The Political Origin of Credit Cycle*

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Abstract

We empirically demonstrates a relationship between declining U.S. presidential approval ratings and a greater propensity for the implementation of expansionary housing credit policies by the government. A theoretical model is proposed to contextualize these observations, suggesting that governments, in the face of dominant information frictions within financial markets, may respond by altering fiscal credit policies to counterbalance the effects of decreased popularity. Conversely, when entry barriers constitute the main financial impediment in an economy, governments favor traditional fiscal policies. The predictions from the model are empirically tested via a cross-country panel analysis. The resulting regression analysis indicates that for developed nations, decreased government popularity tends to be followed by an increase in the credit-to-GDP ratio. However, this correlation is absent in terms of government spending. Notably, the pattern for emerging countries is inversed; while government popularity can forecast government spending, it does not provide insights into forthcoming shifts in credit.

Keywords:Political Economy, Credit Cycle, Political Popularity

JEL Classification: D82, E44, P34

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1 Introduction

The 2008 Global Financial Crisis ignited a renewed interest among economists in understanding the consequences and underlying causes of credit cycles. Recent empirical evidence has identified government credit policies as a significant driver of credit expansions, which are often considered exogenous shocks in credit cycle theories (Mian et al. (2010)). Government policies can be heavily influenced by political factors due to the strategic motives of governments. For example, U.S. President Joe Biden announced a series of credit-related policies when his disapproval rating reached a new high in mid-2022, which subsequently led to a six percentage point recovery in his approval rating by August.

In this paper, we explore the impact of government popularity dynamics on the credit cycle. We start from presenting evidence of a negative correlation between U.S. presidents' approval ratings and the private credit-to-GDP ratio. We observe that private credit expanded significantly when presidential public support waned (e.g., during the Iran-Contra affair under Ronald Reagan or the final year of George H.W. Bush's term), and remained low when presidents enjoyed high public support (e.g., following 9/11 under George W. Bush or during the Persian Gulf War under George H.W. Bush). Examining U.S. housing credit policy, we find that expansionary housing credit policies are more likely to be implemented following a decline in government popularity. Moreover, regressing future changes in government-backed loans on past changes in government approval ratings reveals that a decrease in public support for the government predicts a future increase in government-backed loans.

This observed negative relationship between government approval ratings and credit policies implies that governments may actively manipulate the credit market for political gains. We develop a qualitative model featuring a credit market and two parties competing for the presidency to investigate the drivers of this popularity-smoothing behavior and understand why governments employ credit policies rather than other policy tools. The model considers two primary frictions: information friction, where borrowers' probability of default is private information, and entry barriers, which impose a minimum loan size for borrowers. When entry barriers dominate, traditional fiscal tools are welfare-enhancing, as they effectively allow borrowers to access loans at risk-free rates.

Conversely, when information friction dominates, fiscal credit policies are more effective at improving social welfare by lowering contract rates and expanding credit on an extensive margin.

Incorporating financial friction and governments' credit and traditional fiscal tools, we introduce a two-party competition for the presidency where incumbent government support is subject to popularity shocks. Governments have a strong incentive to smooth these shocks to their public support, as doing so enhances their long-term prospects of remaining in power. Additionally, this incentive to smooth popularity shocks leads both parties to adopt sub-optimal fiscal (credit) policies in a complicit manner, creating room for adjustments when their popularity fluctuates during their tenure.

Our model generates two main predictions. First, governments will actively modify policies to counter negative shocks to their public support. Second, in advanced countries where the primary credit market friction is information friction, governments prefer credit policy tools to gain political advantages. In contrast, in emerging countries where the main friction is entry barriers, governments favor traditional fiscal tools such as public transfers. We compile a cross-country dataset to test the model's predictions. Following previous research, we use the "index of government stability" (henceforth referred to as the popularity measure), a standardized variable provided by the International Country Risk Guide (ICRG) for over 60 countries since 1984, as our measure of government popularity. Additionally, we employ the private debt and household debt-to-GDP ratios as proxies for the credit cycle, which are widely used in the literature as quantitative credit expansion measures and have demonstrated reliable predictive power for financial crises and GDP decline.

Consistent with the model's predictions, we find that a decline in government popularity is associated with a subsequent increase in the credit-to-GDP ratio in advanced economies, as shown in our simple one-step projection. This result emphasizes the explanatory power of near-term movements in government popularity for future credit changes. Our simple projection result is not driven by forward-looking voters who can predict credit market booms, leading to increased confidence in the central government. Since forward-looking behavior would result in an upward bias in the coefficients, the

significant negative relationship we find implies that removing simultaneity should make the negative relationship even stronger. This finding provides suggestive evidence that governments appear to adjust credit policies following changes in popularity.

To reinforce the empirical findings from the simple projection, we employ an Instrumental Variable (IV) approach, inspired by López-Salido et al. (2017), to isolate the component of non-economic government popularity changes driven by past government popularity levels. We demonstrate that the predictable component of popularity changes, which reflects not recent news about future economic or financial conditions but rather an unwinding of past popularity levels, still possesses strong explanatory power for future credit fluctuations. Interestingly, when comparing the coefficients of government stability changes in the second-stage regressions and those in the simple projection, we find that the coefficients have larger absolute values in the second-stage regressions. These results suggest that endogeneity may have driven the coefficient in the opposite direction, implying that self-driven government popularity changes have a more significant impact on determining the credit cycle.

We extend the analysis to include emerging countries and fiscal policy. We discover that in emerging countries, the negative relationship between past popularity changes and future credit changes becomes insignificant, while a decrease in popularity now predicts a future increase in central government debt. Conversely, the relationship between popularity and government debt is weak in advanced countries, further validating the model's predictions.

Literature Review To the best of our knowledge, this is the first paper that investigates the link between political factors and credit dynamics from both empirical and theoretical perspectives. Additionally, by identifying the political origins of credit, our paper contributes to the literature on the credit cycle, particularly regarding the cause of credit expansion – the run-up process to most crises (e.g., López-Salido et al. (2017); Kirti (2018); Bordalo et al. (2018)).

A subset of research focuses on the behavior of local and government-owned banks around

election years. Sapienza (2004), Khwaja and Mian (2005), Carvalho (2014), and Englmaier and Stowasser (2017) provide evidence that government control over banks can lead to significant political influence on firms through the lending channel. Though these studies present strong evidence of credit manipulation by local governments, the contribution of such credit manipulation to the overall dynamics of credit remains unclear. Moreover, in countries like the U.S., the central government may have a more direct influence on the social credit level by altering its fiscal (credit) policy (Lucas (2016)).

Our analysis differs from recent literature on the role of political factors in financial crises. For example, Chang (2007) study the simultaneous determination of financial default and political crises. Herrera et al. (2020) find that the rise in governments' popularity can predict financial crises beyond other early warning indicators in emerging countries. Dagher (2018) focuses on the interplay between politics and financial policy, showing that financial booms and risk-taking during ten infamous financial booms and busts were often amplified by political regulatory stimuli, credit subsidies, and an increasingly light-touch approach to financial supervision. Doerr et al. (2021), Funke et al. (2016), and Gyöngyösi and Verner (2022) explore the adverse political consequences of financial crises, such as political radicalization. Our work differs from theirs by not only reflecting the run-up to extreme financial crises but also examining how political factors drive more moderate non-crisis credit fluctuations, which may have strong implications for economic dynamics in the short- to medium-run business cycle frequency (Mian et al. (2017)).

Our paper also relates to the literature studying the political origin of governments' credit policies. Müller (2019), for example, finds that policies restricting mortgages and consumer credit are less likely to be tightened around election windows; Antoniades and Calomiris (2020) find that voters punish incumbent presidential candidates for the contraction policies in county-level supply of mortgage credit. Unlike the existing literature, our paper investigates government-backed loans, a credit policy widely used in advanced countries and influential in driving the credit cycle.

The paper most closely related to ours is Lepers (2022), in which the author constructs a cross-country panel and documents a negative relationship between popularity changes and credit growth. Nonetheless, our study diverges from Lepers (2022) in two primary

ways. Firstly, the key findings in Lepers (2022) hinge on simple linear projections. In contrast, our paper employs the Instrumental Variable (IV) approach to address potential endogeneity issues. The IV regressions reveal a more robust negative relationship between popularity fluctuations and subsequent credit changes, thereby reinforcing our empirical findings. Secondly, we examine a specific credit policy tool—government-backed mortgages—in the U.S., demonstrating that the same empirical relationship is applicable to a widely-used credit policy tool in advanced countries. Furthermore, we provide a rationale for governments' behavior in manipulating credit policies, illustrating that adjusting credit policy in response to popularity shocks is optimal for a rational government under certain circumstances. Our theoretical framework also explains why the political credit cycle is particularly pronounced in advanced countries.

2 Presidential approval and credit policy: evidence from U.S. data

In this section, we present evidence of the U.S. government intervening in the credit market to counteract declines in presidential approval. We begin by examining major housing credit policies in the U.S. and their relationship with presidential approval. Next, we utilize monthly time series data on U.S. mortgage activity and presidential approval to provide further evidence of the U.S. government's active manipulation of credit for political gains.

2.1 Private Credit and Presidential Approval Ratings

Figure 1 depicts the presidential approval rate and the level of private credit from 1977 to 2007. Specifically, we employ the Hodrick-Prescott (HP) filter with an 8-year business cycle frequency parameter to extract the cyclical component of private credit, while we extract the cyclical component of presidential approval using a 4-year political cycle frequency.

The figure demonstrates a negative correlation between presidential approval and the credit cycle. For example, during President Reagan's term in 1981, he began his presidency with high public support, which peaked at 68% during the fifteenth week after his

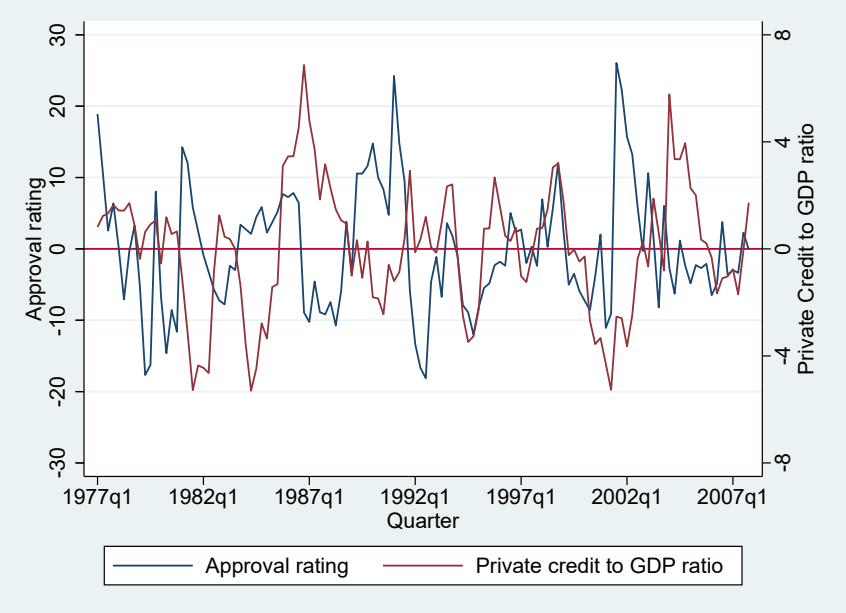


Figure 1: Time series dynamic of approval rating and credit cycle

Note. This figure presents time-series dynamic for cyclical components of presidential approval rating and Private credit to GDP ratio. The cyclical components are obtained from the HP filters(parameter value 1600 for private credit to GDP ratio, and 3200 for approving rate).

inauguration. Concurrently, private credit remained at a low level. Reagan's approval rating plummeted in late 1986 due to the Iran-Contra affair, and the negative effect did not recover until 1988, when his approval was significantly boosted by the passage of the Intermediate-Range Nuclear Forces Treaty. In contrast, during this period, U.S. private credit increased substantially, and the credit boom gradually subsided as Reagan's approval rating recovered.

2.2 Background: Housing Credit Policy-Making Agencies in the U.S.

The evidence that the private credit to GDP ratio is counter-political-cycle raises the question: what is the driving force behind this phenomenon? The relationships of both series to macroeconomic conditions can be ruled out because, as the president's approval rating is typically positively influenced by the performance of the economy, high approval as a result of the expectation of an economic boom will raise the amount of credit[1].

[1]Figure 8 in appendix plots the private credit to GDP ratio and the unemployment rate from 1977 to 2017. The credit to GDP ratio is approximately acyclical, with a correlation of -0.05.

Another explanation for the negative correlation is that the government may intervene in the credit market for political gains. Before proceeding to the empirical evidence, we first briefly review how the government participates in and intervenes in the credit market. We restrict our focus to the mortgage asset market, as the residential mortgage market in the United States is one of the largest capital markets in the world, and housing credit policy intervention has been popular in the past 50 years (Fieldhouse et al. (2018)) and is potentially one of the causes of the 2008 financial crisis.

Historically, policies affecting housing credit have been directed by the president, Congress, the Cabinet, and other regulatory departments and have been assigned to agencies by changing their purchases and mortgage holdings. Here, we review four major government agencies that have actively participated in mortgage asset markets: the Federal National Mortgage Association (FNMA, or Fannie Mae), Federal Home Loan Mortgage Corporation (FHLMC, or Freddie Mac), Government National Mortgage Association (GNMA, or Ginnie Mae), and the Federal Reserve.

Federal National Mortgage Association (FNMA) The Federal National Mortgage Association, commonly known as Fannie Mae, is a government-sponsored enterprise (GSE) founded in 1938 by Congress during the Great Depression as part of the New Deal. Its main purpose is to stimulate the housing market by making more mortgages available to moderate- to low-income borrowers through purchasing and guaranteeing housing mortgages in the secondary mortgage market. Government actions influence FNMA's credit creation mainly through changing its loan limit. For example, the Housing and Community Development Act of 1974 raised FNMA's loan limit from $33,000 to $55,000, and the limit was further increased to $75,000 by the Housing and Community Development Amendments of 1979.

Government National Mortgage Association (GNMA) The GNMA, or Ginnie Mae, was founded in 1968 as a part of the Housing and Urban Development Act of 1968. Unlike Fannie Mae, which was converted to a privately held corporation by the same act, Ginnie

Mae remained on the federal budget balance and does not directly provide loans. Instead, it guarantees investors the payment of mortgage-backed securities. Policy actions influence housing credit by changing the authorized amount for total purchases and commitments outstanding. For example, the Housing and Urban Development Act of 1969 raised GNMA's special assistance program for low- and moderate-income housing from $1.0 to $2.5 billion. The Emergency Home Purchase Assistance Act of 1974 authorized GNMA to make purchases and commitments of up to $7.75 billion outstanding.

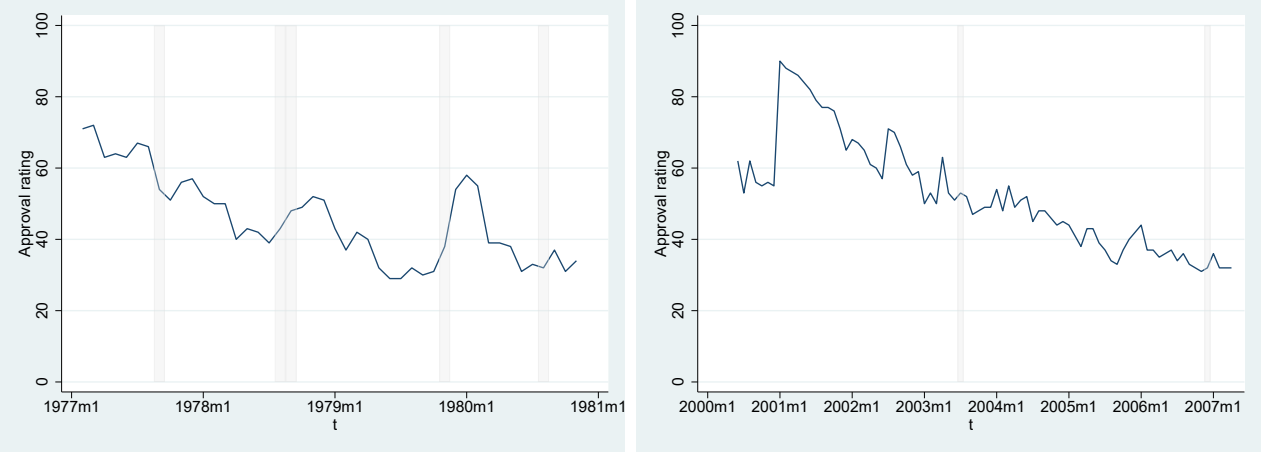
Federal Home Loan Mortgage Corporation (FHLMC) The FHLMC, or Freddie Mac, was established in 1970 as a public enterprise. Its objective is to further expand the secondary mortgage market by pooling mortgages and trading them as mortgage-backed securities (MBS) on the open market. As a GSE agency actively participating in the secondary market, policies affecting FHLMC mainly involve loosening restrictions and expanding its market participation. For instance, the Housing and Community Development Amendments of 1978 allowed purchases from "any mortgagee approved by the Secretary of Housing and Urban Development for participation in any mortgage insurance program under the National Housing Act." The Adjustable-Rate Mortgage Program announced in 1981 approved FHLMC to launch a secondary market program for variable-rate mortgages.

During the Great Recession and ensuing period of housing and financial market fragility, the Federal Reserve Board became the principal buyer of agency debt and a major holder of agency MBS. The Federal Reserve announced on November 25, 2008, that it would initiate the QE1 program to purchase obligations of Fannie Mae, Freddie Mac, and the Federal Home Loan Banks, as well as MBS backed by Fannie Mae, Freddie Mac, and Ginnie Mae (or 'agency MBS'). The QE1 program concluded at the end of 2009, with $1.25 trillion in MBS purchases and $172 billion in debt purchases from FHLMC, FNMA, and GNMA. The QE2 and QE3 programs, launched in 2010 and 2011, respectively, further expanded the Fed's holdings in agency debt and MBS as part of its plan to promote economic recovery from the financial crisis.

In summary, the major housing credit policy-making agencies in the U.S., including FNMA,

GNMA, FHLMC, and the Federal Reserve, have played a significant role in shaping the country's mortgage and housing markets. These agencies have been involved in several key policy interventions that directly or indirectly affect credit availability and housing market dynamics. By examining these agencies and their actions, we can better understand the potential political motivations behind their decisions and explore the factors that contribute to the observed relationship between credit policies and political factors.

2.3 The housing credit policy and presidential approval



(a) The approval rate of Jimmy Carter (b) The approval rate of George W. Bush

Figure 2: The approval rating and the announcement of housing credit policies

*Note.*These figures show the announcement timing of expansionary mortgage asset purchases by federal agencies. The expansionary mortgage asset purchase events are from Fieldhouse et al. (2018).

Figure 2 illustrates the dynamics of the presidential approval ratings for Jimmy Carter and George W. Bush, alongside the announcement dates of expansionary housing credit policies. The figure reveals that most expansionary mortgage asset purchases were announced during periods when the presidents' approval ratings were at local minimums. This pattern suggests that there might be a strategic motivation behind the timing of these policies, possibly aimed at boosting the presidents' approval ratings during times of decline.

Figure 3 displays the relationship between the change in approval ratings over the past three months and the quantity of expansionary mortgage asset purchases by federal agencies. The plot suggests a negative correlation, indicating that a lower growth in ap-

proval ratings tends to precede a larger amount of expansionary mortgage purchases. Intriguingly, approximately 75% of large-scale expansionary policies (i.e., mortgage asset purchases amounting to over 0.2% of the total market-based mortgage value) were announced following a significant decline in approval ratings.

This observation implies that there may be a connection between political factors, such as presidential approval, and the implementation of housing credit policies in the United States. It is worth noting that the presidents' approval ratings could be influenced by various factors, such as the overall economic climate, international events, or domestic political developments. However, the fact that a large proportion of expansionary housing credit policies were announced during periods of declining approval ratings suggests that these policies may have been used as a tool to regain public support and improve the presidents' standings.

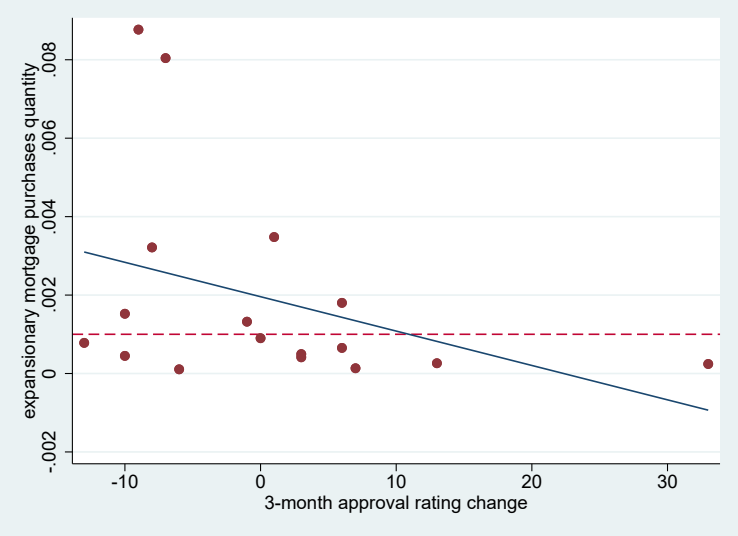


Figure 3: Mortgage purchases quantities and past 3-month approval rating change

Note. These figures show the relation between quantities of expansionary mortgage asset purchases by federal agencies and past 3-month changes of presidential approving rating. The 17 expansionary mortgage asset purchase events are from Fieldhouse et al. (2018), which are mortgage asset purchases with positive value. The dash line means government mortgage asset purchases value is equal to 0.1% of the market mortgage asset value.

2.4 Government-Backed Mortgage and Presidential Approval

The evidence presented in previous sections is based on narratively identified housing policy changes. Recognizing that government agencies like FNMA and FHLMC participate in the credit market more frequently, we extend our analysis to a monthly frequency and delve deeper into the complex interplay between politics and credit.

Our empirical investigation focuses on government-backed mortgage loans, a widely used fiscal credit policy in the U.S. and other advanced economies. We construct a comprehensive U.S. monthly time-series sample, combining new-issue residential mortgage data, presidential job approval rates, and various macroeconomic and financial variables. The data source for new residential mortgages is the Federal Housing Financing Agency's "National Statistics for New Residential Mortgages in the United States." We use the number of originations times the average loan amount to calculate two key variables in our analysis: the quantity of all new residential mortgages and the quantity of new government-insured/guaranteed/direct residential mortgages. Data on presidential job approval rates is obtained from The American Presidency Project (APP) at UCSB[2]. APP's presidential job approval rates are sourced from the Gallup Poll, and we retain the last observation in each month as a monthly observation. To account for potential confounding factors, we control for key monthly macroeconomic variables using Federal Reserve Economic Data. This extensive time-series dataset spans the period from 1998 to 2019.

To test whether the Federal government adjusts its credit supply in response to popularity shocks, we employ a simple projection to investigate the connection between changes in the presidential approval rating and subsequent government credit supply:

$$\frac{GGL}{AL}t+3 = \beta_0 + \beta 1 \Delta Approving_t + \gamma X_t + \epsilon_t \tag{2.1}$$

where $\frac{GGL}{AL}t+3$ represents the composition of government-backed mortgages in all newly issued mortgage loans in month $t+3$[3]. $\Delta Approvingt$ denotes the first-difference in pres-

[2]The American Presidency Project: https://www.presidency.ucsb.edu/.
[3]The composition is multiplied by 100.

idential approval rates over time t. X_t encompasses a set of control variables[4].

	(1)	(2)	(3)	(4)
Dependent variable: GGL to AL ration in the month t+3				
Panel A:OLS				
$\Delta Approving$	-0.042	-0.055	-0.080**	-0.081**
	(0.048)	(0.042)	(0.038)	(0.038)
Panel B:2SLS				
$\Delta Approving$	-3.372*	-1.652**	-0.821*	-0.729*
	(1.844)	(0.739)	(0.420)	(0.381)
Time trend	Yes	Yes	Yes	Yes
Recession dummy	Yes	Yes	Yes	Yes
Macro controls	No	Yes	Yes	Yes
Housing price	No	No	Yes	Yes
Election year dummy	No	No	No	Yes
N	216	216	216	216
KP F-stat	7.06	12.46	20.43	21.94

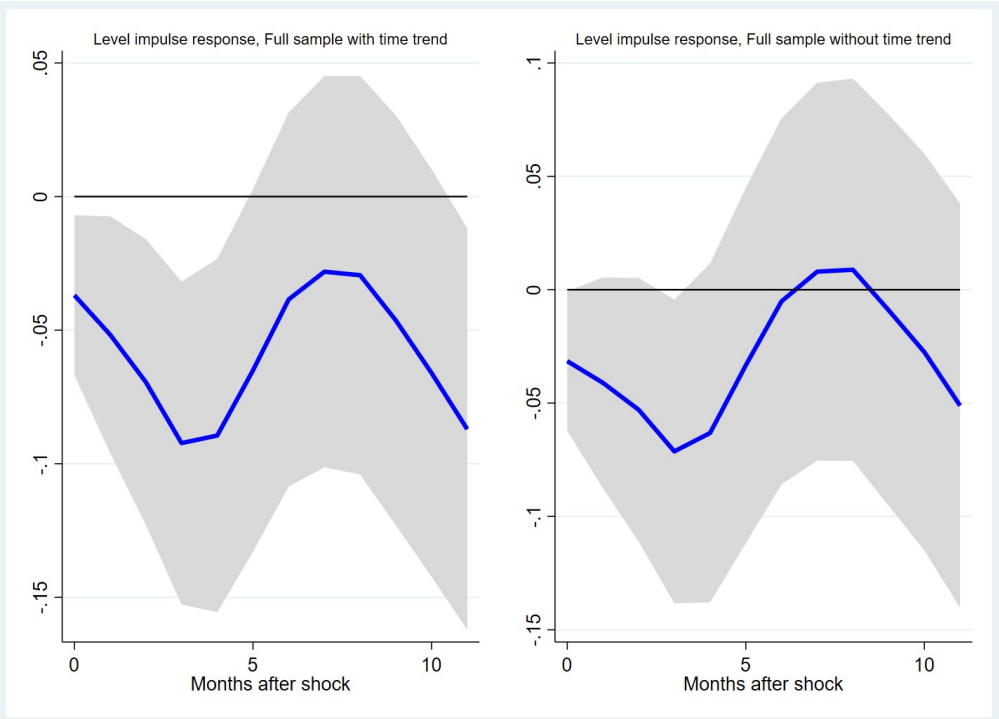
Note. This table reports regressions of the composition of government-backed mortgage in all newly issued mortgage loans in month t + 3 on the first-difference in presidential approving rates over time t (regression 2.1). Macro controls are the federal fund rate, the Chicago Fed's National Financial Conditions Index (NFCI) and unemployment rate.All columns nclude a constant (not reported). Heteroskedasticity- and autocorrelation-consistent asymptotic standard errors reported in parentheses are computed according to Newey and West (1987) with the automatic lag selection method of Newey and West (1994). Sample period: monthly data from 2001 to 2019 * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 1: Simple projection: US mortgage data

The results of the predictive regression (2.1) in Panel A of Table 1 suggest that a decrease in the presidential job approval rate is associated with a higher proportion of government-backed mortgage loans among all newly issued mortgage loans. The coefficients of $\Delta Approving_t$ are negative and statistically significant at the 5% level when all control variables are included. Quantitatively, for example, in column (4), a one standard deviation change in $\Delta Approving_t$, which is approximately 4.4%, predicts a 0.36% increase in the fraction of government-backed mortgage loans in all new mortgages in the third month. To address concerns of endogeneity, we use an instrumental variable approach.

[4]Control variables include the federal funds rate, the Chicago Fed's National Financial Conditions Index (NFCI), unemployment rate, recession dummy, Case-Shiller U.S. National Home Price Index. We also incorporate a time trend and a dummy for election years in this predictive regression setting.

As the presidential approval rating is highly volatile, it is less likely to influence government mortgage credit supply after six months. Furthermore, the presidential approval rating exhibits mean-reverting properties[5]. Therefore, we use the presidential approval rating level from three months prior as an instrument. The 2SLS estimations also yield negative and significant coefficients on approval rating change.



*Note.*This figure presents impulse responses from local projections for 12 months horizon.The specification is equation 2.2. Gray areas represent 95% confidence intervals computed using standard errors according to Newey and West (1987) with the automatic lag selection method of Newey and West (1994).The left panel is the projection with a time trend and the right panel is the projection without a time trend.

Figure 4: Local Projection Impulse Responses for the Composition of Government Backed Mortgage Loans

To test the robustness of our findings, we modify expression (2.1) to measure how the composition of government-backed mortgage loans in all newly issued mortgage loans responds to presidential approval shocks, conditional on controls. We estimate the level responses of the composition using the following specification:

[5]Byers et al. (1997, 2000)

$$\frac{GGL}{AL}t+h=\alpha_0^h+\sum j=0^3\Delta\alpha_{1,j}^h\Delta Approving_{i,t-j}+\sum_{j=1}^{3}\gamma_j^h X_{t-j}+\mu_{t+h}^h \tag{2.2}$$

Here, $\frac{GGL}{AL}_{t+h}$ represents the h-month-ahead composition of government-backed mortgage loans, while the control variables include past three months' approval ratings and controls as indicated previously. The outcomes of these tests are reported in Figure 4. Figure 4 depicts a downward trajectory for the composition, confirming the negative relationship between subsequent composition and changes in presidential approval ratings. This inverse effect is stronger when controlling for a time trend, ensuring that our estimation does not simply reflect an expansion in government-backed mortgage loans over the past two decades.

3 Model

In the previous section, we demonstrated that government-backed mortgages in the US respond negatively to changes in government popularity, suggesting that governments actively manipulate credit policies for political gains. In this section, we present a qualitative model proposing a potential mechanism that rationalizes the government behavior observed in the empirical analysis. Our primary objective is to comprehend why governments have an incentive to react to popularity shocks by altering policies and when they will rely on credit policies to secure political gains.

Rather than assuming a short-termist government, we contend that a rational government is motivated to smooth its popularity over time. This perspective forms the foundation of our model, which is divided into two parts. The first part of the model draws upon Rothschild and Stiglitz (1976), wherein a credit market with entry barriers is filled with competitive lenders and borrowers possessing heterogeneous repayment prospects. The government employs credit guarantees and fiscal transfers as policy instruments, aiming to maximize social welfare in the face of these market frictions.

This model demonstrates that the government's optimal policy is influenced by the sever-

ity of entry barriers; larger entry barriers make it less likely for the government to choose credit policy tools. As a result, the government's strategic choices are shaped by the characteristics of the credit market, which ultimately determine the policy tools employed.

The second part of the model involves two political parties engaging in a repeated game, competing for the presidency. The incumbent government's popularity is a function of voters' utility, combined with an exogenous popularity shock. Both parties determine their policies in response to popularity shocks in order to maximize their expected time in power. This part of the model highlights the role of political competition in driving policy choices, with parties adapting their strategies to win voter support and maintain power.

The model predicts that if the primary friction in the financial market stems from information asymmetry, which is typically the case in advanced economies, the government will opt for credit policies to counteract popularity shocks. Conversely, if the main friction in the financial market is accessibility, which is more common in emerging economies, the government will rely on traditional fiscal tools to counter popularity shocks. We provide empirical evidence supporting this model prediction to conclude this section, reinforcing the notion that both market characteristics and political competition shape the government's strategic choices in response to popularity shocks.

3.1 Government Credit Program v.s. Government Transfer

We assume that the credit market consists of a continuum of borrowers characterized by their type i, for $i \in [0,1]$. The type is borrowers' private information, and type i borrowers default with probability $1-\rho_i$. Assume $\rho_i < \rho_{i'}$ if $i > i'$ and $\rho_i \sim F$. Borrowers have identical utility function which depends on the consumption, net of the tax payment today and the expected amount repaid tomorrow:

$$U = \frac{\nu(\bar{C} + L + \tau)^{1-\gamma}}{1-\gamma} - RL - T, \text{ for } L = 0 \text{ or } L \geq \kappa \tag{3.1}$$

where $\bar{C}$ is a fixed amount of consumption, L is the amount borrowed, R is the interest rate, τ is the government transfer and T is the tax payment. Setting a minimum loan

size κ reflects the entry barrier of the financial market, which is the possibility that the activities financed may have a minimum required investment amount and the presence of fixed costs in loan origination. By rearranging the first order condition from equation (3.1), the desired amount of borrowing can be derived as the following:

$$L_i^* = \left(\frac{R_i}{\nu}\right)^{-1/\gamma} - \bar{C} - \tau \tag{3.2}$$

Lenders are competitive and offer a contract (L, r) as they cannot identify the type of borrowers, where r is the contractual offered rate, and L is the loan size. The contract rate and loan size is assumed to satisfy a zero-profit condition. The lender anticipates whether there is a pooling equilibrium or a separating equilibrium and will choose an offer consistent with that inference. Denote $1 + r_m$ the gross expected return to lenders and the supply of credit is assumed to be infinitely elastic at these equilibrium rates. In the analysis, we focus on the case of pooling equilibrium[6], where the offered rate is a population-weighted average of the expected rates of each type of borrowers which satisfies the zero-profit condition:

$$1 + r_m = \frac{\int_{i \in \mathcal{H}} \rho_i \cdot (1 + r) di}{\int_{i \in \mathcal{H}} di} \tag{3.3}$$

where $\mathcal{H}$ is the set of borrowers borrow a positive amount.

The following proposition establishes an equilibrium where only a fraction of borrowers borrows in the credit market:

Proposition 3.1 *Under certain conditions[7], for a given $r_m > 0$, there is a unique pooling equilibrium contract (L^*, r^*) under which there is an index number $\bar{I}$ such that for $i > \bar{I}$, $L_i = L^* = \kappa$ and for $i \leq \bar{I}$, $L_i = 0$.*

Proof. See Appendix.

In the equilibrium, $i \leq \bar{I}$ borrowers do not borrow because the equilibrium contract (r^*, L^*) is undesirable,

[6] In a separating equilibrium, the offer rate r_i is solved from $\rho_i(1 + r_i) = 1 + r_m$ such that the zero-profit condition holds, and the optimal size of lending is the maximum size that is small enough to deter $i + \Delta$ type to mimic type i borrowers.

[7] Define $r(L)$ the contract rate which satisfies $(1 + r)E[\rho | \rho < \rho^*(L, r)] = 1 + r_m$. Proposition 3.1 holds if $\partial Q(L)/\partial L < 0$, where $Q(L) = F(\rho^*(L, r(L)))L$.

$$\frac{\nu(\bar{C}+\tau)^{1-\gamma}}{1-\gamma} > \frac{\nu(\bar{C}+L^*+\tau)^{1-\gamma}}{1-\gamma} - \rho_i(1+r^*)L^* \tag{3.4}$$

And $\bar{I}$ is the index of the marginal borrower who will borrow exactly the threshold amount $L^*_{\bar{I}} = \kappa$. The threshold $\bar{I}$ is implied by

$$\left(\frac{\rho_{\bar{I}}(1+r^*)}{\nu}\right)^{-\gamma} = \bar{C} + \tau + \kappa \tag{3.5}$$

To support the equilibrium, for borrowers $i > \bar{I}$ with $L^*_i > \kappa$, they will mimic the marginal borrower and hence the contract amount of borrowing is $L = \kappa$. The implied equilibrium contract rate is:

$$1 + r^* = \frac{1+r_m}{\int_{i\geq\bar{I}} \rho_i di} \int_{i\geq\bar{I}} di \tag{3.6}$$

Consider a credit policy, where the government guarantees a portion, g (coverage ratio thereafter), of the promised repayment. By revising the zero-profit condition in equation (3.3), the corresponding contract rate under government guarantee is:

$$1 + r = \frac{1+r_m}{\int_{i>\bar{I}} (\rho_i + (1-\rho_i)g) di} \int_{i>\bar{I}} di. \tag{3.7}$$

To support the credit policy, the expected cost of government is:

$$\int_{i\in[0,1]} (1-\rho_i) g (1+r) L_i di \tag{3.8}$$

which will be financed by the tax payment.

The government finances the public transfer τ today through tax payment tomorrow. Suppose governments can borrow at a government borrowing rate r_f and the tax payment tomorrow is therefore $(1+r_f)\tau$. In addition, there is a fixed amount of government budget B such that:

$$(1+r_f)\tau + \int_{i\in[0,1]} (1-\rho_i) g (1+r) L_i di \leq B \tag{3.9}$$

Now consider the equilibrium established in Proposition 3.1. For borrowers who borrow a positive amount, the equivalent utility function is:

$$\nu\frac{(\kappa+\bar{C}+\tau)^{1-\gamma}}{1-\gamma}-\rho_i(1+r)\kappa-\big(\int_{i>\bar{I}}(1-\rho_i)gdi\big)(1+r)\kappa-(1+r_f)\tau \tag{3.10}$$

and for borrowers who do not borrow in the pooling equilibrium, their utility can be written as:

$$\frac{\nu(\bar{C}+\tau)^{1-\gamma}}{1-\gamma}-\big(\int_{i>\bar{I}}(1-\rho_i)gdi\big)(1+r)\kappa-(1+r_f)\tau \tag{3.11}$$

Hence the corresponding social welfare can be derived as:

$$\int_{i<\bar{I}}\frac{\nu(\bar{C}+\tau)^{1-\gamma}}{1-\gamma}-(1+r_f)\tau di+\int_{i\geq\bar{I}}\frac{\nu(\bar{C}+\tau+\kappa)^{1-\gamma}}{1-\gamma}-(1+r_m)\kappa-(1+r_f)\tau di \tag{3.12}$$

The first term is welfare of borrowers who solely rely on the public transfer (non-borrower thereafer) and the second term is the welfare of borrowers who borrow a positive amount (net-borrower thereafer).

The choice of the optimal policy (τ, g) depends on the relative contribution of the borrower and non-borrowers to the social welfare. If the welfare contribution of a non-borrower is higher than the welfare contribution of a net-borrower, then the social planner should reduce the budget on supplying the credit market and turn to the traditional public transfer. Importantly, the relative contribution depends on the entry barrier κ.

Consider the case where the economy has a large entry barrier to the credit market, which is typically the case in emerging countries (e.g.Scholl (2017)). Assume B satisfies:

$$\nu(\bar{C}+(1+r_f)^{-1}B)^{-\gamma}\geq(1+r_f) \tag{3.13}$$

which ensures the non-borrowers' component of social welfare is always increasing in public transfer for $\tau\in[0,B]$. If κ is sufficiently large, such that the private credit market will completely shut down without government credit guarantee and the net-borrowers are over borrowed in terms of social welfare where:

$$\frac{\nu(\bar{C}+\tau)^{1-\gamma}}{1-\gamma}-(1+r_f)\tau>\frac{\nu(\bar{C}+\kappa+\tau)^{1-\gamma}}{1-\gamma}-(1+r_f)\tau-(1+r_m)\kappa \tag{3.14}$$

for $\tau \in [0, B]$. The optimal policy for the social planer in this case is $(\tau, g) = (B, 0)$, because the contribution of non-borrowers are larger than the net-borrowers in terms of social welfare for all $g \in [0, 1]$. Therefore, the traditional fiscal transfer is welcomed when the entry barrier is severe.

Now consider the case where κ is is sufficiently small such that all the borrowers will enter the credit market once government set its coverage ratio to the maximum. And assume $(\kappa, \tilde{\tau})$ maximizes

$$f(\kappa, \tau) = \frac{\nu(\bar{C} + \kappa + \tau)^{1-\gamma}}{1-\gamma} - (1 + r_f)\tau - (1 + r_m)\kappa \tag{3.15}$$

where $\tilde{\tau} = B - \kappa \int_{i>\bar{I}} (1 + r)(1 - \rho_i) di$ is the corresponding public transfer when $g = 1$. We assume $r_f > r_m$, which ensures entering credit market is welfare enhancing if there is no friction. In this case, the optimal policy for the social planer is $(\tau, g) = (B - \kappa \int_{i>\bar{I}} (1 + r)(1 - \rho_i) di, 1)$ because the contribution of borrowers are larger than the non-borrowers in terms of social welfare. This example suggests that when the dominant friction is the information friction, the social planner should put more focus on the credit policy.

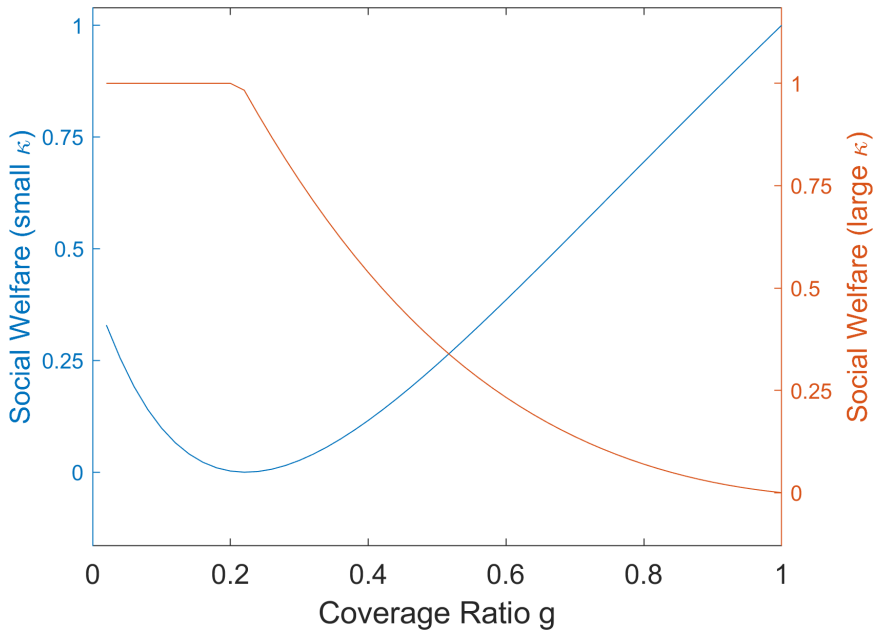


Figure 5: Social Welfare as a Function of g

Note. We set $\nu = 1$, $\gamma = 1$, $\bar{C} = 0.5$, $\bar{\rho} = 1$, $\underline{\rho} = 0.5$, $r_m = 0.02$, $r_f = 0.04$, $B = 0.5$. $\kappa = 0.01$ for the case of low κ and $\kappa = 0.2$ for the case of high κ.

Figure 5 further illustrates the relationship. The red curve is the social welfare as a function of the coverage ratio when κ is large. The curve is flat when g is small because the entry barrier is so large that no one can borrow in the market when the government provide little credit coverage. And it is downward sloping when g goes high because it is too costly for the government to support the risky borrowers. Therefore, the social welfare is maximized with no credit coverage by the government.

The blue curve is the social welfare as a function of the coverage ratio when κ is small. The curve is also downward sloping when g is small because the borrowers who enter the market first are risky and it is costly for the government to support them. As the less risky borrowers enter the market when g becomes large, the curve becomes upward sloping and reaches the maximum when $g = 1$.

3.2 Political Economy Equilibrium

In the previous section, we have shown that to improve social welfare, the public transfer is more effective when the dominant friction is the entry barrier to the credit market, whereas the government credit guarantee is more effective when the dominant friction is the information friction. In this subsection, we present a potential channel that explains why the government does not fix its policy to the optimal level in the first place and why its policies respond to popularity shocks.

We extend the framework in Section 3.1 to infinite horizon. The utility function of borrowers at period t becomes:

$$\frac{(\bar{C} + L_{t,i} + \tau)^{1-\gamma}}{1-\gamma} - RL_{t-1,i} - T_{t-1} \tag{3.16}$$

And the corresponding social welfare function can be expressed as

$$U_t = \sum_t \beta^t \int_{i\in[0,1]} \frac{(\bar{C} + L_{t,i} + \tau)^{1-\gamma}}{1-\gamma} - RL_{t-1,i} - T_{t-1} di \tag{3.17}$$

Assume there are two parties, one is the government in power and the other is the competitor. η is the distribution of voters' idiosyncratic preference of the incumbent govern-

ment over the competitor, the probability of being re-elected can be written as:

$$P_t = Pr(U_{gov,t} + \eta > U_{comp,t}) + \epsilon_t \tag{3.18}$$

where $U_{gov,t}$ is the social welfare if the incumbent government is re-elected and $U_{comp,t}$ is the social welfare when the competitor is elected, η is the individual preference of voters which follows a symmetric distribution, ϵ_t is a shock to the probability of being re-elected (popularity) which follows:

$$\epsilon_t = \begin{cases} \epsilon & \text{with probability } p, \\ -\epsilon & \text{with probability } 1-p \end{cases} \tag{3.19}$$

where $\epsilon > 0$.

Voting happens each period. The elected government is allowed to adjust the credit policy. Assume there is an advantage of policy making for the incumbent where the competitor has to promise a credit policy before the realization of ϵ_t, while the incumbent can adjust the credit policy target after the realization of ϵ_t.

Parties maximize the expected duration in office. Denote (T_t, S_t) the expected time in power for the government and the competitor. Assume the representative of each party has $1-d$ probability to retire each period, and the incumbent will retire if losing the re-election[8]. (T_t, S_t) solves the following recursive equations

$$T_t = E_\epsilon[P_t(1 + dT_{t+1})] \tag{3.20}$$

$$S_t = E_\epsilon[P_t dS_t + (1 - P_t)(1 + dT_{t+1})] \tag{3.21}$$

where E_ϵ denotes the operator that takes expectation with respect to the popularity shock ϵ_t. The right hand side of the first equation is the expected probability of being re-elected times the expected time in power.In the right hand side of the second equation, the first term is the probability of losing the election times the expected time in power as a competitor; and the second term is the probability of winning the election times the expected time in power as an incumbent.

Definition 3.1 *(Political Economy Equilibrium) The Political Economy Equilibrium is a pair of*

[8]By assigning a probability of retirement, it ensures the recursive problem has a fixed point such that $(T_t, S_t) = (T, S)$.

policy functions $\{(g_{gov}, \tau_{gov}), (g_{comp}, \tau_{comp})\}$*, where deviation yields no benefits.*

Here we analyze a equilibrium where candidates apply the *grim trigger strategy*, where the player will punish for the remainder of the game once the opponent defects. And because the candidate of the opposition party must promise a policy before ϵ_t is realized, (g_{comp}, τ_{comp}) degenerates to a constant under this setup. Now suppose the incumbent government applies the optimal policy only if there is a negative popularity shock $\epsilon_t = -\epsilon$. When $\epsilon_t = \epsilon$, the incumbent government applies a suboptimal policy. The competitor promises to the same suboptimal policy to the public in both cases[9]. The following proposition establishes the benefit of defecting:

Proposition 3.2 *Denote* (T_D, S_D) *the expected time in power if either party defects:*

$$S_D = P_e(1 + dT_B) + (1 - P_e)dS_B \tag{3.22}$$

$$T_D = (2P_e - \frac{1}{2})(1 + dT_B) \tag{3.23}$$

where $P_e \coloneqq E_\epsilon[P_t]$*.* (T_B, S_B) *are the expected time in power when both parties always apply the optimal policies:*

$$T_B = \frac{1}{1 - \frac{1}{2}d} \tag{3.24}$$

$$S_B = \frac{\frac{1}{2}(dT_B + 1)}{1 - \frac{1}{2}d} \tag{3.25}$$

The equilibrium where the government applies a suboptimal policy when $\epsilon_t = \epsilon$ exists if there is $P_e > \frac{1}{2}$ such that:

$$S \geq S_D \text{ and } T \geq T_D \tag{3.26}$$

Figure 6 establishes a equilibrium area when d is set to 0.79. In this example, any policy plans such that $E_e[P_t]$ lies in the area is a equilibrium.

Proposition 3.3 *There is* $\epsilon > 0$ *such that a equilibrium exists, in which* $(\tau_{gov}(-\epsilon), g_{gov}(-\epsilon)) = (\tau_{comp}, g_{comp}) \neq (\tau^*, g^*)$ *and* $(\tau_{gov}(-\epsilon), g_{gov}(-\epsilon)) = (\tau^*, g^*)$*.*

[9]Otherwise the incumbent will always gain from deviating by mimicing the competitor's policy when the popularity shock is non-negative

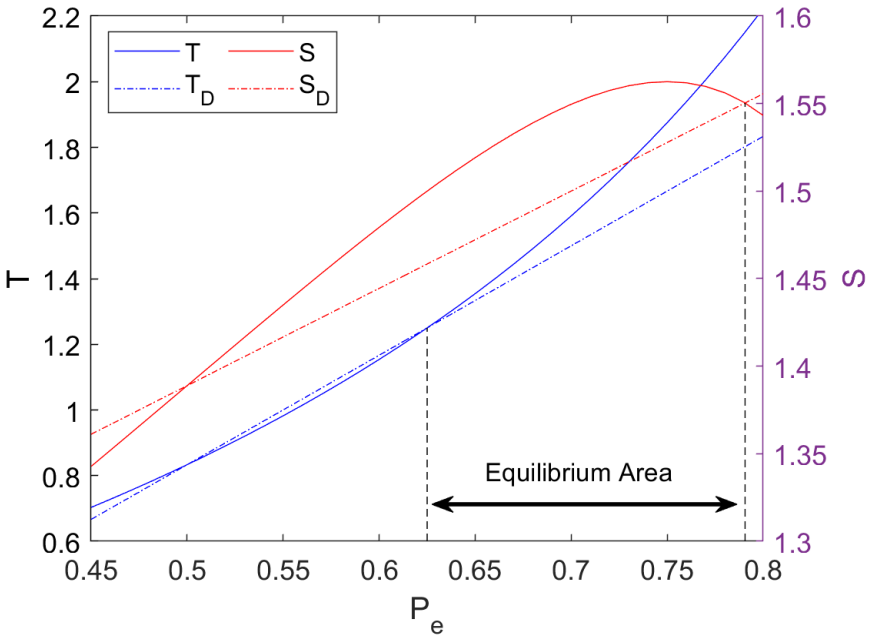
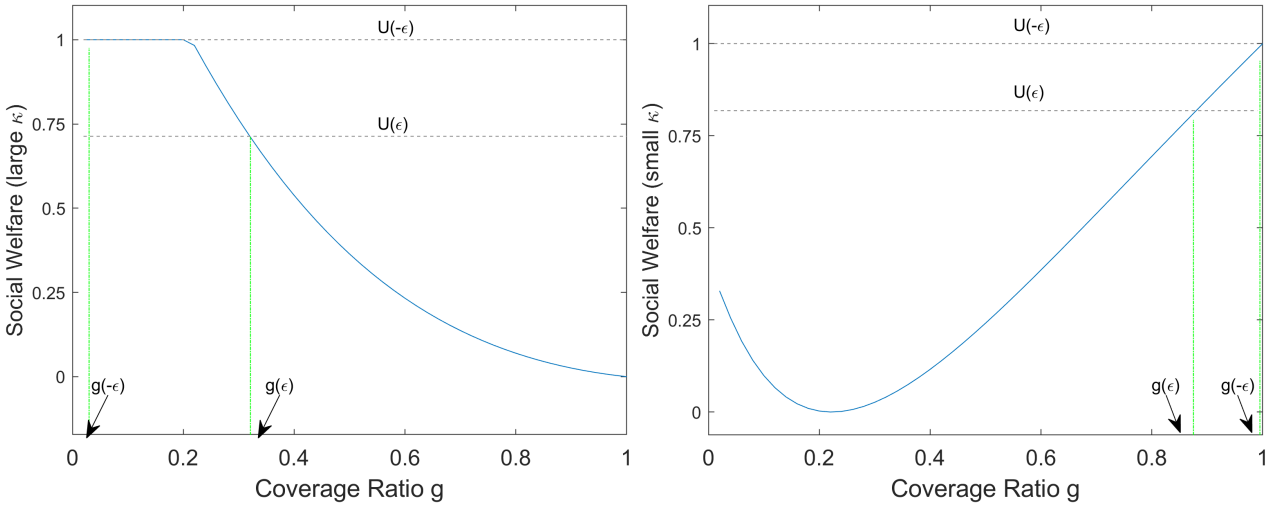


Figure 6: Equilibrium Area

Proposition 3.3 shows that the incumbent government will respond to popularity shock by changing its economic policy in equilibrium, even though the popularity shock itself does not has any direct impact on the economy. Interestingly, government's response will also depends on the level of entry barrier to the financial market κ. As explained in the previous part, if κ is large, the social welfare is a decreasing function in g and the optimal policy is set g to 0. In this case, a suboptimal policy is slightly increasing g and set a public transfer lower than the optimal level (Figure 7a). On the other hand, if κ is small, the optimal policy is to have the coverage ratio g as large as possible, and a suboptimal policy is to set g lower than the optimal level (Figure 7b). The following proposition 3.4 summarizes the discussion of Figure 7:

Proposition 3.4 *There is a $\tilde{\kappa} > 0$, and if $\kappa < \tilde{\kappa}$ ($\kappa > \tilde{\kappa}$), then $\tau_{gov}(-\epsilon) < \tau_{gov}(\epsilon)$ ($\tau_{gov}(-\epsilon) > \tau_{gov}(\epsilon)$) and $g_{gov}(-\epsilon) > g_{gov}(\epsilon)$ ($g_{gov}(-\epsilon) < g_{gov}(\epsilon)$).*

Because the governments' suboptimal policy design depends on the level of entry barrier, Proposition 3.4 implies that for economies with large entry barrier to the credit market, they will rely on public transfer to counter popularity shocks; while for economies with small entry barrier, the governments will react to popularity shocks by adjusting the credit policy.



(a) Large κ (b) Small κ

Figure 7: The Equilibrium Policy for Different κ

4 Government Popularity and credit fluctuation

There are two main predictions from our model framework: first, governments have incentives to counter popularity shocks by changing policies; second, the choice of the policy tool is different for advanced and emerging countries.

This section aims at verifying the model predictions. We start this section by introducing our cross-country dataset. In the next part, we present the OLS results on past changes in government popularity predicting future credit change in advanced economies. And then, we further consolidate the OLS results by proposing an IV strategy. In the last part, we present evidence that governments in advanced countries and emerging countries rely on different policy tools to counter popularity shocks.

4.1 Data

Our cross-country panel contains government support, macroeconomic, and credit-related variables in 22 advanced economies and 67 emerging economies. We classify advanced economies according to Mendoza and Terrones (2012). In the advanced economy subsample, 15 of 22 economies belong to countries with full democracy[10], and the rest be-

[10]Full democracies are nations where civil liberties and fundamental political freedoms are not only respected but also reinforced by a political culture conducive to the thriving of democratic principles. These nations have valid systems of governmental checks and balances, judiciaries whose decisions are enforced

longs to countries with flawed democracies [11], according to the *Democracy Index* compiled by the Economist Intelligence Unit (EIU) published in 2016. None of the advanced economies belong to Authoritarian regimes[12] or Hybrid regimes[13]. Among the 67 emerging economies, only 5 countries in our sample belong to full democracies, and 15 of them belong to flawed democracies. All other 45 countries belong to Authoritarian and Hybrid regimes.

Our country-level panel dataset includes information on government popularity, household and private sector debt to GDP, public debt to GDP, short-term interest rate, real GDP growth rate, inflation, and bank crisis. The data are annual and range from 1984 to 2016. Following the previous research by Herrera et al. (2020), we measure government popularity by the ICRG government stability index (government stability hereafter) from the Political Risk Service Group, a leading supplier of financial, economic, and political risk analysis. [14] In Herrera et al. (2020), the authors use the government stability index to measure government popularity and refer to an increase in the government stability index as a political boom. In addition, Herrera et al. (2020) also builds an alternative cross-country measurement on government approval by collecting opinion poll data from 30 countries and shows strong co-movement between the government stability index and self-constructed government approval measurement.

The data of the private debt to GDP ratio[15], the household debt to GDP ratio, and the public debt to GDP ratio are from the IMF Global Debt Database (GDD). In addition, we

independently, governments that function adequately, and diverse and independent media. Problems in democratic functioning are typically limited in these nations. The countries with full democracy in our sample include Australia, Austria, Canada, Denmark, Finland, Germany, Iceland, Ireland, Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, United Kingdoms.

[11]Flawed democracies are nations, where elections are fair and free and basic civil liberties, are honored but may have issues (e.g., media freedom infringement and minor suppression of political opposition and critics). These nations may have significant faults in other democratic aspects, including underdeveloped political culture, low levels of participation in politics, and issues in the functioning of governance. The countries with flawed democracy in our sample: Belgium, France, Greece, Italy, Japan, Portugal, and the United States.

[12]Authoritarian regimes are nations where political pluralism is nonexistent or severely limited.

[13]Hybrid regimes are nations with regular electoral frauds, preventing them from being fair and free democracies.

[14]According to the PRS group, "the ICRG government stability index is an assessment both of the government's ability to carry out its declared program(s) and ability to stay in office." The government stability index consists of three sub-indexes, government cohesion, legislative strength, and popular support. Each sub-index ranges from 0 to 4 points: A score of 4 equates to extremely low risk and a score of 0 points to extremely high risk. The government stability index is a simple sum of three sub-indexes.

[15]Debt is defined as loans and debt securities (bonds and short-term paper).

add controls for key annual macroeconomic variables using data from the World Bank Open data and the Jordà-Schularick-Taylor Macrohistory Database. The systemic banking crisis dummies in our analysis follow the widely used database from Laeven and Valencia (2018), which draws on systemic banking crisis episodes around the globe from 1970 to 2017. Specifically, a systemic banking crisis in the data is defined as an event that meets two conditions: (1) significant signs of financial distress in the banking system; (2) significant banking policy intervention measures in response to significant losses in the banking system.

4.2 Government popularity predicts credit: simple projection

We start our analysis with the advanced-country subsample. To check whether the hypothesis that governments in advanced countries use credit policy to counter shock to their public supports, we perform a set of fixed effects panel regressions, in which we project the change of the private debt to GDP ratio $d_i^{Private}$ from year t to year $t+2$, by using percentage changes of government stability over the year t. The panel regression for estimating subsequent two-year credit fluctuation with country fixed effects is given by:

$$\Delta_2 d_{i,t+2}^{Private} = \beta_0 + \beta_1 \Delta GS_{i,t} + \gamma X_{i,t} + \rho_i + \epsilon_{i,t} \tag{4.1}$$

where i and t index countries and years, respectively. $\Delta GS_{i,t}$ is 100 times the log change in the government stability over year t, ρ_i is the country fixed effect. $X_{i,t}$ is a vector of controls that includes the log-difference of real GDP per capita from year $t-1$ to t, the short-term interest rate in year t, the private debt to GDP ratio level in year t, and systemic bank crisis dummy.

Table 2 shows the results of the regression (4.1). As we can see from column (1), changes in government stability have substantial predictive power for future credit to GDP ratio fluctuations: a one standard deviation decrease in the government stability, which is around 14%, is associated with an increment in the private debt to GDP ratio about 1.05 percentage in the next two years[16]. Column (2) shows such predictive power is unaffected after the time trend is controlled for, which further ensures that our estimate does not simply reflect a combination of the secular expansion in private credit over the past

[16] 1.05 percentage is around 5% of standard deviations in the two-year change of private debt to GDP ratio after 1984.

	Dependent variable: $\Delta_2 d^{Private}_{i,t+2}$			Dependent variable: $\Delta_2 d^{HH}_{i,t+2}$		
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta GS_{i,t}$	-0.075**	-0.072**	-0.059*	-0.067**	-0.057*	-0.061*
	(0.033)	(0.033)	(0.032)	(0.030)	(0.029)	(0.033)
$\Delta y_{i,t}$	1.982	2.006	2.261*	1.518	1.600	1.902
	(1.296)	(1.322)	(1.222)	(1.335)	(1.364)	(1.250)
$r^s_{i,t}$	-0.552	-0.124	0.314	0.105	1.126	1.023
	(0.477)	(0.989)	(0.905)	(0.534)	(1.125)	(1.080)
$\pi_{i,t}$	-0.561	-0.736	-0.952	-1.327	-1.753	-1.651
	(0.928)	(1.138)	(1.048)	(0.911)	(1.206)	(1.092)
$d^{Private}_{i,t}$	-0.131***	-0.142***	-0.068**			
	(0.016)	(0.027)	(0.026)			
$d^{HH}_{i,t}$				-0.184***	-0.205***	-0.093**
				(0.017)	(0.020)	(0.038)
N	679	679	679	624	624	624
R^2	0.130	0.132	0.105	0.151	0.160	0.102
Bank crisis dummy	Yes	Yes	Yes	Yes	Yes	Yes
Time trend	No	Yes	Yes	No	Yes	Yes
Country FE	Yes	Yes	No	Yes	Yes	No

Note. This table reports regressions of private and household to GDP ratio growth from t to t+2 on the change in government stability from the end of t-1 to the end of t (regression 4.1). All column include a set of economic control: the log-difference of real GDP per capita from year $t-1$ to t, the short-term interest rate in year t, the private debt or household debt to GDP ratio level in year t, and systemic bank crisis dummy. Columns (1) and (4) are country fixed effect regressions without time trends. Columns (2) and (5) are country fixed effect regressions with time trends.Columns (3) and (6) are OLS regressions with time trends. All specifications include a constant (not reported). Reported R^2 values are from within-country variation. Standard errors in parentheses are clustered on country. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2: Simple projection

four decades (Mian et al. (2017)). In column (3), we run a regression without fixed effect, in which we find the same pattern as column (1). Column (4)-(6) repeat the exercises with the Household debt to GDP ratio as the response variable. These regressions also yield significant and negative coefficients of changes in government stability and show similar quantitative magnitude to the previous exercises with private debt.

The results of our simple projection for the cross-country panel show that the near-term movements in popularity of governments have substantial explanatory power for future credit fluctuations. In other words, these results provide suggestive evidence that the de-

pressed current government popularity is often associated with a significant raising in the future national credit level, which confirm the validation of our theoretical framework. In Appendix E, we provide further evidences of the robustness of this dynamic relation by using local projections.

A typical concern to the results from simple projections is the potential endogeneity caused by simultaneous causality. A direct simultaneity comes from the fact that a change in future credit market condition is predictable, and may also affect forward-looking voters' confidence about the government, which in turn influences the government popularity.

However, we can rule out this kind of explanation for our results because a predictable credit market boom is typically associated with stronger confidence about the central government due to forward-looking behavior. This will lead to an upward bias of our simple projection results[17]. However, as our simple projections yield a significant negative relationship between popularity change and future change of credit level, remove the simultaneity should make the negative relationship even stronger.

4.3 Government popularity predicts credit: two-step approach

Admittedly, there are also other sources that may introduce bias to our simple projection results. To deal with potential simultaneities which are more indirect and further consolidate the simple projection results, we use an instrumental variables (IV) approach. Previous studies in political science, such as Byers et al. (1997, 2000), show that government popularity is persistent and mean-reverting. Therefore, we use the past popularity to forecast future changes in the government popularity in the first-step. The economic interpretation of our IV approach is in the spirit of López-Salido et al. (2017): in the first step, we isolate the component of non-economic government popularity change driven by past government popularity levels; and then, we check if the component of popularity changes predicted by the past popularity levels still has strong explanatory power for future credit fluctuations in the second step.

[17] Liu and Shaliastovich (2022) document high approval ratings forecast a decline in the dollar risk premium several years ahead in the US, and use a model interpret it as policy valuations (approvals) are forward-looking and increase at times of high expected policy-related growth and low policy-related uncertainty.

Formally, the specification of the first step is:

$$\Delta GS_{i,t} = \theta_0 + \theta_1 GS_{i,t-n} + \rho_i + v_{i,t} \tag{4.2}$$

where $\Delta GS_{i,t}$ is the log-difference in the government stability over year t and 100 times. And $GS_{i,t-n}$ the log of the government stability in year $t-1$, $t-2$ or $t-3$ [18]. ρ_i is the country fixed effect. The results of the first-stage regression confirm the mean-reverting property and is reported in appendix D.

We then generate the fitted government stability change $\Delta\widehat{GS}_{i,t}$ based on the first-step regression, and interpret the fitted value as capturing the self-driving component of popularity change. In the second-step regression, we repeat the simple projection with fitted value:

$$\Delta_2 d_{i,t+2}^{Private} = \beta_0 + \beta_1 \Delta\widehat{GS}_{i,t} + \rho_i + \epsilon_{i,t} \tag{4.3}$$

Results from the second stage are presented in Table 3. The results coincide with our findings in simple projections: even after resolving the endogeneity problem, depressed government popularity is associated with a significant raising in the future national credit level.

The baseline results in columns (1) and (2) of Table 3 show that a decline in the component of government popularity, which is driven by a reversal of prior popularity, predicts a future two-year credit increment. The sign and the significance of coefficients of $\Delta\widehat{GS}_{i,t}$ are preserved when we introduce the vector of control variables to account for potential macroeconomic confounding factors (columns (5) and (6)). Moreover, as shown in columns (3) and (4), the explanatory power of self-driven popularity changes is not only strong in the subsequent two-year changes in credit, which we used as the baseline in the previous analysis, but also in the credit ratio changes in the subsequent year. This finding suggests that the credit level could have an immediate response when there is a shock to the government popularity [19].

[18] We also report results use all three past observations as instruments

[19] In many macroeconomic setting, it is difficult for a potential instrument to convincingly satisfy the exclusion restriction. In our two-step approach, it may be that the past political popularity level has an effect on subsequent credit fluctuation. However, as we discussed in the previous subsection, this effect would have the opposite sign of what we find here: a low level of political popularity should occur in expectation of a worse economic condition and a lower credit growth because of voters' forward looking behaviour. Our two-step approach rule out other source that may introduce bias. The omitted variables associated

	(1) $\Delta_2 d^{Private}_{i,t+2}$	(2) $\Delta_2 d^{HH}_{i,t+2}$	(3) $\Delta d^{Private}_{i,t+1}$	(4) $\Delta d^{HH}_{i,t+1}$	(5) $\Delta_2 d^{Private}_{i,t+2}$	(6) $\Delta_2 d^{HH}_{i,t+2}$
Panel A:Instrument $\Delta GS_{i,t-1}$						
$\Delta \widehat{GS}_{i,t}$	-0.810***	-0.466***	-0.275***	-0.134**	-0.604***	-0.356**
	(0.226)	(0.179)	(0.081)	(0.053)	(0.191)	(0.152)
KP F-stat	246.285	265.26	274.59	221.68	274.59	221.68
Panel B:Instrument $\Delta GS_{i,t-2}$						
$\Delta \widehat{GS}_{i,t}$	-0.725**	-0.506	-0.371***	-0.251**	-0.714**	-0.514*
	(0.251)	(0.328)	(0.127)	(0.111)	(0.292)	(0.274)
KP F-stat	190.43	214.17	190.93	173.37	190.93	173.36
Panel C:Instrument $\Delta GS_{i,t-3}$						
$\Delta \widehat{GS}_{i,t}$	-0.778***	-0.463**	-0.523**	-0.410*	-1.002*	-0.788
	(0.350)	(0.215)	(0.242)	(0.243)	(0.517)	(0.526)
KP F-stat	140.95	121.36	119.78	93.31	119.78	93.31
Panel C:Instrument $\Delta GS_{i,t-1}$ **&** $\Delta GS_{i,t-2}$ **&** $\Delta GS_{i,t-3}$						
$\Delta \widehat{GS}_{i,t}$	-0.742***	-0.458**	-0.330***	-0.206**	-0.671**	-0.455*
	(0.253)	(0.211)	(0.113)	(0.093)	(0.267)	(0.240)
KP F-stat	63.66	74.85	75.41	64.47	75.41	64.47
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Macro Control	No	No	Yes	Yes	Yes	Yes
Bank crisis dummy	No	No	Yes	Yes	Yes	Yes

Note. This table reports regressions of private and household to GDP ratio growth from t to t+1 and t to t+2 on the fitted change in government stability (results of Table 5) from the end of t-1 to the end of t (regression 4.3). Columns (3) to (6) include a set of economic control: the log-difference of real GDP per capita from year $t-1$ to t, the short-term interest rate in year t, the private debt or household debt to GDP ratio level in year t, systemic bank crisis dummy. All columns are country fixed effect regressions with time trends, all specifications include a constant (not reported). Reported R^2 values are from within-country variation. Standard errors in parentheses are clustered on country. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Second-stage results

Thus, overall, results in the analyses above reveal a robust linkage between politics and credit[20]: an decrease in government popularity lead to a subsequent expansion in private

with popularity levels would likely positively link to credit. This argument suggests that the estimates we provide are conservative in quantifying the negative effect of popularity change on subsequent credit fluctuation.

[20]We conduct robustness checks of analysis in this section by controlling for country-specific political and institutional factors including: (1) democracy scores from the Polity data set (2) the political system, presidential or parliamentarian (3) Years until next election (4) Years in office. Appendix F show that these

debt or household debt to GDP ratio.

4.4 Credit v.s. Fiscal: the choices of policy tools in advanced and emerging economies

We now show how the other model prediction is connected to the data. Proposition 3.4 implies that for economies with large entry barrier to the credit market, they will rely on public transfer to counter popularity shocks. In light of this proposition, we present evidence that government popularity seems to be an important in determining public spending in emerging countries. However, the same relationship does not hold for credit level in emerging countries.

We cannot directly observe the central governments spending in emerging economies before IMF set up fiscal policy monitor in 2009. However, we can use central government public debt as a proxy for spending. Table 4 replicates the two-step regressions in Section 4.3. We use central government or private debt change in the subsequent year as the dependent variable and estimate with the sample of emerging or advanced economies. Our model suggests, in countries where the information friction is dominant (κ is small), the government tends to respond to swings of government support by adjusting credit policy rather than traditional fiscal tools. Column (3) and (4) report the regression results of how private and central government debt react to changes of government stability in advanced countries. Consistent with our model predictions, the coefficient is significant only for private credit in the sample of advanced countries.

On the other hand, if κ is large, which means the entry barrier of the credit market is the dominant friction, the model predicts that the government will rely more heavily on the traditional fiscal tool to counter the drop in government support. Columns (1) and (2) check how central government debt and private respond to the change of government stability in emerging economies, where credit markets are typically underdeveloped and hence with poor accessibility to common people. Consistent with the model prediction, we find the results are reversed in the sample of emerging countries. The empirical results yield strong evidence of manipulation of general fiscal spending in response to fluctuations of government support, whereas there is only weak evidence of manipulation of private credit.

additional controls do not affect our results qualitatively.

	(1) Emerging $\Delta d^{Private}_{i,t+1}$	(2) Emerging $\Delta d^{Government}_{i,t+1}$	(3) Advanced $\Delta d^{Private}_{i,t+1}$	(4) Advanced $\Delta d^{Government}_{i,t+1}$
Instrument $\Delta GS_{i,t-1}$ **&** $\Delta GS_{i,t-2}$ **&** $\Delta GS_{i,t-3}$				
$\Delta \widehat{GS}_{i,t}$	-0.048	-0.099*	-0.330***	0.026
	(0.031)	(0.054)	(0.099)	(0.034)
N	1527	1456	631	599
Bank crisis dummy	Yes	Yes	Yes	Yes

Note. This table reports regressions of private and Central government debt to GDP ratio growth from t to t+1 on the fitted change in government stability from the end of t-1 to the end of t (specification same as regression 4.3). The first stage regression, fitting government stability change from t-2 government stability level(specification same as regression 4.2) are estimated separately in emerging and advanced economies samples. The dependent variables in each column are:(1) Private debt in emerging countries (2) Central Government debt in emerging countries (3) Private debt in advanced countries (4) Central government dent in emerging countries. All columns are country fixed effect regressions with time trends, all specifications include a constant (not reported). Reported R^2 values are from within-country variation. Standard errors in parentheses are clustered on country. Standard errors reported in parentheses and are clustered by country. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Two-step regression on advanced and emerging countries

5 Conclusion

Existing empirical research has provided multiple evidence suggesting active manipulation of credit by local governments for political gains. In this paper, we find evidence of credit manipulation at the aggregate level, where governments reacts to the swings of popularity by adjusting credit policy tools such as government-backed mortgage loans. In the model, we rationalize governments' utilization of credit tool to respond to the fluctuation of government support. The political interest maximizing government sets policy targets to a suboptimal level in exchange for adequate policy space for countering the sudden drop of government support.

Our paper identifies political factors as a potential source of the credit cycle. The building-up of credit may not only be a result of investors' extrapolation of good news (Bordalo et al. (2018)) or other shocks to fundamentals, but also reflect governments' policies incentivized by the wish to revert the declining government support. The manipulation also reflects a typical deficiency of democratic societies: the government will keep the policy intervention at a suboptimal level to leave adequate policy space to counter sudden drops in support during its term in office.

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A Private credit to GDP ratio and the unemployment rate

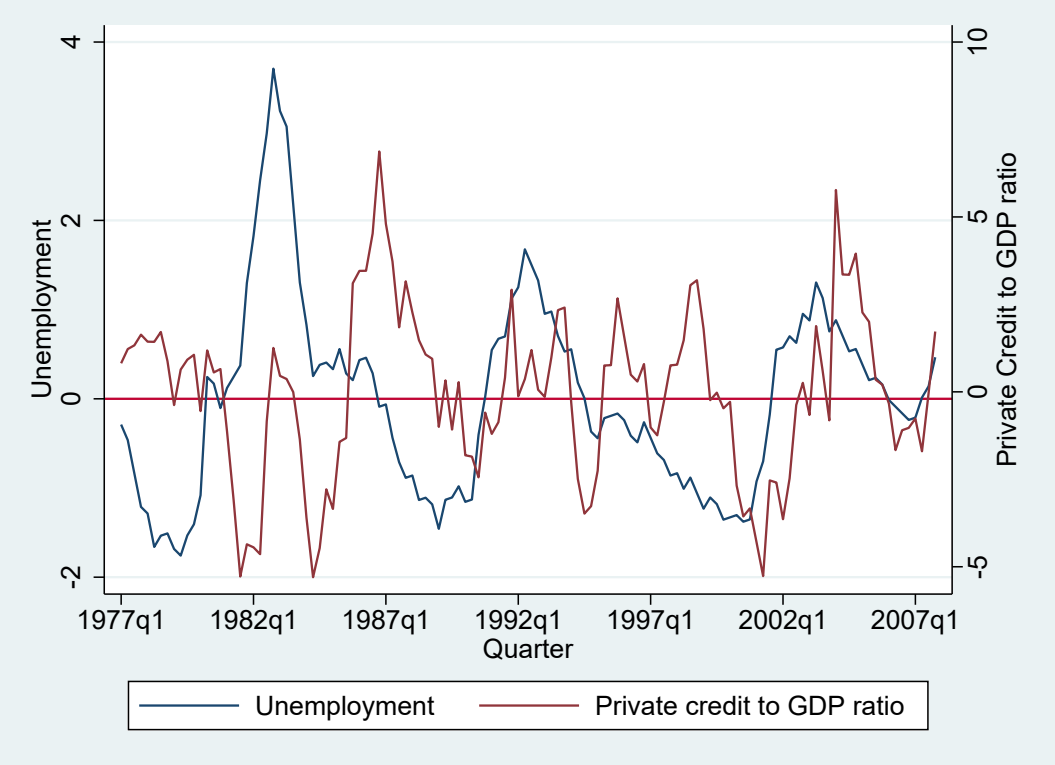


Figure 8: Time series dynamic of approval rating and credit cycle

Note. This figure presents time-series dynamic for cyclical components of Private credit to GDP ratio and de-trended unemployment. The cyclical components are obtained from the HP filters (parameter value 1600 for private credit to GDP ratio).

B The proof of Proposition 3.1

We first describe the game as the following:

- Think about (L, r) as segmented markets defined by its offered rate r and contractual borrowing amount L.
- Borrowers can search on every market without cost.
- Lenders' cost of financing is $1 + r_m$. The zero-profit condition implies only (L, r) yielding zero profit will exist.
- Lenders maximize the expected amount of credit.

Borrowers' optimal searching is to search on (L, r), which provides them with desirable contracts. Define $\mathcal{U}(L) = \frac{(\bar{C}+L+\tau)}{1-\gamma} - T$, borrower i will search on (L, r) if

$$\mathcal{U}(0) < \mathcal{U}(L) - \rho_i(1+r)L \tag{B.1}$$

Therefore the marginal borrower on (L, r) is

$$\rho^*(L, r) = \frac{\mathcal{U}(L) - \mathcal{U}(0)}{(1+r)L} \tag{B.2}$$

if $\frac{\mathcal{U}(L)-\mathcal{U}(0)}{(1+r)L} \leq 1$ and $\rho_{I^*} = 1$ otherwise.

Lenders form beliefs that are consistent with Borrowers' equilibrium searching strategy:

$$Pr(\rho_i < \rho | (L, r)) = \frac{F(\rho)}{1 - F(\rho^*(L, r))} \tag{B.3}$$

The expected amount of credit is

$$F(\rho^*(L, r))L \tag{B.4}$$

The lenders' problem can then be written as:

$$\max F(\rho^*(L, r))L \tag{B.5}$$

$$s.t. \quad (1+r)E[\rho | \rho < \rho^*(L, r)] = 1 + r_m, \quad L \geq \kappa \tag{B.6}$$

Define $r(L)$ the contract rate which satisfies $(1+r)E[\rho|\rho < \rho^*(L,r)] = 1+r_m$. The lenders' problem is solved at κ if $\partial Q(L)/\partial L < 0$, where $Q(L) = F(\rho^*(L,r(L)))L$.

C Proof of Proposition 3.2

When both parties uniformly apply the optimal policy, the welfare $U_{comp} = U_{gov}$ and hence the probability of reelection $P_B = \frac{1}{2}$. We can solve (T_B, S_B) by equation 3.20,

$$T_B = \frac{1}{2}(1 + dT_B)S_B = \frac{1}{2}dS_B + \frac{1}{2}(1 + dT_B)$$

Next, recall that under the equilibrium strategy, $U^*_{gov}(\varepsilon) = U^*_{comp} \equiv U_0$. Now, if the competitor deviates to the optimal policy:

- when there is a positive popularity shock, his probability of winning the election is

$$Pr\big(U_1 + \eta > U_0\big) + \varepsilon$$

  where U_1 denotes the welfare of government applying the optimal policy.

- when there is a negative popularity shock, his probability of winning the election is

$$\underbrace{Pr\big(U_0 + \eta > U_0\big)}_{=\frac{1}{2}} + \varepsilon$$

therefore the expected probability of winning the election is the same as the incumbent's expected probability of winning under the equilibrium strategy $P_e = E_e[P_t]$.

When the incumbent deviates, he will apply the optimal policy design even when $\epsilon_t = \epsilon > 0$. Therefore, the probability of winning is the same when $\epsilon_t = -\epsilon$ and the probability of winning when $\epsilon_t = \epsilon > 0$ is

$$Pr\big(U_1 + \eta > U_0\big) - \varepsilon$$

In sum, the expected probability of winning under deviation is $2P_e - 1$.

D First stage of IV

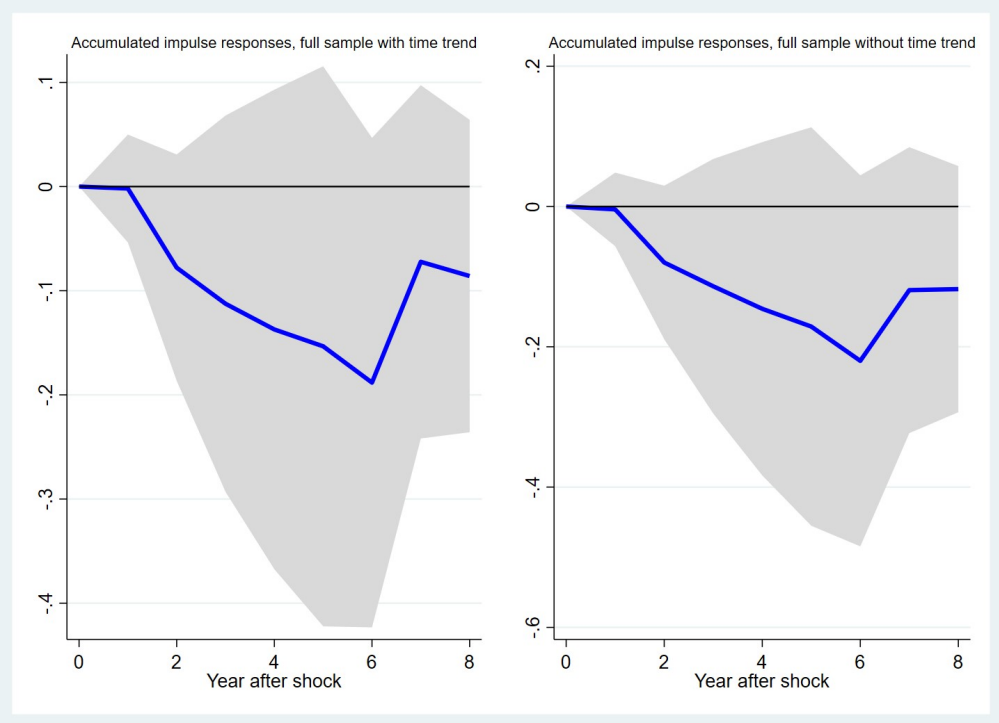
	(1) $\Delta GS_{i,t}$	(2) $\Delta GS_{i,t}$
Panel A:Instrument $\Delta GS_{i,t-1}$		
$GS_{i,t-1}$	-0.249 ***	-0.269***
	(0.016)	(0.016)
Panel B:Instrument $\Delta GS_{i,t-2}$		
$GS_{i,t-2}$	-0.269 ***	-0.275***
	(0.020)	(0.020)
Panel C:Instrument $\Delta GS_{i,t-3}$		
$GS_{i,t-3}$	-0.205 ***	-0.201***
	(0.017)	(0.018)
Panel D:Instrument $\Delta GS_{i,t-1}$ **&** $\Delta GS_{i,t-2}$ **&** $\Delta GS_{i,t-3}$		
$GS_{i,t-1}$	-0.108***	-0.141***
	(0.023)	(0.027)
$GS_{i,t-2}$	-0.176***	-0.165***
	(0.039)	(0.043)
$GS_{i,t-3}$	-0.023	-0.014
	(0.030)	(0.031)
Country FE	Yes	Yes
Macro controls	No	Yes
Bank crisis dummy	No	Yes

Note. This table reports forecasting regression of the change in government stability from the end of t-1 to the end of t on the government stability level from t-1, t-2, t-3 or all 3 past observations (regression 4.2). The regression is a country fixed effect regression include a constant (not reported). Reported R^2 values are from within-country variation. Standard errors in parentheses are clustered on country. Column (2) add the macro control (private sector debt to GDP level, short-term interest rate, real GDP growth rate, inflation) and bank crisis dummy. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: First-stage results

E Robustness Using Local Projections

How robust is the dynamic relations between government popularity and credit fluctuation? To answer this question, we estimate impulse responses using Jordà (2005) local projections. Impulse responses from local projections are well suited for assessing the robustness of the dynamic relation, as they are more robust to mis-specification, easily allow for the inclusion of control variables, and allow for inference directly on the estimated impulse responses. We start from checking the robustness of the connection between gov-



Note. This figure presents impulse responses from local projections for 8 years horizon.The specification is equation E.1. Gray areas represent 95% confidence intervals computed using standard errors clustered on country. The left panel is the projection with time trends and the right panel is the projection without time trends.

Figure 9: Local Projection Impulse Responses for the Private Debt to GDP ratio

ernment popularity and subsequent credit change:

$$\Delta_h d^{Private}_{i,t+h-1} = \alpha^h_0 + \sum_{j=0}^{3} \alpha^h_{1,i,j} \Delta GS_{i,t-j} + \sum_{j=1}^{3} \gamma^h_{i,j} X_{i,t-j} + \rho^h_i + \mu^h_{i,t+h-1} \tag{E.1}$$

Where $\Delta_h d^{Private}_{i,t+h-1}$ is the h years ahead accumulated change of the private debt to GDP ratio for country i. The control variables including past three years government popularity change and macro controls as indicated in section 4. The local projection impulse responses to popularity shocks are given by the sequence of coefficients of $\Delta GS_{i,t}$. Left panel presents along with 95% confidence intervals computed using standard errors clustered on country. The baseline estimates reveal a dynamic pattern that government popularity negatively connects with credit change in the following several years. Exclusion of a time trend does little to alter the main finding.

F Cross-country analysis with political controls

	(1) $\Delta_2 d^{Private}_{i,t+2}$	(2) $\Delta_2 d^{HH}_{i,t+2}$
Panel A:Instrument $\Delta GS_{i,t-1}$		
$\Delta \widehat{GS}_{i,t}$	-0.494 ***	-0.255***
	(0.136)	(0.084)
KP F-stat	300.02	208.50
Panel B:Instrument $\Delta GS_{i,t-2}$		
$\Delta \widehat{GS}_{i,t}$	-0.459 ***	-0.259**
	(0.139)	(0.106)
KP F-stat	179.37	163.44
Panel C:Instrument $\Delta GS_{i,t-3}$		
$\Delta \widehat{GS}_{i,t}$	-0.457 ***	-0.221*
	(0.154)	(0.129)
KP F-stat	91.90	69.92
Panel D:Instrument $\Delta GS_{i,t-1}$ **&** $\Delta GS_{i,t-2}$ **&** $\Delta GS_{i,t-3}$		
$\Delta \widehat{GS}_{i,t}$	-0.455***	-0.248***
	(0.140)	(0.095)
KP F-stat	77.79	62.86
Country FE	Yes	Yes
Macro controls	Yes	Yes
Bank crisis dummy	Yes	Yes
Political control	Yes	Yes

Note. This table reports regressions of private and household to GDP ratio growth from t to t+2 on the fitted change in government stability (results of Table 5) from the end of t-1 to the end of t (regression 4.3). Same as 3, all columns include a set of economic control. In addition, all columns include a set of political controls:democracy scores, the political system, years until next election, years in office. All columns are country fixed effect regressions with time trends, all specifications include a constant (not reported). Reported R^2 values are from within-country variation. Standard errors in parentheses are clustered on country. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Second-stage results