A THEORY OF LOAN SYNDICATION

PAUL SCHURE
University of Victoria

DAVID SCOONES
University of Victoria

QINGHUA GU
University of Victoria

Abstract

We provide a new theory of loan syndication. Bank syndicates control sector risk by downsizing the industry when market demand fails to meet expectations.

JEL: G21, G32, L10

Keywords: Syndicated loans, syndicated lending, capital structure, financial distress, bankruptcy

Corresponding author: Paul Schure Department of Economics, University of Victoria, PO Box 1700 Stn CSC Victoria BC Canada V8W 2Y2 schure@uvic.ca

2,435 words without footnotes, 2,683 words with footnotes

Introduction

The market for syndicated loans is huge. In 2003 banks extended close to USD 2 trillion in syndicated loans. The standard theory for why banks join forces in a syndicate is risk diversification (e.g. Hurn (1990) and Simons (1993)). The banks in the syndicate share the risk of large, indivisible investment projects. Syndicates may also arise because additional syndicate members provide informative opinions of investment projects (see Sah and Stiglitz (1986), or Song (2003) in the context of bond underwriting syndicates) or additional expertise after the funding has been extended (see Brander, Amit, and Antweiler (2002) for syndication in a venture capital context).

In this paper we advance a new, complementary theory of the bank syndicate. The model we propose hinges on uncertainty as well, but the focus is on *sector risk* ("aggregate risk"). In our model the syndicate goes beyond passive portfolio construction and takes actions that increase profitability after the uncertainty is resolved. Thus, the motive for syndication here is to *control* the risk of the loan portfolio, rather than *sharing* risk. To clearly contrast our model with the risk-sharing argument for syndication we assume banks (and firms) are risk-neutral.[1]

Our model stresses the interplay between the loan market and the output market. Assume investments have a large sunk component and that each firm's variable costs may be covered even in an adverse state of demand (i.e. there are quasi-rents). As long as there are quasi rents, firms that are linked to *individual* creditors will not be declared

[1] Our model does not hinge on the syndicate's market power in the credit market either. To exclude this effect we assume firms have all the bargaining power *vis a vis* the bank syndicate. Further, our model is devoid of agency conflicts or informational issues.

bankrupt upon a default, but will successfully renegotiate their loans ("forbearance"). But in case of syndicated lending some firms financed will be declared bankrupt because the syndicate maximizes the value of its loan *portfolio*. In an adverse state of demand the syndicate effectively owns the firms in the industry and it shall eliminate competitors so as to increase industry profitability. This process of elimination stops as soon as the surviving firms can service their debt again. From an ex ante perspective the possibility of future restructuring with syndicates raises expected industry profitability, and therefore entry. In fact, the model predicts that syndication implies a more volatile output market structure in the sense that more firms enter while there is also a higher likelihood of exit.

In our model syndication (in the loan market) is an indirect way to exercise market power in the output market. Our model was inspired by the May 2002 bankruptcy of KPNQwest N.V. who operated Europe's largest and most efficient fibre-optic IP backbone. After describing the model and two extensions we will give an account of the bankruptcy of KPNQwest. We will argue that (1) KPNQwest's bank syndicate took a much larger loss on KPNQwest than was necessary and that (2) it became clear in 2002 that the output market was in an adverse state of demand. Our model can explain the paradoxical behaviour of KPNQwest's bank syndicate.

Bolton and Scharfstein (1996) develop a theory of the optimum number of lenders. They show that multiple lenders curb the borrower's incentive to default for strategic reasons. Bolton and Scharfstein's (1996) argument hinges on the assumption that lenders are uncoordinated during the loan renegotiation stage. Thus they do not explain syndicated loan agreements, which include coordination mechanisms such as provisions for decision-making by the syndicate banks, or the finding of Brunner and

Krahnen (2001) that syndicate members step up coordination in case of distress. Our model stresses the importance of the coordination role of the syndicate.

A simple model

Our model is a variant of the familiar Cournot competition model with constant costs and linear demand. Assume there are three time periods, 0, 1, and 2, and a large number of identical, risk-neutral *entrepreneurs* and *banks*. Entrepreneurs with no capital have access to an investment *project* requiring a fixed capital investment of F in period 0. Each bank has a fund endowment of precisely F. Nature reveals the state of demand in period 1 and the output market opens in period 2. Demand is given by $p = A^{\sigma} - q$ for $\sigma \in \{L, H\}$, where $A^L < A^H$.[2] Nature selects $\sigma = H$ ("the good state") with probability *p* and $\sigma = L$ ("the bad state") with probability $1-p$. With F borrowed and invested, the entrepreneur's *firm* can produce output at a constant marginal cost c in period 2. We maintain throughout that $c < A^L$.

The No-Syndicate Case

In period 0 nature first randomly determines the sequence in which entrepreneurs approach individual banks. Each offers a take-it-or-leave-it loan contract that specifies *F*, the loan amount, and *D*, the repayment amount. Rejected entrepreneurs lose the

---

[2] We also assume there is a $\underline{n} \geq 1$ such that $p\left(\frac{A^H - c}{\underline{n}+1}\right)^2 + (1-p)\left(\frac{A^L - c}{\underline{n}+1}\right)^2 - F > 0$ and $\left(\frac{A^L - c}{\underline{n}+1}\right)^2 - F < 0$. This says there is a certain number of firms such that *expected* industry profits are positive, but profits are negative in the bad state.

opportunity to invest. We assume that the contract is *short-term*, i.e. due (or callable) in period 1 when demand uncertainty is resolved. The assumption that the loan is short-term is immaterial in the no-syndication case, but it will benefit firms in the syndication case. In period 1, firms borrow funds to repay the loan based on their anticipated period-2 return. The period-1 loan market is again competitive. In case the anticipated proceeds are smaller than D, a firm offers to repay whatever it can borrow. In this case, the bank can either accept the lower payment – we will term this *forbearance* – or declare the firm *bankrupt* and destroy its assets. In period 2 all surviving firms engage in Cournot competition.

We restrict attention to the symmetric, pure strategy subgame perfect Nash equilibrium of this game. In period 2, let there be n firms, which realize (gross) profits $\Pi_{n\sigma} = \left(\frac{A^\sigma - c}{n+1}\right)^2$ if the state of demand is A^σ. In period 1, firms anticipate these profits and repay $\min\{D, \Pi_{n\sigma}\}$. Banks never drag firms into bankruptcy because $\Pi_{nL} > 0$. In period 0, entrepreneurs choose D such that the bank's participation constraint is just satisfied and they obtain the expected surplus from the relationship. Thus the number of entrepreneurs that enter in the no-syndication case is given by:

$$n_{ns}^* = \max\left\{n \in N : p\left(\frac{A^H - c}{n+1}\right)^2 + (1-p)\left(\frac{A^L - c}{n+1}\right)^2 - F \geq 0\right\}$$

The Syndicate Case

Now assume that banks form a large syndicate of B banks that lends to each firm. Assume that each bank in the syndicate supplies an equal amount to each firm, namely

F/B, and that the shares stay constant over time. We keep the assumption that the syndicate lends firms at the competitive rate. This assumption is reasonable because in actual syndication processes banks compete for the role of arranger *before* the syndicate is formed. The arranger only forms the syndicate after the arranger and the borrower have agreed on the so-called mandate describing the terms of the loan deal (see e.g. Rhodes (1996), Chapter 3).

The difference between the no-syndication and syndication scenario emerges in the bad state. The syndicate can forbear, or declare bankruptcy and destroy the assets of defaulting firms. The syndicate has an incentive to declare firms bankrupt and restrict period-2 competition because it effectively owns the industry in the bad state. The process of eliminating firms stops as soon as the remaining firms can service their debt again. Thus, roughly speaking the bank syndicate eliminates firms so as to maximise the number of firms that able to make the promised repayment. We have,

Lemma 1. In equilibrium the number of firms that the syndicate declares bankrupt, is given by $k^*(n,D) = \min\left\{k \in N : \left(\frac{A^L - c}{n-k+1}\right)^2 - D \geq 0\right\}$.[3]

Anticipating this in period 0, the entrepreneur's problem is to offer a repayment that solves:

[3] We have conveniently ignored the integer problem here. It may of course be that the optimum number of bankruptcies is in fact $k^*(n,D) - 1$.

$$\max_D \left\{ p\left(\left(\frac{A^H - c}{n+1}\right)^2 - D\right) + (1-p)\left(\frac{n - k^*(n,D)}{n}\right)\left(\left(\frac{A^L - c}{n - k^*(n,D) + 1}\right)^2 - D\right)\right\}.$$

subject to the participation constraint of the syndicate

$$pD + (1-p)\left(\frac{n - k^*(n,D)}{n}\right)D - F \geq 0\,.$$

Call the solution $D^*(n)$. The equilibrium number of firms in the syndication case is given by

$$n_s^* = \max\left\{ n \in N : p\left(\frac{A^H - c}{n+1}\right)^2 + (1-p)\left(\frac{n - k^*(n, D^*(n))}{n}\right)\left(\frac{A^L - c}{n - k^*(n, D^*(n)) + 1}\right)^2 - F \geq 0 \right\}$$

Proposition 1. (Weakly) more firms enter when financing is coordinated by a bank syndicate.

Proof: Compare the definitions of n_s^* and n_{ns}^* and observe that the difference is in the second term of the profit expression. In particular, for given n, expected profits of an entrant are higher with syndication. Hence, we must have that in equilibrium weakly more firms enter with a syndicate than when firms are financed individually: $n_s^* \geq n_{ns}^*$.

Proposition 2. Define the *competitiveness* of the industry as the number of firms engaging in Cournot competition in period 2. In the good state the industry is (weakly) more competitive with a syndicate than without. In the bad state the industry is less competitive with a syndicate than without.

Proof: Part 1 is true because $n_s^* \geq n_{ns}^*$ and in the good state firms service their debt. Part 2 follows from Lemma 1 and the fact that no firms are eliminated without the co-ordination of a bank syndicate.

Two Extensions

The bankruptcy procedure

Most bankruptcy procedures effectively boil down to asset *auctions*. A simple argument shows that our model is robust to this procedure. Assume that the bad state occurs and that the syndicate has eliminated $0 \leq k < k^*(n, D)$ firms. Consider the auction of the assets of firm $k+1$. Notice that bids backed by the syndicate that add up to an amount smaller than D are simply transfers from the left pocket to the right pocket of the syndicate. An independent bidder will bid up to the anticipated rents accruing from the assets, i.e. $\left(A^L - c \big/ n-k+1\right)^2 < D$. Hence, incumbents backed by the bank syndicate will place the winning bid.

Technology

We assumed that the variable costs of all firms are identical and equal to *c*. A question that is interesting for normative analysis is to see whether the syndicate always has an incentive to eliminate the highest cost (least efficient) firm in case of low demand. It turns out that this may or may not be the case. The following is an example for the counterintuitive case in which the syndicate's best strategy in the bad state is to weed out the most cost-efficient firm. Assume $A^L = 1$ so that we have $p = 1 - Q$ in the bad state; let there be $n = 3$ firms, all with indebtedness $D = 0.07$; and let $c_1 = 1/4$ and

$c_2 = c_3 = 1/3$. It can be shown that the syndicate members receive close to 0.130 when keeping all three firms, close to 0.135 when eliminating one of the high-cost firms, and 0.140 when eliminating the low-cost firm.[4] Although industry profitability is higher when eliminating a high-cost firm, the low-cost firm would pay the bank just 0.07 while the remaining high-cost firm cannot pay back entirely. In case the low cost firm is eliminated both high-cost firms can service their debt.

The Bankruptcy of KPNQwest N.V.

By early 2002 KPNQwest operated Europe's largest, most efficient fibre-optic data network. On May 23, KPNQwest filed for bankruptcy protection with about Euro 2.3B of debt. KPNQwest's bank syndicate[5] immediately suspended the firm's Euro 525m line of credit although it was extended just 2 months earlier and only 60% of the funds had been taken up (Financiele Dagblad, 2002c). The company immediately received two bids for its network. AT&T, keen on expanding in Europe, offered Euro 265m, while Infonet offered Euro 285m (Financiele Dagblad, 2002c). Both deals fell through, and a week later on May 31, 2002, KPNQwest filed for bankruptcy. Stripped of the necessary working capital, KPNQwest and the court administrators struggled to keep the network running and prevent clients from migrating to competitors. But in June the syndicate seized the payments KPNQwest customers had made to save the network, and the rescue attempt failed (ZDNet (2002), Financiele Dagblad (2002a, 2002c)). Within a few weeks most of

---

[4] In particular, in case all firms are kept the bank receives all gross profits of the firms, i.e. about 0.0573 from the low-cost firm and about 0.0364 from each high-cost firm. In case a high-cost firm is eliminated the bank receives min(0.0926,0.07) = 0.07 from the low-cost firm and about 0.065 from the high-cost firm. In case the low-cost firm is eliminated the bank receives min(0.074,0.07) = 0.07 from each high-cost firm.

[5] The syndicate consisted of Citigroup, ABN AMRO, Fortis, Barclays, Bank of America, Dresdner Kleinwort Wasserstein, and Deutsche Bank.

KPNQwest's clients were gone. The court administrators sold the network in parts[6] recovering a fraction of the earlier offers, an amount estimated to be as little as Euro 70m (Financiele Dagblad, 2002b).

Though much of the action occurred out of public view, the bank syndicate that financed KPNQwest network seems to have played an important role in the firm's demise. The syndicate's tough stance is a puzzle since from the end of May 2002 it effectively owned the company, and everyone concerned seemed to agree that the whole, life network was worth much more than the sum of its parts.[7] Our model explains the behaviour of KPNQwest's bank syndicate as an attempt to destroy its assets with the aim of boosting the earnings prospects of KPNQwest's rivals.

Data on the positions of the syndicate members in KPNQwest's rivals is not publicly available, but some of its syndicate members specifically pointed out the risks of their exposure to the telecoms sector as a whole in their 2002 annual reports. The year 2002 was a difficult year in the telecoms industry. For example, Global Crossing and MCI/Worldcom, two of KPNQwest's largest rivals in Europe, filed for bankruptcy protection (in January 2002 and July 2002, respectively). It is safe to state that the "bad state" had occurred.

Conclusion

In this paper, we provide a new theory of loan syndication in which banks join the syndicate to control their risks. The theory predicts that syndicates form to finance risky

[6] Part of KPNQwest's problems were due to its assets being distributed across jurisdictions. Court administrators in several EU countries had a hand in the asset sales.
[7] For instance, Trimoteur Investments, who offered about Euro 200 million for the network in June, stated that KPNQwest's network was worth three times as much if it were be kept intact.

investments in industries with substantial ex post barriers to entry. Loan syndication leads to more entry and exit. Future work should explore whether the argument is robust for alternative specifications of the technology, whether the syndicate is stable, investigate the issues of welfare, regulation, and antitrust policy, and firmly establish the empirical relevance of the model.

References

Bolton, Patrick and David S. Scharfstein (1996). Optimal Debt Structure and the Number of Creditors, *Journal of Political Economy*, 104, 1-25.

Brander, James A., Raphael Amit and Werner Antweiler (2002). Venture-Capital Syndication: Improved Venture Selection vs. the Value-Added Hypothesis, *Journal of Economics & Management Strategy*, 11, 423–452.

Brunner, Antje, and Jan Pieter Krahnen (2001). Multiple lenders and corporate distress: Evidence on debt restructuring, CFS Working Paper No. 2001/04, University of Frankfurt.

Financiele Dagblad (2002a). Curatoren dagen banken KPNQwest voor de rechter, *Het Financiele Dagblad* (FD.nl), 21 June 2002.

Financiele Dagblad (2002b). Van euro 40 mrd naar euro 70 mln, *Het Financiele Dagblad* (FD.nl), 27 August 2002.

Financiele Dagblad (2002c). Optisch Bedrog, *Het Financiele Dagblad* (FD.nl), 5 September 2002.

Hurn, Stanley (1990). *Syndicated Loans: A Handbook for Banker and Borrower*, Woodhead-Faulkner Ltd. (Prentice Hall Europe), Cambridge, UK.

Rhodes, Tony (ed.) (1996). *Syndicated Lending: Practice and Documentation*, Euromoney Publications PLC, London, UK

Sah, R.K. and J.E. Stiglitz (1986). The Architecture of Economic Systems: Hierarchies and Polyarchies, *American Economic Review*, 76, 716-727.

Simons, Katerina (1993). Why do Banks Syndicate Loans?, *New England Economic Review*, 1993 Jan/Feb issue, 45-52.

Song, W-L. (2003). Competition and Coalition among Underwriters: The Decision to Join a Syndicate. Wharton Financial Institutions Center Working Paper No. 03-20.

ZDNet (2002). Banks call for KPNQwest scrutiny, *ZDNet*, 24 June 2002, 9:55 AM PDT (http://www.zdnet.com/ > News).