Economic Modelling 49 (2015) 19–31

Contents lists available at ScienceDirect

Economic Modelling

journal homepage: www.elsevier.com/locate/ecmod

The dynamics of bank debt renegotiation in Europe: A survival analysis approach ☆

Christophe J. Godlewski *

University of Haute Alsace & EM Strasbourg Business School, LaRGE Research Center, PEGE, 61 avenue de la Forêt Noire, 67000 Strasbourg, France

ARTICLE INFO

Article history:
Accepted 24 March 2015
Available online xxxx

Keywords:
renegotiation process
bank loans
multiple failure-time data
Cox model
Europe

ABSTRACT

Debt renegotiation matters for the borrower-lender relationship to ensure the credit agreement is regularly amended to include new information. I investigate the determinants of the dynamics of bank loan renegotiations using a sample of 1 600 amendments to private debt contracts in Europe. Employing a stratified Cox-type hazard model, I find that initial loan terms, banking pool features, amendments' characteristics, and the legal environment significantly influence the duration time between renegotiations. Contract complexity, informational frictions in the borrower-lender relationship, the uncertainty of the economic environment, and the legal protection of creditors play a major role in shaping the dynamics of bank loan renegotiation in Europe.

1. Introduction

According to the theory of complete contracts, debt renegotiation destroys the value of entering a contract, which in turn should eliminate any incentives to renegotiate (Dewatripont and Maskin, 1990; Hart, 1995). Indeed, the scope for renegotiation can have an adverse effect on ex ante incentives and contract efficiency (Dewatripont and Maskin, 1995; Fudenberg and Tirole, 1990; Hart and Moore, 1988). However, in a world with frictions, contracts are bound to be incomplete and thus not renegotiation-proof. Several theoretical studies show that the possibility of renegotiation has a profound impact on security design, incentives, and welfare (cf. Acharya et al., 2006; Bester, 1994; Chemmanur and Fulghieri, 1994; Dessein, 2005; Gale and Hellwig, 1989; Garleanu and Zwiebel, 2009; Hart and Moore, 1988; Mella-Barral, 1999; Pawlina, 2010).[1] Their main conclusion is that leaving scope for renegotiation can actually enhance the efficiency of contracts.

Surprisingly, despite rich theoretical predictions, empirical evidence regarding debt renegotiation is still at an early stage. Roberts and Sufi (2009) show that private credit agreements are renegotiated early in the life of the loan following the arrival of new information, leading to significant changes to the contract terms. In a more dynamic setting, Roberts (2015) found that most loans are renegotiated multiple times over relatively short timeframes. According to Nikolaev (2013), the scope for renegotiation is higher among companies with higher uncertainty, greater agency conflicts, lower information frictions, and tighter creditor control rights. Godlewski (2015) shows that early and less frequent renegotiations substantially increase borrowing firms' abnormal return in Europe and thus bear some certification value.

These empirical findings raise further important questions regarding the determinants of the dynamics of bank debt renegotiation. Indeed, if new information triggers a renegotiation and the latter bears a certification value, it is of utmost interest to better understand the dynamics of loan renegotiation, in particular the determinants of this process. Hence, the aim of this article is to provide empirical evidence on these issues by focusing on a large set of variables that can influence the duration between renegotiation rounds and by investigating the cross-country dimension of my dataset covering loan renegotiations in Europe.

A first contribution is to use a cross-country sample of 1 600 loan amendments from January 1999 until June 2011 in Europe, in which companies rely mostly on bank lending as a major external source of capital to fund their growth. For instance, in 2011, the ratios of domestic credit provided by the banking sector and total value of stocks traded to GDP were equal in the European Union to 156.5% and 58.3%, respectively (source: World Bank).[2] In this context, the design of bank debt contracts is even more fundamental to insuring efficient capital allocation in the economy. Considering a large set of characteristics such

☆ I thank an anonymous referee and the participants of the AFFI International Conference 2014 (Aix-en-Provence), Financial Management Association (FMA) European Conference 2014 (Maastricht), and International Finance and Banking Society (IFABS) Conference 2014 (Lisbon), in particular Nicos Koussis and Suran Pakhachanyan for helpful comments and suggestions. The usual disclaimer applies.

* Tel.: +33 3 68 85 21 21.
E-mail address: godlewski@unistra.fr.

[1] Section 2 provides an overview of the relevant literature.

[2] For comparison, in the US these ratios equaled 232.5% and 205.1%, respectively (source: World Bank).

http://dx.doi.org/10.1016/j.econmod.2015.03.017
0264-9993/

as initial loan contract, banking pool, and subsequent amendment characteristics, but also countries' legal and institutional environment, as well as the effects of the recent financial crisis, is a second contribution. Finally, a third contribution lies in the explicit inclusion of the relationship between durations separating subsequent renegotiations by employing the conditional risk set model proposed by Prentice et al. (1981) due to the specific nature of the date (i.e. multiple failure-time with repeated ordered events). This is a stratified Cox-type model which allows taking event dependence into account to identify the effect of various covariates on duration in a multivariate setting.

The closest related paper is Nikolaev (2013), who uses a large sample of loan amendments in the US to study the impact of debt contract features on the scope of renegotiation, employing a Cox proportional hazard duration model. Another related paper is by Roberts (2015), who uses hand-collected data from the US to investigate not only what happens in a renegotiation, but also when it occurs. He investigates the determinants of the number of renegotiation rounds, amendments to different loan terms (such as covenants), and durations.

My paper offers complementary evidence due to the fact I focus on a different continent (Europe). Here bank lending represents a larger proportion of external financing for firms than in the US. A better understanding of bank loan renegotiation dynamics provides valuable knowledge regarding which determinants shape debt contract efficiency over the course of the borrower-lender relationship. Furthermore, I investigate a broader set of variables, such as loan terms, amendments characteristics, and banking pool features, as well as the cross-country dimension of my sample, in particular legal and institutional variables that may affect renegotiation dynamics. Finally, I apply an econometric method which explicitly accounts for durations' dependence in a multiple failure-time data setting in order to investigate more precisely the dynamics of renegotiations.

The rest of the article is structured as follows. I discuss the relevant theoretical and empirical literature in Section 2 and provide empirical hypotheses in Section 3. Section 4 is devoted to the methodology and data description. The results are provided and discussed in Section 5. Finally, Section 6 concludes the article.

2. Renegotiation of debt contracts

In this section I discuss the main theoretical motivations and empirical results regarding the occurrence of renegotiation, the implication for renegotiation outcomes and its dynamics.

2.1. Theoretical motivations

The theoretical motivations for the renegotiation of debt contracts can be rooted in a vast literature on financial contracting, in particular dynamic or strategic theory of contracting.[3]

Debt renegotiation can occur when contracting parties are unable or unwilling to commit to the initial terms of their agreement. This is more likely to occur when unanticipated or non-contractible states of the world occur, and can be considered as the consequence of ex post inefficiency under the prevailing terms of the initial contract. Eventually, changing the terms of the loan can translate into a mutual gain for the borrower and the lender.

In other words, renegotiation stems from various contracting frictions and leaving scope for renegotiation is a possible way to complete the contract and enhance its efficiency. One can consider that the main contracting frictions are related to the initial contract design, and thus its inefficiency or incompleteness, and the adverse effects of ex ante incentives related to the disciplining role of the contract.

[3] (Berlin and Mester, 1992; Bester, 1994; Biais et al., 2010; Bolton and Scharfstein, 1990; Clementi and Hopenhayn, 2006; DeMarzo and Fishman, 2007; DeMarzo and Sannikov, 2006; Garleanu and Zwiebel, 2009; Gorton and Kahn, 2000; Huberman and Kahn, 1988).

Contract incompleteness results of various factors, such as bounded rationality, transaction costs, non-verifiability of information, etc. Information frictions, such as information asymmetry and verifiability make it more difficult to write efficient contracts and thus increase the scope for renegotiation. However, information asymmetry makes renegotiation more difficult while non-verifiability of information reduces the potential gains from renegotiation. Thus, with initial contract being inefficient or incomplete, the realization of exogenous uncertainty leads to renegotiation (Hart, 1995) and makes more sophisticated contracts more costly for the counterparties. In that case, for instance, longer term contracts should be renegotiated more often.

The initial contract design also stems from a bargaining process on how the initial, and eventually subsequent, surplus is shared. Therefore the scope for renegotiation decreases with the number of lenders (Bolton and Scharfstein, 1996) or conflicting incentives among creditors (Berglöf and von Thadden, 1994). A positive shock to the borrower that improves credit quality should shift the bargaining power in his favor (Hart and Moore, 1998), eventually allowing them to renegotiate more advantageous terms, in particular if market conditions provide more outside options to obtain external financing for the firm. Moreover, Pawlina (2010) shows that the possibility of debt renegotiation at default exacerbates firm's underinvestment problem and that placing the entire bargaining power with lenders can eliminate this particular problem.

Furthermore, scope for renegotiation is a function of incentives alignment, which is driven by the contractual allocation of control and decision rights. These are optimally assigned to the party with better incentives (Aghion and Bolton, 1992). Under asymmetric information and greater uncertainty, the initial loan contract hands stronger control rights to the lender. Indeed, better-informed borrowers usually yield control rights to less informed lenders (Dessein, 2005), while Garleanu and Zwiebel (2009) show that stronger rights are granted to the lender by the borrower in the initial contract when information asymmetry is greater, when it is more costly to acquire information by the lender, and when it is less costly to renegotiate. Moreover, the allocation of these rights has also important implications for the timing of renegotiation (early vs late) and the allocation of bargaining power with respect to moral hazard problems. Indeed, the lender's renegotiation strategy may also reduce a borrower's incentives to engage in opportunistic renegotiation (Bourgeon and Dionne, 2013). This is a crucial element, especially when a negative shock occurs, which can lead to loan renegotiation when liquidation is ex post Pareto inefficient, in turn leading to less favorable terms.

The borrower can also consider the renegotiation process as a signaling game to influence the lender's renegotiation strategy ("tough" or "soft") via the repayment offer (Gale and Hellwig, 1989). Furthermore, Acharya et al. (2006) show that the effect of strategic debt service, i.e., equity holders exploiting the incentives of debt holders to avoid costly liquidation and thus renegotiate the terms of the loan, depends critically on firm's cost of external financing. They show that allowing for strategic debt service leads to a decline in involuntary firm liquidity defaults, especially for firms with lower cost of outside capital. Renegotiation can also be considered by the lender as a reputation device, providing incentives to devote a larger amount of resources to information production in order to make the "right" renegotiation decision (Chemmanur and Fulghieri, 1994); for instance, the latter can avoid a soft budget constraint problem.

Overall, debt reorganization can even enhance the market value of debt as the process enables creditors to avoid ill-timed liquidation (Mella-Barral, 1999). However, Berlin and Mester (1992) show that firms with a high ex ante credit risk find the option to renegotiate most valuable.

Nevertheless, renegotiations bear several costs in terms of a fee that varies with the size and complexity of the loan, time, and effort. Furthermore, in the case of a large (syndicated) loan with a large banking pool, the amendments must be approved by a certain percentage of lenders,