Matthew D'Urso **Research Statement**

I am a quantitative macroeconomist studying the implications firm and household heterogeneity have on stabilization policy. I specialize in writing non-linear models that are micro-founded and calibrated to real-world data, where aggregate outcomes are functions of the distributions of firms and households.

Firm Debt Relief in Financial Downturn (Job Market Paper)

In my job market paper, "Firm Debt Relief in Financial Downturn" I develop a model of financial frictions that is calibrated to accurately fit the skewed unconditional size distribution of firms in the United States, as well as match key financial moments in the data. I then use the model as a quantitative laboratory to study a variety of debt relief policies that vary in terms of which subsection of firms are eligible for relief during a financial downturn.

I model financial market frictions by assuming collateralized borrowing. Investment among firms with insufficient collateral is limited by their inability to borrow, leading to a misallocation of capital. A shock to firms' access to credit exacerbates the misallocation as growing firms have a stronger reliance on external financing. This shock generates a recession with features similar to that of the 2008 Financial Crisis: an initial rise in consumption, a steep fall in investment, and a slow initial fall in output. Debt relief, where a government pays a fraction of firms' outstanding financial obligations, allows firms that suffer the most to access funds that the private sector will not provide, potentially mitigating the effects of a financial crisis. Identifying where to direct funds for the best return is important, as the government in my model borrows to afford debt policy and must eventually pay this debt back by increasing taxes, slowing the later stages of the recovery.

Financial frictions interact with firm-level productivity, a stochastic process drawn from a Pareto distribution. While the slowed growth seen in young and small firms can also be reproduced in models using the more common log-normal distribution (Khan & Thomas, 2013), this model delivers something further: larger firms are inefficiently smaller than they should be. Productive firms must borrow more to grow to their efficient size on the long right tail of the size distribution, making them more susceptible to a financial crisis than under the more commonly assumed Gaussian shock processes.

Policy that targets firms with the highest level of excess return to capital investment improves aggregates the most, reducing the drop in output from a 2.25 percent decrease from steady state to 1 percent, an improvement of over 50 percent. Understanding that excess return may not be a readily observable target for policymakers, I consider firm size and age as alternative targets. My model is well equipped to analyze these policies as not only does it match the size distribution of firms, it endogenously reproduces an age-size distribution of firms ages 1-5 that matches what is seen in the United States. Using these model generated distributions, I divide firms into small, medium, and large size bins, which correspond to employment share bins in the BDS data, as well as a young firm bin for firms under 5 years of age. Despite many policies in the United States targeting small firms (Paycheck Protection Program, Small Business Administration loans), I find that policy that targets medium size firms outperforms those that target small, large, and young firms in dampening the severity of a financial crisis. Output, investment, labor hours, and aggregate TFP all have higher troughs under the policy that targets medium size firms. Medium size firms more important to aggregate production than small firms, while also being more hindered in their lifecycle growth by financing constraints than large firms, so relief can be usefully spread across this group of firms. However, all of these more observable policy targets fall short of the excess return policy.

Misallocation, Sticky Prices, and Monetary Transmission (with Aubhik Khan)

Models of Sticky Prices typically lack persistent heterogeneity across firms, other than in their relative price. In future work with Aubhik Khan, we will explore the role of credit market frictions, affecting firms' ability to finance investment, for the transmission of monetary policy. Critically, in contrast to Ottonello and Winberry (2020) our approach will involve a setting that reproduces the size and size-over age distribution of firms.

Into the canonical sticky price model, we introduce a nontrivial distribution of firms that vary over their persistent productivity, capital and debt. Traditional sticky price models generate allocative inefficiencies through markups and relative price distortions arising from monopolistically competitive firms infrequently adjusting their nominal prices. We introduce a distribution of upstream firms that produce a homogeneous commodity that is an input for downstream price-setting firms. Financial frictions limit upstream firms' access to external finance. Some highly productive but cash-poor firms are unable to borrow enough to reach their efficient level of capital. Given decreasing returns to scale in capital and labor at the individual firm, the resulting misallocation of capital further reduces aggregate total factor productivity.

In our setting, changes in the real interest rates following reductions in the monetary policy rate, in a recession, partly offset firms' cost of loans. This improves the allocation of capital boosting aggregate TFP. The fall in GDP is dampened beyond that which would be seen in a model with borrowing constraints. Fitting the size distribution of firms allows us to offer an empirically consistent estimate of the extent to which firms' borrowing constraints amplify the effectiveness of monetary policy. The nonlinear solution of our model allows us to evaluate the effectiveness of unconventional monetary policy operating through firms' balance sheets. For example, at the zero lower bound, debt relief programs can stimulate GDP by increasing firm productivity.

Stabilization vs Inequality: A Trade-off to Debt Relief?

Building off my job market paper, I study a potential tradeoff to debt relief policy: mitigating recession at the cost of increased wealth inequality. Debt relief policies have the potential to benefit all households by reducing the length and severity of financially driven recessions, while also increasing firm value. However, this is where the potential to exacerbate household wealth inequality originates. In partial equilibrium, increasing firm value increases the value of their shares, which are typically owned in greater concentration by wealthy households. In general equilibrium, expanding the budget set of wealthy households by increasing the value of the shares they own causes a positive wealth effect, increasing their consumption. Decreasing marginal utility of consumption from a small percent of the population responsible for a disproportionate share of consumption puts upward pressure on the equilibrium wage, decreasing factor demand which partially offsets the stabilizing effects of fiscal policy.

Moving forward, my research agenda will focus on real business cycle models that emphasize the effects firm and household heterogeneity have on aggregate dynamics. This is essential to understand not only how the incidence of shocks varies over firm size and age, or household wealth, but also how to better design policy recommendations for the benefit of all agents in the economy.