Monetary and Fiscal Fetters: Macroeconomic Constraints and the Politics of Countercyclical Credit Management

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Abstract

Recent research suggests that governments adopt policies aimed to boost private credit growth as a policy response to adverse economic conditions, financial crises, and rising inequality (Rajan 2010, Kern and Amri 2016, Ahlquist and Ansell 2017). We build on this work and test a new political theory of credit growth, in which governments encourage private credit growth as an instrument of domestic stimulus when they face more stringent on the use of traditional macroeconomic policy tools (monetary and fiscal policy). We test this argument using time-series, cross-sectional data covering 73 countries from 1986 to 2012. Using data on countries' Mundell-Fleming "trilemma" commitments and national/supranational fiscal rules, we find strong evidence that more stringent monetary and fiscal policy constraints have a significant countercyclical effect on the rate of private credit growth. We also conduct a synthetic control analysis on the "PIIGS" countries of the Eurozone (Portugal, Ireland, Italy, Greece, and Spain) from 1999 to 2012. We find that these countries became significantly more likely to pursue policies of credit growth during economic downturns after adopting the Euro than they were in the 1980-1998 pre-EMU period. These results strongly suggest that Eurozone governments seek to escape the monetary and fiscal fetters imposed by EMU membership by embracing private credit growth as an alternative to monetary and fiscal stimulus.

Introduction

A decade since the collapse of Lehman Brothers and the onset of the most serious banking and financial crisis since the interwar era, the massive scope of the transatlantic "Lost Decade" has become apparent. Although overall unemployment has returned to pre-crisis levels in most industrialized countries, it remains extremely high in the countries hit most severely by the Eurozone crisis (e.g., Greece and Italy), and youth unemployment remains stubbornly high throughout the Eurozone. Even in countries that have done relatively well during the crisis, higher rates of economic growth mask severe and rising levels of income and wealth inequality (Piketty 2013, Milanovic 2016). In the US, the economy still remains significantly smaller than it would have been based on its pre-crisis trend (Barnichon et al. 2018).

In addition to the economic damage, the past decade of financial crises and Great Recession has had massive political effects across the industrialized world. From the victory of "Leave" in the United Kingdom's June 2016 Brexit referendum, to the election of Donald Trump in the United States and the rise of right-wing nationalist and Euroskeptic parties in most EU member-states, the economic crises and shocks of the last decade have transformed the political landscape in the world's richest countries. Right-wing leaders, from Donald Trump to Nigel Farage to Marine Le Pen, have seized on widespread insecurity to assert a new xenophobic nationalism, rejecting migrants and refugees and fueling a backlash against free trade. Although the electoral fortunes of these candidates and parties has been decidedly mixed—as evidenced by Emmanuel Macron's victory in the 2017 French presidential election and the re-election of Angela Merkel in Germany in September, 2017—politics in OECD countries have clearly taken a "hard right turn" (Funke et al. 2016). This stark rightward shift in rich countries' domestic politics has also cast doubt on the

future of the liberal international economic and political order (Morrison 2017, Pepinsky 2017, Staniland 2018).

Given the serious economic and political consequences of financial crises and recessions, governments have strong incentives to adopt policies that mitigate their negative impact on economic growth, employment, and voters' wealth and income. Understanding the ability and willingness of governments to manage their economies in response to financial crises and economic downturns remains a question of urgent importance. In this paper, we build on important recent work on the political economy of government policy responses to crises and adverse economic conditions (Walter 2013, Chinn and Frieden 2012, Ahlquist and Ansell 2017). We develop and test a new political theory of credit growth, in which governments encourage private credit growth as an instrument of domestic stimulus when they face *de jure* and *de facto* constraints on the use of monetary and fiscal policy.

We argue, and show, that governments under more severe Mundell-Fleming "trilemma" constraints—fixed exchange rates, capital mobility, and lack of monetary policy autonomy—are more likely to employ private credit as a countercyclical stimulus tool than countries without such constraints (Mundell 1960, Fleming 1962). Likewise, we also show that governments whose fiscal policy autonomy is constrained by national or supranational fiscal rules—restrictions on debt levels, deficits, and expenditures—are more likely to pursue countercyclical credit management. We find similar effects for governments that have borrowed heavily in foreign currency and are already highly indebted. Furthermore, we show that these incentives to substitute credit growth for monetary and fiscal policies are strongest for left-wing governments and in times of economic stagnation. We test this argument using time-series, cross-sectional data covering 73 countries from 1986 to 2012. In addition, we conduct a synthetic control analysis on the "PIIGS" countries

of the Eurozone (Portugal, Ireland, Italy, Greece, and Spain) from 1999 to 2012. We find that these countries became significantly more likely to pursue policies of credit growth during economic downturns after adopting the Euro than they were in the 1980-1998 pre-EMU period. Together, these results strongly suggest that governments more constrained by monetary and "fiscal fetters" embrace private credit growth as a substitute for monetary and fiscal stimulus.

The remainder of our paper proceeds as follows. We begin with a brief survey of the relevant literatures on the determinants of credit growth, financial crises, and post-crisis policies before introducing our theory. We then present our data and empirical analysis and conclude with a discussion of the implications of our findings for our understanding of the political economy of financial crises.

Financial crises and the politics of macroeconomic stimulus: existing literature

The literature on the origins of financial crises focuses heavily on the origins of high levels of private credit growth. Following the conclusion that surges in private credit growth ("credit booms") are one of the most significant predictors of financial crises (Schularick and Taylor 2012, Jorda et al. 2016), scholars have attempted to determine when and why credit growth exceeds sustainable levels. A range of studies have established links between credit booms and capital inflows or large current account deficits (e.g. Mendoza and Terrones 2008, Reinhart and Reinhart 2009, Elekdag and Wu 2011, and Plantin and Shin 2018), suggesting that financial crises may be the product of large inflows of foreign capital and severe balance of payments imbalances (Chinn and Frieden 2011, Walter 2013). Other studies, however, question the causal chain linking capital inflows to credit growth. Copelovitch and Singer (2017) find that large capital inflows are destabilizing in certain types of financial systems—namely, those in which banks compete

alongside large and deep securities markets—but that inflows primarily affect financial stability by altering the quality of bank lending rather than the overall level of credit. Moreover, Amri et al. (2016) find that the link between capital surges and credit booms may not be as strong as often represented: depending on measurement choices, an average of only 8-28% of credit booms are preceded by capital surges, whereas just 3-12% of capital surges were followed by credit booms (Amri et. al. 2016, 19, 23).

A related body of work focuses not on the capital flow/credit boom nexus but rather on credit growth as a policy outcome. Rather than simply reflecting lending by domestic financial institutions flush with newly available international capital, domestic credit growth may instead be an intentional government policy response to rising income inequality (Rajan 2010, Ahlquist and Ansell 2017) or to adverse economic conditions, especially prior to elections, in line with the logic of "political credit cycles" (Kern and Amri 2016). The logic behind these studies is that government policies that increase credit flows or make borrowing cheaper for consumers and firms will stimulate the economy through a variety of channels, including increased growth and rising personal income. We add to this literature by offering a new political theory of private credit growth. While we agree with existing work that governments have strong incentives, under certain conditions, to increase the flow of private credit, these incentives must be evaluated in the context of other macroeconomic policy tools available to governments. We argue that governments are most likely to act to increase private domestic credit growth when they are unable to employ the more traditional tools of macroeconomic adjustment: monetary and fiscal policy. As noted above, this is especially the case for countries that have adopted fixed exchange rates and full capital

account openness, in line with the Mundell-Fleming "trilemma," as well as for countries that have adopted national or supranational fiscal rules that limit their ability to spend and borrow.[1]

Countercyclical credit management: a political theory of credit growth

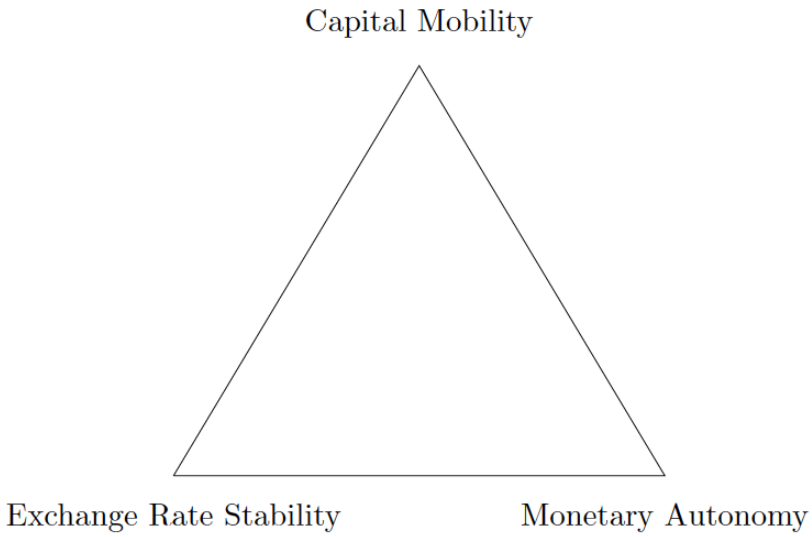
The supply-side politics of credit growth: macroeconomic policy constraints

Our theory focuses on the monetary and fiscal policy commitments that constrain a government's ability to adjust in response to financial crises, rising inequality, and economic stagnation. We focus first on monetary commitments, building off of the logic of the canonical Mundell-Fleming model, which outlines a fundamental macroeconomic policy conundrum faced by all governments in the modern global economy (Mundell 1960, Fleming 1962). The Mundell-Fleming trilemma, as illustrated in Figure 1, depicts trade-offs between three competing monetary policy goals: global financial integration, exchange rate stability, and domestic monetary policy autonomy. Each of these dimensions contains a spectrum of policies, but they are best illustrated by their ideal points: full capital mobility, a fixed exchange rate, and fully autonomous monetary policy. Since the 1980s, there has been relatively little meaningful variation in capital account openness in higher-income countries, with most governments maintaining open capital accounts

[1] Economists have engaged in a robust debate about whether the monetary trilemma has now been transformed into a dilemma. Rey (2013) provides evidence of substantial positive co-movements in gross capital flows and asset prices around the world, which are in turn correlated with the VIX index, a measure of market volatility and uncertainty based on the implied volatility of S&P 500 Index options. She argues that the existence of this "global financial cycle" means that, regardless of exchange rate choice, countries with open capital accounts lack monetary policy autonomy, contradicting the trilemma. Various authors (e.g., Bruno and Shin 2015, Miranda-Agrippino and Rey 2015, Rey 2016) also find that the global financial cycle is substantially driven by changes in U.S. monetary policy. On the other hand, Klein and Schambaugh (2015) find significant differences in monetary policy autonomy between pegged and floating countries with open capital accounts, suggesting that the trilemma remains relevant. Georgiadis and Mehl (2016) show that domestic monetary policy shocks may be amplified or diminished by a country's net foreign currency position, which implies that floating countries may still have access to effective independent monetary policy. Our argument builds on this latter perspective and brings the focus on macroeconomic policy autonomy in the modern age of global finance into conversation with the aforementioned political economy literature on policy responses to financial crises and adverse economic conditions.

and refraining from imposing capital controls (Aizenmann et al. 2010). As a result, in many cases the trilemma choice has distilled—in practice—to a trade-off between the exchange rate stability rendered by fixing the exchange rate, or monetary policy autonomy and a flexible exchange rate.

Figure 1: Mundell-Fleming Trilemma: Pick Two



For countries with fixed exchange rates and open capital accounts, private credit offers a way to circumvent constraints on traditional macroeconomic tools that are occupied with maintaining the exchange rate. As monetary policy is targeted at the exchange rate and not domestic economic conditions, manipulations of domestic credit should be less likely to be limited by tightening or loosening monetary conditions. Thus, governments with open capital accounts and fixed exchange rates should find private credit more attractive as a demand management tool than those with flexible exchange rates for two reasons: (1) fixed exchange rates remove access to a crucial macroeconomic management tool, monetary policy, thereby restricting governments' menu of available policy tools; and (2) lack of monetary policy should create more policy space for

independent private credit expansions as they will not be directly constrained by targeted adjustments to the money supply. This gives rise to our first hypothesis:

> *H1: All else equal, rates of private credit growth should be higher in countries faced with more stringent trilemma constraints*

While the Mundell-Fleming trilemma primarily emphasizes trade-offs in monetary policy objectives, these commitments also have implications for fiscal policy (Clark and Hallerberg 2000, Schoenmaker 2013). Theoretically, fixed exchange rates enable governments to enact effective fiscal policy expansions because central banks are engaged in maintaining the exchange rate rather than managing domestic economic conditions (Clark and Hallerberg 2000). Under flexible exchange rates, in contrast, fiscal expansions are more likely to be neutralized by an adjustment in the money supply, although there is some evidence that fiscal policy still has a positive effect on output under flexible rates (e.g., Bodea and Higashijima 2017). Thus, governments' facing more stringent monetary commitments may still retain some degree of fiscal policy autonomy.

However, governments may also face constraints on their fiscal policy autonomy through the adoption of national or supranational rules limiting budget deficits, debt levels, and/or expenditures. In some cases, these rules are directly related to monetary commitments, as in the case of the EMU's Stability and Growth Pact, which regulates member-states' budget deficits and debt levels. In most cases, however, these rules are separate, as in the adoption of balanced budget laws at the national or subnational level. In either case, fiscal commitments to limit spending, borrowing, and/or deficits further constrain a government's ability to adjust and respond to economic downturns, financial crises, and other shocks. This gives rise to our second hypothesis:

> *H2: All else equal, rates of private credit growth should be higher in countries faced with more stringent fiscal policy constraints*

While we focus primarily on *de jure* fiscal policy constraints imposed by national and supranational rules, governments may also face *de facto* constraints on their ability to borrow, even if they are not bound by fiscal rules limiting debt, deficits, or spending. These *de facto* constraints arise in cases where sovereign debt levels are already high, especially when governments borrow primarily in foreign currency. Under these conditions, governments have less "room to move" in the face of financial crises, recessions, and economics shocks (Mosley 2000).

In sum, we argue that a government's monetary and fiscal commitments are vital to understanding credit growth and the politics of macroeconomic management. The tools available to governments to manage their national economies are directly related to their monetary and fiscal commitments: countries with open capital accounts and fixed exchange rates opt to forgo monetary policy autonomy, thereby losing a principal instrument for managing the economy. Similarly, fiscal rules may further constrain governments' ability to adjust to financial crises, economic downturns, and other shocks. Finally, highly indebted governments and those borrowing heavily in foreign currency may also find their fiscal autonomy limited.

The demand-side politics of credit growth: economic downturns and partisanship

While trilemma commitments and fiscal rules constrain governments' macroeconomic policy autonomy, the question remains as to when governments are most likely to attempt to circumvent these "fiscal fetters." We focus here on two possible variables: the state of the economy and the partisan identity of the government in power. First, we expect that the aforementioned legal and institutional constraints on macroeconomic policy autonomy will be most binding in bad economic times. Domestic political pressure to "fix" the economy is likely to be greatest in periods of slower economic growth and higher unemployment, such as following

financial crises or in the midst of recessions. Faced with the political consequences of economic turmoil but unable to employ traditional policy tools, governments have strong incentives to find an alternative mechanism of economic stimulus. Thus, we expect that the manipulations in private credit by countries with more stringent trilemma and fiscal rule commitments will be countercyclical rather than procyclical, because the constraints on traditional monetary and fiscal tools force more procyclical policy than under conditions of greater macroeconomic policy autonomy. This gives rise to our third hypothesis:

> *H3: All else equal, governments under more stringent monetary and fiscal constraints will be more likely to pursue countercyclical credit management when economic growth declines*

Second, we anticipate that the search for policy alternatives rendered by constraints on monetary and fiscal stimulus will be more likely under left-wing governments than right-wing governments due to their distinct political bases. Left-wing parties historically represent lower economic classes and domestically-oriented constituents such as laborers, producers of non-tradable goods and services, and import-competitors, whereas right-wing parties tend to capture the upper classes, often including export producers and corporate and financial actors (Alesina et al. 1997, Iversen and Soskice 2006). These constituencies give rise to distinct preferences over macroeconomic policies, with right-wing parties supporting tighter fiscal and monetary conditions, higher interest rates, less inflation, and less redistribution than left-wing parties (Alvarez et al. 1991, Iversen and Soskice 2006). Redistribution generally brings to mind fiscal policy and taxation, but credit growth can also be an effective redistributive policy tool (Rajan 2010, Ahlquist and Ansell 2017). Moreover, though there is substantial debate about the extent to, and conditions under, which partisan economic cycles occur, parties do retain some autonomy to implement their

preferred macroeconomic policies (Mosley 2000, Clark and Arel-Bundock 2013, Kern and Amri 2016). Given left-wing parties' distinct voter constituencies, political pressures should make them more likely to attempt to escape the constraints imposed by trilemma constraints and fiscal rules, and they should therefore find credit expansions more attractive as a policy response to economic downswings. Consequently, our final hypothesis is:

> *H4: All else equal, rates of credit growth should be higher under left-wing governments than right-wing governments in countries with more stringent monetary and fiscal constraints.*

In sum, our argument links supply-side constraints on government policy autonomy with demand-side pressures to offset the negative effects of economic stagnation. Governments with less monetary and fiscal policy autonomy should be more likely to pursue countercyclical credit management than those with greater macroeconomic flexibility, and this should be most likely in hard economic times and for left-wing governments. In contrast, governments with fewer trilemma and fiscal constraints will be more likely to use these traditional policy levers to manipulate the business cycle, and the ability of these tools to respond directly to domestic economic conditions limits the scope for effective and independent credit policies.

Empirical Analysis

In order to test these hypotheses, we first analyze a dataset of 73 middle- and high-income countries from 1986 to 2012. Throughout our analysis, we employ an error-correction linear model with fixed effects and clustered standard errors robust to spatial and temporal dependence. The results remain substantively similar if we use regular fixed effects models with cluster-robust standard errors; however, given the global nature of finance—perhaps best exemplified by the

spreading of financial crises via contagion— the spatial dependence specification better accounts for interdependence among groups as well as heteroskedasticity between groups (Driscoll and Kraay 1998).

We employ a single-equation error correction model (ECM) for our analysis. The ECM specification is appropriate in cases where there are both long-term equilibrium relationships between X and Y and short-run fluctuations as a result of period-to-period changes in the explanatory variables (see De Boef and Keele 2008, 185-87; Box-Steffensmeier et. al. 2014, 150-70; Soroka et. al. 2015, 464-65). ECMs are useful for estimating both relationships and are applicable to both integrated and stationary time series. The estimated specification is:

$$\Delta Y_t = \alpha + \alpha_1 Y_{t-1} + \beta_0 \Delta X_t + \beta_1 X_{t-1} + \beta e_t$$

where X is a vector of covariates. β_0 and β_1 are vectors of associated coefficients for the year-on-year change and lag versions of these covariates, respectively. In this specification, changes in Y are a function of contemporaneous changes in X, as well as the one period lagged values of both X and Y. If the ECM is appropriate, then $-1 < \alpha_1 < 0$ and α_1 is statistically significant.

We analyze two dependent variables as measures of private domestic credit growth. The first is the yearly change in private credit provision as a percentage of GDP, with a mean of 1.43 (percent) and a standard deviation of 5.70.[2] Our second dependent variable is the year-on-year change in M3, broad money, relative to GDP, which captures wider money and credit availability.[3] M3 includes the narrow components of the money supply in M1 and M2, along with large time deposits, money market funds, and other measures of private credit. As such, it provides information about the overall stock and flow of credit in the economy that is not included in the

[2] Data from: *World Development Indicators*. Washington, D.C.: The World Bank.
[3] Ibid.

narrower monetary aggregates (M1 and M2) used by central banks as monetary policy targets.[4] Our sample for M3 covers 52 countries, and has a mean of 8.96 and a standard deviation of 25.71.

Our first key independent variable, *Trilemma*, is a composite measure of monetary policy constraints. To construct this variable, we draw on the trilemma indices data of Aizenmann, Chinn, and Ito (2012). These data code the three "corners" of the Mundell-Fleming trilemma: monetary policy autonomy, exchange rate stability, and capital account openness. Each variable is scaled on a continuous 0 to 1 index, with 0 indicating complete policy autonomy and 1 indicating no policy autonomy. Thus, exchange rate stability takes a value of "0" when a country has adopted a freely floating exchange rate regime, and a value of "1" when it has adopted a hard peg fixed exchange rate. Capital account openness takes a value of "0" when a country has imposed complete capital controls and a value of "1" when it has removed all controls. To measure monetary policy autonomy, Aizenmann et al. calculate "the reciprocal of the annual correlation between the monthly interest rates of a country and its "base" country (the country to which it pegs its exchange rate or would be most likely to do so) (2013).[5] *Trilemma* is the sum of these three variables, normalized between 0 and 1. Higher values, therefore, indicate less macroeconomic policy autonomy. For example, member-states of the Eurozone have a trilemma index value of "1" indicating that they have a completely fixed exchange rate, no monetary autonomy, and complete capital account openness. We include both the one-year lag and the year to year change in this variable, reflecting the conviction that credit conditions may be influenced both by long-run trends as well as short-term changes in macroeconomic policies. In our full sample, the trilemma index has a mean of 0.59 and a standard deviation of 0.2, with an observed minimum of 0.1.

[4] https://www.newyorkfed.org/aboutthefed/fedpoint/fed49.html
[5] On base countries, see Klein and Shambaugh (http://www.dartmouth.edu/~jshambau/Papers/KleinShambaughClassificationDescription.pdf).

Our second key independent variable is *Fiscal rules*, a count of the number of national and supranational rules a country has adopted that limit its fiscal policymaking autonomy. The data for this variable are drawn from the IMF's *Fiscal Rules Dataset, 1985-2015*, which covers 96 countries and defines a fiscal rule as that which "imposes a long-lasting constraint on fiscal policy through numerical limits on budgetary aggregates. Fiscal rules typically aim at correcting distorted incentives and containing pressures to overspend, particularly in good times, so as to ensure fiscal responsibility and debt sustainability" (IMF 2017). The dataset includes variables measuring four types of rules: budget balance rules, debt rules, expenditure rules, and revenue rules, applying to the central or general government or the public sector. We employ the count variable measuring the total number of fiscal rules in place for a country—whether national or supranational—in a given year. The number ranges from 0 to 6 in our sample, with a mean of 1.3. Figures 2 and 3 show the distributions of both dependent variables and the monetary and fiscal indices.

Figure 2: Sample distributions of private credit (left) and broad money (right)

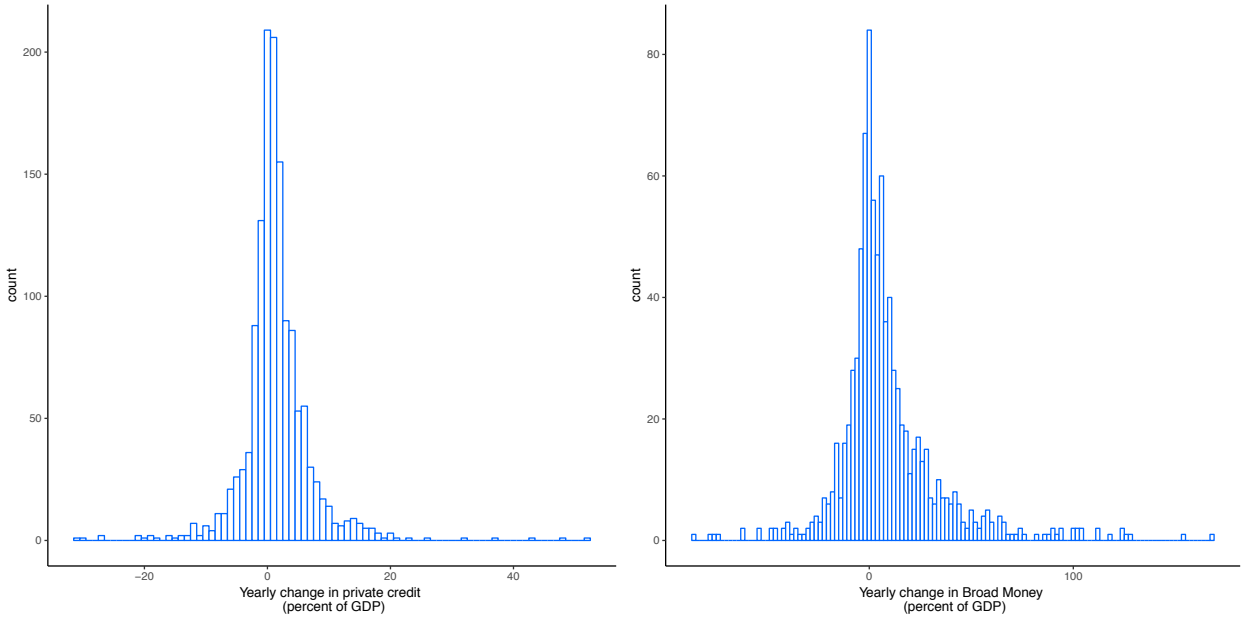
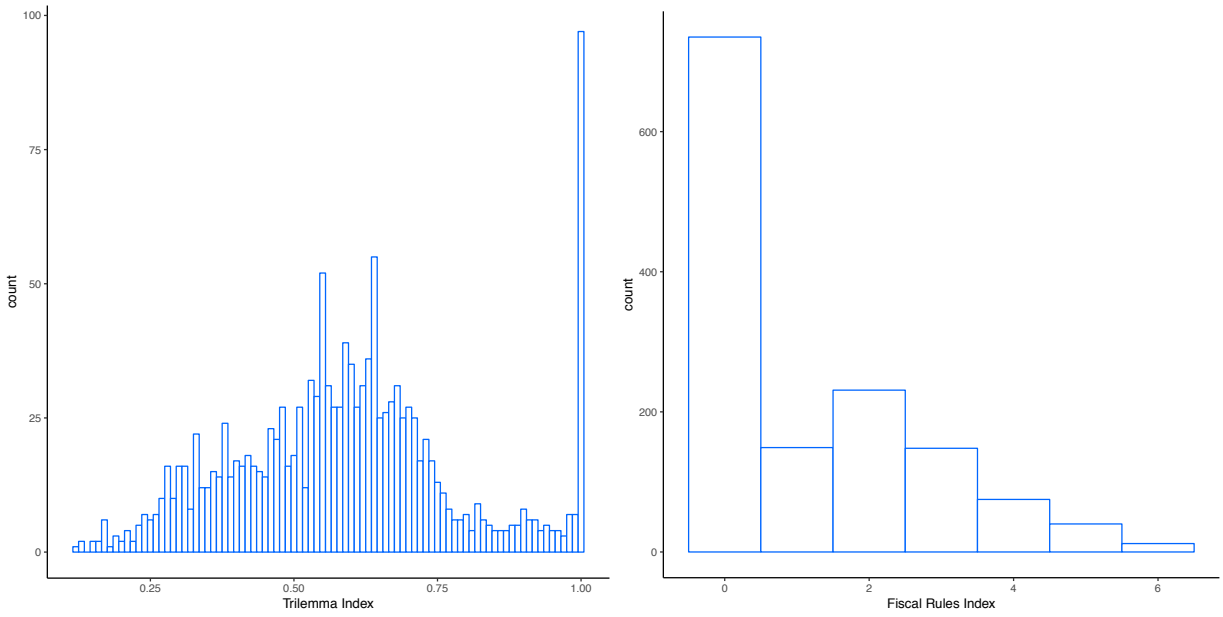


Figure 3: Sample distributions of monetary (left) and fiscal indices (right)



In addition to legal fiscal policy constraints, we use two measures that can represent *de facto* fiscal constraints. The first is the percentage of foreign currency denominated public and publicly-guaranteed debt as a percentage of total sovereign debt. We construct this measure using the "Currency composition of PPG debt" data from the *WDI*. The World Bank only carries currency composition data for low and middle-income countries, so our *foreign currency debt* measure covers 39 countries of the 73 of our full sample. The rationale for including this *de facto* measure is that countries who have high levels of foreign currency denominated debt might find it harder to continue financing fiscal policy by borrowing. The second *de facto* fiscal measure we control for is public debt as a percentage of GDP, with the reasoning that higher levels of debt constrain further borrowing. These data cover the whole sample and are taken from the IMF's *Historical Public Debt Database* (IMF 2016).

Finally, our left-wing government variable is a simple dummy variable indicating whether or not all major government branches are controlled by a left-wing party; the measure combines the left-center-right measure of executive ideology, from the World Bank *Database of Political Institutions* (2015), with the *DPI*'s "allhouse" variable, indicating that the party of the executive also controls the legislature.[6] As with all the independent variables, we include one-year lagged levels as well as changes, although our primary quantity of interest here is the level, since changes measure both partisanship and shifts in the government in power, and because the lagged partisanship of the government is more likely to affect current credit growth and policies than the current-period change. We also include a range of economic and political controls that likely

[6] While the World Bank DPI executive ideology variable has some shortcomings—it is a blunt measure and constant across time despite the potential for shifting party positions—it is highly correlated with other measures of government partisanship (e.g. The Manifesto Project's RILE measure), and our results remain substantively the same if we use other measures.

influence credit growth, including level of democracy, current account balance, GDP, and dummies for financial crises.

We first run non-interactive models to estimate the unconditional effects of monetary and fiscal constraints on private credit growth. To investigate our subsequent hypotheses, we interact the lagged value of the monetary and fiscal indices with the yearly change in (log) GDP per capita, and then with the left-wing government dummy to find the conditional effects of macroeconomic constraints on private credit. The simple error-correction models with the full sample shows that, in support of our theory, monetary and fiscal policy constraints do indeed affect domestic money and credit conditions. From Table 1, we can see that the extent (levels) of both monetary and fiscal constraints is associated with a statistically and substantively significant, positive effect on credit growth and growth in M3, as predicted by our first and second hypotheses.[7] Holding all other covariates constant, a one standard deviation increase in the trilemma index, reflecting less monetary autonomy and further global financial integration, is associated with an unconditional 1.43 percent increase in private credit relative to GDP and a 1.37 percent increase in M3 relative to GDP. Both effects are significant at the $\alpha < 0.01$ level. We also find a significant and positive effect of legal fiscal constraints on both private credit and M3. All else constant, a one standard deviation increase in fiscal rules is associated with a 1.16 percent increase in private credit, and an even stronger 3.6 percent increase in broad money relative to GDP. Both effects are again significant at the $\alpha < 0.01$ level, indicating strong support for our second hypothesis.

For comparison, these effects are similar in magnitude to—or even larger than—that associated with an increase in the current account deficit: a one standard deviation increase in the current account deficit (as a percentage of GDP), corresponds to a 1.23 percent increase in private

[7] All specifications include the same controls. Subsequent tables omit them for space concerns.

credit relative to GDP. Much of the literature on credit growth and financial crises has emphasized a link between capital inflows (i.e. current account deficits) and credit growth (e.g. Mendoza and Terrones 2008, Reinhart and Reinhart 2009, Elekdag and Wu 2011, Amri et al. 2016, and Plantin and Shin 2018); in support of our theory, we are able to show an additional and strong effect of domestic macroeconomic policy choices on the rate of private credit provision.

With respect to our other independent variables, we recover a negative relationship between public debt levels and private credit. This may represent competition between public and private investment, reflecting a crowding out effect of public spending. On the other hand, we find a positive effect of public debt on broad money. This makes intuitive sense: an expansion of the public sector is reflected in an expanded monetary base. There is, however, a positive association between foreign currency denominated public debt and private credit, suggesting that foreign debt may constrain public borrowing and shift credit to the private sector. Finally, we see that left government has an unconditional effect only on broad money, and not on private credit.

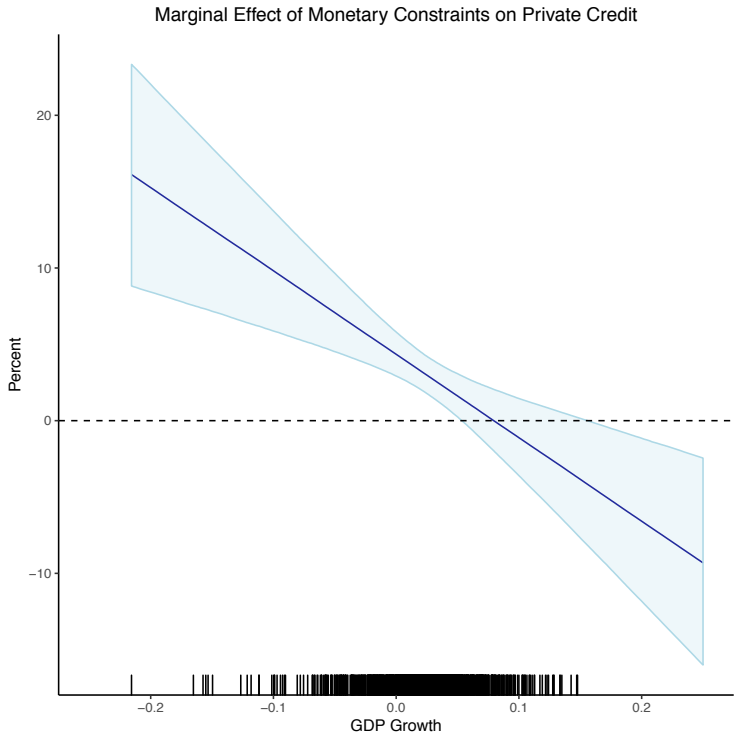
Below we present results for the empirical tests of our conditional hypotheses. We present marginal effects plots in the interest of space, though the regression tables can be found in the appendix. Figure 4 plots the interaction between monetary constraints, the business cycle, and the effect on private credit (see Table A1 in the appendix for regression results). Our third hypothesis predicts that the effects of monetary and fiscal policy constraints on credit growth should be *countercyclical.* In fact, this is precisely what we see with private credit growth as our dependent variable. Figure 4 shows that the effects of monetary constraints on private credit provision are strongly contingent on the stage of the business cycle: in downturns, increases in monetary policy constraints are associated with positive changes in private credit. However, while we find a strong

countercyclical relationship between monetary constraints and private credit, we find no conditional effects whatsoever of monetary constraints on growth in broad money.

Table 1: Full Sample with Driscoll-Kraay Standard Errors

	Dependent variable:	
	Δ Private Credit (pct GDP)	Δ Broad Money (pct GDP)
	(1)	(2)
Private credit$_{t-1}$ (pct GDP)	−0.070***	
	(0.023)	
Broad money$_{t-1}$ (pct GDP)		−1.017***
		(0.035)
Trilemma index$_{t-1}$	7.189***	8.400***
	(1.363)	(3.193)
Δ Trilemma index	0.066	12.690*
	(1.270)	(7.190)
Fiscal rules index$_{t-1}$	0.769**	3.051***
	(0.369)	(0.814)
Δ Fiscal rules index	−0.267	−0.911
	(0.341)	(1.318)
Foreign currency debt$_{t-1}$ (pct)	0.090**	−0.222
	(0.045)	(0.176)
Δ Foreign currency debt (pct)	−0.085	−0.410
	(0.062)	(0.259)
Left$_{t-1}$	1.395	4.885**
	(0.927)	(2.409)
Δ Left	1.276	0.364
	(1.144)	(3.952)
Public debt (pct GDP)$_{t-1}$	−0.025***	0.059*
	(0.006)	(0.034)
Δ Public debt (pct GDP)	−0.009	0.103***
	(0.015)	(0.036)
Current account balance$_{t-1}$	0.166***	0.119
	(0.041)	(0.083)
Δ Current account balance	0.112***	0.028
	(0.031)	(0.057)
Polity$_{t-1}$	−0.010	−0.121
	(0.051)	(0.256)
Δ Polity	−0.192*	0.097
	(0.103)	(0.218)
GDP per capita$_{t-1}$	3.670***	22.909***
	(1.071)	(4.575)
Δ GDP per capita	−20.744***	5.110
	(6.589)	(10.220)
Banking crisis$_{t-1}$	−3.073***	3.234**
	(0.463)	(1.502)
Banking crisis$_t$	1.150*	2.457
	(0.654)	(2.450)
Constant	−39.316***	−163.119***
	(12.045)	(31.945)
Observations	1,390	890
Groups	73	56
Fixed Effects	✓	✓
Adjusted R^2	0.229	0.806
F Statistic	223,248.31*** (df = 44; 25)	34,685.5*** (df = 44; 25)
Note:		*p<0.1; **p<0.05; ***p<0.01

Figure 4: Monetary Constraints and Economic Growth
(DV: Private Credit/GDP)



We also find strong countercyclical effects of legal fiscal rules on private credit *and* broad money: more fiscal rules are associated with higher rates of private credit and broad money growth during downturns. Figures 5 and 6 plot the interactions between fiscal rules and GDP growth for each dependent variable (see Table A2 for regression results). In a final exploration of *H3*, we investigate the relationship between foreign currency borrowing and public debt levels. While not capturing the business cycle *per se*, public debt levels capture a fiscal policy cycle that is often countercyclical as public expenditures increase with social insurance outlays during recessions. There is no strong relationship between public debt, foreign-currency debt, and broad money, but we do find significant relationships between public debt, foreign-currency debt, and private credit

provision (Table A3). Figure 7 plots this interaction. We see a strong positive effect of foreign-currency borrowing on private credit at high levels of public debt. This makes intuitive sense:

Figure 5: Legal Fiscal Constraints and Economic Growth
(DV: Private credit/GDP)

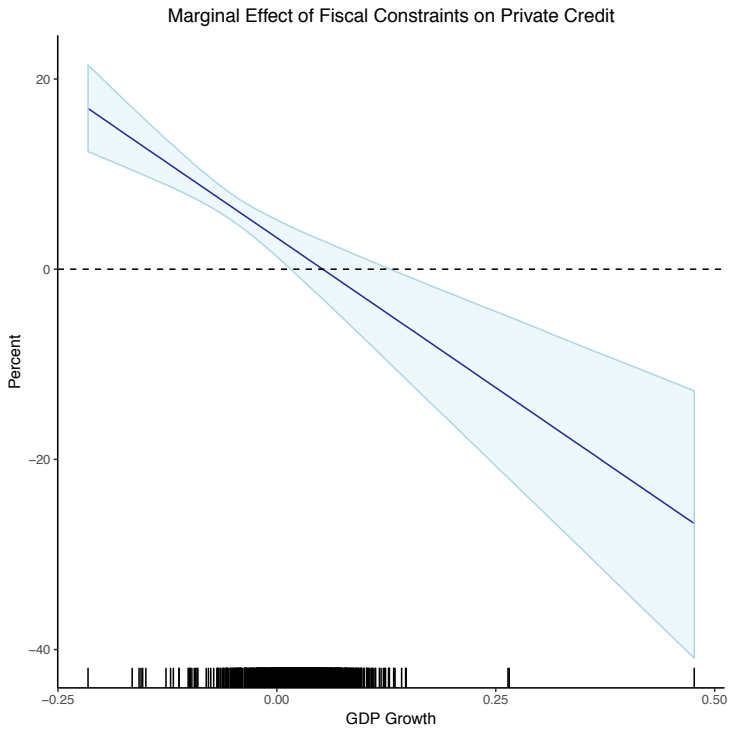


Figure 6: Legal Fiscal Constraints and Economic Growth
(DV: Broad money/GDP)

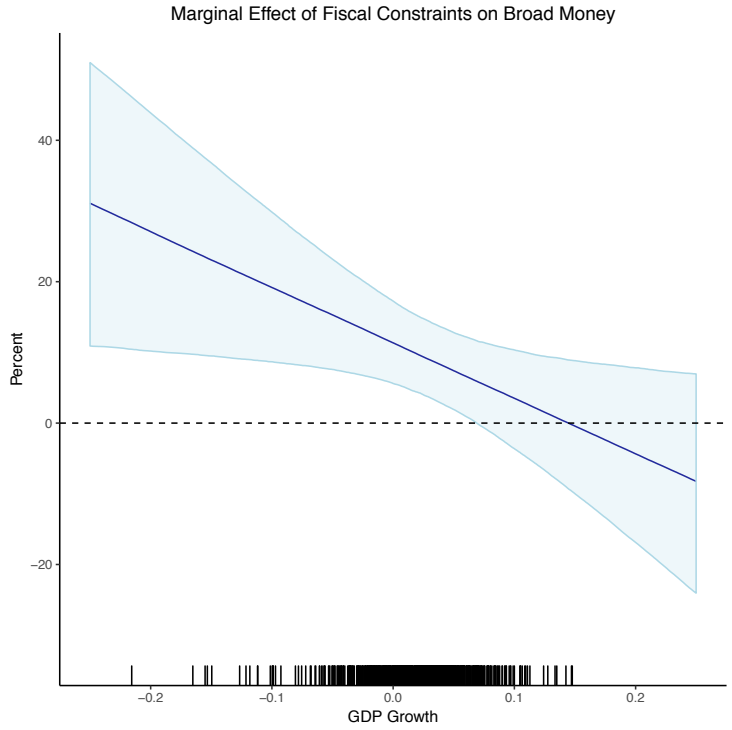
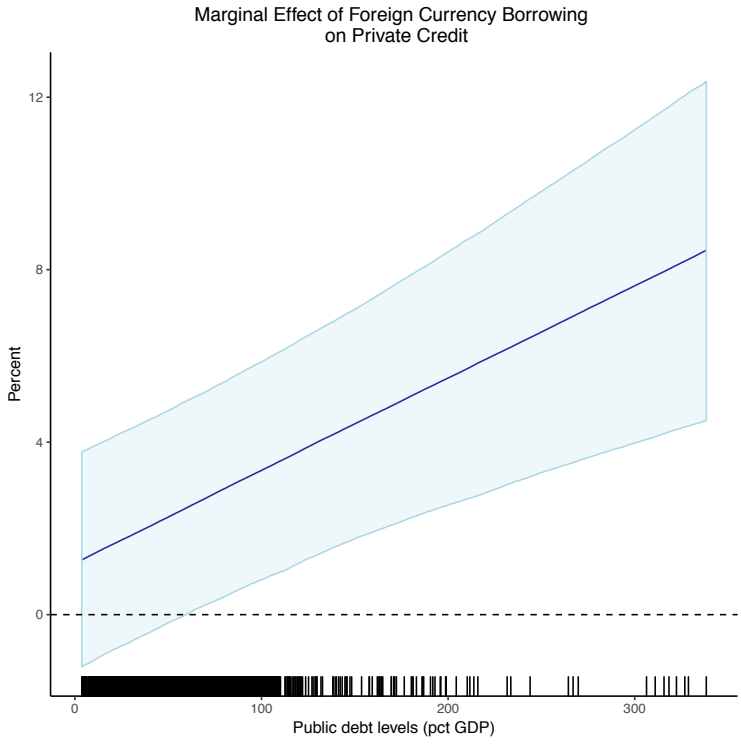


Figure 7: *De facto* Fiscal Constraints and Private Credit



higher levels of public debt represent greater *de facto* fiscal policy constraints, and in conjunction with high levels of foreign-currency debt, we might expect governments to feel particularly constrained with respect to public borrowing. In this case, they may turn to private credit stimulus as an alternative method of managing their economies. This pressure should be less intense if governments can finance fiscal policy through further foreign borrowing.

All told, the results of these interactive models suggest strong support for our theoretical framework that macroeconomic policy constraints—largely legal/institutional, but in some cases *de facto*—lead to countercyclical credit stimulus. In "good" times, both trilemma and legal fiscal rules are associated with lower levels of credit growth, as we would expect; governments committed to fixed exchange rates and capital account openness are more likely to adopt tighter monetary and fiscal policy than those choosing alternative points on the Mundell-Fleming trilemma and not facing legal fiscal constraints. In "bad" times, however, both types of constraints become "golden fetters" (Eichengreen 1992), and governments find themselves unable to lower interest rates and/or run larger deficits in order to stimulate the macroeconomy. As our results indicate, these are precisely the cases in which escaping the macroeconomic policy constraints via the incentivization of private credit growth becomes most attractive as a policy substitute.

Finally, we investigate our second demand-related hypothesis (*H4*): does government partisanship affect the pursuit of credit stimulus for governments that are otherwise policy constrained? We find strong evidence that it does (Tables A4 and A5). Figures 8 and 9 show that, across the board, left-wing governance and monetary and fiscal policy constraints are positively associated with both private credit and M3 growth. These results suggest that governments face asymmetric pressures to stimulate economic growth based on partisanship and distinct voter

constituencies. Left-wing governments may be more prone to search for alternative macroeconomic management tools when their hands are otherwise tied.

In sum, we find strong evidence for all four of our core hypotheses. Monetary and fiscal policy constraints are strongly associated with both private credit and broad money growth. Moreover, this effect appears crucially contingent on the business cycle; credit increases in constrained economies during downturns and decreases during upturns. We also find strong evidence of a partisan dimension to the countercyclical credit hypothesis: traditional macroeconomic policy constraints may "bite" harder for left-wing governments, and as a result credit growth is significantly higher under left-wing governance than otherwise. In what remains of our empirical analysis, we test our theory on the advanced economies of the EMU.

Figure 8: Left-wing Governance and Fiscal Rules
(DV: Private credit/GDP)

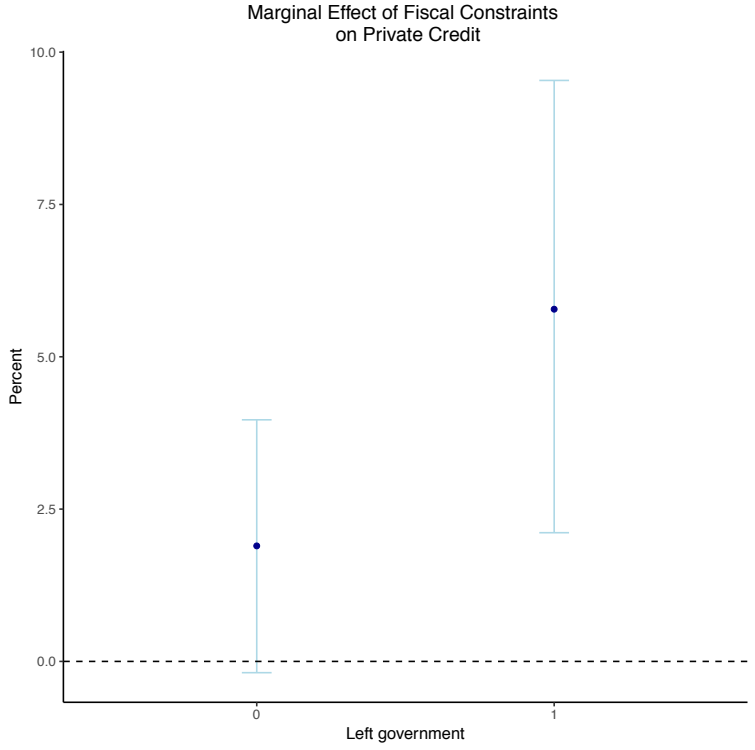
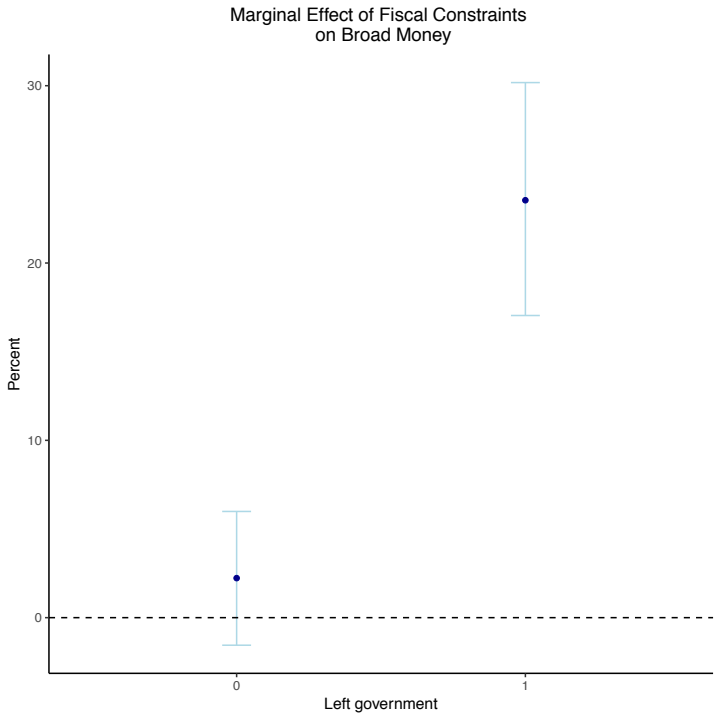


Figure 9: Left-wing Governance and Fiscal Rules
(DV: Broad money/GDP)



Synthetic control analysis: credit growth in Eurozone countries before and after EMU

Thus far, our analysis has shown that countries under more severe monetary and fiscal constraints are more likely to experience higher levels of private credit growth and more likely to reduce bank reserve requirements. These results are in line with our expectation that governments with less monetary and fiscal policy autonomy will pursue the provision of cheap credit as an instrument of domestic stimulus. In spite of these findings, endogeneity remains a potential concern. It may be the case that a country's choice of exchange rate regime, its level of capital account openness, and/or its adoption of fiscal policy rules in a given year may be influenced by private credit growth or financial regulations such as bank reserve requirements.

In order to address these concerns, we focus on a subset of countries in which monetary and fiscal policy constraints can be plausibly taken as exogenous: the member-states of the Eurozone. For Eurozone countries, monetary union means that member-states cannot adopt a more flexible exchange rate regime or independently use monetary policy as a tool of macroeconomic stimulus. In addition, as the Euro crisis has made abundantly clear, EMU countries have limited ability to employ fiscal policy in economic downturns. The Stability and Growth Pact (SGP), while unevenly and only partially enforced (Baerg and Hallerberg 2016), limits the fiscal policy autonomy of EMU member-states through a combination of debt and deficit targets and fiscal surveillance mechanisms. The SGP has been further strengthened since 2011 with the "Six Pack" and "Two Pack" reforms that increase budgetary surveillance and implement procedures to limit macroeconomic imbalances and excessive debt among and between EMU member-states.[8] Finally, as members of the EU's single market, the Eurozone countries have little ability to employ capital controls in the face of large capital inflows or outflows. Consequently, we seek to test our argument on the Eurozone sample of countries from 1999 to 2012, in order to see whether these countries have become more likely to pursue policies aimed at increasing credit growth in the years since they have sacrificed macroeconomic policy autonomy by adopting the single currency.

To do this, we employ the synthetic control method (SCM) for comparative case studies (Abadie and Gardeazabal 2003; Abadie et. al. 2010, Abadie et. al. 2015). SCM is similar to a difference-in-differences approach, but in contrast to DID, SCM estimates treatment effects for a treated unit of interest based on a weighted average of untreated units that closely matches the treated unit in the pre-treatment period (Galiani and Quistorff 2016). SCM is well-suited to

[8] On the SGP and the Six Pack/Two Pack reforms, see https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/european-semester/framework/eus-economic-governance-explained_en.

analyzing the Eurozone, since studying the Euro's effects presents small-sample data problems, and because finding relevant comparison units in a broader sample of countries is more difficult. The goal is to compare post-intervention (post-Euro adoption) outcomes on credit growth between the treated units (Eurozone member-states), and the synthetic control, which is not exposed to the intervention, for a post-intervention period (2000-2012) (Abadie et. al. 2015). In our analysis, we seek to compare an individual Eurozone member-state (e.g., Greece) against "synthetic" Greece, constructed from a weighted-average of non-Eurozone countries in our donor pool. Our expectation is that we should find further evidence of the countercyclical pattern identified in our previous analysis: following the adoption of the Euro (i.e., once trilemma constraints become more stringent), credit growth should be lower than it would be otherwise (i.e., if EMU countries had not adopted the single currency) in good economic times, but higher in bad times.

In order to generate our synthetic controls, we use a set of 14 non-Eurozone countries in the OECD as our donor poll. This sample excludes the post-Communist members that have joined since the mid-1990s, for which credit growth data are unavailable for the full 1980 to 2012 sample and which were not fully market economies until the mid-1990s. The countries in the donor pool include: Australia, Canada, Chile, Denmark, Iceland, Israel, Japan, Korea, Norway, Sweden, Switzerland, the United Kingdom, and the United States. Using this pool of countries, we draw on 19 years of pre-intervention data (1980-1998) to estimate the post-intervention outcomes for private credit growth. As Abadie et. al. (2015) note, matching on as large a number of pre-intervention observations as possible helps to control for unobserved factors and for the heterogeneity of the effect of observed and unobserved factors on outcomes (498).[9]

Since we are particularly interested in the propensity of trilemma-constrained governments

[9] We conduct our analysis using the *synth* command for Stata (Abadie et. al. 2010) and the *synth-runner* extension by Galiani and Quistdorf (2016).

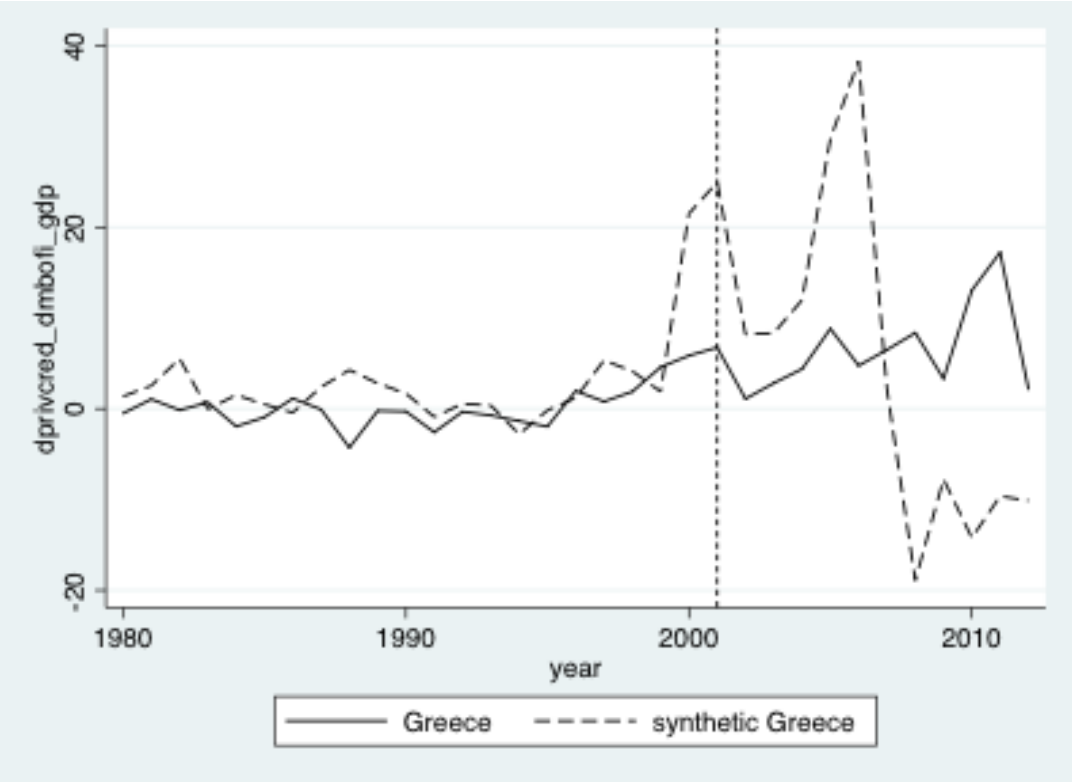
to adopt credit-increasing policies in hard times, we apply the SCM, specifically, to estimate the effect of monetary union on credit growth in the countries hit hardest by the global and Euro crisis shocks of 2008-12: the "PIIGS" countries (Portugal, Ireland, Italy, Greece, and Spain). The "treatment" variable is adoption of the Euro, which occurred in 1999 for the original twelve EMU member-states and 2001 for Greece. In the pre-intervention period, we use lagged values of the dependent variable (change in private credit/GDP) and the following independent variables for 1982, 1990, and 1998: trilemma index, lagged private credit/GDP, lagged current account deficit/GDP, and the lagged GDP per capita growth rate. We also include the 1980-1998 overall period average of the World Bank's systemic banking crisis variable to control for the effects of historical financial instability on outcomes in the post-Euro era.

For each of the PIIGS countries, we first estimate the treatment effect of EMU membership and generate the unit weights for each synthetic control. After estimating each effect, we then run placebo tests, which estimate the same model on each untreated unit in the donor pool, assuming it was treated at the same time (Galiani and Quistdorff 2016, 4). This generates a distribution of effects for the treated country and donor pool units, which enables us to estimate the probability that the estimated treatment effect was observed by chance. We exercise caution in interpreting these probability estimates as confidence intervals, since—as Abadie et. al. (2015) and Galiani and Quistdorff (2016, 4) note—they do not have the standard interpretation when treatment is not randomly assigned. Nonetheless, these estimates give us a sense of the cases and observations in which observed post-EMU changes in credit growth and reserve requirement are most likely to be statistically significant.

Figures 10-12 illustrate the estimated treatment effect, treatment vs. placebo effects, and estimated probabilities for Greece. The analysis generates a "synthetic Greece" that is a weighted

combination of Iceland (47.1%), Denmark (29.9%), Chile (12.3%), the US (1.7%), and Canada (0.09%). Figure 10 graphs observed vs. predicted credit growth for Greece vs. "synthetic Greece" before and after the country joined the Euro in 2001.

Figure 10: Trends in private credit growth, Greece vs. Synthetic Greece



We see here that the observed vs. estimated values in the pre-Euro area are quite close, while the estimated vs. observed outcomes after 2001, when Greece joined the Euro, deviate substantially. Credit growth in "synthetic Greece" is estimated to have been substantially higher in the pre-financial crisis years (2001-6), and substantially lower in the 2007-12 period, when Greece was rocked first by the global financial crisis and subsequently by the Eurozone debt crisis. This pattern suggests that monetary and fiscal constraints have had two effects in the post-Euro

era: restraining credit growth in "normal" times, while increasing credit growth in "crisis" periods. Such a pattern is in line with our expectation that governments unable to use monetary and fiscal policy as tools of macroeconomic adjustment may seek to increase credit growth as a substitute adjustment policy in hard times. Figures 11 and 12 provide an illustration of the likely significance of these effects.

Figure 11: Estimated treatment and placebo effects: credit growth, Greece vs. donor pool

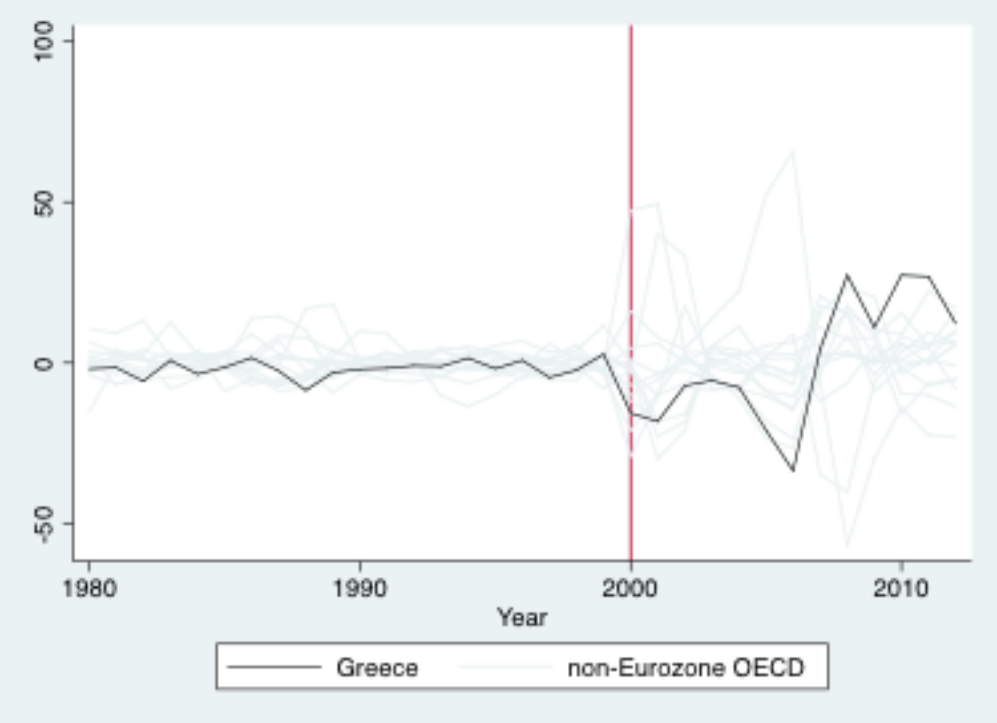
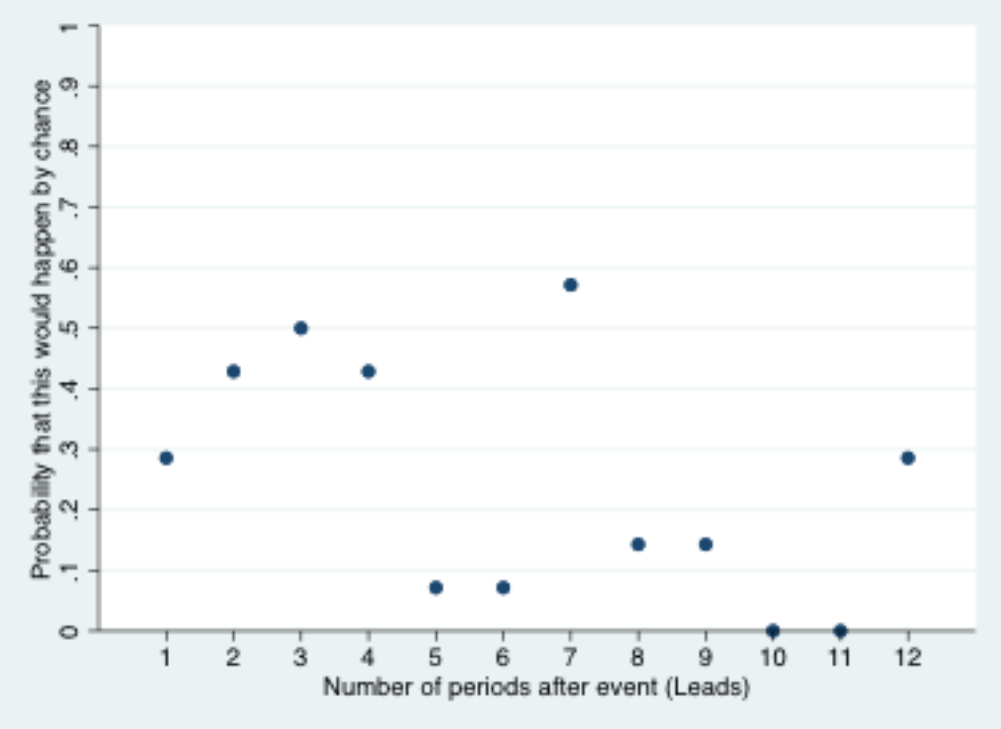


Figure 12: Greece – Probability that estimated treatment effect is observed by chance



As Figure 12 illustrates, the probability that the difference between Greece and "synthetic Greece" in 2010-11 is random chance is effectively zero, indicating that credit growth in Greece during the Euro crisis was almost certainly significantly higher than it would have been had Greece not joined the Euro and still retained monetary and fiscal policy autonomy. Figure 12 also provides weaker evidence that credit growth in Greece in 2006-7 was significantly lower than it would have been had Greece not joined the Euro: the probability that the estimated effects here for "synthetic Greece" are random chance is less than 10%. Thus, the Greek synthetic control analysis provides evidence of the same pattern we found earlier in the regression analysis: monetary and fiscal constraints contribute to a countercyclical pattern in credit growth, in line with our core argument.

Figures 13-15 illustrate the results of the synthetic control analysis for Spain. Here,

"synthetic Spain" is a weighted average of the observed values for Iceland (29.3%), Denmark (28.9%), Sweden (15.9%), Japan (12.3%), Norway (8.8%), Chile (2.9%), and the US (1.8%). Once again, the pre-intervention estimates closely mirror the actual observed values for Spain, particularly in the 1990s, before diverging markedly in the post-EMU era. Again, the same pattern is evident as with Greece: observed credit growth for Spain is lower than estimated credit for "synthetic Spain" in the pre-crisis period (2001-6) and higher in the crisis era (2007-12).

Figure 13: Trends in private credit growth, Spain vs. Synthetic Spain

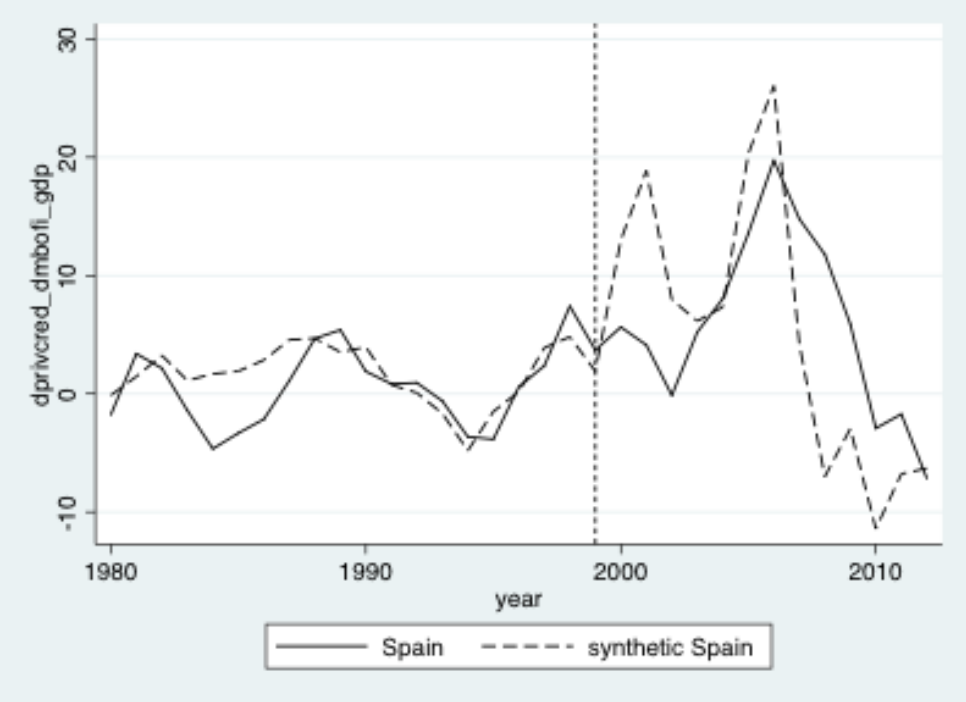


Figure 14: Estimated treatment and placebo effects: credit growth, Spain vs. donor pool

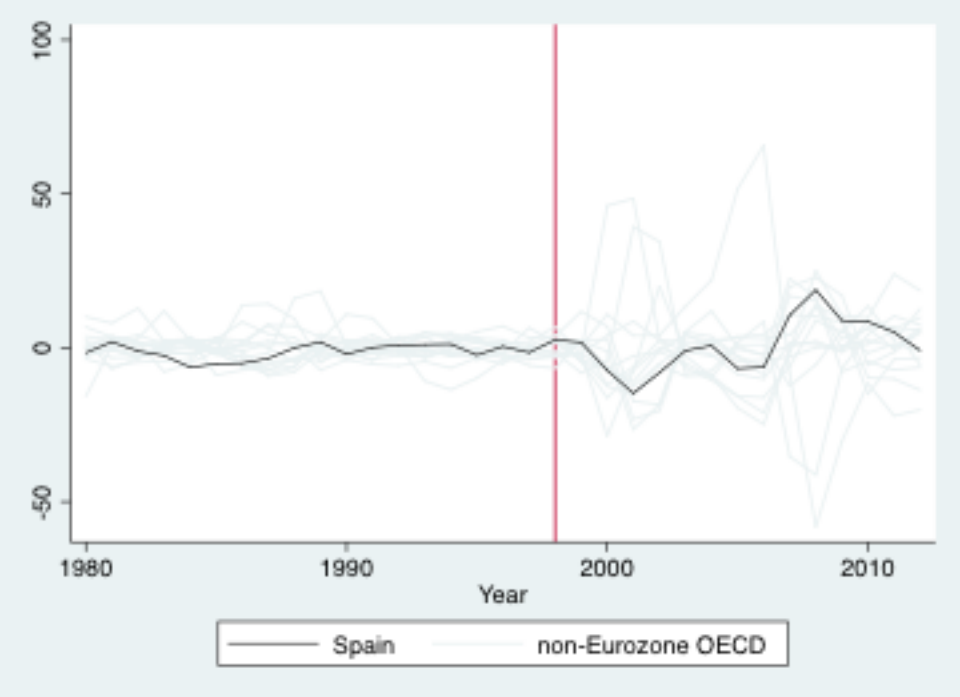
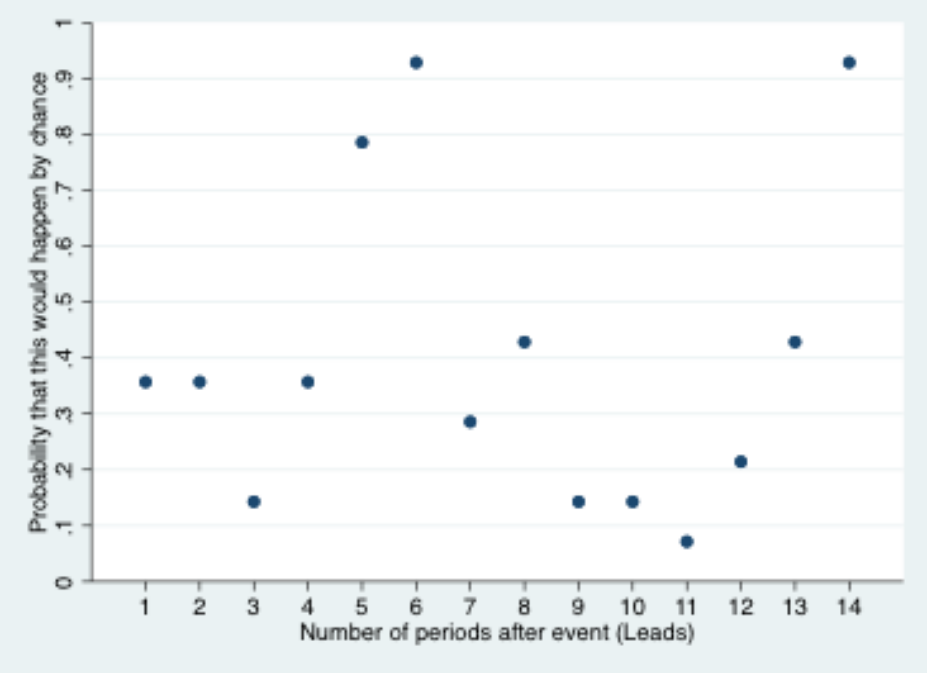


Figure 15: Spain – Probability that estimated treatment effect is observed by chance



Figures 14 and 15 illustrate the estimated treatment effects for "synthetic Spain" vs. the placebo effects for the countries in the donor pool. Here, the estimated probabilities suggest weak(er) significance in 2010 (11 years after Spain joined EMU in 1999): the probability that the estimated treatment effect is observed by chance is less than 10%. Thus, the pattern for Spain mirrors that of Greece in the Euro crisis period. Although the evidence is less clear-cut, it is still suggestive that EMU membership—and the increased monetary and fiscal policy constraints that accompanied it—led Spanish politicians to pursue policies of cheap credit during the depths of the Euro crisis.

We conduct similar synthetic control estimation Italy, Ireland, and Portugal. The corresponding graphs are presented in the Appendix. "Synthetic Italy" is a weighted average of Denmark (45.4%), Israel (19.9%), Norway (12.7%), Canada (8.2%), Switzerland (3.6%), Japan (2.5%), and Sweden (0.7%). "Synthetic Ireland" is a weighted average of Australia (58.7%), Norway (28.8%), the US (10.6%), and Japan (1.9%). "Synthetic Portugal" is a weighted average of Israel (34.4%), Chile (17.6%), Korea (15.1%), Iceland (11.9%), Switzerland (11.8%), Canada (5.7%), and the US (3.6%). The results for Italy and Portugal illustrate the same pattern seen in the Greek and Spanish cases: observed credit growth is lower than estimated credit growth for "synthetic Italy" prior to 2007 and higher afterward during the global and Eurozone crises. The estimated probabilities again suggest weak significance for the treatment effect during the Euro crisis, this time in 2011 (12 years after Italy joined EMU in 1999): the probability that the estimated treatment effect is observed by chance is less than 10%. At the same time, the analysis strongly suggests that the treatment effect of greater credit growth for "synthetic Italy" in 2002 is significant. Likewise, credit growth in "synthetic Portugal" is higher in the pre-crisis era but lower

from 2007 onward. Once again, these results are estimated to be different from random chance with a probability of less than 10%.

While the results for Greece, Spain, Italy, and Portugal suggest a consistent pattern, the estimated treatment effect for Ireland is the reverse pattern from that seen in the previous cases. Here, estimated credit growth in the post-EMU period is lower for "synthetic Ireland" than for observed Ireland in the pre-crisis period but greater in the crisis era (2007-12). We speculate that there are two possible reasons for this discrepancy. First, Ireland's financial crisis in 2010 was primarily a crisis resulting from the bursting of a credit bubble fueled by large quantities of interbank lending, capital inflows, and real estate investment. In contrast, the rest of the "PIIGS" countries experienced a more garden-variety balance of payments crisis driven primarily by sovereign borrowing. Thus, for Ireland, pursuing countercyclical credit management as a policy response to crisis and recession was not really an available option in the 2010-12 period, while the Irish banking sector was partially nationalized and undergoing massive retrenchment in its lending. Second, the weighted average for "synthetic Ireland" is calculated largely from non-European countries, with Australia and the US comprising a much larger share of the weighting. This weighting reflects Ireland's fundamentally different position in global value chains and global capital markets prior to 2008. In short, Ireland's position as a partially "Anglo" and partially "Euro" economy stands out from its "PIIGS" peers, and this may explain the discrepancies.

Overall, the synthetic control analysis provides further evidence in support of our argument that monetary and fiscal constraints affect government's incentives to use private credit as a substitute for traditional macroeconomic adjustment policies in hard times. In four of the five PIIGs countries, the expected countercyclical pattern is evident and the data suggest that credit growth was greater during the Euro crisis period (2008-12) than it otherwise would have been had

Greece, Spain, Italy, and Portugal not faced the stringent constraints imposed on monetary and fiscal policy autonomy by Eurozone membership. In conjunction with our earlier results, the findings here lend support to our argument that governments pursue credit growth as a way to escape the macroeconomic constraints on traditional economic stimulus policies imposed by the Mundell-Fleming trilemma.

Conclusion

In the wake of a decade of severe economic and political costs due to the global financial crisis and Great Recession, understanding which policies governments adopt in response to hard economic times remains of the utmost importance. In this paper, we bring together recent work on the politics of macroeconomic management with the literature on the Mundell-Fleming trilemma in open economy macroeconomics. We argue, and show, that countries under more stringent monetary and fiscal constraints are more likely to employ private credit as a countercyclical stimulus tool than countries without such constraints. We test this argument using both time-series, cross-sectional data covering 73 countries from 1986 to 2012, and synthetic control analysis of the Eurozone countries hit hardest by the Euro crisis of 2008-12. Our results strongly suggest that more stringent monetary and fiscal policy constraints have a significant countercyclical effect on private domestic credit growth. Within the Eurozone, we find that four of the five "PIIGS" countries (Portugal, Ireland, Italy, Greece, and Spain) became significantly more likely to pursue policies of credit growth during economic downturns after adopting the Euro than they were in the 1980-1998 pre-EMU period. Together, these results strongly suggest that governments more constrained in their ability to use monetary and fiscal policy as tools of

macroeconomic adjustment are more likely to pursue private credit growth as a substitute means of countercyclical stimulus.

Our analysis raises a range of new questions for future research. To what extent are governments successful—both economically and politically—in escaping the "fiscal fetters" imposed by exchange rate commitments, fiscal rules, and foreign currency borrowing? Future work should focus on modeling the effects of credit growth policies on key economic outcomes, as well as on political outcomes, especially the electoral fortunes of office-seeking politicians in democratic countries. In addition, our work here suggests that a key consequence of membership in European Monetary Union has been an exacerbation of financial credit cycles: credit growth is lower in good times and higher in bad times than it would otherwise have been if EMU countries retained a greater degree of exchange rate flexibility, with the corresponding increased monetary and fiscal policy autonomy. Understanding what this means, both for financial stability and macroeconomic policy outcomes, remains an important question going forward. Finally, our analysis suggests the need to delve deeper into how patterns of countercyclical credit management vary across space and time, given the different results we find across the various samples of countries we analyze in our study. Ultimately, the research here highlights the need to focus more clearly on how constraints imposed by tying one's hands on monetary and fiscal policy affect the political economy of macroeconomic policymaking, especially in hard times.

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Appendix A – Interactive results

Table A1: Monetary Constraints and Economic Growth

	Dependent variable:	
	Δ Private Credit (pct GDP)	Δ Broad Money (pct GDP)
	(1)	(2)
Private credit$_{t-1}$ (pct GDP)	−0.076***	
	(0.023)	
Broad money$_{t-1}$ (pct GDP)		−1.017***
		(0.035)
Trilemma index$_{t-1}$	8.710***	7.943**
	(1.488)	(3.191)
Δ GDP per capita	41.985***	−6.666
	(15.951)	(43.262)
Δ Trilemma index	−0.100	12.695*
	(1.355)	(7.170)
Fiscal rules index$_{t-1}$	0.794**	3.050***
	(0.344)	(0.816)
Δ Fiscal rules index	−0.275	−0.899
	(0.320)	(1.320)
Foreign currency debt$_{t-1}$ (pct)	0.110***	−0.225
	(0.036)	(0.180)
Δ Foreign currency debt (pct)	−0.070	−0.412
	(0.061)	(0.262)
Left	1.623*	4.817*
	(0.891)	(2.597)
Δ Left	1.191	0.333
	(1.027)	(3.999)
GDP per capita$_{t-1}$	4.451***	22.890***
	(0.924)	(4.535)
Trilemma index$_{t-1}$ × Δ GDP per capita	−109.144***	24.105
	(30.359)	(95.262)
Constant	−49.341***	−162.193***
	(9.789)	(30.872)
Observations	1,390	890
Groups	73	56
Fixed Effects	✓	✓
Controls	✓	✓
Adjusted R^2	0.247	0.806
F Statistic	28,198.2*** (df = 45; 25)	4,923.85*** (df = 45; 25)
Note:		*p<0.1; **p<0.05; ***p<0.01

Table A2: Legal Fiscal Constraints and Economic Growth

	Dependent variable:	
	Δ Private Credit (pct GDP)	Δ Broad Money (pct GDP)
	(1)	(2)
Private credit$_{t-1}$ (pct GDP)	−0.076***	
	(0.023)	
Broad money$_{t-1}$ (pct GDP)		−1.015***
		(0.034)
Trilemma index$_{t-1}$	7.071***	9.152***
	(1.282)	(2.732)
Δ Trilemma index	0.955	13.584*
	(1.151)	(7.280)
Fiscal rules index$_{t-1}$	1.096***	3.778***
	(0.330)	(0.988)
Δ GDP per capita	−10.689**	17.272
	(4.555)	(11.209)
Δ Fiscal rules index	−0.193	−0.762
	(0.327)	(1.266)
Foreign currency debt$_{t-1}$ (pct)	0.080**	−0.225
	(0.041)	(0.181)
Δ Foreign currency debt (pct)	−0.089	−0.434
	(0.074)	(0.277)
Left$_{t-1}$	1.377	4.947**
	(0.914)	(2.391)
Δ Left	1.128	0.355
	(1.059)	(3.888)
GDP per capita$_{t-1}$	4.864***	24.782***
	(1.062)	(4.386)
Fiscal rules index$_{t-1}$ × Δ GDP per capita	−13.946***	−37.981***
	(4.012)	(12.363)
Constant	−48.478***	−179.374***
	(11.576)	(30.138)
Observations	1,390	890
Groups	73	56
Fixed Effects	✓	✓
Controls	✓	✓
Adjusted R^2	0.243	0.810
F Statistic	29,677.18*** (df = 45; 25)	11,843.37*** (df = 45; 25)
Note:		*p<0.1; **p<0.05; ***p<0.01

Table A3: de facto Fiscal Constraints

	Dependent variable:	
	Δ Private Credit (pct GDP)	Δ Broad Money (pct GDP)
	(1)	(2)
Private credit$_{t-1}$ (pct GDP)	-0.075^{***}	
	(0.023)	
Broad money$_{t-1}$ (pct GDP)		-1.015^{***}
		(0.033)
Trilemma index$_{t-1}$	8.110^{***}	8.392^{***}
	(1.353)	(3.106)
Δ Trilemma index	0.957	13.033^{*}
	(1.253)	(7.054)
Fiscal rules index$_{t-1}$	0.771^{**}	2.974^{***}
	(0.361)	(0.844)
Δ Fiscal rules index	−0.227	−0.888
	(0.342)	(1.288)
Foreign currency debt$_{t-1}$ (pct)	0.040	−0.300
	(0.042)	(0.192)
Public debt$_{t-1}$ (pct GDP)	-0.075^{***}	−0.020
	(0.017)	(0.093)
Δ Foreign currency debt (pct)	−0.095	−0.398
	(0.059)	(0.255)
Left$_{t-1}$	1.507	4.957^{**}
	(0.966)	(2.434)
Δ Left	1.393	0.488
	(1.169)	(3.880)
Δ Public debt (pct GDP)	−0.005	0.106^{***}
	(0.014)	(0.034)
lfx_debt_pct:lpubdebtgdp	0.001^{***}	0.001
	(0.0002)	(0.001)
Observations	1,390	890
Groups	73	56
Fixed Effects	✓	✓
Controls	✓	✓
Adjusted R^2	0.241	0.808
F Statistic	$66{,}869.72^{***}$ (df = 45; 25)	$4{,}701.14^{***}$ (df = 45; 25)
Note:		*p<0.1; **p<0.05; ***p<0.01

Table A4: Monetary Constraints and Left-wing Governance

	Dependent variable:	
	Δ Private Credit (pct GDP)	Δ Broad Money (pct GDP)
	(1)	(2)
Private credit$_{t-1}$ (pct GDP)	-0.072^{***}	
	(0.023)	
Broad money$_{t-1}$ (pct GDP)		-1.017^{***}
		(0.035)
Trilemma index$_{t-1}$	6.107^{***}	1.921
	(1.438)	(3.033)
Left$_{t-1}$	-2.964^{***}	-13.054^{***}
	(1.148)	(4.736)
Δ Trilemma index	0.205	12.819^{*}
	(1.300)	(7.103)
Fiscal rules index$_{t-1}$	0.806^{**}	2.743^{***}
	(0.363)	(0.859)
Δ Fiscal rules index	−0.261	−0.977
	(0.339)	(1.345)
Foreign currency debt$_{t-1}$ (pct)	0.084^{*}	−0.250
	(0.045)	(0.167)
Δ Foreign currency debt (pct)	−0.099	-0.461^{*}
	(0.063)	(0.246)
Δ Left	1.206	0.351
	(1.049)	(3.905)
Trilemma index$_{t-1}$ × Left$_{t-1}$	8.266^{***}	36.173^{***}
	(2.407)	(11.279)
Observations	1,390	890
Groups	73	56
Fixed Effects	✓	✓
Controls	✓	✓
Adjusted R^2	0.235	0.812
F Statistic	$20{,}652.76^{***}$ (df = 45; 25)	$4{,}328.04^{***}$ (df = 45; 25)
Note:		*p<0.1; **p<0.05; ***p<0.01

Table A5: Fiscal Constraints and Left-wing Governance

	Dependent variable:	
	Δ Private Credit (pct GDP)	Δ Broad Money (pct GDP)
	(1)	(2)
Private credit$_{t-1}$ (pct GDP)	−0.073***	
	(0.023)	
Broad money$_{t-1}$ (pct GDP)		−1.032***
		(0.032)
Trilemma index$_{t-1}$	7.667***	8.463**
	(1.387)	(3.427)
Δ Trilemma index	0.112	10.906
	(1.262)	(7.055)
Fiscal rules index$_{t-1}$	0.633*	0.743
	(0.351)	(0.639)
Left$_{t-1}$	0.116	−0.700
	(0.595)	(1.885)
Δ Fiscal rules index	−0.259	−1.602
	(0.331)	(1.388)
Foreign currency debt$_{t-1}$ (pct)	0.107**	−0.046
	(0.044)	(0.150)
Δ Foreign currency debt (pct)	−0.071	−0.296
	(0.059)	(0.239)
Δ Left	1.349	1.529
	(1.151)	(3.438)
Fiscal rules index$_{t-1}$ × Left$_{t-1}$	1.310***	7.105***
	(0.444)	(1.150)
Observations	1,390	890
Groups	73	56
Fixed Effects	✓	✓
Controls	✓	✓
Adjusted R^2	0.237	0.823
F Statistic	29,941.86*** (df = 45; 25)	16,234.14*** (df = 45; 25)
Note:		*p<0.1; **p<0.05; ***p<0.01

Appendix B – Synthetic control results: Italy, Ireland, and Portugal

Figure B1: Trends in private credit growth, Italy vs. Synthetic Italy

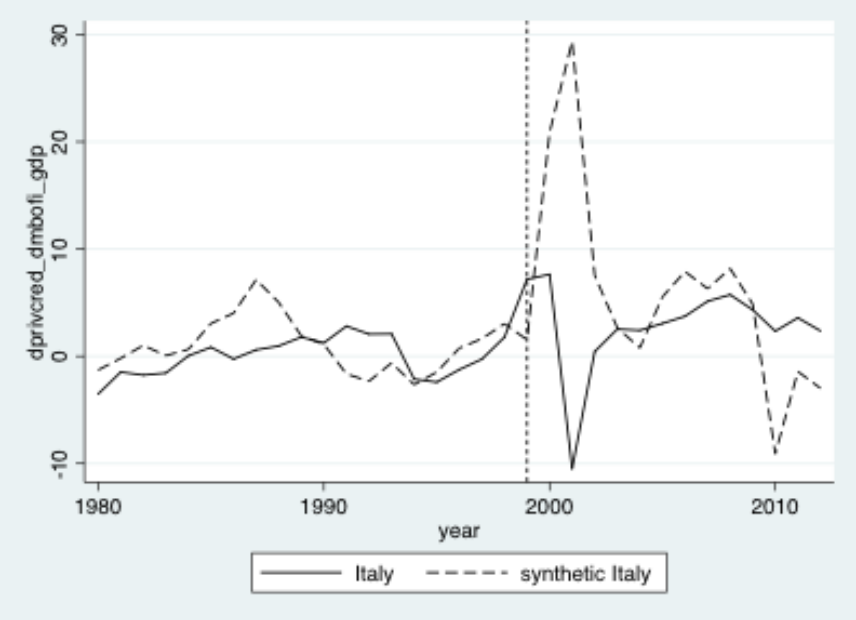

Figure B2: Estimated treatment and placebo effects: credit growth, Italy vs. donor pool

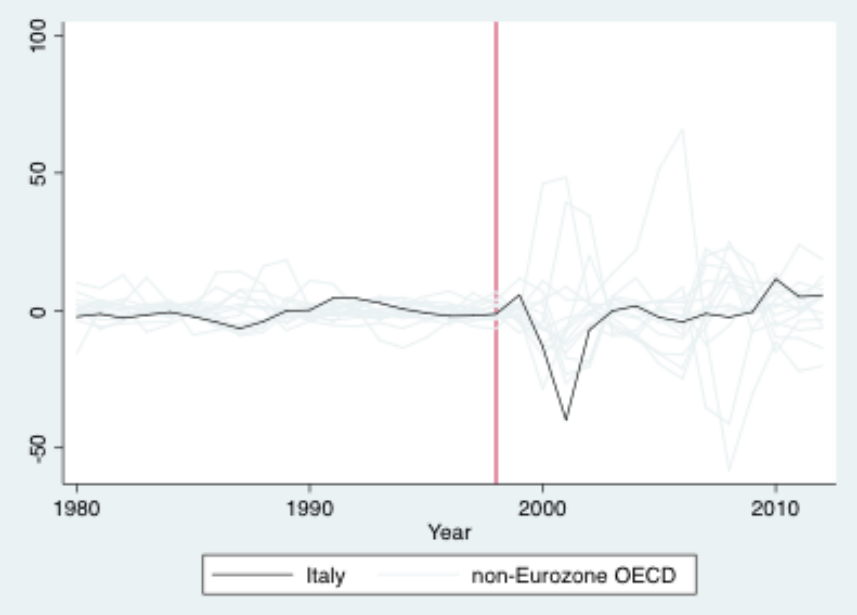

Figure B3: Italy – Probability that estimated treatment effect is observed by chance

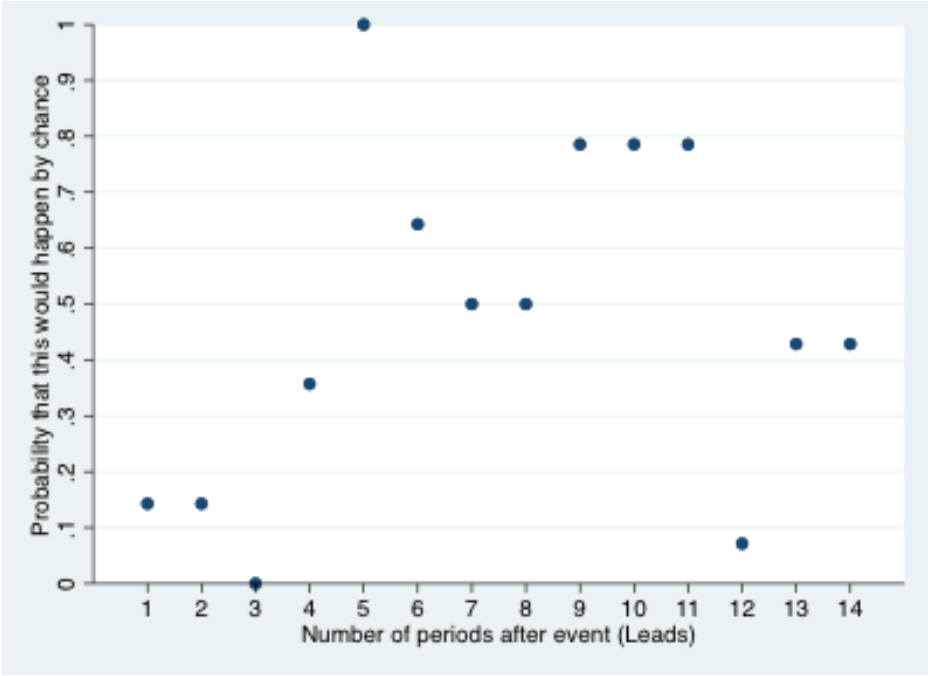

Figure B4: Trends in private credit growth, Ireland vs. Synthetic Ireland

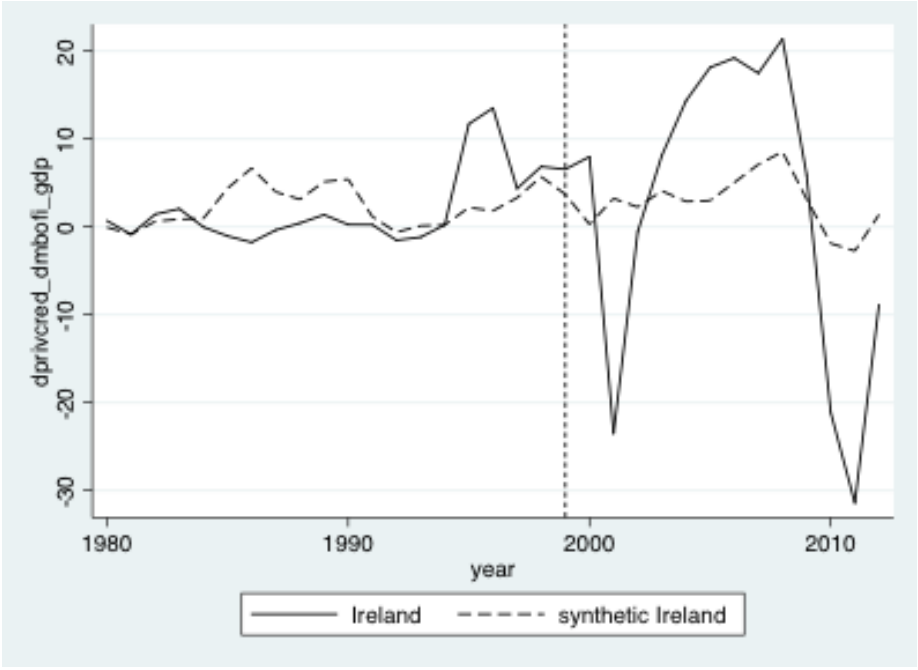

Figure B5: Estimated treatment and placebo effects: credit growth, Ireland vs. donor pool

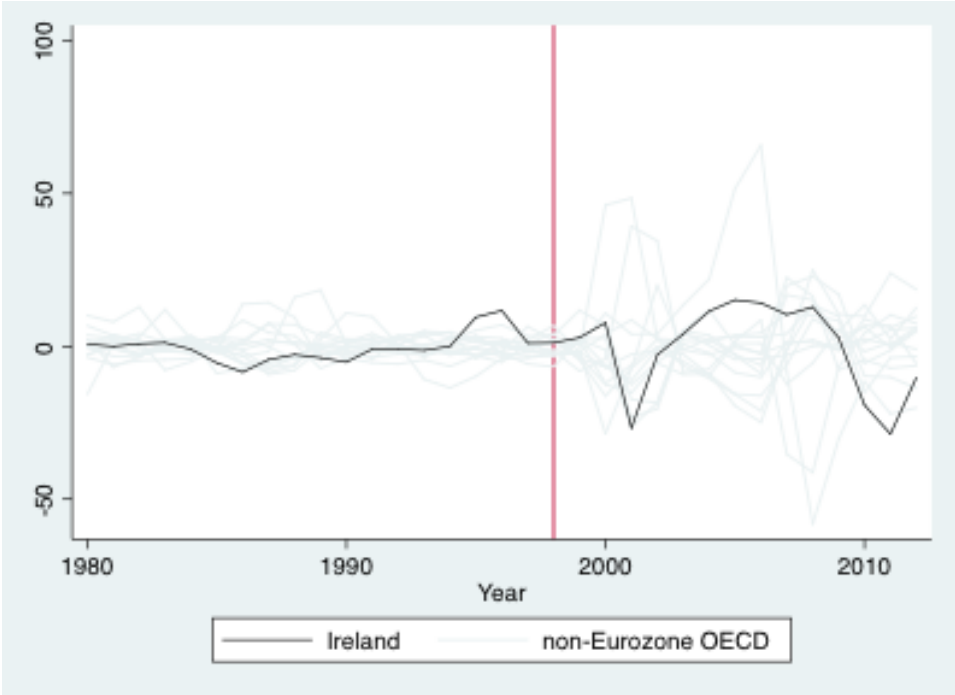

Figure B6: Ireland – Probability that estimated treatment effect is observed by chance

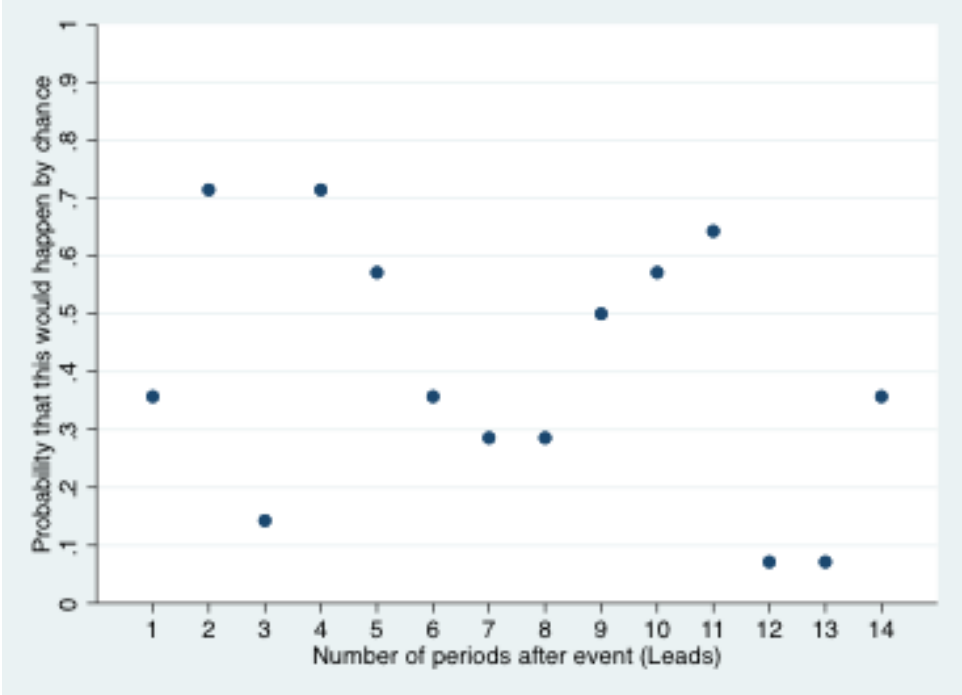

Figure B8: Trends in private credit growth, Portugal vs. Synthetic Portugal

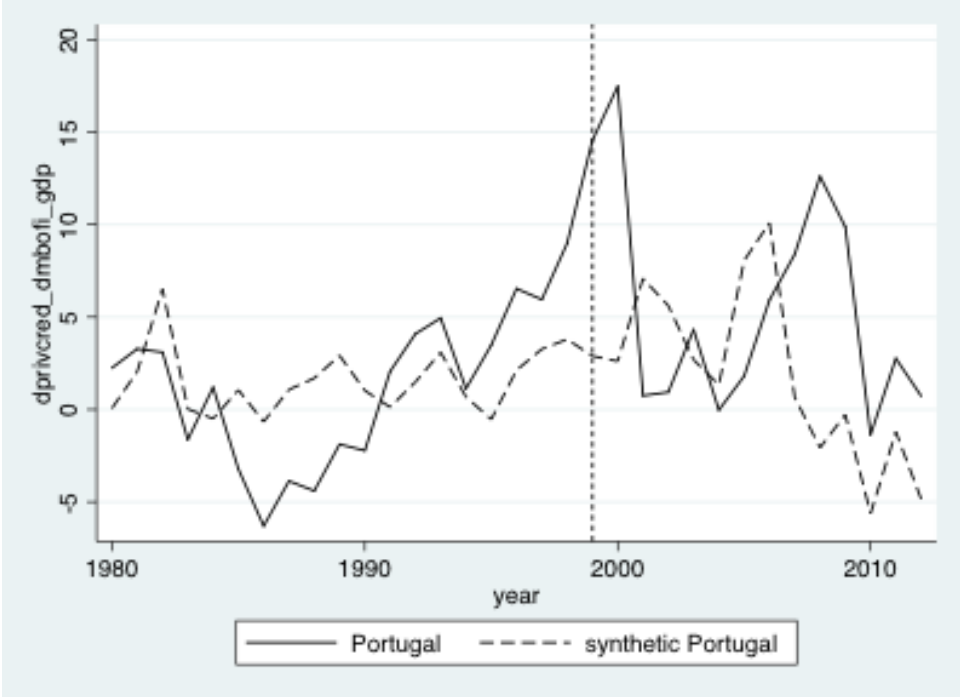

Figure B9: Estimated treatment and placebo effects: credit growth, Portugal vs. donor pool

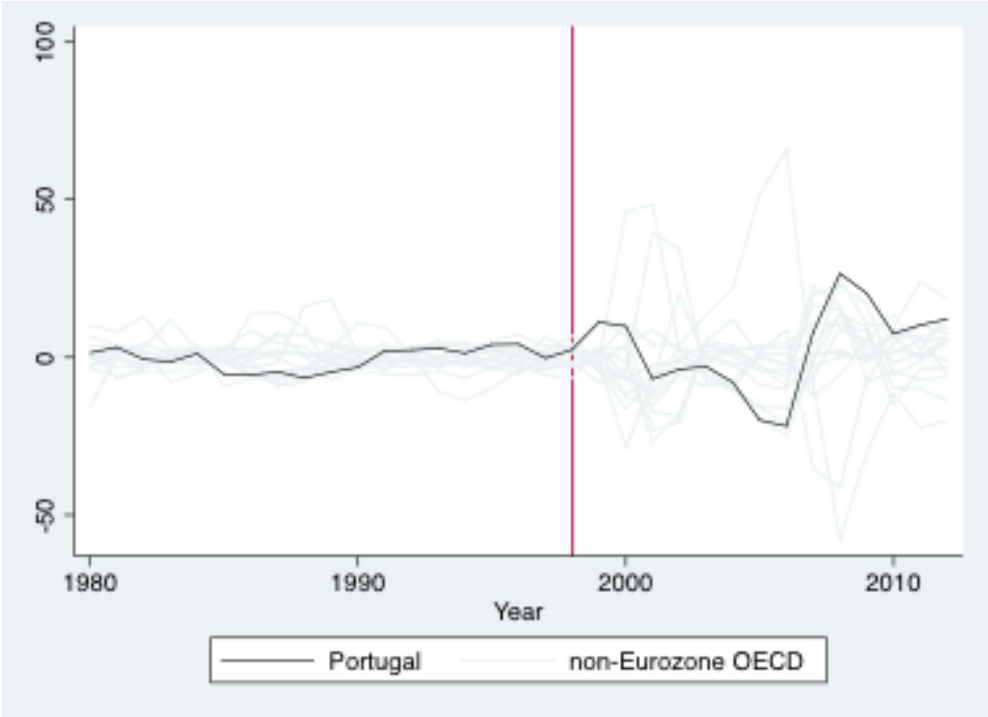
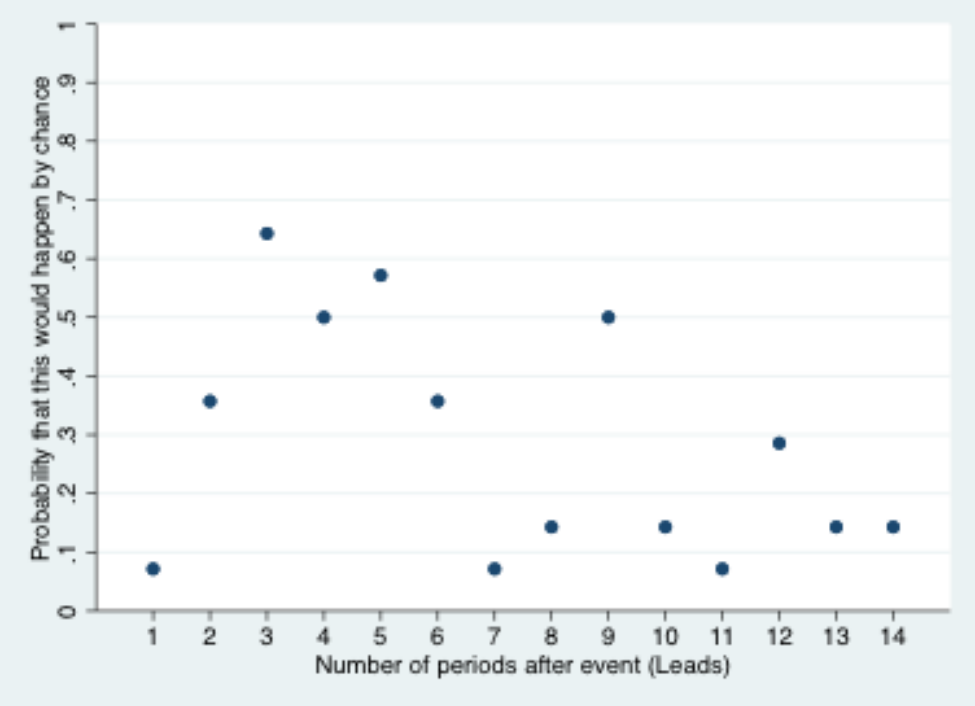
Figure B10: Portugal – Probability that estimated treatment effect is observed by chance