

The Macroeconomics of Corporate Debt

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The 2020 COVID-19 crisis can spur research on firms' corporate finance decisions and their macroeconomic implications, similar to the wave of important research on banking and household finance triggered by the 2008 financial crisis. What are the relevant corporate finance mechanisms in this crisis? Modeling dynamics and timing considerations are likely important, as is integrating corporate financing considerations into modern quantifiable macroeconomics models. Recent empirical work, including articles in this special issue, on the drag from debt in the COVID-19 crisis provides a first glimpse into the new research agenda. (*JEL* E22, E44, G32, G33)

Received July 23, 2020; editorial decision: July 23, 2020 by Editor Andrew Ellul

The U.S. enters the 2020 COVID-19 recession after a decade-long increase in corporate leverage. The pandemic has led to sharp declines in earnings in many industries, straining debt service and raising concerns about a wave of bankruptcies. How have high levels of corporate debt affected the investment and hiring decisions of firms? What are the social consequences of widespread bankruptcies in the business sector? What is the macroeconomic impact of these considerations for aggregate demand and aggregate supply? How should monetary and fiscal policies best deal with the credit dimension of the COVID-19 recession? Monetary policy affects the price of credit. How should such policies be designed when they interact with credit frictions? The 2020 COVID-19 recession brings into sharp relief questions regarding the role of corporate debt in macroeconomic performance.

The 2008 financial crisis drew attention to bank capital structure and the role of bank and nonbank short-term debt in exacerbating the

We thank Andrew Ellul, Isil Erel, Uday Rajan, and Zhiguo He for their comments. Send correspondence to Markus Brunnermeier, markus@princeton.edu.

The Review of Corporate Finance Studies 9 (2020) 656–665

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doi:10.1093/rcfs/cfaa015

Advance Access publication August 14, 2020

financial crisis. A substantial body of work has been devoted to this topic over the last decade. This work details how disruptions to credit supply affects asset markets and aggregate activity. Likewise, the role of household real estate wealth and mortgage debt has been understood to be a central factor in the 2008 recession and slow recovery. Motivated by this observation, research over the last decade has sought to understand housing and household finance. Banking and household finance have been among the most productive areas of research over the last decade.

The lessons learned in 2008 do not readily carry over to the current situation. At present (July 2020), capital markets and the banking sector appear to be functioning smoothly. Supporting the liquidity and capital of banks to avoid disruptions in credit supply is not central to the current environment. In 2020, the key questions center on credit demand, and on credit frictions in the corporate sector.

The payoff to theoretical and empirical research on this topic is high. The COVID-19 recession has resulted in a sizable shock to firm financing. Data on the behavior of large and small firms in the current recession can shed light on corporate finance models. Positive and normative questions regarding corporate debt, noted above, are best answered by integrating corporate finance into macroeconomic models. As researchers working at the boundary of finance and macroeconomics, we encourage a renewed focus on the macroeconomic effects of corporate debt.

The rest of this paper offers some thoughts on how research in this area may develop. The paper is not a survey on either corporate finance or macroeconomics research, of which one can find other, more comprehensive papers.

1. Corporate Finance Theory

We have three principal theories of debt, corporate finance and firm behavior.

1. The entrepreneurial owner-manager model: In these models, an entrepreneur with limited personal wealth obtains outside financing to undertake the expenditures (capital, labor) to run a firm. The entrepreneur is the only equity holder (owner) of the firm. Informational frictions (moral hazard, adverse selection) or limited commitment of the entrepreneur to repay outside investors limits the quantity and form of outside financing. Moreover, outside financing often takes the form of debt, which mitigates these financing frictions. A large literature fits this category. Prominent models here include [Townsend \(1979\)](#), [Innes \(1990\)](#), [Nachman and Noe \(1994\)](#), [Hart and Moore \(1994\)](#), and [Holmstrom and Tirole \(1998\)](#).

2. The agency model: Because of the separation between ownership and control (Berle and Means 1932), agency problems arise and managers may choose projects that, while in their own interests, do not maximize firm value. Jensen's (1986) free cash flow theory describes managers with empire building tendencies. In [Hart and Moore \(1995\)](#) debt is chosen as a financial contract that can reign-in these empire-building tendencies by forcing managers to pay out free cash flow and align managerial decisions with efficiency.
3. The model of shareholder-debtholder conflicts: This model, exemplified in [Myers \(1977\)](#) and [Leland \(1994\)](#), postulates a manager that runs a firm in the interest of outside equity holders. The firm borrows because debt is tax advantaged. The deviation from efficiency arises because shareholders' cash flows differ from that of the firm so that managerial actions that maximize shareholders' value will not generally align with maximizing enterprise value. Debt overhang, as described by Myers, can lead to managers to reject positive net present value models. Managers may also choose projects that are risky but negative net present value.

Model 1 is most applicable to a small business. In these cases, the owner is essential to the running of the business and is also the equity owner of the business. Models 2 and 3 are applicable to large publicly traded firms as well as private-equity-backed firms. In these cases, the firm is run by professional management that can and is often replaced. The organizational problem of the firm is to ensure that the management makes decisions that maximize enterprise value.

2. Corporate Finance in Macroeconomic Models

The [Bernanke, Gertler, and Gilchrist \(1999\)](#) "financial accelerator" model is the most influential framework to examine the macroeconomic consequences of corporate financing frictions. The model combines elements of [Kiyotaki and Moore \(1997\)](#) and [Bernanke and Gertler \(1989\)](#). The core mechanism in the model is that the "net worth" of entrepreneur-managers is a state variable that drives the efficiency of corporate investments and macroeconomic outcomes. When net-worth is high, investment is efficient and near a frictionless benchmark. As net-worth falls, the effective required return on corporate investments rises and investment falls relative to the frictionless benchmark. Dynamics in this model are driven by the dynamics of net-worth. A negative shock to firm productivity lowers profits and net worth today, reducing firm scale, leading to lower profits tomorrow. The depressed firm activity lowers the demand and price of capital. Since entrepreneur-managers own capital, this force further lowers their net worth. This dynamic is the financial

accelerator: aggregate investment, hiring, and consumption are shaped by the dynamics of the aggregate net-worth of the entrepreneur-manager sector. Furthermore, asset price feedback channels where risk-premia drive asset valuations can be layered on this model, as in the work of Brunnermeier and Sannikov (2014) and He and Krishnamurthy (2019). For evidence on the excess bond premium and macroeconomic aggregates see Gilchrist and Zakrajsek (2012).

The Bernanke, Gertler, and Gilchrist framework is built on a corporate finance model of type (1) from above; that is, an entrepreneur-manager firm, most apt to describe small business behavior (more specifically, the model is built on Townsend 1979). Yet the bulk of the U.S. corporate sector better fit the assumptions underlying Models 2 and 3. To the extent that the focus in macroeconomics is to understand the amplification and propagation of business cycle shocks, this misspecification may be second order. However, to understand the macroeconomics of debt—the drag from high debt, debt maturity, restructuring of debt, government subsidies to borrowing—it is of first-order importance to correctly specify the corporate financing block. Revisiting macro-finance models with this in mind is a valuable pursuit.

Corporate finance theory work is typically organized around two or three period models that are designed to deliver qualitative insights. But to make progress in macroeconomics, these models need to have true dynamics as common in macro-models. Dynamic models can be taken to the data, quantified, and simulated. Dynamics are needed to consider asset price feedback channels, since asset pricing is inherently forward looking. Dynamic considerations are also important to study the impact of uncertainty, as well as the timing and delay of real and financing decisions. Are shocks transient or permanent? Do they give rise to only liquidity concerns or also solvency concerns?

Finally, government policy can affect the economy via both current and future actions. In equilibrium, government behavior defines a policy rule as a function of the state variables of the system. This policy rule may be one that is chosen via commitment, or the result of actions that are optimized in a subgame. Modeling and quantifying government policy also requires dynamic models.

The last two decades has witnessed a spurt of dynamic corporate finance models. See for example the early work by Leland (1994) and recent work by Hennessy and Whited (2005) and DeMarzo and He (2020). These models can be tied to data as discussed in Strebulaev and Whited (2012). It will be valuable for these models to interface with macroeconomic frameworks where the corporate financing considerations affect aggregate outcomes and to address both positive and normative questions about the role of corporate debt.

3. Bankruptcy and Macroeconomics

In a world with complete Arrow-Debreu securities and contracts, the institution of bankruptcy has no role. In such a world, control and cash flow rights are preassigned in every possible future contingency. In contrast, in a world with incomplete contracts, the owner of assets has the (residual) control rights in the states when they are not explicitly assigned. This insight of Grossman and Hart (1986) has been applied to debt and creditor rights in bankruptcy by Aghion and Bolton (1992) and [Hart and Moore \(1994\)](#). Viewed from this angle, bankruptcy procedures that specify and reassign control and cash flow rights simply complete the contract space.

From the standpoint of this Arrow-Debreu framework, the contingency should vary across macroeconomic environments. For example, in some environments, bankruptcy should favor continuation over liquidation, whereas in others the reverse case applies. To what extent do current corporate financing institutions deliver this conditionality?

Corporate finance research distinguishes between the different roles of bankruptcy (see, e.g., [White 1989](#)):

1. Bankruptcies whose social purpose it is to unbundle and reshuffle assets so that parts of the company are carved out, sold off, and merged with other firms. Bankruptcy, and even the threat of bankruptcy, facilitates the reorganization of resources.
2. Bankruptcies whose social purpose is to remove current owners who maintain residual control rights over the firm's assets.
3. Bankruptcies whose social purpose is to restructure investors' cash flow rights, such as under existing debt contracts. Firms' incentives to invest and hire might be distorted due to debt overhang problems, which a debt restructuring mitigates.

The role of bankruptcy varies markedly across these objectives and firms. Case 1 should ideally lead to a Chapter 7 liquidation, where individual assets are sold separately to the highest bidder. Case 2 concerns firms and Chapter 11 reorganization whereby the new owners gain control rights over the firm's assets. In Case 3, control rights are assigned optimally, but debt write-downs are needed to correct incentive distortions. In this latter case, Chapter 11 bankruptcy rules affect the bargaining power across various claim holders and the outcomes of debt restructuring (both in bankruptcy and in out-of-court debt restructurings as in [Gertner and Scharfstein 1991](#)).

Macroeconomic considerations enter here. Some observers argue that the bankruptcy process should be altogether suspended during the

COVID-19 crisis.¹ Again, differentiating between the distinct ways that bankruptcy plays out is useful. If bankruptcy primarily liquidates firms and reallocates assets, then a bankruptcy moratorium might indeed be a good policy. To the extent that the January 2020 blueprint for the economy remains valid if a vaccine was to be introduced tomorrow, the reallocation role of bankruptcy in this recession is socially costly. In contrast, if the main impact of bankruptcy in the current recession is to beneficially enable debt restructuring, then bankruptcy should be facilitated. That is, for bankruptcy to implement an Arrow-Debreu contingency, this analysis indicates that in the current epidemic, role (3) above should be enhanced relative to (1) and (2).

The COVID-19 crisis is a large exogenous macro-shock that may create default externalities. The bankruptcy of a single key firm can have detrimental real and financial knock-on effects on its suppliers, customers, and lenders. These externalities are typically not considered in bankruptcy procedures. Strategic complementarities exacerbate these externalities and can even lead to multiple equilibria situations. An ideal “macro restructuring mechanism” takes these externalities into account, such as via the Super Chapter 11 arrangement, proposed by Miller and Stiglitz (1999). Skeel (2020) discusses a number of the challenges that the COVID-19 crisis raises in the bankruptcy process.

Another macroeconomic consideration of bankruptcy arises in the decision to file for bankruptcy. The timing of bankruptcy restructuring might be different between the private equity holders’ and the social planner’s perspective. To understand this divergence, consider a case with zero social bankruptcy costs. The control rights are temporarily transferred to a third party, the bankruptcy court, until restructuring is finalized. Social efficiency would dictate the closure of insolvent firms, enabling resources to be reallocated toward more productive firms. In contrast, the private incentives of equity holders derive from their call option on the firms’ enterprise value as in Leland (1994). Equity holders take actions that keep their option value alive which leads to strategic delay and zombification (a phenomenon best understood within a multi-period model). Social bankruptcy costs generate an additional dimension. Now, the social planner also has a real option since bankruptcy incurs irreversible social costs. During times of large uncertainty, such as the current the COVID-19 crisis, the social planner may wait and see before “investing” and triggering bankruptcy. Reducing bankruptcy costs, for example, by shrinking debtor-in-possession (DIP) financing, may be a beneficial measure to promote debt restructuring (DeMarzo, Krishnamurthy, and Rauh 2020). See Brunnermeier and Krishnamurthy

¹ See, for example, the March 22, 2020, letter by lawyers from the National Bankruptcy Conference to U.S. Congress as quoted in the *Financial Times* (Tett 2020).

(2020) for a more detailed discussion of these timing and optionality issues.

The above considerations are just some that arise around the corporate finance of bankruptcy when viewed through a macro lens.

4. Empirical Studies

The COVID-19 recession is unique in its size and scope. The recession has evidently dramatically affected firm cash-flows. As we outline in a paper written for Brookings (Brunnermeier and Krishnamurthy, 2020), both the average level of corporate bond spread spreads and the dispersion in corporate bonds spreads have risen considerably from the start of the year to June of 2020. The behavior of spreads reflects a combination of decreased cash-flows and pre-existing debt, driving differential financial stress in the cross-section of firms.

Halling, Yu, and Zechner (2020), in this issue, document patterns of bond and equity issuance in the U.S. market over the period from March 2020 to May 2020. While equity issuance dried up, the Fed actions revived corporate bond issuances albeit at elevated spreads. Acharya and Steffen (2020), also in this issue, document the liquidity stress in large firms in their drawdown of credit lines. Li et al. (2020) present evidence that banks have met these liquidity demands without being impeded by capital constraints. Corporates rather than banks have been at the center of the credit dimensions of this recession.

Additionally, the government has subsidized credit to firms through a variety of programs, ranging from the Federal Reserve's corporate bond purchase programs, the Main Street Lending Program, and the Small Business Administration's Paycheck Protection Program.

The recession shock can be exploited to shed light on the nature of corporate financing frictions in the firm sector. As with work following the 2008 recession on the impact of credit-supply shocks, research can exploit firm heterogeneity to understand corporate financing frictions.

The impact of the government's interventions can also be used to understand firm financing. The government's interventions in the mortgage market in the 2008 recession and recovery have enabled researchers to better understand household financing constraints. Likewise, government interventions in the firm sector can shed light on corporate financing constraints. There is early work examining these issues, but more can be done. Schivardi, Sette, and Tabellini (2020) shed light on whether policy in this recession may exacerbate the problem of "zombie" lending. That is, a typical concern with providing credit support to firms in a recession is that it impedes reallocation and promotes zombies that crowd out productive investments. As noted earlier, this may be less of

a concern if the COVID recession creates the need for less reallocation than in a typical recession. Schivardi, Sette, and Tabellini (2020) provide empirical evidence consistent with this viewpoint.

The small and medium-size enterprise (SME) sector employs nearly 50% of the U.S. labor force. Young, small, firms in particular are important drivers of job creation (Haltiwanger, Jarmin, and Miranda, 2012). Carletti et. al. (2020), in this issue, studies a sample of Italian firms, showing that the COVID recession has affected the SME sector more severely than the large firm sector. However, the bulk of the existing empirical corporate finance work has studied the large firm sector. Although data challenges abound, it is critical to expand this research to cover small firms. To draw an analogy, we now have a good quantitative understanding of the marginal-propensity-to-consume out of housing wealth from work over the last decade. We likewise need to measure the marginal propensity to invest/hire out of liquid assets for SMEs.

Small firms access credit in non-traditional ways. Only about 50% of small firm financing comes from banks, with the other 50% coming from sources including trade credit and FinTechs. How has the source of financing affected firm outcomes in this recession? What are the macroeconomic consequences of the rise of non-traditional lending? The issues raised by shadow banking and mortgage lending in the 2008 crisis will need to be revisited in the context of small firm credit.

5. Conclusion

The 2008 global financial crisis led researchers to focus on bank and household balance sheets. The 2020 COVID-19 crisis is very different. The corporate sector is at the frontlines of this crisis. We have outlined some fruitful directions that may be taken by work at the intersection of corporate finance and macroeconomics.

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