Section I: Introduction

Policymakers and researchers have long viewed balance sheet lending by deposit-taking institutions—traditional banks—as the predominant way loans are supplied to households and firms (Sunderam 2015). Under this view, banks use deposits to extend loans, which they hold on their balance sheet until repayment or default. Therefore, traditional banks have been the main focus of regulation and supervision in financial intermediation. The bank balance sheet view omits two important aspects of modern financial intermediation.

First, a substantial share of financial activity has migrated to the less regulated shadow banking sector.[1] For instance, following the increase in bank regulation after the 2008 financial crisis, the share of shadow bank loan origination more than doubled in the $10 trillion U.S. residential mortgage market. Shadow banks now account for the majority of new mortgage originations (Buchak et al. 2018). Financial intermediation regulation therefore needs to account for this "*shadow bank migration margin*" of adjustment in the supply of financial intermediation.[2] In this paper, we document the shadow bank migration margin primarily for activities which do not require on-balance-sheet financing. Banks, by virtue of deposit financing, retain an advantage in balance-sheet intensive activities. In other words, differences in financing result in market segmentation.

Second, banks themselves sell over 50% of the originated loans instead of holding them on their balance sheet (see Buchak et al. 2018, Irani et al. 2018, Seru 2019). We document a new margin of adjustment by traditional banks, which we call the "*balance sheet retention margin.*" When faced with shocks, traditional banks adjust their business models, switching from on-balance-sheet lending to off-balance-sheet lending. The two sets of facts we document suggest that the allocation of intermediation activity and risks between banks and shadow banks is determined by the industrial organization of financial intermediation as well as the changing business models of banks. We then build a workhorse structural model of the financial intermediation sector and demonstrate that these margins of adjustment are central to understanding consequences of policies such as capital requirements and monetary policy.

We explore the interaction of banks and shadow banks in two main residential mortgage market segments in the U.S.—the conforming market and the jumbo market—for two broad reasons. First, these two segments account for the vast majority of the $17.8 trillion[3] residential mortgages originated during our sample period (Beraja et al. 2019; Wong 2018; Palmer 2015). Second, the institutional difference between these segments allows us to study the role of balance sheet capacity. Originating conforming mortgages does not require as much balance sheet capacity since these loans are eligible

[1] See Gennaioli, Shleifer, and Vishny (2013); Ordonez (2018); and Moreira and Savov (2017) for models of shadow banking, and Greenwood and Scharfstein (2013) and Adrian and Ashcraft (2016) for a comprehensive review.

[2] For instance, the banking regulation proposal of the Minneapolis Federal Reserve, the "Minneapolis Plan," discusses taxing activity that migrates to shadow banking following higher capital requirements: https://www.minneapolisfed.org/publications/special-studies/endingtbtf/final-proposal/summary-of-the-minneapolis-plan-to-end-too-big-to-fail.

[3] Mortgage Bankers Association estimates for 1–4 unit family homes [accessed August 12, 2019] https://www.mba.org/Documents/Research/Historical%20Mortgage%20Origination%20Estimates.xlsx.