

RESEARCH STATEMENT

Qingqing Cao

I am an economist working in the areas of macroeconomics and international finance. My research focuses on the macroeconomic consequences of financial market frictions and financial intermediation. The overarching theme is how banks' intermediation roles are influenced by factors such as their access to liquidity, information production, and balance sheet positions. In my research, I mostly use dynamic macroeconomic models to study and quantify theoretical mechanisms and policy implications. I also incorporate micro-level data to test these theoretical mechanisms. My work seeks to advance three research agendas. In what follows, I begin by discussing the published and completed work within each theme and subsequently provide a brief overview of ongoing projects.

1. Banking, Information, and Macroeconomic Implications

One fundamental function of banks is information production. This information is crucial for credit allocations to borrowers, which influences activities like entry, investment, innovation, and ultimately the macroeconomy.

In “**Liquidity and Discipline. Bank Due Diligence Over the Business Cycle**” [1] (with Di Pietro, Kokas, and Minetti; published in the *Journal of the European Economic Association* in 2022), we show that banks' information production on loans, such as credit ratings and risk models, is influenced by their access to liquidity and the values of loan portfolios. Our quantitative model features financing constraints faced by banks when gathering both retail and wholesale fundings, which can be mitigated by costly due diligence that enhances loan pledgeability. Two main mechanisms shape banks' due diligence efforts in recessions: the “liquidity channel”, which implies that tighter liquidity prompts more due diligence from banks to restore access to liquidity, and the “pledgeability channel”, which demonstrates that decreased values of loan portfolios reduce the marginal productivity of loan analysis and thus dilute due diligence incentives.

The calibrated model predicts that due diligence deteriorates during expansions and intensifies during contractions, consistent with loan-level evidence we find from U.S. banks and the view that banks relax lending standards in booms but tighten them during recessions. In terms of aggregate implications, this countercyclical due diligence reduces the impact on investment and output caused by funding liquidity shocks through the liquidity channel, though it may moderately magnify the effects of loan quality shocks through the pledgeability channel. Interestingly, credit policies, especially when implemented as equity injections into banks, can directly alleviate banks' liquidity constraints, potentially undermining the stabilizing effects of due diligence.

Banks accumulate information about borrowers primarily through long-term credit relationships. Despite extensive studies on the impact of relationship banking on incumbent firms, its influence on firm entry remains unclear. My paper “**Credit Markets, Relationship Lending, and the Dynamics of Firm Entry**” [2] (with Giordani, Minetti, and Murro; published in *Re-*

view of Economic Dynamics in 2023) addresses this question. Using granular survey data of Italian firms, we find that local credit markets with stronger credit relationships feature fewer but larger entrants. Moreover, these markets exhibit a higher prevalence of spinoffs—firms founded by former managers of incumbent firms—relative to de novo entrants, which are created by new entrepreneurs. The type of information accumulated by banks plays a major role. Credit relationships more significantly reduce de novo entry when banks’ information is incumbent-specific. On the other hand, they more effectively promote spinoff entry when banks’ information is easily transferable from incumbents to spinoffs.

We rationalize these findings through a quantitative model and incorporate two information channels. The “embedded information flows,” which refer to banks’ information accumulation on managers of incumbent firms, favor spinoff entry by these managers. The “non-embedded information spillovers,” which capture banks’ information on incumbents’ technology, sector or local economy, may either promote entry if such information can be resued on entrants or discourage entry if they crowd out banks’ capacity to acquire information on entrants. The calibrated model quantitatively replicates our empirical findings. It also predicts that stronger credit relationships increase aggregate output despite of slowing down entry, mainly due to increased investment scales by all firms and the credit reallocation from de novos to spinoffs.

In addition to its distinct effects on incumbents and entrants, lender’s information can also impact credit allocations to mature or innovative technologies. We explore this mechanism in “**Credit Crunches, Asset Prices, and Technological Change**” [3] (with Araujo, Minetti, and Murro; published in *Review of Economics Dynamics* in 2019). We demonstrate, through a theoretical model, that firms’ collateral assets ease their access to credit and investment but can also inhibit their innovation, as lenders’ information on mature technology may be wasted if firms innovate. In equilibrium, collateral-poor firms lack access to credit, firms with medium collateral assets obtain credit and innovate, while collateral-rich firms also secure credit but stick with the mature technology. A contraction in the price of collateral assets thus squeezes collateral-poor firms out of the credit market but fosters innovation among collateral-rich firms. These findings are consistent with the innovation patterns of a large sample of European firms during the 2008-2010 credit crisis. In particular, while the majority of firms postponed innovation during the crisis, a significant number of firms, primarily concentrated in the segment of businesses with substantial collateral assets, increased their investment in innovation. Our model also predicts that unconventional policies, such as direct lending and asset purchase subsidization, boost total investment but may dampen the increase in innovation of collateral-rich firms.

As banks accumulate information through past experiences, a natural question arises: do these experiences enhance monitoring efficiency and thus incentivize more diligent information production, or do they instead foster laziness, causing banks to rely on past experiences? We demonstrate in “**Banking on Experience**” [4] (with Degryse, Kokas, and Minetti; reject and resubmit at *The Review of Corporate Finance Studies*) that the answer depends on the type of experiences. Using U.S. corporate loan-level data, we find that experience with borrowers and co-lenders reinforces

banks' monitoring incentives. However, sector experience, especially banks' prior experience in capital purchases and sales within the borrower's sector, dilutes monitoring incentives, calling for larger involvement in lending syndicates. We rationalize our findings through a simple loan syndication model in which all forms of experience facilitate monitoring, but sector experience eases lenders' liquidation of borrowers' assets among sector peers in the event of loan default, allowing them to extract a larger value from asset liquidation and diluting their incentive to properly monitor the loan.

Ongoing work. When banks possess superior information about their asset holdings, the resulting information asymmetry can lead to endogenous illiquidity of these assets and misallocation of credit. In “**Adverse Selection, Liquidity Shortage, and Government Liquidity Facilities**” [5] (working paper), I study the effect of unconventional monetary policies in the presence of asset illiquidity caused by asymmetric information about asset qualities. I build a tractable dynamic macroeconomic model, where banks can sell illiquid private assets subject to adverse selection, as well as liquid government bonds, to obtain funds for financing their investments. The equilibrium features a shortage in liquidity, indicated by the liquidity premium of government bonds, as well as suboptimal investment. Quantitatively, the central bank's asset purchases and liquidity facilities have a large impact on credit market conditions and the aggregate economy. This is due to their mitigating effect on adverse selection: the central bank's purchase of private assets directly alleviates adverse selection by boosting asset demand, while the provision of liquid government bonds enhances banks' future demand for illiquid private assets, thus alleviating future adverse selection. Interestingly, the provision of government bonds sometimes exacerbates adverse selection by facilitating a flight to liquidity and crowding out the demand for the private assets.

In another ongoing project, we explore the long-run implications of bank financing of innovations in “**Financial Frictions, Credit Reallocations, and R&D**” [6] (with Beqiraj, Minetti, and Tarquini; work in progress), in line with our earlier work [3]. We build a quantitative model with endogenous growth and bank intermediation. Banks extend credits to traditional sectors taking tangible assets as collaterals as well as to innovative sectors taking intangible assets as collaterals. A financial crisis triggered by a fall in the tangible asset value causes a reallocation of credit to the innovative sector and possibly a fast recovery of the economy.

2. Multinational Banking and Business Cycles

My research on banking and financial intermediation also extends to international settings. In recent decades, following the relaxation of foreign bank entry restrictions, multinational banks have significantly expanded their presence in advanced and emerging countries. How does the expansion of multinational banks influence the dynamics of business cycles of host countries? Do these banks play a stabilizing or destabilizing role?

My first endeavor to address this question is in the paper “**Recessions and Recoveries: Multinational Banks in the Business Cycle**” [7] (with Minetti, Olivero, and Romanini; pub-

lished in the *Journal of Monetary Economics* in 2021). We build a two-country DSGE model incorporating two well-documented empirical features of multinational banks. First, their internal capital markets enable swift cross-border liquidity transfers, which in the model influences the host country’s short-run response to shocks. Second, multinational banks face disadvantages compared to local banks in allocating credit to local firms, particularly small and informationally opaque firms, which tends to influence the medium-run response to shocks. Take together, these two features induce a trade-off between the depth of a recession and the speed of the recovery for the host country following negative shocks, in line with empirical evidence we document from a broad panel of economies spanning the last three decades. When calibrated to the Polish economy, the model predicts that the presence of multinational banks reduces the average depth of recessions by up to 5%, while lengthening the average duration by about 10%. The model also generates rich implications for structural and cyclical policies on whether they can ameliorate the trade-offs induced by multinational banks.

My paper, “**Global Banks and Macroeconomic Stability. Liquidity, Control, and Monitoring**” [8] (with Beqiraj, De Hass, and Minetti; working paper), delves deeper into the organizational structure and business models of global banks. These aspects govern the internal decision-making processes of these complex financial institutions and ultimately shape their impact on macroeconomic stability. The key element of our two-country model is that global banks can exert control over the loan monitoring activities of local affiliates and allocate liquidity across their conglomerates. We demonstrate that global banks with a centralized business model, characterized by centrally hired loan officers and deep internal capital markets, help stabilize the host economy following financial shocks but can amplify the effects of real shocks. The model predictions are consistent with the behavior of a large panel of global bank parents and affiliates. We also investigate in the model how the stabilizing or destabilizing influence of global banks varies depending on key organizational characteristics, such as the degree of balance sheet consolidation.

3. Bank Lending, Inflation, and Monetary Policy

Banks play an important role in the transmission of monetary policy. This area of my work examines how banks’ balance sheets and intermediation influence inflation dynamics, as well as the effectiveness and design of monetary policy both in the short and long terms.

Due to banks’ direct exposure to nominal government debts and the maturity mismatch of their balance sheets, a persistent increase in the inflation rate reduces their net worth. How significant is the cost of inflation to banks? In “**The Sovereign-Bank Nexus and the Inflation Channel**” [9] (with Minetti and Rowe; working paper), we empirically quantify the effect of a change in inflation expectation on the real value of assets, liabilities and net worth of U.S. commercial banks using bank-level data from the Bank Reports of Conditions and Income. Under a partial-equilibrium assumption that the sole real effect of inflation were to revalue nominal contracts, we find a high elasticity of banking capital to long-term inflation expectations: a 1% increase to long-term inflation expectations leads to a 15% decrease in banks’ Tier 1 capital. The magnitude of loss remains similar

regardless of whether banks hold interest rate derivatives or not, and whether banks are deemed systemically important or not.

I then study how the cost of inflation on banks affects the optimal design of fiscal and monetary policy in “**Optimal Fiscal and Monetary Policy with Collateral Constraints**” [10] (published in *Journal of Economic Dynamics and Control* in 2024). In my model, banks raise external funds through collateralized borrowing, and their holdings of nominal government debt can serve as collateral. The government finances fiscal expenditures by imposing distortionary taxes and using state-contingent inflation. Inflation reduces the real value of debt and tightens banks’ collateral constraints, impeding allocation of credit and dampening economic activities.

In response to government expenditure shocks, the Ramsey optimal policy balances the shock absorbing benefits of state-contingent inflation against the costs of tightening banks’ financing constraints, and therefore perfect tax smoothing is no longer optimal. In the calibration to postwar U.S. data, the optimal policy features a much smaller role of inflation in buffering government expenditure shocks compared to standard models. When considering price stickiness and long-term government debt, optimal inflation is modest and persistent, and the role of inflation in fiscal financing increases with the maturity of government debt.

In addition to its implications for inflation dynamics, bank lending also plays a significant role in shaping the long-term effects of monetary policy. My paper, “**Persistent Slumps: Innovation and the Credit Channel of Monetary Policy**” [11] (with Beqiraj, Minetti, and Tarquini; working paper), explores the long-term effects of monetary policy through the bank lending channel. We develop a quantitative model featuring financial intermediation and endogenous innovation, where credit frictions constrain firms’ investment and R&D expenses. A monetary tightening worsens lending conditions for the innovation sector, leading to substantial and enduring stagnation. These findings are consistent with Bayesian Vector Autoregression estimates of the responses of credit and innovation aggregates to monetary shocks. The quantitative analysis further reveals that such long-term effects of monetary shocks are especially pronounced when the innovation sector is relatively more sophisticated and profitable.

Ongoing work. Recent empirical literature suggests that firms facing financial frictions raise product prices in response to adverse shocks, contributing to the flattening of the Phillips Curve since the 2008 crisis. In our ongoing work, “Inflation, Financing Costs, and Monetary Policy” [12] (with Jiang and Sun; work in progress), we investigate the implications of this phenomenon for monetary policy. If firms raise product prices following a monetary tightening that leads to increased interest costs, the effectiveness of the tightening in curbing inflation may be diminished. Using data on utility price and utility firms’ balance sheets, we document evidence that highly leveraged firms respond to increased interest costs by raising their output prices, especially during periods of rising policy rates. We are currently developing a quantitative model with heterogeneous firms to rationalize these findings and study their aggregate effects and policy implications.

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