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How capital regulation and other factors drive the role of shadow banking in funding short-term business credit ☆

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ABSTRACT

This paper empirically analyzes how capital regulation, risk, and other factors altered the relative use of shadow banking-funded, short-term business debt since the early 1960s. Results indicate that the share was affected over the long run not only by changing information and reserve requirement costs, but also by shifts in relative regulation of bank versus nonbank credit sources—such as Basel I in 1990 and reregulation in 2010. In the short-run, the shadow bank share rose when deposit interest rate ceilings were binding on traditional banks, the economic outlook improved, or risk premia declined, and fell when event risks arose.

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1. Introduction

The relative importance of the "shadow banking system" generally increased in the decades preceding the 2007–09 financial crisis in the U.S. and subsided following the crisis amid efforts to reform the financial system. For example, the share of short-term business credit of nonfinancial corporations funded by securities markets—e.g., nonbank loans funded with uninsured debt, securitized bank loans, and commercial paper directly issued by nonfinancial corporations—has roughly doubled since the late 1960s (Fig. 1). Netting out commercial paper, there have been large shifts in the share funded through the shadow system.[1]

The existing literature offers a number of potential factors that drove these developments—ranging from the long-run effects of regulatory arbitrage and financial innovation to short-run cyclical and financial market shocks—but there is little empirical evidence that assesses such factors jointly and that provides perspective on their actual roles. Addressing this gap in the literature, this study tracks and synthesizes these factors into a cohesive empirical framework that provides estimates about how various factors drove both the long-run evolution of and the short-run variation in shadow banking's relative importance in funding short-term nonfinancial corporations over the past half-century.

This is particularly relevant to understanding the role of shadow banking in the global financial crisis and its aftermath for several reasons. First, experience reflects that commercial paper and debt issued by nonbank financial firms are both vulnerable to financial market shocks and can be pro-cyclical, as reflected in the sharp post-2007 drop in shadow bank lending and as emphasized in recent papers by Adrian and Shin (2009a, 2009b, 2010), Geanakoplos (2010), Gennaioli et al. (2013), and Gorton and Metrick (2012), *inter alia*. Second, the size of the shadow system

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[1] The security-funded share plotted in Fig. 1 internalizes substitution between commercial paper directly issued by nonfinancial firms and credit to nonfinancial corporations.

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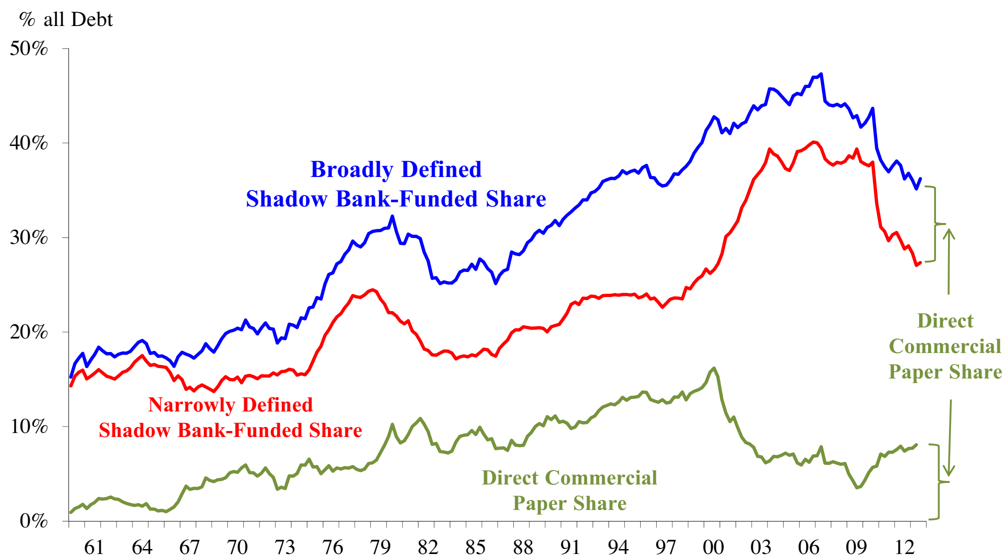

Fig. 1. The relative importance of the shadow banking system as tracked by the security-funded share of short-run nonfinancial business credit.

can affect the magnitude of such effects (e.g., through fire-sale effects as in Luck and Schempp, 2014). For these reasons, the size of the shadow banking system and its reaction to liquidity shocks make the real economy vulnerable to credit shortages stemming from flights to quality. Furthermore, these effects may not be fully offset by banks, especially if correlated loan losses impair the capital adequacy of bank and nonbank financial firms, as occurred in the 2008 crisis. By quantifying the various factors affecting the shadow bank share of short-term nonfinancial business credit, the financial architecture model developed here can help inform not only short-run policy responses to financial crises, but also the long-run design of financial systems that balance the gains from sound financial innovation with the need for some financial stability.

To establish these findings, this study is organized as follows. Section 2 provides a brief literature review of how shadow banking has been defined elsewhere and of the factors that have affected the relative use of shadow banks as a source of short-run business finance since the early 1960s. Building off these insights, Section 3 presents an estimable, empirical specification for modeling the relative reliance of nonfinancial firms on shadow-funded debt. Section 4 reviews the main empirical results using quarterly data since the early 1960s, and Section 5 provides some additional robustness checks. Findings are interpreted in Section 6, which draws parallels with the experience of the 1930s.

2. Literature review: what is shadow banking and what drives it?

The literature touches on two major aspects of shadow banking relevant for this study's empirical assessment of what has driven nonfinancial businesses' use of the shadow banking system as a source of short-term credit. The first is defining shadow banking and the second concerns the factors driving its use over time?

2.1. Defining shadow banking

Attempts to define and measure shadow banking take several approaches. Of these, the definition used in this paper is close in spirit to the seminal work of Pozsar et al. (2010, 2012) in three key respects. First, within the segment of nonfinancial corporate debt, the definition is similar to Pozsar et al. (2010, 2012, pp. 7–8) who combine the liabilities in the flow of funds related to securitization with short-term money instruments not backstopped by deposit insurance (e.g., commercial paper) in gross and net calculations. Second, shadow bank credit lacked the access to public backstops (e.g., deposit insurance or Federal Reserve liquidity facilities) except when during the recent crisis, official liquidity facilities and credit guarantees replaced private sector guarantees, to paraphrase Pozsar et al. (2010, 2012, p. 2).[2] Third, the definition used here combines debt primarily funded through two of the three broad shadow subcategories of Pozsar et al. (2010, 2012)—the internal and external shadow bank subsystems. However, it effectively omits the government-sponsored shadow bank subsystem by excluding debt secured by real estate, an aspect of shadow banking not covered in the present study.

A slightly different approach is taken by the Financial Stability Board ("FSB," 2012, p. 3), which defines shadow banking as, "credit intermediation involving entities and activities outside the regular banking system". The FSB later clarifies this as inclusive of securitization and nonbank lenders. The definition was subsequently further modified to include "entities and activities *fully or partially* outside the regular banking system, *or non-bank credit intermediation in short*," (italics indicate modifications, FSB, 2014, p. 4). The variable tracking shadow banking in this paper has some similarities with this definition, but is narrower because it focuses on sources of short-term corporate debt, does not include off-balance sheet products that have not been tracked over time, and is less focused on the asset-transformation activities that shadow banks use to raise funds.

In general, for practical estimation purposes, the current study more narrowly focuses on one dimension of nonfinancial corporate short-term debt, whereas in the broader views of shadow banking—exemplified by the FSB (2012) and Pozsar et al. (2010, 2012)—shadow banks serve key roles on both the asset and liability sides of the overall financial sector balance sheet. For example, Claessens et al. (2012) discuss in detail how shadow banks address several unmet financial needs, noting that the liabilities that shadow banks create help address the need for collateral in financial markets and that shadow banks similarly help address some credit demands unmet by commercial banks. Another aspect of shadow banking is that shadow and more conventional bank activities are often intertwined (see Claessens et al. (2012) and Jackson (2013)), which raises some limitations and qualifications for

[2] An alternative definition of Claessens and Ratnovski (2014) proposes defining shadow banking as, "all financial activities, except traditional banking, which require a private or public backstop to operate".

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