Systemic risk and financial regulation

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CHAPTER 5

Conclusions

This chapter discusses our main findings and their policy implications. In addition, we reflect on the limitations of our research and suggest avenues for future research.

5.1 Main findings and policy implications

This thesis aims to study several crucial issues about systemic risk and financial regulation. Specifically, Chapter 2 applies four recently developed market-based measures to estimate systemic risk of Chinese banks. These measures are ΔCoVaR of Adrian and Brunnermeier (2016), MES of Acharya et al. (2017), and SII and VI of Zhou (2010). We find that these four systemic risk measures yield different rankings for the banks considered, but correlations among rankings based on the ΔCoVaR, the SII and the VI measures are significant. Ranking of banks based on the MES measure has very week correlations with the rankings based on other measures. Despite the difference of ΔCoVaR and MES with respect to banks' rankings based on banks' ΔCoVaR and MES, they yield similar results; namely that systemic risk in the Chinese banking system tended to increase during the global financial crisis (GFC) and was relatively low after the crisis. However, systemic risk began to rise in 2014, arriving at a relatively high level at the end of 2014.

The GFC also triggered a debate about bank size as a proxy for bank systemic importance (e.g., see Zhou, 2010; and Zhang et al., 2015). To provide insight, we examine the correlations between bank rankings based on bank size

and on different systemic risk measures. We find that only the rankings based on bank size and MES are significantly and highly correlated. The correlations of rankings based on size and ΔCoVaR, SII or VI of banks are relatively low and statistically insignificant. Our results support the finding of Zhou (2010) that bank size is not a good proxy for systemic importance, but contrast with Zhang et al. (2015) who find that size is the most consistent proxy for systemic risk across different financial crises. An important policy implication of these analyses is that financial regulators should take both accounting and market-based measures into account when identifying systemically important banks.

Chapter 3 examines the evolution of US bank capitalization and explores its relationship with the cross-section of banks' stock returns. We use the book-valued capital ratio (BCR), the market-valued capital ratio (MCR) and the stressed capital ratio (SCR) as three proxies for bank capitalization. We find that banks' average BCR rose steadily during the 1985–2014 period while banks' average MCR and average SCR substantially changed along with the banking crises and the changes of financial regulation. Similarly, Flannery and Rangan (2008) also attribute the buildup of bank capital in the 1990s to the financial regulatory innovations. While Flannery and Rangan (2008) find that both the BCR and the MCR capture the buildup of bank capital in the 1990s, our results show that they evolve quite differently in the 2000s. Therefore, our results point to the necessity to study bank capitalization from different perspectives. This has important implications for current financial regulatory reforms. While financial regulators tend to rely on accounting information to assess bank safety, market information should not be ignored for bank regulation practices.

In Chapter 3, we also show that there is a negative and significant relationship between bank capitalization and expected bank stock excess returns during the tranquil period 1994–2007, especially when bank capitalization is captured by market-based capital ratios. The negative relationship remains significant in risk-adjusted returns of the MCR-sorted and of the SCR-sorted decile portfolios, but becomes insignificant in risk-adjusted returns of the BCR-sorted decile portfolios. Besides, we find that the BCR proxies for risk exposures to the market and value factors, while the MCR and the SCR proxy for risk exposures to the market and size factors. During the turbulent period 2008–2014, we find that the MCR (SCR) is not associated with bank stock returns anymore, but the BCR is significantly and positively associated with bank stock returns. A possible reason for these findings is that during the tranquil period investors rely more on the market assessment of bank capitalization while they turn to

focus more on the accounting perspective of bank capitalization when a systemic banking crisis occurs.[1] Thus, riskier banks, as indicated by the MCR or the SCR, have to provide higher stock returns during the tranquil period following the risk–return trade-off. But when bank failures happen frequently and investors prefer to hold high-quality assets, riskier banks indicated by the BCR have lower (or even negative) stock returns, as suggested by the flight-to-quality phenomenon in the US stock market found by Ghysels et al. (2014, 2016) and Kotchoni (2018).

Chapter 4 conducts a counterfactual analysis to examine the effectiveness of the Dodd-Frank Act (DFA) in terms of reducing systemic risk in the US financial system. The DFA was passed to promote US financial stability by reforming the financial regulatory system. According to the annual report of FSOC (2015), some accounting ratios of banks have significantly improved after the 2007-2009 financial crisis, implying increased stability in the US financial system. However, the key question is how much of the improved financial stability can be attributed to the passage and implementation of the DFA. To this end, we adopt two market-based systemic risk measures to capture the degree of systemic risk in the banking system. These two measures can also be interpreted as indicators of financial stability, as suggested by FSOC (2011). We then utilize the synthetic control method (SCM) to construct a control group and the difference-in-differences (DID) method to evaluate the treatment effect of the DFA.

Our results suggest that the DFA did not have a significant impact on systemic risk in the US banking system during the 2010–2015 period, and reveal the existence of endogenous systemic risk persistence. We find that the evolution of systemic risk is positively and significantly related to its past values. The robustness of our finding is enhanced by three additional tests regarding the research design and other potential concerns. Our finding provides empirical evidence for recent theoretical studies arguing that the DFA could increase the interconnectedness of financial institutions and reduce financial stability due to its unintended implications (e.g., Kroszner and Strahan, 2011; Acharya and Richardson, 2012; and Zhou, 2013). Given our empirical evidence and the theoretical studies, it is necessary for regulators and policy-makers to reflect on the current financial regulatory system.

[1] Similarly, Bessler and Kurmann (2014) and Bessler et al. (2015) find that risk exposures of US banks significantly changed during the GFC. This implies that bank stock investors adjusted their investment strategy during the GFC.

5.2 Limitations and future research

In this section, we reflect on the limitations of our studies and discuss possible avenues for future research.

We identify three limitations of our research in Chapter 2. First, we only compare four systemic risk measures while there are more than 30 measures as surveyed by Bisias et al. (2012). Second, our sample only covers the post-GFC period so that we are unable to know the performance of these measures over a longer time period. These two limitations are mainly due to the restriction of data availability. Third, we examine the measures for China only. Further research can be pursued to tackle these limitations. For instance, pending data availability, one may empirically compare the performance of existing systemic risk measures for banks in the same country, the performance of one systemic risk measure for banks in different countries, and the performance of systemic risk measures over a long period. Such a comprehensive study could provide concrete and systematic knowledge about the pros and cons of various systemic risk measures. Previous studies such as Bisias et al. (2012), Rodriguez-Moreno and Peña (2013) and Benoit et al. (2017) seek to study various systemic risk measures, but none of them simultaneously compares the performance of systemic risk measures across time, institutions and countries.

We identify two limitations of our research in Chapter 3. First, although we use three capital ratios as proxies for bank capitalization, we do not examine the regulatory capital ratios, such as Tier I and Tier II capital ratios. Given that the risk-weighted assets are subject to manipulation (see Lesle and Avramova, 2012; and Mariathasan and Merrouche, 2014), it would be meaningful to examine how far the regulatory capital ratios deviate from the market-based capital ratios. Second, we examine the relationship between bank capitalization and expected stock returns based on US banks. Future research can conduct similar analyses for banks in other advanced and emerging countries. Such a study would allow us to examine whether the relationship also holds for banks in other countries and whether the capital ratios used are informative indicators of bank solvency in all cases.

We identify two limitations of our research in Chapter 4. First, we are not able to examine what exactly caused the ineffectiveness of the DFA in reducing systemic risk. Second, we do not examine the specific effects of different provisions in the DFA. We do not conduct these two examinations because our goal

is to provide an insight into the overall effect of the DFA. Given that the regulatory reform is still ongoing, further research is essential. However, tackling these two questions is a great challenge as it is difficult to disentangle internal and external reasons for the limited effectiveness of the DFA. Instead, it is possible to understand the effects of different provisions through building theoretical models.

Last, we want to point out that we make an important innovation to the literature regarding the methodology to assess policy effectiveness. We illustrate how to use the synthetic control method combined with the difference-in-differences method to conduct policy evaluations. Previously, the two methods have been separately used for policy evaluations, but so far the combination of both methods in order to overcome each method's weaknesses has been ignored. Our analysis shows that their combination is very fruitful as it informs the effect of financial regulation. Future research can follow the methodology illustrated in Chapter 4 to conduct policy evaluations, such as the impact of stricter financial regulation on financial stability.