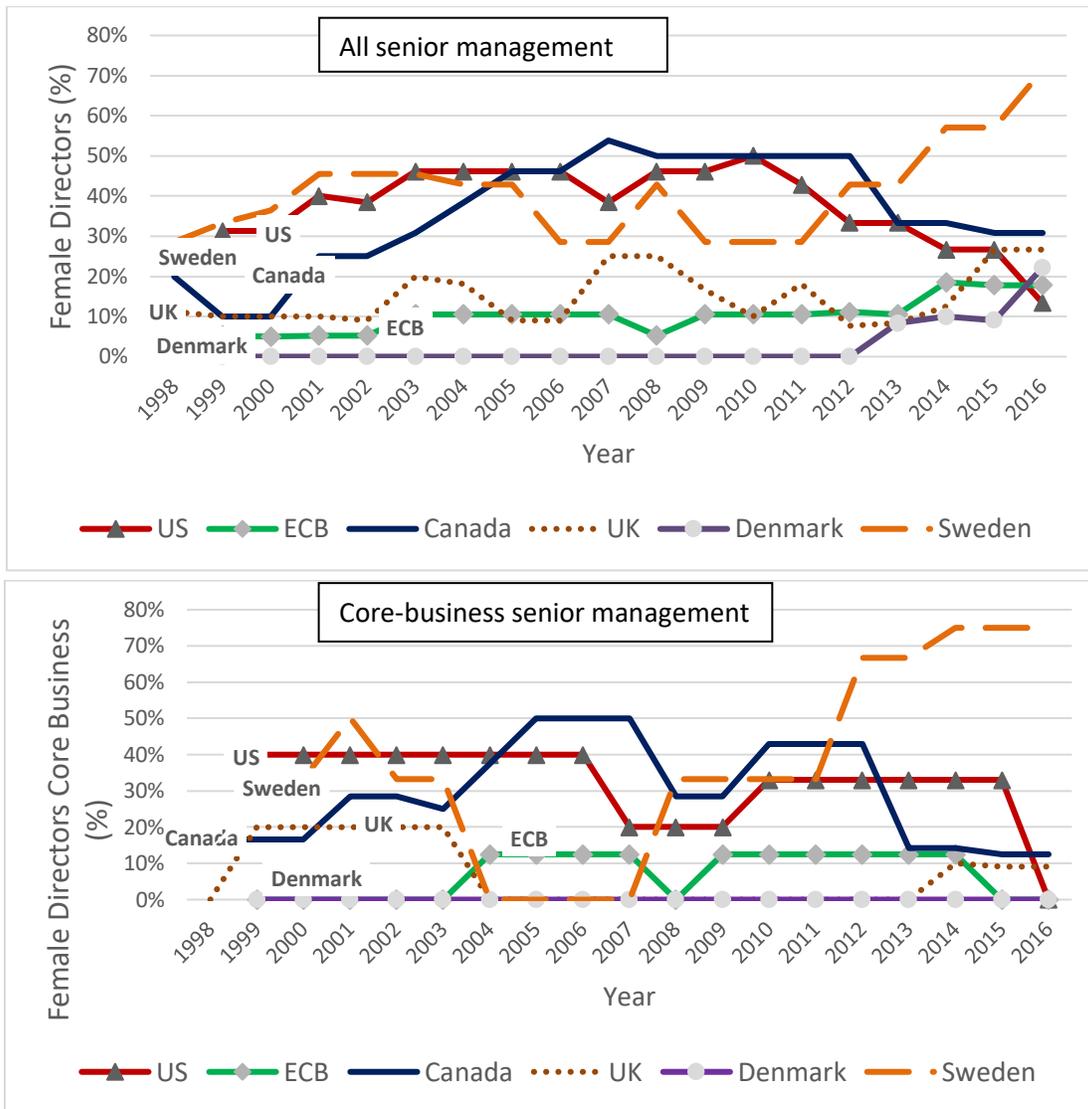
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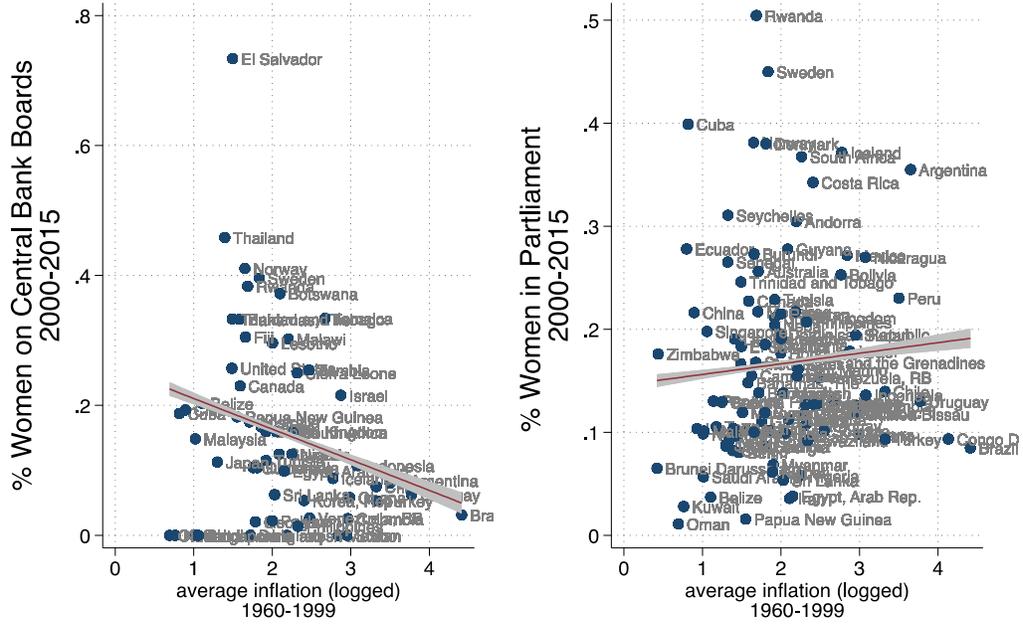
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Figure 2. Percent women in senior central bank management positions



Note: The source for the data are the central bank Annual Reports.

Figure 3: Bivariate Correlations Between Women's Representation and Historical Inflation



Countries Included in Sample		
(Model 3, Table 1)		
Albania	Greece	Oman
Argentina	Guatemala	Pakistan
Armenia	Guyana	Papua New Gu
Australia	Hungary	Peru
Austria	Iceland	Philippines
Azerbaijan	India	Poland
Bahamas, The	Indonesia	Portugal
Bangladesh	Iraq	Romania
Barbados	Ireland	Russian Feder
Belarus	Israel	Rwanda
Belgium	Italy	Saudi Arabia
Belize	Jamaica	Sierra Leone
Bhutan	Japan	Singapore
Bosnia and He	Jordan	Slovak Repub.
Botswana	Kazakhstan	Slovenia
Brazil	Kenya	South Africa
Bulgaria	Korea, Rep.	Spain
Canada	Kuwait	Sri Lanka
Chile	Kyrgyz Repub.	Sudan
China	Latvia	Sweden
Colombia	Lesotho	Switzerland
Croatia	Lithuania	Tajikistan
Cuba	Luxembourg	Thailand
Cyprus	Macedonia, FY	Trinidad and
Czech Republ.	Malawi	Tunisia
Denmark	Malaysia	Turkey
Egypt, Arab I	Malta	Turkmenistan
El Salvador	Mauritius	Uganda
Estonia	Mexico	Ukraine
Ethiopia	Moldova	United Arab I
Fiji	Mongolia	United Kingd
Finland	Namibia	United States
France	Netherlands	Uruguay
Georgia	New Zealand	Uzbekistan
Germany	Nigeria	Venezuela, RI
Ghana	Norway	Yemen, Rep.
		Zambia