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Bank defaults and spillover effects in US local banking markets

Chris Tsoumas

School of Social Sciences, Hellenic Open University, Parodos Aristotelous 18, 26335 Patra, Greece

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ABSTRACT

I examine the spillover effect of a bank default on its neighboring banks over the 2007Q1–2015Q4 period propagating through the disrupted local economic activity in areas the failed institution was operating in through its branches. The results show that the affected neighboring banks' insolvency risk increases considerably one year after the shock, especially during the crisis. This effect is driven by capital deterioration, increase in non-performing loans and a surge in the volatility of profits. Moreover, this spillover effect is asymmetrically distributed, impinging more neighboring banks that bear higher risk whereas better capitalized ones are not better shielded. Policy implications of these findings are discussed.

1. Introduction

Although the issue of contagion in banking has attracted much attention in the literature during the last decades, the experience of the recent financial crisis has brought into play a renewed interest on the subject. The majority of existing studies focus on the financial linkages among banks and the spillover effects of shocks in financial networks. In this way, shocks as, e.g., the failure of a bank, are transmitted fast and may have a domino effect on other financial institutions and the economy.

In the present study I take a different perspective and focus on the effect of a bank default on its neighboring banks propagating through the disrupted local economic activity in areas the failed institution was operating in through its branches.

This disruption of local activity in turn affects neighboring banks above and beyond country-wide economic conditions. Neighboring banks are defined as these the branch network of which overlaps, fully or partially, in local markets with the branch network of the failed institution.

For this, I exploit information on US bank branches in local markets, i.e., counties, as well as bank failures over the 2007Q1–2015Q4 period. Then, I construct a default shock measure for neighboring banks that accounts for the degree of their branch network overlap with that of the failed bank in US counties and the magnitude of bank competition in these markets. I focus on the neighboring banks' insolvency risk, capitalization, profitability and loan portfolio characteristics one year after the default shock. The empirical strategy follows the event study literature with an exogenous treatment, however I address reverse causality and endogeneity concerns by using appropriate techniques and control regressions.

The effect of a bank default on neighboring banks could, in principle, run both ways (see [Kaufman, 1994](#) and references therein). It could be negative, i.e., a spillover effect transmitted through the adverse local economic conditions caused by the bank failure. In short, neighboring banks possibly have common asset exposures in the local markets they operate, e.g., mortgage lending, and thus may be prone to shocks such as a bank failure which may cause a drop in asset prices in the area due to, e.g., early liquidations. In addition, the disruption in the availability of credit in the counties the failed bank was operating may cause the abandonment of profitable firm investments in the area. Combined with the possible reluctance of the remaining institutions to provide these firms with risky loans may lead to a drop in the overall local economic activity. Local consumers may also be affected in a similar way,

E-mail address: ctsoum@eap.gr.

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whereas any welfare loss of the failed bank's depositors and the possible loss of confidence to the neighboring banks' health may exacerbate the shock to the local economy. This shock subsequently impinge on neighboring banks that have presence through their branches in these areas.

On the other hand, the effect could be positive operating through the decrease in bank competition in these local banking markets and the rise in the demand for the surviving bank's products (loans, deposits etc.). Moreover, the resolution of a failed bank may benefit the remaining neighboring banks through the elimination of the higher deposit rates paid or the lower loan rates charged by the insolvent bank. Naturally, the magnitude of either effect, negative or positive, is a function of, among others, the degree of bank competition in the local markets as well as of the affected banks' financial condition.

The results show that the balance tilts towards the negative, i.e., spillover, effect. A bank default causes an increase in the insolvency risk of neighboring banks one year after the default shock, the maximum impact on these banks' z-score, relative to the non-affected ones, being about -17.75% . The effect is much more pronounced during the crisis, however it does not vanish in the post-crisis era. The drop in the affected banks' z-score is driven by a decline in capitalization, due to non-performing loan write-offs, and a surge in the volatility of bank profits, which could reach for a default shock of maximum magnitude the levels of -5.8% and 40% , respectively. Instead, the profitability of affected banks remains intact. Moreover, sensitivity analyses show that neighboring banks with higher assumed risk, measured by their risk-weighted assets ratio, and are larger are more susceptible to the spillover repercussions of bank defaults. Lastly, the decline in loan origination of neighboring banks can reach a maximum value of about -5% .

Overall, these findings suggest that the spillover mechanism triggered by bank failures and propagated through the local real economy activity can have serious repercussions for neighboring banks and mandate for policy interventions at the local economy level and/or tailor made support measures for these banks. More importantly, the results show that the spillover effect of bank failures cannot be mitigated through more immediate actions by the affected banks such as, e.g., the raising of new capital. Thus, they send a signal for more conservative bank decisions since the risks that could threaten a bank's stability may well originate beyond its control.

The paper touches upon three strands of the literature. First, it adds to the extant research on contagion and highlights the consequences banks' branch network overlap in local markets has when one of these banks fails. Second, it relates to the literature on banking markets and their importance for the local economies they operate in (e.g. [Nguyen, 2014](#)). Third, it bears to the literature that aim to quantify the impact financial losses have on the real economy (see, among others, [Adrian & Boyarchenko, 2012](#); [Brunnermeier & Sannikov, 2014](#)).

The remainder of this paper is organized as follows. Section 2 provides a brief literature review on contagion in banking. Section 3 presents the data and the construction of the main explanatory variable, whereas Section 4 analyzes the empirical methodology. Section 5 discusses the results. Finally, Section 6 concludes.

2. Literature review

Very recently, [Glasserman and Young \(2016\)](#) provide an excellent survey of the large, theoretical and empirical, literature on contagion in financial networks, whereas they also highlight the issues that still remain unresolved. The channels through which shocks are transmitted across the financial system abound: Bank interconnectedness via the interbank market and the payment system facilities; common exposures to other related parties and the derivatives markets; contractual obligations, combined with bank opacity, are among the many, yet non-exclusive, drivers of contagion.

Other forces that operate in tandem with explicit bank financial linkages and lead to increased financial system fragility include fire sales of claims on ailing banks by investors, which put pressure on asset prices raising the cost of capital for the surviving banks ([Duarte and Eisenbach, 2015](#)). In addition, information contagion in case of bad news such as a bank default affects banks that share common characteristics with the failed institution (low capitalization, high assumed risk etc.) through a confidence shock. This situation is anticipated by banks and leads to ex-ante bank herding behavior, i.e., correlated investments ([Acharya & Yorulmazer, 2008](#)), also increasing the cost of bank borrowing, and may cause unexpected increases in non-performing loans or deposits outflows and ultimately bank runs when the shock occurs ([Aharony & Swary, 1996](#)).

Another, albeit more limited, strand of the contagion literature pays attention to the effect of shocks transmitted through real economic activity. For example, [Giesecke and Baeho \(2011\)](#) explore the dynamic interaction between the real and the financial sector when measuring systemic risk and extract information stemming from industrial defaults for predicting bank defaults. [Berrospide, Black, Lamont, and William \(2016\)](#) show that local economic shocks such as high mortgage delinquencies in an area may be transmitted to other geographical areas via multi-market banks' reduced lending in the latter. [Lux \(2016\)](#) pinpoints the common counterparty risk through loans of banks to the same firms. In the same spirit, [Azizpour and Giesecke \(2008\)](#) document that a corporate default directly impacts positively the probability of default of surviving firms, an effect operating through their contractual relationships in the economy. As they argue, this channel operates above and beyond the firms' exposures to observable or unobservable (frailty) risk factors.

The adverse effect a disruption in credit supply has on local real outcome is corroborated by [Greenstone et al. \(2014\)](#). They document that a lending shock in US counties cause a drop in small business loan originations, especially during the crisis. In the same spirit, [Nguyen \(2014\)](#) finds that bank branch closings cause persistent decline in small business lending and through that, to the real economic activity in local US markets.

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