

likely to be small in the majority of our counterfactuals. First, in the case of capital requirements, we find that the overall impact on lending volumes is small due to the shadow bank migration and balance sheet retention channels. Because the effect on the overall amount of credit is small, house price responses are likely to be small. Quantitatively, Adelino et al. (2013) study changes to the conforming loan limit and find that houses constrained by the conforming loan limit see prices declines of only 0.5%. In our model, house prices feed back into desired loan size. Our estimates predict that a 0.5% reduction in house prices is associated with roughly a 0.2%, or \$400, decrease in desired loan size on average. This is a small decrease relative to the average desired loan size of \$220,000, as well as the large variation in estimated desired loan size across markets and borrowers. Finally, in the case of unconventional monetary policy, credit expansion in GSE lending would tend to increase house prices, thereby acting to mute the overall impact of the counterfactual policy. This would not, however, impact our broader point concerning how lending growth is allocated among bank balance sheets, bank securitization, and shadow banks.

## **Section VI: Related Literature and Conclusion**

### *VI.A Related Literature*

The increased amount of bank-like activity taking place outside the traditional banking system has attracted increased attention. Buchak et al. (2018) analyze the recent dramatic growth of shadow banks and fintech lenders in the residential mortgage market and find that the regulatory burden faced by traditional banks and growth of financial technology can account for a large part of the recent shadow bank growth. Fuster et al. (2018) provide complementary evidence that suggests fintech lenders adjust supply more elastically than other lenders in response to exogenous mortgage demand shocks, thereby alleviating capacity constraints associated with traditional mortgage lending. Kim et al. (2018) discuss potential liquidity risks faced by shadow bank lenders. Irani et al. (2018) focus on corporate loans and study the role of bank capital regulation in the growth of shadow banks. Our paper focuses on the limits of shadow banks, which arise from their lack of balance sheet capacity, and points out that banks' ability to adjust their business models to balance sheet capacity shocks makes them similar to shadow banks. We explore the consequences of these two features on the structure of the mortgage market both in segments where originate-to-distribute is common and in segments where it is less common. In addition, our structural model allows us to assess the role of capital requirements, government credit subsidies, and unconventional monetary policy on the overall distribution of mortgage credit across borrowers, as well as on bank stability.

Our paper is also related to a growing literature that uses structural models to study industrial organization in the context of consumer finance. Egan, Hortaçsu, and Matvos (2017), for example, study banking competition and financial fragility through the context of a structural model of demand for bank deposits, and Egan, Lewellen, and Sunderam (2017) structurally decompose the sources of bank value.<sup>24</sup> Similarly, Aguirregabiria, Clark, and Wang (2019) structurally estimate the economies of scope between bank deposits and loans. Buchak et al. (2018) use a structural framework to analyze

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<sup>24</sup> See also Cox (2017) who develops a structural model of the borrowers' repayment preferences in the student loan market and uses it to measure the overall gains in consumer surplus from risk-based pricing.