

Information-Concealing Credit Architecture

A Brief Summary

Link to the full paper: https://yeli-macrofinance.com/info_concealing_chain.pdf

The financial system operates through intricate networks of intermediated funding and collateral flows. This complexity has been widely criticized for its opacity: it obscures systemic vulnerabilities, creates regulatory challenges, and complicates crisis management. In this paper, we argue that such complexity can benefit the economy by expanding credit capacity.

Our starting point is a classic question: what is the best way to pledge an asset of uncertain value to obtain credit? When borrower and lender are symmetrically uninformed about asset value, credit capacity is maximized “in the dark”: credit based on the expected asset value (an information-insensitive loan) exceeds average credit under revealed asset values (information-sensitive loans), because value revelation requires costly information production, and the cost is ultimately borne by the borrower in the form of reduction of financing capacity. The size of an information-insensitive loan is nevertheless limited by an incentive-compatibility (IC) constraint on the lender—the more credit the lender extends, the stronger her temptation to inspect the collateral as greater wealth is at stake.

Prior studies emphasize that assets can be structured to deter collateral inspection: pooling reduces value uncertainty through diversification, and layers of securitization raise examination costs. We instead take the asset characteristics as given and show that a network of debt contracts discourages costly examination. In our model, a firm pledges an existing asset of uncertain value to fund a project with unpledgeable returns. The asset already exists, so our paper does not seek to answer the question whether a lack of information production encourages origination of low quality assets. The goal here is simply to enlarge financing capacity as much as possible because the project is highly productive.

In our model, debt is effectively a probabilistic asset ownership—the lender owns the collateral only if the firm defaults. A credit intermediation chain dilutes the asset ownership for both the end lender and the intermediary relative to that of a direct lender. If the end borrower defaults and the intermediary receives the collateral, the intermediary may still be solvent and repay the end lender rather than hand over the collateral, as we assume that the intermediary’s failure is correlated but not perfectly correlated with that of the end borrower. Therefore, the end lender is less likely to end up owning the collateral—and has a weaker incentive to examine it—than if she financed the end borrower directly. The intermediary’s incentive to examine the asset is also weaker than a direct lender, because when the borrower defaults, it may also fail and pass the collateral down to the end lender. As a result, the credit chain splits the collateral ownership probabilistically between the intermediate and end lenders, relaxing the IC constraints on the size of the information-insensitive loan and thereby allowing more credit to flow to the end borrower.

Importantly, the intermediary does not need to contribute new resources. Consider two firms that both face liquidity needs: credit is maximized when each uses the other as an intermediary rather than borrowing directly—what drives credit capacity is the chain architecture itself.

We embed this ownership-dilution logic into a general model of credit chains with heterogeneous information costs and an arbitrary joint distribution of failures, where the chain’s capacity to channel funds is pinned down by the bottleneck link. The optimal chain equalizes the temptation to examine the

collateral across links: intermediaries with higher examination costs, or whose failures are more correlated with the end borrower's, should be placed upstream, closer to the end borrower. In short, agents more likely to get the collateral should be less likely to keep it. The optimal chain can emerge from decentralized formation: modeling chain formation as a sequential game of bilateral invitations and bargaining, we show that a subgame-perfect equilibrium implements the optimum, whether the chain is initiated by the end borrower or the end lender.

Our analysis provides a rationale for the seemingly excessive complexity of intermediated credit flows, with sharply structured predictions. Chains matter more when collateral is information-sensitive and direct lenders are tempted to examine it. Long chains add little value if intermediaries are homogeneous, as the bottleneck is always the same first link between the end borrower and the first intermediate lender. Safer or more diversified intermediaries should appear downstream, away from end borrowers, because once they receive the collateral, they tend to keep it, much as banks in practice finance riskier non-bank lenders that in turn lend to firms and households.

Finally, we highlight that whereas alternative arrangements for diluting asset ownership and discouraging costly examination, such as multilateral contracting, may face important frictions, the credit chains we characterize rely only on bilateral debt contracts: it is not the design of complex contracts that enlarges financing capacity, but the architecture of simple contracts.