

The State of Federal Credit Policy in the United States: A Review from 1977

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Abstract

We examine the current state of federal credit policy in the United States by creating a new dataset of federal credit programs spanning from 1977 to 2023 on a quarterly basis. Our dataset includes detailed spending information at the agency level, covering departments such as Agriculture, Education, Energy, and Housing and Urban Development, among others. Once the data is collected, we pursue two main objectives. First, we document the dynamic patterns of spending by these programs and their relationship with other macroeconomic indicators. Second, we analyze the impact of government loans on private sector credit access and its associated costs. We see this work as a significant initial contribution to the literature on fiscal policy, addressing a gap caused by the absence of a comprehensive dataset and enabling analysis of these programs.

Keywords: federal credit policy, loan guarantees, direct loans.

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1 Introduction

Federal credit programs include subsidies, guarantees, or direct loans provided by the federal government to non-public sectors. Some federal agencies have the authority to borrow money from the Treasury to fund direct loan programs, with the Treasury raising the necessary funds by selling Treasury securities to the public. Additionally, their tax-exempt status enables state and local governments to borrow from the federal government at lower costs, allowing them to run their own credit programs by passing on the interest savings to selected borrowers (Gale, 1991).

Significant resources are allocated to federal credit programs. In 2023, the United States Treasury held \$2 trillion in bonds issued by federal government departments and agencies to finance these programs, representing 7.2% of GDP. This amount has been steadily rising over the past two and a half decades, up from \$153 billion in 1995. For context, these programs lent \$54 billion in 1976 when they began. Furthermore, in 2010, new loans issued by 150 different federal budget programs totaled \$900 billion, which was nearly 6.5% of GDP.

The credit supplement of the Budget of the US federal government (Office of Management and Budget, 2024) shows 57 unique loan programs (including both direct loans and loan guarantees) and 143 reported line items for fiscal years 2024 and 2025. Importantly, some of these programs are actively extending new loans, while others are managed programs (i.e., no longer financing new projects).

The shares by program have changed significantly over the years. In 2023, the most important sectors targeted by these programs were education (about 70%), small business loans (20%) and housing (8%), with the rest going towards agriculture, energy and exporters.

Credit policies are also worth studying given their differences with other types of fiscal stimulus packages. Federal direct loans and guarantees can act as good automatic stabilizers since participation rates and loan amounts can increase during recessions without legislative action (see Lucas, 2016).

Despite the scale of these programs and their unique characteristics as fiscal stimulus tools, a comprehensive dataset on federal credit does not currently exist. Our aim in this paper is to begin addressing this gap. To achieve this, we have compiled a novel and comprehensive dataset on federal credit from various U.S. federal government departments and agencies, covering the period from the first quarter of 1977 to the last quarter of 2023.

We hope that the provision of this extensive time series data will enable the literature to empirically test hypotheses about the macroeconomic effects of credit policy, which have thus far been explored only theoretically. (see Gale, 1990, Gale, 1991 and Elliott, 2011, among others). These data will also contribute to studies estimating the government spending multiplier of federal credit programs like Lucas (2016) and to the broader work on fiscal multipliers started by Blanchard and Perotti (2002) (see Ilzetzki and Végh, 2013, Ramey and Zubairy, 2018 and Ben-Zeev and Zubairy, 2023, among many others).

2 A Review of Federal Credit Policy

Federal loans are granted to the private sector and state and local governments by various departments and agencies of the United States national government. In this section, we present a summary of several of these programs. In the data analysis, we focus our attention on the largest of these programs only.

Under the Federal Credit Reform Act and through the Federal Financing Bank (FFB), the federal government makes funds available to federal agencies, military exchanges or guaranteed borrowers authorized to issue, sell or guarantee obligations. The FFB was created in 1973 to operate as a financial clearinghouse for federal agency borrowing. The idea was that the coordination of all agencies debt offerings would allow the FFB to obtain funds at interest rates lower than the rates obtained by individual agencies trying to sell their own securities, and in a manner less disruptive to credit markets than when individual agencies approached private markets with a host of unfamiliar offerings (Pantalone and Platt, 1986).

The FFB lends without a fee and at a rate lower than what the borrower would receive in private credit markets, in no case lower than the Treasury rate. Loans are given for any amount and any maturity on a common basis for all borrowers.

Below, we delve into federal loans granted by various agencies and programs.

2.1 Loans to Agriculture

The Farm Service Agency (FSA) of the Department of Agriculture provides loans to farmers with the goal of alleviating credit constraints resulting from market failures associated to fluctuations in income for agricultural producers. Farming income is generally more volatile and unpredictable compared to other types of income, which exacerbates the typical informational asymmetries between borrowers and lenders.

The FSA direct loan program primarily targets beginning farmers and socially-disadvantaged, small, non-commercial farms. In contrast, the guaranteed loan program, with higher loan limits, broader eligibility, and stricter creditworthiness requirements, is more likely to serve commercial-sized farms (Dodson and Ahrendsen, 2016).

Historically, FSA loan programs have provided credit to family-operated farms experiencing temporary financial difficulties. In the last few years, however, especially due to the consolidation of the agricultural sector into fewer and larger farms, FSA credit has been reallocated to larger farms with better access to private loans. Moreover, many of these farms are now organized as a partnership, corporation, or trust, which allows them better borrowing conditions and risk hedging by operating non-farming activities.

This has led some policy makers and analysts question the role of federal credit policy as an indirect subsidy to agricultural producers on the grounds that the credit frictions do not seem as relevant now as they did for smaller farms back in the 1930's when the FSA was instituted as part of President Roosevelt's "New Deal". In fact, the share of federal credit attributed to the Department of Agriculture has fallen from 60% of the total in 1980 to less than 10% in 2023.

However, these policy recommendations are not based on a formal analysis of the macroeconomic impact of federal rural loans as a fiscal policy. Such an analysis has yet to be conducted. Naturally,

having a sufficiently long time series of quarterly data on these loans is essential for that kind of study.

2.2 Loans for Education

Since 1994 the Department of Education makes available direct loans, through the William D. Ford Federal Direct Student Loan (FDSL) program to undergraduate and graduate students and the parents of dependent undergraduate students to finance postsecondary education. Four types of loans are offered: Subsidized Stafford Loans for undergraduate students as financial aid; Unsubsidized Stafford Loans for undergraduate and graduate students; PLUS Loans for graduate students and the parents of dependent undergraduate students; and Consolidation Loans through which borrowers may combine multiple loans into a single loan (Smole, 2015).

Federal Family Education Loans are no longer being made; however, Smole (2015) estimates that by 2015 \$304 billion were still outstanding in FFEL unpaid loans.

This credit is granted at subsidized rates and the maximum interest rate for each type of loan is regulated by the government under the Higher Education Act. The government pays the interest on Subsidized Loans while beneficiaries are still in school and six months after graduation. Unsubsidized Loans and PLUS Loans are granted independent of financial need, and beneficiaries pay interest as it accrues. Typically, these loans also provide better opportunities for deferment, forbearance and forgiveness than other non-government loans offered by the private sector.

2.3 Housing Loans

The Federal Housing Administration (FHA), Veterans Administration, Federal National Mortgage Association, and Federal Home Loan Mortgage Corporation have played major roles in the development of liberal and efficient primary and secondary mortgage markets in the United States (Quigley, 2006).

Programs focus on low-rent housing, loan guarantees for community development, housing benefits for the elderly or handicapped and for veterans, and guarantees for both mortgage and risk insurance.

The 1934 Act established the FHA to oversee a program of home mortgage insurance against default, intended to serve all prospective homeowners since the loan amounts were limited to three times the median house price.

In 1944 the VA loan program was established, initially as a “readjustment” for veterans upon their return to civilian life. It then became available to them for more than a decade after returning. Federal guarantees are for up to 60% of the face value of a mortgage loan.

Federal support for housing credit also began in the aftermath of the Great Depression, with the establishment of the Federal Home Loan Bank in 1932 with the goal of providing short-term loans to thrift institutions specialized in retail mortgages to help stabilize their mortgage lending. In 1938, the Federal National Mortgage Association was established as a wholly owned government corporation to facilitate a secondary mortgage market, and it became Fannie Mae, a government-sponsored enterprise (GSE), in 1968. Freddie Mac was established as a GSE in 1970 and became publicly traded in 1989.

Over time, the fraction of mortgage originations attributable to the FHA and VA has declined systematically (Quigley, 2006). Private mortgage suppliers have gradually increased their market share as default rates fell for long-term, low-interest, government-insured mortgages.

Aaron (1972) argues that over time, limits on the FHA and VA loan amounts coupled with increases in housing prices meant that federal credit served less the needs of middle- and upper middle-income households. Quigley (2006) argues these institutions now play a reduced role in expanding homeownership opportunities for U.S. households.

2.4 Energy Loans

The Department of Energy provides direct large-scale loans, and the sectors covered include the construction of nuclear reactors, solar, wind and fossil projects, and modernization of automotive manufacturing, among others. By partnering with the borrowers, it provides access to capital and flexible financing as well as valuable expertise. By the end of 2023, the amount of bonds outstanding to finance energy loans was \$5.7 billion, 0.3% of total federal credit, and 0.02% of GDP.

2.5 Department of the Interior

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage, and oversees its trust responsibilities and commitments to American Indians, Alaska Natives, and affiliated island communities.

The Agency provides both direct loans, like the Helium fund, and guaranteed loans by the Bureau of Indian Affairs or Territorial Affairs for public land management, revolving funds to cooperative associations and tribes, loans related to mineral resources, for irrigation systems and small reclamation projects.

2.6 Department of Transportation

This agency provides guaranteed loans and it also grants loans directly. It does so through the Maritime Administration Loan Fund, the Minority Business Resource Center Fund, the Transportation Infrastructure Finance and Innovation Fund of the Federal Highway Administration, the Federal Railroad Administration, and the Tiger Tifia Loan Fund.

2.7 Loans to Small Businesses

The Small Business Administration (SBA) was created in 1953 to help small enterprises. It provides both direct loans and guarantees and special circumstance/disaster direct loans. Loan guarantees are expected to yield efficiency gains related to limiting the role of the government in processing the loans and the oversight of debt collection.

The SBA guarantees nearly 50,000 new loans each year, every congressional district receives support, and representatives of every industrial sector apply.

Since the 1990's and through the implementation of the low documentation program, the SBA has delegated much of the implementation and screening of loan guarantees to commercial banks, resulting in a significant increase in the number of agency loans.

2.8 Loans to Veterans

Federal credit policy finances the provision and administration of some of the benefits and services to veterans provided by the Department of Veterans Affairs. Direct loans and loan guarantees to veterans include, among other things, vocational rehabilitation, employment services, and assistance to homeless veterans through transitional housing programs.

2.9 The Export-Import Bank

The Eximbank was created in 1981 to aid the post-war reconstruction of Europe (which would provide larger markets for the United States) and to help US exporters directly with the goal of closing the US balance of payments gap (Feldman, 1978). As a result, Eximbank makes it possible for American exports to bid for business on more equal terms (Whittlesey, 1939).

The Bank was established with a dual mandate: to be self-sustaining by lending only when there is a reasonable chance of repayment, and to provide export financing competitively with countries that subsidize projects typically considered too risky by private lenders. For a critique of the obvious tension in this dual mandate see Feldman (1978) and James (2012).

Later in 1981 the Bank was subject by Congress to a set of restrictions including the due consideration of any adverse effects of loans on US industry and availability of materials, the requirement of environmental impact studies, limits to the exports of nuclear power and heavy water production, and limiting projects to \$50 million unless declared of national interest.

The Bank's products include direct loans, loan guarantees, credit insurance and working capital guarantees of short-term loans to U.S. exporters. Loans are provided to selected companies believed to have a high potential for growth. Congress last set the Bank's lending limit to \$140 billion. As of 2021, the Bank reported authorizing \$5.8 billion for more than 2,000 transactions, to support some \$9.2 billion of U.S. export sales (Akhtar, 2022). In October of 2023, the Bank recorded over \$8.7 billion in financing to support US exporters of all sizes.

2.10 International Loans

The Overseas Private Investment Corporation (OPIC) was the United States government's development finance institution until it merged with the Development Credit Authority of the United States Agency for International Development to form the U.S. International Development Finance Corporation. It was created by President Nixon's Administration in 1971 and dissolved in 2019. OPIC services were available for new and expanding business enterprises in more than 160 countries worldwide.

By offering loan guarantees to the private sector, it helped American businesses gain footholds in emerging markets, catalyzing revenues, jobs, and growth opportunities both at home and abroad. It achieved its mission by providing investors with financing, political risk insurance, and support for private equity investment funds when commercial funding could not be obtained elsewhere. By complementing lending from the private sector, OPIC used to provide financing in countries where commercial institutions often were reluctant or unable to lend.

OPIC's Department of Small and Medium-sized Enterprise Finance offered qualified small businesses a streamlined approval process and direct loans (up to 65 percent of the total project cost) from

\$100,000 to \$10 million with terms from three to fifteen years.

All OPIC projects adhere to high environmental and social standards and respect workers' rights. By mandating high standards, OPIC aimed to raise the industry and regional standards in countries where it funded projects.

Another type of direct loan are Economic Assistance Loans provided by the U.S. Agency for International Development (USAID), the world's most important international development agency.

3 The Data

We compile a new dataset on federal credit policies from the United States Treasury's holdings of securities issued by government corporations and other agencies, as detailed in the monthly Treasury statements of receipts and outlays of the U.S. government. Compiling this dataset is challenging because the data are only accessible through the Treasury bulletins published by the Bureau of the Fiscal Service. These bulletins provide the bond data as scanned PDFs of the printed versions, released quarterly. The task is further complicated by the need to create a long-term time series, as the format of the bulletin has changed over the years.

The statements provide data on these bond holdings by agency, namely, the departments of Agriculture¹, Education, Energy, and Housing and Urban Development,² the Export-Import Bank of the United States, and the Small Business Administration.

Table 1 of the online Appendix contains the summary statistics of this data by program which shows that the average over time of outstanding bond holdings has been \$39 trillion 2015 dollars for the SBA, \$25 trillion for the HUD, \$9 trillion for the Export-Import Bank, and \$65, \$280 and \$3.5 trillion for the departments of Agriculture, Education and Energy, respectively. We also note the significant volatility in federal spending. For instance, loans to small businesses fell by 40% in the first quarter of 2003, while they increased by 1,500% in the second quarter of 2020 during the onset of the pandemic, reflecting substantial stimulus efforts aimed at supporting small businesses.

We infer that these programs act as automatic stabilizers during downturns in the business cycle. For instance, the stock of bonds nearly quadrupled during the global financial crisis, from the beginning of 2008 to the end of 2009 (from \$257 trillion to \$963 trillion). In 2023 total bond holdings amounted to \$1,580 trillion (in 2015 dollars) rising significantly during just four decades all the way from \$182 trillion in 1976, at the beginning of our sample. Since the inception of federal credit programs, even during years of marked expansion in macroeconomic activity when fiscal stimulus is less needed, like 1995 and 2005, bond holdings were \$193 and \$277 trillion, respectively.

The average quarterly growth rate for the stock of bonds used to finance credit policy varies significantly across departments. Bonds issued by the Export-Import Bank grew at the fastest average rate of 25.96%, while Energy bond issuance displayed little volatility and an average quarterly growth of 0.6%. The Department of Education together with the SBA and the HUD make up for the largest shares of bonds: 70%, 18% and 6%, respectively of the total amount outstanding.

¹The Department of Agriculture includes the Farm-Service Agency and the following services: Rural Utilities, Rural Housing and Community Development, Rural Business and Cooperative Development and Foreign Agricultural.

²The Department of Housing includes the Federal Housing Administration and other housing programs.

To understand the economic impact of federal credit, we examine data on bond holdings by the US Treasury that were issued by the Departments of Agriculture and Education, as well as the HUD, to finance their programs. Total bond holdings start at \$181 billion (3% of GDP) at the beginning of our sample in 1977 and end at \$1.58 trillion (7% of GDP) in 2023. Spending by these programs was at an all-time low during the period ranging from 1995 to 2007, just before the global financial crisis (GFC), during which it was always below 2% and an average of 1.7% of GDP. With fiscal stimulus becoming a priority after the crisis, spending started expanding soon after that.

Figure 1 presents the time series for spending on these programs, represented by the quarterly outstanding stock of bonds issued by each agency or department.

There are significant compositional changes across the decades in the shares by program in the overall Treasury holdings of securities. While loans by the Department of Agriculture represented 60% and 70% of the total in 1980 and 1990, respectively, they averaged only about 20% in the 2000's. The Department of Education also changes its share pretty drastically over the years, from 50% in 2000, to 80% in 2010 (partially due to the Great Recession and the stimulus programs related to lowering the cost of education for American families), to 70% in 2023. Spending by the SBA is usually very negligible as a share of the total, but it rose to more than 50% of the total in 2020 as a result of the pandemic relief efforts aimed at subsidizing small businesses which were disproportionately affected by lockdown and social distancing measures.

Table 1 provides an initial look at the dynamic patterns in federal credit. All government loans generally move in tandem, except for HUD loans. Other than credit granted by the departments of Agriculture and Energy, all other types of loans tend to be inversely correlated with HUD loans. The table also shows the business cycle properties of government loans. All types of credit exhibit strong procyclicality, with the only exception of loans by the HUD which tend to rise during macroeconomic recessions.

Using scatter plots (not shown here due to limits in the number of exhibits) as an initial look at the dynamics of federal loans relative to that of the credit-to-GDP ratio, we observe a positive relationship for loans by the SBA, the Export-Import Bank and the Departments of Agriculture, Education and Energy. The only exception is loans by the HUD, which are inversely correlated with credit in the private sector. The post-2020 observations specifically show that the subsidies and credit to businesses as part of the pandemic relief efforts, while significant in volume, did not seem to have affected these correlation patterns.

4 Estimation and Results

4.1 Effects of Federal Loans on Access to Private Credit

We investigate the impact of federal credit policy on borrowing conditions, specifically loan amounts and interest rates, for consumers and firms. We aim to assess empirically the trade-off between two alternative transmission channels that we postulate regarding the effects of federal credit loans on access to credit from lenders in the private sector. On the one hand, federal credit can “crowd-out” lending from the private sector if lenders decide to reallocate credit to other customers away from those who

get government financing. On the other, if borrowers use government loans as “intangible collateral” in lending contracts with banks, qualifying for federal loans could loosen up their borrowing constraints and then federal credit might “crowd-in” private lending. Which of these two effects dominates is ultimately an empirical question that we address here.

First, we examine the effect of federal loans on the credit provided by private sector lenders to domestic, private non-financial sectors. We begin with a simple bivariate regression and then progressively add controls for the macroeconomic environment. Additionally, through interaction terms, we explore how federal credit policy interacts with GDP growth and the cost of credit. By doing so, we aim to determine whether there are differences in the policy’s impact on private sector credit during periods of varying economic growth and differing credit costs.

We estimate the following model:

$$\log(L_t) = \alpha + \beta \log(FC_t) + \epsilon_t \tag{1}$$

In the second model, we add quarterly dummies and the recession dummy. In the third model, we add GDP growth as a control for the state of the macroeconomy, and in the fourth, we also add the inflation rate (π_t) and the federal debt-to-GDP ratio ($\frac{Debt_t}{Y_t}$) as in the following equation:

$$\log(L_t) = \alpha + \beta \log(FC_t) + \gamma_1 GDPgrowth_t + \gamma_2 \pi_t + \gamma_3 \frac{Debt_t}{Y_t} + \epsilon_t \tag{2}$$

The dependent variable is credit availability, measured as the GDP share of loans to domestic private non-financial sectors. We regress this measure on federal credit spending. The regression also includes quarterly dummies to control for seasonality in the data and a dummy for the global financial crisis of 2008 and 2009.

The results are shown in Table 2. Below, we discuss the results for each type of program separately.

Small Business Administration: The initial bivariate regression indicates that a 1% increase in federal credit raises private lending by 0.106%. The magnitude of the effect is robust to controlling for seasonality in the data and for the state of the macroeconomy via GDP growth and/or a recession dummy. Once we allow for other macroeconomic controls including the debt-to-GDP ratio, the inflation rate and a measure of long-term bond yields, this effect is reduced to 0.05% but remains statistically significant. The coefficient on the interaction effect between loans and GDP growth being not statistically significant indicates no asymmetries in the effects of government loans over the business cycle. What we do find evidence for is some asymmetries in the effects when the cost of credit is high vs low. Government loans tend to have a larger impact when the yield on long-term Treasuries is higher. Importantly, the linear effect disappears and the entire 0.01% increase in credit access is explained only by the interaction of the variable of interest with a falling cost of credit.

Export-Import Bank: An increase of 1% in loans by the Bank raises private credit availability by 0.25% and 0.14% when macroeconomic controls are included in the regression. Again, we find no evidence for asymmetries over the business cycle. However, with loans for international trade, the effect is actually diminished in periods of high interest rates.

Department of Agriculture: An increase of 1% in loans for agriculture raises credit by private lenders

by approximately 0.6%, and they have a stronger effect when long-term interest rates are higher.

Department of Education: Loans aimed at financing education have a 0.17% impact, which is reduced to 0.08% once growth, the cost of credit, inflation and the debt situation are accounted for.

Department of Energy: Loans by the Department of Energy have the strongest effect across the categories of federal spending with a multiplier impact of around 1.4. However, that effect disappears completely once controls other than GDP growth are introduced in multivariate regression models.

Housing and Urban Development: Loans to finance housing projects are the only category that has a negative correlation with access to credit from private lenders. While explaining this feature and the differences with loans from all other departments and agencies is beyond our scope, we offer here a couple of potential ways to think about this result. First, recall from Table 1 that HUD loans are countercyclical as opposed to procyclical like all others. These loans tending to increase during recessions definitely explains part of the inverse relationship with other loans. Second, given the obvious inherent lags in construction and building development, these loans might take longer to actually start generating economic activity and therefore, increasing the demand and supply of associated loans by other private banks.

It is noteworthy that GDP growth generally does not have a significant impact on credit availability. Long-term bond yields are inversely associated to credit availability which is consistent with the abundant evidence on countercyclical credit spreads (see Olivero and Aliaga-Díaz, 2010, Aliaga-Díaz and Olivero, 2011 and Gilchrist and Zakrajsek, 2012 among others).

The findings related to inflation are also intriguing. Although all variables are measured in real terms, suggesting that inflation should not affect credit availability, we observe statistically significant effects of rising living costs, which are sometimes negative and sometimes positive. Loans by the Departments of Energy and Education show a positive association with inflation rates. This could be because inflation reflects some characteristics of a booming economy, leading to better access to credit from private lenders. However, it remains unclear why this explanation holds in some cases but not in others, even after accounting for GDP growth and the debt ratio.

We also experimented with redefining both the dependent and the independent variable as GDP-shares, namely $\frac{L_t}{GDP_t}$ and $\frac{FC_t}{GDP_t}$, respectively instead of using the logs. Those results were qualitatively consistent with the benchmark ones.

We also studied whether the conclusions discussed above are robust to controlling for the cost of credit using alternative definitions for interest rates. For the benchmark results, we used the yield on 10-year Treasury securities. In this sensitivity analysis, however, we measured the cost of credit using the 1-year yield, the bank prime loans rate, the 30-year interest rate on mortgages, and the yields on Aaa and Baa bonds according to Moody's ratings.

The results for all robustness checks are available from the authors upon request.

4.2 Interest Rates

We now examine how federal loans influence government bond yields. The benchmark model is a bivariate regression of the market yield on 10-year Treasury securities on the amount of federal credit

(in logs) as in:

$$GS_t^{10yr} = \alpha + \beta \log(FC_t) + \epsilon_t \quad (3)$$

In the second model, we add quarterly dummies and the recession dummy. In the third model, we add GDP growth as a control for the state of the macroeconomy, and in the fourth, we also add the inflation rate (π_t) and the federal debt-to-GDP ratio ($\frac{Debt_t}{Y_t}$) as in:

$$GS_t^{10yr} = \alpha + \beta \log(FC_t) + \gamma_1 GDPgrowth_t + \gamma_2 \pi_t + \gamma_3 \frac{Debt_t}{Y_t} + \epsilon_t \quad (4)$$

Lastly, in models 5-9, we test the robustness of the results to using alternative measures of the cost of credit. We use the yield on 1-year Treasury bills, the bank prime loan rate, the rate on 30-year mortgages, and the Moody's Aaa and Baa corporate bond yields, respectively. Figure 2 shows the results for these nine alternative models.

The estimated β coefficients provide evidence for a statistically significant and negative effect of federal credit policy on interest rates and the cost of loans.

We interpret these results as initial evidence that government credit improves borrowing conditions by reducing the cost of private sector loans. Importantly, this pattern is seen for both yields on Treasury-issued securities as well as on interest rates determined in equilibrium in the private sector, including the bank prime and the 30-year mortgage rates as well as private bond yields. Also, this reduction in interest rates is robust to the inclusion of macroeconomic controls for GDP growth and inflation as well as for seasonality in the data.

Interesting asymmetries exist in this relationship, though. While loans by the Export Import Bank, the Small Business Administration and by the departments of Agriculture, Education and Energy all lower the cost of borrowing for the private sector (regardless of how those costs are measured, with Treasury bond yields, with bank prime loan or mortgage rates, or with private Aaa and Baa bond yields), those by the Department of Housing and Urban Development seem to raise interest rates. Clearly, this difference in how HUD loans impact credit conditions must be related to how HUD spending exhibits a countercyclical pattern while spending by all other departments is procyclical. Explaining the heterogeneities between HUD loans and other types of federal credit is beyond the scope of this paper. We believe this is a promising area for further research that could delve deeper into the microeconomics of HUD loans, explore the idiosyncratic characteristics and regulations of housing markets, and potentially utilize more detailed data at the loan level.

4.3 Dynamics

In this section we aim to study the dynamic patterns of the impact of federal loans on credit access by the private sector. Intuitively, it might take more than just a quarter for lenders in the private sector to adjust their supply in response to loan applicants signalling increased credit worthiness through having qualified for either guarantees or direct loans from the federal government. Moreover, it could be argued that the contemporaneous effect, as measured by β in equations (1) and (2) just reflects the comovement of two macro series that are both procyclical over the business cycle and/or that exhibit positive trends in the long run. Thus, we want to extend the regression of model (1) and (2) to allow

for lags of the independent variable recognizing that these new market signals might take time from private lenders. Moreover, it might be the case that producers use federal credit first and only later, tap on private lenders for additional funds to complete investment projects.

To do so, we extend the model in equation (1) to allow for lags as in:

$$\log(L_t) = \alpha + \beta \log(FC_t) + \sum_{i=1}^4 \gamma_i \log(FC_{t-i}) + \gamma_5 GDPgrowth_t + \gamma_6 \pi_t + \gamma_7 \frac{Debt_t}{Y_t} + \epsilon_t \quad (5)$$

The first model contains the contemporaneous measure of federal credit and one lag; the second to fifth models include one, two, three and four lags, respectively.

These results are presented in Figure 3, which plots the γ coefficients on the contemporaneous as well as the lagged measures of federal credit by all departments. These results show a positive contemporaneous effect on credit access of federal loans by the departments of Agriculture and Education, by the Small Business Administration and by the Export-Import Banks. Conversely, loans by the departments of Energy and Housing and Urban Development reduce credit by private lenders. We arrive at the same conclusions when accounting for lagged effects at all different degrees of lags. Interestingly, as we move from one model to the next by adding an extra lag, the coefficients on previous lags tend to lose statistical significance and the last lag is the one that retains the significance.

We interpret this result as preliminary evidence of the importance of lagged impacts of federal credit. We acknowledge that this is an incomplete dynamic analysis, which requires further VAR-type estimations, possibly a structural VAR à la Blanchard and Perotti (2002) or a local projection analysis á la Jordá (2005). We see this short section as an introduction to the dynamic behavior of the effect of government credit policies on loan markets.

Our preliminary results open two promising avenues for further research. The first is using dynamic structural VAR empirical models to isolate the exogenous elements in federal credit spending and to empirically study the dynamics in the response of private credit. The second is developing theoretical models to understand the transmission mechanisms through which accessing a government loan might change credit conditions obtained from private lenders. We leave these ideas for future work.

5 Conclusions

We construct a novel database on quarterly federal loans in the United States from 1977 to 2023. By digitizing this dataset and making it available to the academic community, our goal is to allow for more empirical tests of the relationship between federal credit spending and macroeconomic aggregates which has so far been studied only in the context of theoretical models. We leave these tests to future work.

In our empirical study, we examine how private lenders adjust their credit supply in response to changes in the availability of government loans. One perspective, supported by existing microeconomic studies, suggests that increased government lending could lead to a “crowding-out” effect, where commercial banks and other private lenders redirect loans away from the recipients of public assistance towards other uses. Alternatively, we propose a different mechanism, a “crowding-in” one: when bor-

rowers who face collateral constraints qualify for government loans, they can use these loans as a form of intangible collateral to secure credit from private lenders. This might lead private lenders to increase their credit supply, an “extensive margin” effect. Determining which of these effects is more prevalent and as a result, whether private credit falls or rises in response to injections of federal credit, is an empirical question that, to the best of our knowledge, has not yet been addressed. Our paper aims to fill this gap in the literature, and we interpret our results as an indication that the second channel dominates.

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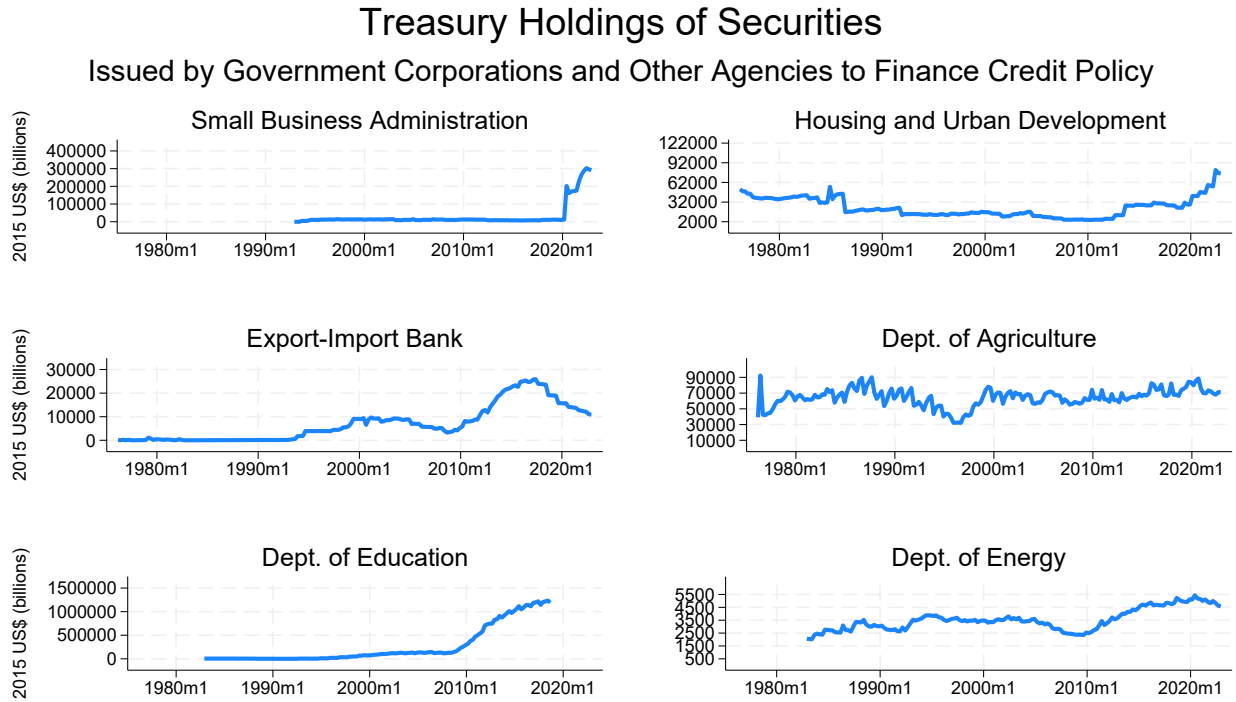
Table 1: Correlation Patterns in Federal Credit Programs

	SBA	HUD	EX-IM Bank	Agriculture	Education	Energy	GDP
SBA	1						
HUD	0.6259*	1					
Export-Import Bank	0.1465	-0.2273*	1				
Agriculture	0.2340*	0.2456*	0.3122*	1			
Education	0.1415	-0.1455	0.8520*	0.1228	1		
Energy	0.3830*	0.4614*	0.5408*	0.1217	0.5393*	1	
GDP	0.4852*	-0.2478*	0.9024*	0.2174*	0.9314*	0.6732*	1

All variables are in logs and in real terms.

A * denotes correlation being significant at the 1% level.

Figure 1: Treasury Bond Holdings for Financing of Federal Credit Programs



Source: Monthly Treasury Statements of receipts and outlays of the United States government.

Table 2a: The Effects of Federal Loans on Credit Access in the Private Sector

Small Business Administration						
	(1)	(2)	(3)	(4)	(5)	(6)
FC (logs)	0.105*** (0.0164)	0.106*** (0.0163)	0.106*** (0.0163)	0.0504*** (0.00986)	0.0425*** (0.0113)	0.00953 (0.0250)
FC (logs) * GDP growth					1.363 (0.955)	
FC (logs)*GS 10yr						0.00826* (0.00466)
GDP growth			-2.087 (2.112)	-0.161 (1.142)	-16.03 (11.17)	-0.310 (1.134)
$\frac{Debt}{Y}$				-0.000434 (0.00102)	-0.000387 (0.00101)	0.000332 (0.00110)
GS 10yr				-0.141*** (0.0128)	-0.138*** (0.0128)	-0.213*** (0.0426)
inflation				0.0710 (0.0587)	0.0855 (0.0593)	0.102* (0.0608)
N	124	124	124	124	124	124
Housing and Urban Development						
	(1)	(2)	(3)	(4)	(5)	(6)
FC (logs)	-0.263*** (0.0533)	-0.238*** (0.0585)	-0.228*** (0.0586)	-0.171*** (0.0260)	-0.175*** (0.0318)	-0.156*** (0.0489)
FC (logs) * GDP growth					0.463 (2.545)	
FC (logs)*GS 10yr						-0.00345 (0.00915)
GDP growth			-3.290 (3.534)	-0.00935 (1.281)	-4.837 (26.55)	-0.0510 (1.289)
$\frac{Debt}{Y}$				0.0121*** (0.00111)	0.0121*** (0.00111)	0.0121*** (0.00111)
GS 10yr				-0.0501*** (0.00949)	-0.0499*** (0.00953)	-0.0143 (0.0953)
inflation				-0.0192 (0.0541)	-0.0179 (0.0547)	-0.0180 (0.0543)
N	191	191	190	190	190	190
Export Import Bank						
	(1)	(2)	(3)	(4)	(5)	(6)
FC (logs)	0.255*** (0.0107)	0.256*** (0.00996)	0.253*** (0.0100)	0.142*** (0.0130)	0.134*** (0.0146)	0.199*** (0.0259)
FC (logs) * GDP growth					0.810 (0.617)	
FC (logs)*GS 10yr						-0.00749** (0.00300)
GDP growth			-0.200 (1.614)	-0.370 (1.227)	-7.355 (5.464)	0.0224 (1.214)
$\frac{Debt}{Y}$				0.00486*** (0.000946)	0.00469*** (0.000952)	0.00333*** (0.00111)
GS 10yr				-0.0447*** (0.0101)	-0.0490*** (0.0106)	0.00265 (0.0214)
inflation				0.00873 (0.0553)	0.0151 (0.0554)	0.000454 (0.0544)
N	148	148	147	147	147	147

The dependent variable is credit to domestic private non-financial sectors (in logs of real values).
Standard errors in parentheses.

* p<0.1 ** p<0.05 *** p<0.01

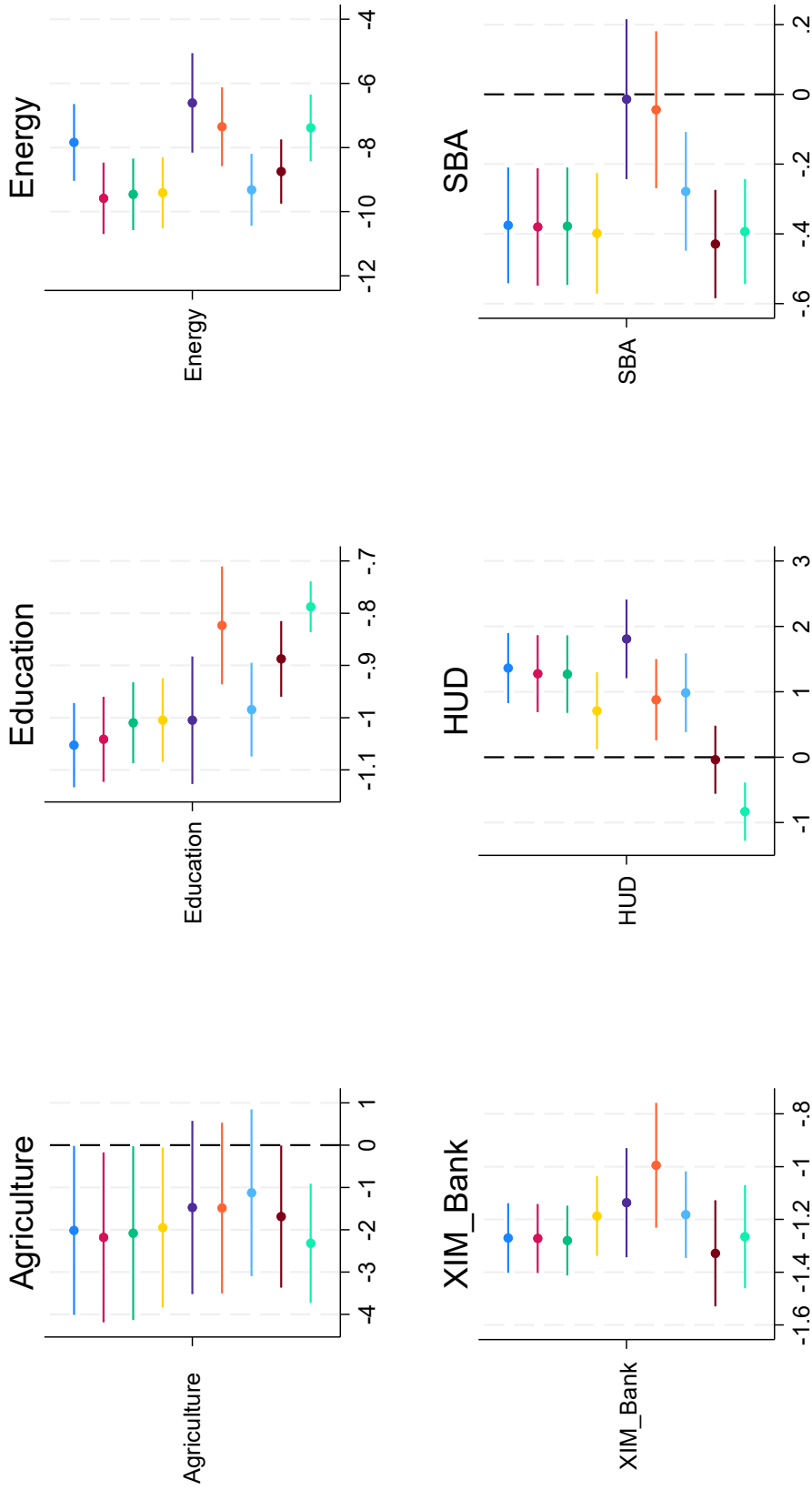
Table 2b: The Effects of Federal Loans on Credit Access in the Private Sector

	Department of Agriculture					
	(1)	(2)	(3)	(4)	(5)	(6)
FC (logs)	0.613*** (0.197)	0.644*** (0.196)	0.585*** (0.199)	0.181** (0.0792)	0.0526 (0.112)	-0.538* (0.287)
FC (logs) * GDP growth					12.96 (8.004)	
FC (logs)*GS 10yr						0.113** (0.0433)
GDP growth			-2.438 (3.607)	0.172 (1.410)	-145.6 (90.01)	0.244 (1.388)
$\frac{Debt}{Y}$				0.00789*** (0.00107)	0.00785*** (0.00107)	0.00871*** (0.00110)
GS 10yr				-0.0837*** (0.00903)	-0.0840*** (0.00899)	-1.332*** (0.480)
inflation				-0.121** (0.0572)	-0.118** (0.0569)	-0.101* (0.0568)
N	191	191	190	190	190	190
	Department of Education					
	(1)	(2)	(3)	(4)	(5)	(6)
FC (logs)	0.170*** (0.00649)	0.166*** (0.00631)	0.162*** (0.00604)	0.0833*** (0.00995)	0.0760*** (0.0108)	0.0518*** (0.0183)
FC (logs) * GDP growth					1.537* (0.900)	
FC (logs)*GS 10yr						0.00619** (0.00303)
GDP growth			-10.41*** (2.474)	-4.579** (2.015)	-20.62** (9.604)	-5.076** (2.007)
$\frac{Debt}{Y}$				-0.000105 (0.000907)	-0.0000990 (0.000901)	0.00141 (0.00116)
GS 10yr				-0.0822*** (0.00907)	-0.0787*** (0.00924)	-0.134*** (0.0270)
inflation				0.178*** (0.0519)	0.163*** (0.0522)	0.178*** (0.0513)
N	147	147	147	147	147	147
	Department of Energy					
	(1)	(2)	(3)	(4)	(5)	(6)
FC (logs)	1.109*** (0.120)	1.406*** (0.110)	1.391*** (0.110)	-0.103 (0.0917)	-0.122 (0.0960)	-0.222 (0.141)
FC (logs) * GDP growth					2.916 (4.177)	
FC (logs)*GS 10yr						0.0225 (0.0202)
GDP growth			-2.825 (2.338)	0.0529 (1.151)	-24.56 (35.27)	0.125 (1.152)
$\frac{Debt}{Y}$				0.00299*** (0.00102)	0.00306*** (0.00103)	0.00365*** (0.00118)
GS 10yr				-0.129*** (0.00815)	-0.127*** (0.00839)	-0.306* (0.159)
inflation				0.128** (0.0547)	0.131** (0.0549)	0.124** (0.0547)
N	164	164	164	164	164	164

The dependent variable is credit to domestic private non-financial sectors (in logs of real values).
Standard errors in parentheses.

* p<0.1 ** p<0.05 *** p<0.01

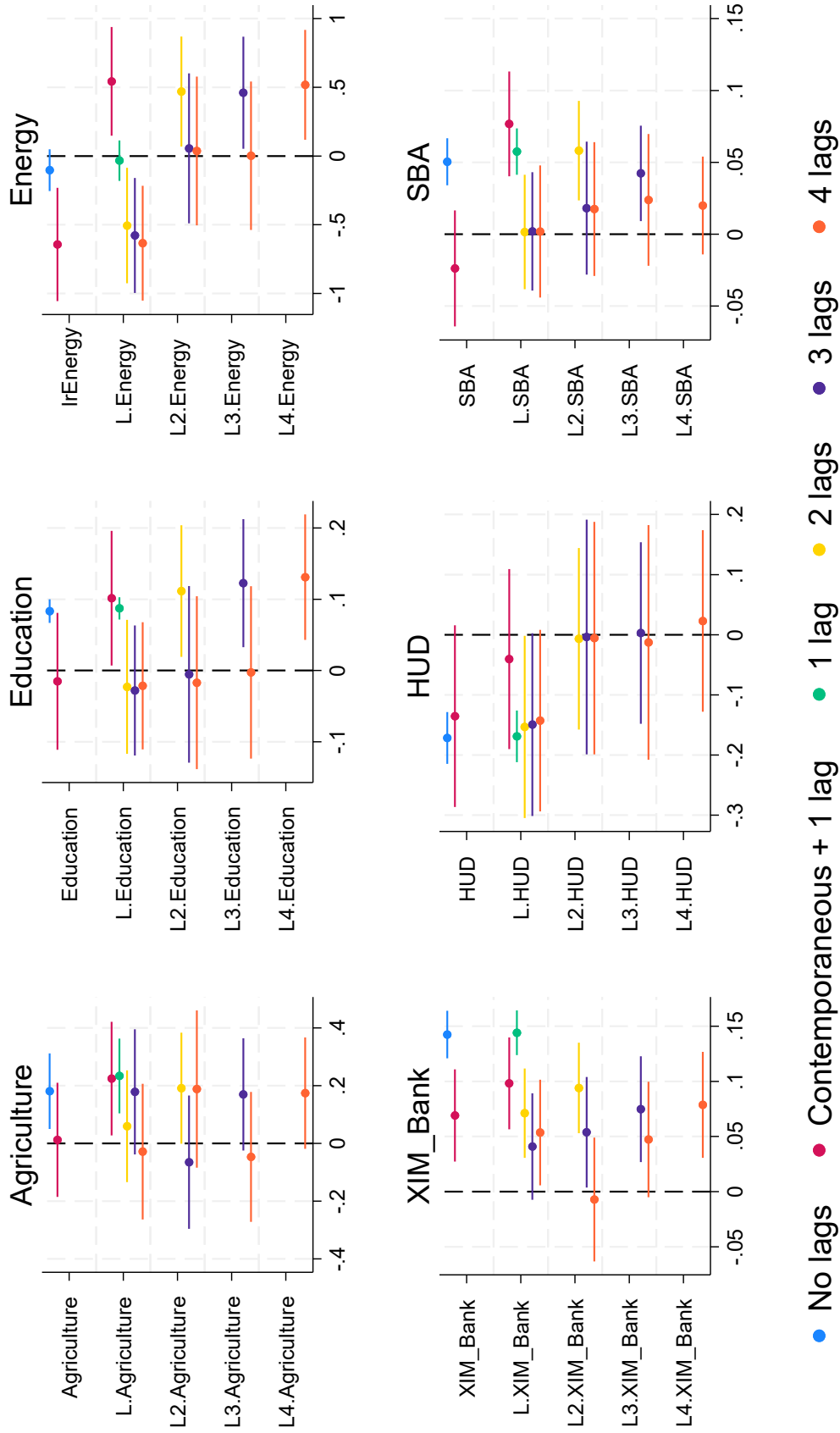
Figure 2: Effects of Federal Credit Policy on Interest Rates



• **Model 1** • **Model 2** • **Model 3** • **Model 4** • **Model 5** • **Model 6** • **Model 7** • **Model 8** • **Model 9**

The graph shows the $\hat{\beta}$ estimates from equations (3) and (4) with their confidence bands. Model 1: Bivariate regression of $GS10yr$ on $\log(FC_t)$ as in equation (3). Model 2: Bivariate regression with recession and quarterly dummies. Model 3: $GDPgrowth$ added as a control as in equation (4). Model 4: $GDPgrowth$, π_t (inflation), and $\frac{DEBT}{Y}$ (debt-to-GDP ratio) added as controls. Models 5-9: Yield on 1-year Treasury securities, bank prime loan rate, 30-year mortgage rates, Aaa bond yields and Baa bond yields used as dependent variables, respectively.

Figure 3: Dynamic Effects of Federal Credit Policy on Credit Access in the Private Sector



The graph shows the $\hat{\beta}$ estimates from equation (5) with their confidence bands. The different colors correspond to the models with no lags of the independent variable, with both the contemporaneous measure and one lag and with different number of lags.