Springer Link

Search Log in

Published: 28 September 2020

Reinsurance, debt capacity and financial flexibility

Xiaoyi Li & Yung-Ming Shiu

The Geneva Papers on Risk and Insurance - Issues and Practice (2020)

43 Accesses | Metrics

Abstract

Prior studies conclude that hedging has a positive effect on firms' debt capacity; however, in the present study, we argue that this relationship is moderated by their financial flexibility. Using statutory data from 2001 to 2016 from the National Association of Insurance Commissioners database on U.S. property and casualty insurers and a simultaneous equations model, we examine how financial flexibility moderates the effect of reinsurance—a risk management tool commonly used by insurance firms—on debt capacity. We find that the relationship between reinsurance usage and debt capacity is positive for financially inflexible insurers, but negative for their financially flexible counterparts, thereby suggesting that the effects of reinsurance are actually dependent upon the financial flexibility of insurers. Several robustness checks are conducted and our main results remain qualitatively unchanged.

This is a preview of subscription content, access via your institution.

Access options	
Buy article PDF 34,95 € Tax calculation will be finalised during checkout. Instant access to the full article PDF.	Buy journal subscription 111,21 € Tax calculation will be finalised during checkout. Immediate online access to all issues from 2019. Subscription will auto renew annually.
Rent this article via DeepDyve.	Learn more about Institutional subscriptions

Notes

1. 1.

For example, hedging has been shown to alleviate expected bankruptcy costs (Smith and Stulz 1985; Pérez-González and Yun 2013), thereby facilitating higher leverage (Leland 1998). Hedging, in the form of insurance or reinsurance, can also help insurers take on more risk and expand their debt capacity (Zou and Adams 2008; Shiu 2011). Graham and Rogers (2002) further showed that hedging affects capital structure choices and increases debt capacity.

2. 2.
As regards the issues examined in this study, placing the focus on the insurance industry provides several benefits. First, detailed information on reinsurance usage is required to be reported to regulators. Second, most of the prior related studies have tended to adopt derivative usage as a proxy for a risk management tool. It is difficult to distinguish between the main purpose of such derivative usage given that some firms use derivatives to speculate; clearly, however, this problem does not arise in insurance purchases since the insured party can only obtain indemnity, which is less than or equal to the loss. Reinsurance, as insurance purchased by insurance firms, has the same feature.

3. 3.
We are grateful to the anonymous referee for pointing out that liquidity can reflect financial flexibility. From a liquidity perspective, firms with more cash holding cannot be defined as financially flexible, because prior studies found that financially constrained firms usually hold more cash (Duchin 2010; Devos et al. 2012). We follow Marchica and Mura (2010) and measure financial flexibility based on several firm characteristics instead of just one single indicator, such as liquidity.

4. 4.
We are grateful to an anonymous referee for pointing out the importance of taking into account the specialness of insurance when arguing about the relation between hedging and debt capacity. For instance, in contrast to generally more homogenous and large debtholders in conventional corporate settings, insurers' policyholders are many and varied and cannot voluntarily liquidate the firm in the event of their fixed claims not being met.

5. 5.

Baker and Wurgler (2002) indicated that the observed debt ratio is the cumulative outcome of selling overpriced equity. DeAngelo and DeAngelo (2007) subsequently argued that the importance of financial flexibility is ignored, since many debt ratio decisions are motivated by the need to maintain financial flexibility.

6. 6.
On the one hand, DeAngelo et al. (2018) found that when firms deleveraged to restore their financial flexibility, this resulted in a remarkable increase in cash holdings. On the other hand, some studies have concluded that financially inflexible firms, or constrained firms, may also tend to accumulate more cash; for example, Bessler et al. (2013) found that those firms that had difficulties obtaining financing in the capital market tend to maintain the largest cash holdings.

7. 7.
Our initial data cover the years from 2001 to 2016. Because we estimate optimal debt capacity using one period lagged explanatory variables, however, the data used in our main regressions actually start from the year 2002.

8. 8.
The reinsurance variable, proxied by the ratio of reinsurance premiums ceded to direct business written plus reinsurance assumed, usually lies within the range of 0 and 1. Those that are not bound within this range are probably due to temporal mismatches in income flows (Mayers and Smith 1990). We therefore winsorise this variable by setting values below 0 to 0 and values above 1 to 1. As a robustness check, we remove observations outside the range from the sample. The tenor of the results is qualitatively unchanged. However, readers are cautioned that winsorisation may introduce bias into the data as the outliers are replaced with other values. We thank an anonymous referee for pointing out the downside of winsorisation.

9. 9.
Flannery and Hankins (2013) evaluated the performance of seven methods and concluded that GMM estimators are well-suited to estimating capital structure models.

10. 10.

Following Fier et al. (2013), we include the following firm characteristics as control variables: *Size*, the natural logarithm of total admissible assets; *Prof* (profitability), the ratio of net income to total admissible assets; *GrOpp* (growth opportunities), the ratio of changes in net premiums written to total admissible assets; *RBC*, the risk-based capital ratio; *HHIBus* (*HHIGeo*), which refers to the Herfindahl–Hirschman Index based on lines of business (geographical) concentration; *Mutual*, a binary variable that denotes mutual insurers; and *Other*, a binary variable denoting insurers classified as neither stock nor mutual investors. The one period lagged leverage is treated as an endogenous variable. All of the independent variables are lagged by one period.

11. 11.

As regards the regressions of the effect of debt capacity on reinsurance, we include several important variables: firm size (*Size*), profitability (*Prof*), growth opportunity (*GrOpp*), derivatives (*Deriv*), long-tailed business (*Longtail*), lines of business concentration (*HHIBus*), lines of geographical concentration (*HHIGeo*), RBC ratio (*RBC*), and organisational form (*Mutual* and *Other*). Warner (1977) indicated that bankruptcy costs are negatively related to firm size. Thus, small firms will need more reinsurance to hedge than large firms. Profitable insurers hold more capital, since reinsurance is a substitute for capital (Adiel 1996), and thus profitable insurers tend to decrease reinsurance. The primary function of reinsurance is to reduce underwriting risk. So, we control for underwriting risk by long-tail business. Similarly, diversification and the organisational form of insurers are related to risk exposure. We also control for the effect of diversification and organisational form. Myers (1984) showed that firms with more growth opportunities tend to be riskier. A positive relation between growth opportunity and reinsurance is expected. As suggested by Shiu (2016), derivatives are a substitution for reinsurance. We include derivatives in our model. Besides, reinsurance is related to regulatory scrutiny. Some insurers who are less sensitive to reinsurers' performance may use reinsurance to meet regulatory requirements (Park et al. 2019). Thus, insurers with a low RBC ratio should increase reinsurance.

12. 12.

We use the same model to test whether the opposing relationship between reinsurance usage and debt capacity for

financially flexible and financially inflexible insurers also exists for extremely financially flexible and inflexible insurers. The subsample is classified by insurers, with extremely financially flexible and inflexible insurers being identified based on a balanced 2002–2016 sample. Extremely financially flexible insurers are defined as those maintaining spare debt capacity throughout the sample period, whilst extremely financially inflexible insurers are defined as those whose actual debt capacity is greater than their optimal debt capacity throughout the sample period. The effect of reinsurance is found to be significantly negative (positive) for extremely financially flexible (inflexible) insurers.

13. 13.
We thank an anonymous referee for suggesting further analyses in order to glean more insights from the data. In order to save space, we do not report the tabulated results, which are available from the authors upon request.

14. 14.
We are grateful to an anonymous referee for the comments on the possible effects of countries' institutional factors and insurers' lines of business on the results.

References

1. Adiel, R. 1996. Reinsurance and the management of regulatory ratios and taxes in the property-casualty insurance industry. *Journal of Accounting and Economics* 22: 207–240.

2. Baker, M., and J. Wurgler. 2002. Market timing and capital structure. *Journal of Finance* 57: 1–32.

3. Bessler, W., W. Drobetz, R. Haller, and I. Meier. 2013. The international zero-leverage phenomenon. *Journal of Corporate Finance* 23: 196–221.

4. Blundell, R., and S. Bond. 1998. Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics* 87: 115–143.

5. Byoun, S., and Z. Xu. 2013. Why do some firms go debt free? *Asia-Pacific Journal of Financial Studies* 42: 1–38.

6. Chen, X., E. Higgins, H. Xia, and H. Zou. 2020. Do financial regulations shape the functioning of financial institutions' risk management in asset-backed securities investment? *The Review of Financial Studies* 33: 2506–2553.

7. Cummins, J.D., and G.P. Nini. 2002. Optimal capital utilization by financial firms: Evidence from the property-liability insurance industry. *Journal of Financial Services Research* 21: 15–53.

8. DeAngelo, H., and L. DeAngelo. 2007. Capital structure, payout policy and financial flexibility. *Unpublished Working Paper, University of Southern California, Los Angeles, CA*.

9. DeAngelo, H., L. DeAngelo, and T.M. Whited. 2011. Capital structure dynamics and transitory debt. *Journal of Financial Economics* 99: 235–261.

10. DeAngelo, H., A.S. Goncalves, and R.M. Stulz. 2018. Corporate deleveraging and financial flexibility. *Review of Financial Studies* 31: 3122–3174.

11. Denis, D.J., and S.B. McKeon. 2012. Debt financing and financial flexibility: Evidence from proactive leverage increases. *Review of Financial Studies* 25: 1897–1929.

12. Denis, D.J., and V. Sibilkov. 2010. Financial constraints, investment and the value of cash holdings. *Review of Financial Studies* 23: 247–269.

13. Devos, E., U. Dhillon, M. Jagannathan, and S. Krishnamurthy. 2012. Why are firms unlevered? *Journal of Corporate Finance* 18: 664–682.

14. Dionne, G., and T. Triki. 2013. On risk management determinants: What really matters? *The European Journal of Finance* 19: 145–164.

15. Duchin, R.A.N. 2010. Cash holdings and corporate diversification. *Journal of Finance* 65: 955–992.

16. Faulkender, M., and R. Wang. 2006. Corporate financial policy and the value of cash. *Journal of Finance* 61: 1957–1990.

17. Flannery, M.J., and K.W. Hankins. 2013. Estimating dynamic panel models in corporate finance. *Journal of Corporate*

Finance 19: 1–19.

18. Fier, S.G., K.A. McCullough, and J.M. Carson. 2013. Internal capital markets and the partial adjustment of leverage. *Journal of Banking and Finance* 37: 1029–1039.

19. Flannery, M.J., and K.P. Rangan. 2006. Partial adjustment toward target capital structures. *Journal of Financial Economics* 79: 469–506.

20. Graham, J.R. 2000. How big are the tax benefits of debt? *Journal of Finance* 55: 1901–1941.

21. Graham, J.R., and D.A. Rogers. 2002. Do firms hedge in response to tax incentives? *Journal of Finance* 57: 815–839.

22. Haushalter, G.D. 2000. Financing policy, basis risk and corporate hedging: Evidence from oil and gas producers. *Journal of Finance* 55: 107–152.

23. Hovakimian, A., T. Opler, and S. Titman. 2001. The debt-equity choice. *Journal of Financial and Quantitative Analysis* 36: 1–24.

24. Kayhan, A., and S. Titman. 2007. Firms' histories and their capital structures. *Journal of Financial Economics* 83: 1–32.

25. Leland, H.E. 1998. Agency costs, risk management and capital structure. *Journal of Finance* 53: 1213–1243.

26. Mankai, S., and A. Belgacem. 2016. Interactions between risk taking, capital, and reinsurance for property-liability insurance firms. *Journal of Risk and Insurance* 83: 1007–1043.

27. Marchica, M.T., and R. Mura. 2010. Financial flexibility, investment ability and firm value: Evidence from firms with spare debt capacity. *Financial Management* 39: 1339–1365.

28. Mayers, D., and C.W. Smith. 1990. On the corporate demand for insurance: Evidence from the reinsurance market. *Journal of Business* 63: 19–40.

29. Myers, S.C. 1984. The capital structure puzzle. *The Journal of Finance* 39: 574–592.

30. Park, S.C., X. Xie, and P. Rui. 2019. The sensitivity of reinsurance demand to counterparty risk: Evidence from the U.S. property–liability insurance industry. *Journal of Risk and Insurance* 86: 915–946.

31. Pérez-González, F., and H. Yun. 2013. Risk management and firm value: Evidence from weather derivatives. *Journal of Finance* 68: 2143–2176.

32. Shiu, Y. 2011. Reinsurance and capital structure: Evidence from the United Kingdom non-life insurance industry. *Journal of Risk and Insurance* 78: 475–494.

33. Shiu, Y. 2016. Is reinsurance a substitute for or a complement to derivative usage? Evidence from the U.K. non-life insurance industry. *The Geneva Papers on Risk and Insurance—Issues and Practice* 41: 161–178.

34. Smith, C.W., and R.M. Stulz. 1985. The determinants of firms' hedging policies. *Journal of Financial and Quantitative Analysis* 20: 391–405.

35. Strebulaev, I.A., and B. Yang. 2013. The mystery of zero-leverage firms. *Journal of Financial Economics* 109: 1–23.

36. Warner, J.B. 1977. Bankruptcy costs: Some evidence. *Journal of Finance* 32: 337–347.

37. Zou, H., and M.B. Adams. 2008. Debt capacity, cost of debt and corporate insurance. *Journal of Financial and Quantitative Analysis* 43: 433–466.

Author information

Affiliations

1. Department of Risk Management and Insurance, National Chengchi University, 64, Sec. 2, Zhi-Nan Road, Wen-Shan District, Taipei, 11605, Taiwan

Xiaoyi Li

2. Department of Risk Management and Insurance, Risk and Insurance Research Center, College of Commerce, National Chengchi University, 64, Sec. 2, Zhi-Nan Road, Wen-Shan District, Taipei, 11605, Taiwan

Yung-Ming Shiu

Corresponding author

Correspondence to Yung-Ming Shiu.

Ethics declarations

Conflict of interest

The authors declare that they have no conflict of interest.

Additional information

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Appendix

Definition of variables

Variable	Definition
Debt capacity (*DebtCap*)	The ratio of liabilities to surplus
Reinsurance (*Rein*)	The ratio of reinsurance premiums ceded to direct business written plus reinsurance assumed
Cash (*Cash*)	Total net cash divided by total admissible assets
Financial surplus (*FinSurp*)	Cash flow minus dividend minus investment minus the change in surplus as regards policyholders
Size (*Size*)	Ln (Total admissible assets)
Profitability (*Prof*)	The ratio of net income to total admissible assets
Growth opportunity (*GrOpp*)	The ratio of change in net premiums written to total admissible assets
RBC ratio (*RBC*)	RBC ratio

Variable	Definition
Longtail (*Longtail*)	The ratio of insurance reserves to losses incurred
HHIBus (*HHIBus*)	Line of business Herfindahl–Hirschman Index
HHIGeo (*HHIGeo*)	Geographic Herfindahl–Hirschman Index
Derivatives (*Deriv*)	Fair values of derivatives transaction divided by total admissible assets
Mutual (*Mutual*)	Binary variable denoting mutual insurers
Other (*Other*)	Binary variable denoting insurers not classified as stocks or mutual

Rights and permissions

Reprints and Permissions

About this article

Cite this article

Li, X., Shiu, YM. Reinsurance, debt capacity and financial flexibility. *Geneva Pap Risk Insur Issues Pract* (2020). https://doi.org/10.1057/s41288-020-00190-7

- Received23 April 2020
- Accepted27 August 2020
- Published28 September 2020
- DOIhttps://doi.org/10.1057/s41288-020-00190-7

Keywords

- Reinsurance
- Debt capacity
- Financial flexibility

Not logged in - 140.119.96.195

Taiwan TAEBC eBook Consortium 2016 CRY (3002339428) - 5166 SpringerLink Taiwan TAEBC eBook Consortium (3000182799) - Taiwan Trial Consortium (3002083039) - 7452 SpringerLink Taiwan TAEBC eBook Consortium - 2010

(3000222544) - 17007 Taiwan Consortium (3991454581) - 8429 SpringerLink Taiwan eJournal Consortium (3000251287) - Taiwan TAEBC eBook Consortium 2015 (3001997788) - Taiwan Consortium - Academic (3002622062) - 9243 SpringerLink Taiwan Maths eJournal Consortium (3000651002) - Taiwan Trial Consortium (3001059271) - Taiwan TAEBDC eBook Consortium 2014 (3991456190) - 4803 SpringerLink Taiwan eJournal Consortium 2010 (3000185072) - TAEBDC consortium (3001336515) - National Chengchi University (2000375266)

SPRINGER NATURE

© 2021 Springer Nature Switzerland AG. Part of Springer Nature.