Discussion paper

TRANCHING IN THE SYNDICATED LOAN MARKET

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Keywords: Loan; Debt finance; Tranche; Law and finance

JEL Classification: G2, G21, K22

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1. Introduction

Tranching refers to the number of securities offered as part of the same transaction, with riskier parts of the 'pie' sliced off into different baskets and sold to investors with differing risk appetites. Loan tranching is an important mechanism that facilitates financing for riskier companies by matching their borrowing needs with investors' risk and return profiles. A well functioning tranching market is also important for facilitating loan finance in different countries around the world.

In this paper, we examine factors that influence the propensity for loan tranching around the world. As well, we examine the structure of tranches within a loan in terms of the difference in spreads between the highest quality and lowest quality tranches. Our paper contributes to the literature on how country-level investor protection shapes firm-level financial contracting. The law and finance view is that the general legal mechanism to efficient financial contracting is the legal protection of outside investors – whether shareholders or creditors – through laws and enforcements (see Djankov, McLiesh, and Schleifer, 2007; Djankov et al., 2008; Haselmann, Pistor and Vig, 2009). The alternative Coasian view (Bergman and Nicolaievsky, 2007) is that regulations of financial markets are unnecessary because sophisticated investors write financial contracts regardless of legal and institutional conditions.

Existing studies evidence that the legal environment affects the way loans are structured (e.g., Bae and Goyal, 2009, and Esty and Megginson, 2003). One empirical approach is to consider each tranche separately, assuming they are unrelated. For instance, Bae and Goyal (2009) show that borrowers located in countries with better creditor rights are able to raise larger loan facilities (i.e., tranches). However, borrowers primarily care about the ultimate size of the loan (i.e., the sum of all the tranches). If creditor rights also affect the extent of tranching, the overall effect on borrowers

may become more complex. Similarly, Esty and Megginson (2003) examine the effect of legal risk on lending terms at the facility level in connection with project finance, without taking into account the fact that borrowers often raise their loans in different facilities.[1]

We examine a very large sample of loans from the LPC DealScan database. We study data from over 100,000 loans (not facilities/tranches) among 115 countries over the years 1995–2009. Our approach is unique insofar as we consider the structure of such loan tranches by taking the loan level as unit of observation. As well, while other papers focus on publicly traded companies in DealScan through merging the database with other databases such as Worldscope (Bae and Goyal, 2009), in this paper we do not merge the DealScan data with datasets on publicly traded companies because a substantial portion of the loans are made to firms that are not publicly traded. The private firms comprise the more interesting part of the DealScan data we examine. DealScan only has 28% of observations from publicly traded companies. By considering private firms, we reveal many interesting findings in relation to legal and other factors that influence tranching in an international setting.

Broadly speaking, the data examined are consistent with the legal approach of financial contracting. We observe a greater use of tranching in English common law countries than in countries of other legal origins (French, German, Scandinavian, and Socialist), and a narrower range of spreads among tranches of a same loan in common law countries. These findings are consistent with the view that common law countries are better able to quickly adapt to complex legal issues, such as those involving tranched securities, and exhibit lower transaction costs. The data further indicate tranching is less prevalent among countries where corruption is more problematic, which

[1] Another set of studies takes a country-level approach (e.g., La Porta et al., 1997, 1998, and Djankov et al., 2007, 2008); there, the problem does not arise, but this approach cannot account for borrower characteristics.

suggests that tranching is more costly due to the resulting inefficiency and because managers in corrupt countries require more monitoring. As well, there is evidence that the extent of tranching and the spread of tranches depend on the efficiency of debt markets and creditor rights. Also, this paper highlights these legal differences between developed and developing countries. For developing countries, the data highlight pronounced inefficiencies and insensitivity to the economic factors that drive tranching among developed countries.

In addition to legal conditions, the data show other factors that affect the extent of tranching: asymmetric information, borrower risk, transaction costs, and the presence of institutional investors. First, the data strongly supports the view that loans have more tranches for private companies than public companies, and the price of tranches for private loans exhibits a much wider spread. Second, companies without an investment grade credit rating use tranching more often, and the price range of these tranched loans is much greater. These findings are explained by the fact that tranching is more pronounced when there is greater information asymmetry between borrowers and lenders, and the borrower is of greater risk. As well, the data highlight the fact that a majority of the loans are non-investment grade, and all of the findings are much more applicable to this subset of non-investment grade loans. Third, transaction costs strongly influence the extent of tranching. For larger loans, it is much more cost effective to establish more tranches, because many of these costs are fixed costs. Fourth, the extent of tranching reflects institutional abilities and experience, as tranching products are more complex.

Our findings contribute to three related strands of literature. First, and most directly, our paper relates to a growing literature on tranching. The literature in tranching to a large degree is understandably focused on structured finance. Although tranching does not require securitization per se, securities created through securitization typically involve tranching. Brennan, Hein, and Poon (2009) relate tranching of CDOs to the mechanism through which their rating is derived. Given that

CDO-underlying assets tend to be more highly correlated than corporate assets, Brennan et al. theorize that there is higher systematic risk in CDO tranches than tranches of similarly rated corporate bonds. This risk can induce investment banks to tranche CDOs in order to get arbitrage benefits. DeMarzo (2005) shows pooling assets in a securitization transaction exacerbates information problems, but nevertheless also creates diversification benefits if these are not overly correlated. As in Brennan, Hein, and Poon (2009) and DeMarzo (2005), Coval, Jurek, and Stafford (2008), Hamerle, Liebeg, and Schropp (2009), and Firla-Cuchra and Jenkinson (2005) likewise focus on tranching in connection with structured finance, and find evidence that asymmetric information and market segmentation plays a role in the tranching of securitized assets. However, these studies consider securitized assets and not loans directly, unlike in our paper. By contrast, we focus on tranches of corporate (syndicated) loans, and thus testing this hypothesis is not within the scope of our data set. We study tranching of single loans instead and not a portfolio of loans; that is, our focus is not on structured finance but on syndicated loans, thereby making the concern of correlations within, and credit ratings of, asset pools inapplicable to our context.

Second, our paper closely relates to the literature on the optimal structure of debt. Indeed, from the perspective of the borrower, tranching a large loan into segments of different risk-return profile is similar in spirit to choosing its optimal capital structure, in particular debt structure. Prior work has examined the choice between public and private debt, notably by emphasizing the extent of dispersion of debt held, which influences renegotiation of claims in the event of default (see, e.g., Hege and Mella-Barral, 2005, and Hackbarth, Leland, and Hennessy, 2007). Often this context is restricted to cases in which debt is not widely held. Although this literature provides guidance as to the choice between public (widely held) and private (closely held) debt, it does not offer as much insight into the issuance of different claims of debt simultaneously, as is done in tranching.

Third, our paper likewise relates to the growing literature on syndicated lending and law and finance. Djankov, McLiesh, and Schleifer (2007), Djankov et al. (2008) and Haselmann, Pistor and Vig (2009) construct measures of debt efficiency and enforcement around the world, and show that these measures strongly relate to legal origin, and influence the availability of loan finance. Building on a large literature that studies the factors that affect credit spreads, Bae and Goyal (2009) examine the effect of legal protection on loan size, maturing, and interest rate spreads for 48 countries around the world, and show that in countries with weak legal protection banks are more likely to reduce loan amounts, shorten loan maturities, and increase loan spreads. Similarly, Mansi, Maxwell, and Wald (2009) find that differences in state laws influence the structure of loan contracts in the U.S. However, based on our review of this and related literature, prior work does not examine the extent or structure of loan tranches in respect to legal differences around the world.

Overall, our paper contributes to the literature by focusing for the first time on the extent and structure of loan tranches, and in an international context. The findings, which are based on a very large worldwide data set, have a number of important managerial and policy implications for understanding when tranching can be used to efficiently pass on risks of loans to investors. Further, we highlight institutional difficulties among syndicated loan markets in developing countries and ways in which those difficulties can be overcome, such as through a greater presence of institutional investors.

This paper is organized as follows. Section 2 develops testable hypotheses. Section 3 presents the data and statistics. Section 4 presents the multivariate analyses. We summarize the concluding remarks and policy implications in Section 5.

2. Related Literature on Tranching

The literature on securitization focuses on portfolios of loans, such as studies like Brennan, Hein, and Poon (2009). In our context, by contrast, we focus on syndicated loans and not structured finance securitization. This distinction is important, because loan syndication does not involve the pooling of assets before tranching takes place. Instead, syndicated loans involve the tranching of a single loan in which different groups of banks and not a single group provide the full amount of the loan. Unlike structured finance securitization, the underlying assets typically used to secure the loan stem from a single company and not a portfolio of investments. Therefore, the rationales for tranching in securitization contexts such as for collateralized debt obligations and mortgage backed securities (Brennan, Hein, and Poon, 2009) are not directly applicable to the context of loans from a single company.

For the context of syndicated loan tranching, we conjecture that there are five primary factors that influence the extent of tranching: asymmetric information, borrower risk, transaction costs, the presence of institutional investors, and the legal system.

Asymmetric Information between Borrower and Investors:

Risky tranches can be purchased by institutional investors who can collect specific information on borrowers. Because less risky investments are less "information sensitive" to the idiosyncratic risk of borrowers, senior tranches help to protect uninformed investors from competing with those who do have better information and thus are more willing to buy subordinated tranches (Boot and Thakor, 1993, Franke and Krahnen, 2008, and DeMarzo, 2005). Pronounced asymmetric information creates benefits to tranche a loan. In equilibrium, uninformed investors buy senior tranches; informed investors buy junior tranches, which are more information sensitive. Since the lack of a stock market listing is considered to generate greater asymmetric information, we expect unlisted borrowers to tranche their loans more often. Further, this asymmetric information induces

pricing with greater differences in rates between the lower quality and higher quality tranches within the same loan.

Therefore, we conjecture that borrowers where asymmetric information is greater are more likely to tranche their loans and there is a greater spread between the lowest and highest quality tranche within the same loan. Wide evidence shows that private firms exhibit greater asymmetric information (e.g., most recently, Sufi, 2007). Therefore, we test this prediction by comparing private firms with publicly listed firms, and expect private firms to tranche more often their loans.

Borrower Risk:

Risky borrowers are more likely to have heterogeneous assets on their balance sheet or to create tranches with different risk levels through over-collateralization. In contrast, borrowers that only hold risk-free assets are not able to offer anything else other than risk-free tranches. In this case, there are no benefits at all to tranche a risk-free loan, because all tranches have the same characteristics. Loans of risky borrowers, on the other hand, can offer tranches with different risk levels by over-collateralizing some tranches, and by paying a higher rate for such risk. Thus, borrowers with pronounced risks, such as those that are not investment grade, are more likely to tranche loans, and there is a greater spread between the lowest and highest quality tranche within the same loan.

Transaction Costs and Loan Size:

Tranching involves costs such as legal, regulatory, rating agency, and servicing costs (Brennan, Hein, and Poon, 2009). There are also costs of setting up a bank syndicate as well as document costs. Different tranching transaction costs are rather fixed, and can become substantial in

percentage terms for small loans. Thus, smaller loans are less likely to be tranched, because the resulting tranches are too small and are not cost effective.

Note that although we expect that a larger loan is more likely to be tranched, it is unclear whether the spread on tranches within the same larger loan is smaller or greater. The transaction costs theory provides no clear indication on the heterogeneity of tranches. Theoretical studies do not provide us with any empirical prediction on this question either. We therefore leave our analysis open, as an empirical question.

Importance of Institutional Investors and Prioritization:

In a country where institutional investors are more important, tranching is more likely because structured products are mostly (if not all) sold to institutional investors. Indeed, tranching enables them to prioritize some tranches over others, creating tranches with different risk profiles. Some institutional investors are more prone to invest in safer tranches (e.g., pension funds due to regulatory restrictions on investments in risky assets), but informed ones might buy the riskier ones (e.g., Boot and Thakor, 1993). Active investors are further more likely to be willing to purchase riskier tranches, because they manage risk through the monitoring of companies that issue tranches. We therefore expect loans originated in countries where institutional investors are more prevalent are more likely to be tranched.

Here also, it is unclear whether the presence of institutional investors affects the spreads on tranches within the same loan. Indeed, if these institutional investors are active, we can expect tranches to be more heterogeneous; however, the reverse holds if they are passive investors. Because we generally do not know which type an investor is, we cannot test the effect it has. Thus, we refrain from making an empirical prediction for our analysis.

Legal Environment and Regulation:

Several legal aspects are critical for facilitating tranching. The first dimension is how the legal environment can mitigate asymmetric information and moral hazard between borrowers and creditors. The other dimension important for debt holders is enforceability of laws and contracts. To disentangle these two dimensions, we investigate different aspects that affect the risk of debt holders and their capacity to recover their loan in case of default. In particular, we incorporate three measures widely used in other studies: efficiency of debt markets, creditor rights, and the level of corruption in the country of the borrower. The first directly relates to the extent of asymmetric information, while the two others to transaction costs arguments of tranching loans. Creditor rights (as defined by La Porta et al., 1998) relate to the legal right of lenders to seize secured assets in case of default. The easier it is, the lower the costs of tranching. Corruption (as measured by the Corruption Perception Index), on the other hand, affects enforceability and thus the monitoring needs of lenders on borrowers. Similarly, more efficient debt markets (following here Djankov et al., 2008, that measure efficiency as reduced costs of maintaining the company as a going concern) also affect enforceability and monitoring needs, with more efficient markets reducing these costs. We investigate all three dimensions, as they appear to provide complementary perspectives of the impact of the legal environment on loan tranching practices due to the way these different variables are measured.

First, at a general level, La Porta et al. (1998) show English legal origin countries are more flexible legal systems that can accommodate and facilitate more complicated financial transactions. As such, we expect more frequent use of tranches in common law countries. At the same time, we typically associate common law countries with lower costs of debt due to the fact that the legal system mitigates the costs of asymmetric information. This lower expected cost reduces the price of

risk and makes the spreads between high and low quality tranches within the same loan narrower. Djankov, Mceish, and Schleifer (2007) and Djankov et al. (2008) show that access to credit and more efficient loan markets is typical with common law English legal origin and information-sharing institutions. Based on this legal view, we expect therefore that loans originated in common law countries are more likely to be tranched but have narrower spreads between the lowest and highest quality tranche within the same loan. In the alternative Coasian view (Bergman and Nicolaievsky, 2007), regulations of financial markets are unnecessary because financial contracts take place between sophisticated issuers and sophisticated investors, suggesting that the market can find a way to get around weak institutions. Our empirical analyses below test these competing predictions.

Second, countries with more efficient debt markets have lower costs associated with asymmetric information due to the fact that risks and costs of bankruptcy are lower (La Porta et al., 1998, Djankov, Mceish, and Schleifer, 2007, and Djankov et al., 2008). This institutional benefit in turn reduces the need to have extensive tranching to segregate off lower quality levels of debt. Thus, loans originated in countries with more efficient debt markets are less likely to be tranched and have narrower spreads between the lowest and highest quality tranche within the same loan.

Third, countries with stronger creditor rights increase the expected benefits to higher risk lenders, all else being equal (La Porta et al., 1997, 1998, Djankov, Mceish, and Schleifer, 2007, and Djankov et al., 2008). This increase in turn makes it more feasible to establish riskier tranches. We expect these riskier tranches to be priced with a higher spread. This results in a wider range of prices for the tranches. In other words, loans originated in countries with stronger creditor rights are more likely to be tranched and have wider spreads between the lowest and highest quality tranche within the same loan.

Fourth, the legal system likewise induces incentives to take value-enhancing risks (John, Litov, and Yeung, 2009). In countries with weak legal systems and more extensive corruption,

corporations are often run by entrenched insiders who appropriate corporate resources. Hamerle, Liebeg, and Schrop (2009) show how tranches with high systematic risk can be generated and how arrangers can exploit this risk to their advantage. To this end, we expect investors to be more willing to buy loans more extensively tranched that originate in countries with lower levels of corruption, but that these tranched loans have a higher differences in interest rates (spread) to reflect the more pronounced variation in risks.

3. Data and Summary Statistics

Our primary data source is the Loan Pricing Corporation (LPC) DealScan database from which we extract the details on syndicated loans. Given our focus on tranching, our unit of observation is a loan and not a facility. We use the full sample of 115 developed and developing countries and 105,051 loans covering the years 1995–2009. We exclude transactions prior to 1995, since LPC has poor coverage of transactions outside the US prior to that year (Bae and Goyal, 2009).

We match the LPC database with information on market conditions in different countries around the world from Morgan Stanley Capital International. As well, we use information on legal conditions that pertain to debt markets in different countries from Djankov, McLeish, and Schleifer (2007) and Djankov et al. (2008), and legal origin variables as per La Porta et al. (1998). Some of these legal variables vary over time, as indicated in Table 1. Other legal variables are time invariant, and have been used in related work (Bae and Goyal, 2009). We restrict our presentation of legal variables to a concise set that is pertinent to tranching, but do consider other legal variables used in Bae and Goyal (2009) and others. We further match the data with annual, time-varying measures of

corruption from Transparency 1 International.[2] Finally, we match data on the importance of institutional investors from OECD.[3]

We focus on two dependent variables pertaining to tranching: (i) the actual number of tranches of the loan, and (ii) the difference between the percentage spread of the highest quality tranche and the lowest quality tranche within the same loan. We show the robustness of our results to an alternative measure of the second dependent variable as the ratio of the percentage spread of the highest quality tranche relative to the lowest quality tranche within the same loan. All of the variables are defined in Table 1.

[Insert Table 1 Here]

To test our factors that we believe affect tranching practices, we use the following measures summarized in Tables 1 and 2. Information asymmetry is represented by a dummy variable equal to one if the company is listed on a stock exchange. Publicly listed companies have prospectus requirements to obtain a listing and on-going reporting requirements, while private companies have little or no disclosure obligations. Borrower risk is represented by a dummy variable equal to one if the company's senior debt is rated as investment grade (BBB and higher for S&P rating). Transaction costs are represented by the size of the loan, as transaction costs are fixed and are comparatively less important the larger the size of the loan. We use financial assets held by institutional investors relative to GDP in each country to whether the presence of institutional investors help borrowers to

[2] http://www.transparency.org/policy_research/surveys_indices/cpi
[3] OECD Market Database - Financial Market Trends 2008.

tranche their loans. Also, to test the importance of legal conditions, we use four variables: legal origin, efficiency of debt markets, creditor rights, and corruption.[4]

[Insert Table 2 Here]

Table 3 provides a number of summary statistics. Overall, in the data for all observations, 31.6% of the deals are tranched. Among the tranched deals, the average number of tranches is 2.509. However, there is substantial variation in the sample, with a maximum of 29 tranches for one deal. Overall, 95% [90%] of all deals have no more than 6 [3] tranches.

Unlike Bae and Goyal (2009) and others who also use the DealScan database, we do not merge with datasets on publicly traded companies because a substantial portion of the loans are made to firms that are not publicly traded. The private firms comprise the largest (and potentially most fruitful) part of the data we examine. In Table 3 we report the data only have 28% of observations from publicly traded companies. If we were to merge our dataset with other data on publicly traded firms such as Worldscope, we would exclude more than half of the DealScan sample.[5] The potentially most interesting part of the sample, at least for examining tranching, is from private firms. Finally, merging our sample with Worldscope may particularly affect less developed countries so that the number of countries considered would be reduced and thus also the variation in legal variables.

[4] We considered a number of alternative legal indices but did not materially impact the variables reported, with exceptions in cases where there was excessive collinearity across variables.

[5] The tradeoff from examining both private and public companies herein is that we have fewer variables on firm-specific factors. Public traded companies have reporting requirements from which additional explanatory variables can be created. Here, we are able to compare private to public, and consider investment grade ratings, etc. (see Tables 1 and 3), and do so with a much larger dataset with more than twice the number of observations relative to a dataset from only publicly traded companies.

Table 3 presents summary statistics and comparison tests for tranched versus non-tranched deals. The data indicate public companies are less likely to have a tranched loan: 29.5% of non-tranched loans have a public listing and 24.6% do not, and these differences are significant at the 1% level and consistent with our prediction about asymmetric information. In further support of this prediction, note that 68.6% of tranched loans are corporations but only 61.0% of non-tranched loans are corporations, which is a difference significant at the 1% level. Consistent with expectations on borrower risk, for borrowers that have tranche, 7.2% of the borrowers are investment grade, but for deals that are not tranched 11.4% are not investment grade, and these differences are significant at the 1% level.

[Insert Table 3 Here]

Table 3 also shows support for the impact of transaction costs insofar as loans with tranches are significantly larger. The average non-tranched loan size is $317 million, while the average tranched loan size is $520 million. Further, the presence of institutional investors appear to be an important factor as tranched loans are significantly more common in countries with a greater presence of institutional investors.

Table 3 indicates legal conditions further matter across countries for tranching. Eighty-two percent of loans are tranched in common law countries, but only 72.3% of loans are tranched in civil law countries, as expected. By contrast, countries with more efficient debt markets have less tranching, consistent with our discussion in Section 2. The average country efficiency rating for non-tranched loans is 81.0% versus 79.6% for tranched loans, and these differences are significant at the 1% level. Countries with higher creditor rights indices are significantly more likely to be tranched: the average creditor rights are 1.629 for the subsample of deals that are tranched, and 1.499 for the subsample that are not tranched. Finally, countries with higher levels of corruption have loans that

are more likely to be tranched, but the differences are not economically large. The average corruption ranking for tranched loans is 8.285, and it is 8.364 for non-tranched loans.

Panel A of Table 4 summarizes the average and maximum number of tranches used in each country, as well as the spread range. The country with the most number of tranches on average and widest spread range is Laos. A number of countries in the data have no tranches (indicated by the value 1 in Table 4) and others have very small spread ratios. English common law countries have on average fewer tranches (1.57) and narrower spreads (60.84) than French civil law countries (1.79 and 63.37, respectively). German legal origin countries have an average of 1.63 tranches and an average spread of 27.36. Scandinavian legal origin countries have an average of 1.46 tranches and an average spread of 96.21. Finally, socialist legal origin countries have an average of 1.38 tranches and an average spread of 31.38. Panel B of Table 4 statistically compares the differences by legal origin. English legal origin countries have more tranches and lower spreads than Scandinavian legal origin countries, and English legal origin countries have lower spreads than French legal origin countries, consistent with our prediction. The other differences by legal origin are not consistent with our expectations; nevertheless, these difference tests do not control for other things being equal, unlike our multivariate analyses below.

[Insert Table 4 Here]

Table 5 presents a correlation matrix for the main variables in the data. The correlations with the primary dependent variables and our results are generally consistent with the comparison tests discussed in conjunction with Table 3. The correlations provide strong support for predictions on the effect of asymmetric information, borrower risk and transaction costs. There is a significant negative correlation between tranching and public listings (-0.083) as well as spreads (-0.039) and spread ratios (-0.018). There is a significant negative correlation between investment grade and tranches (-

0.070), spread differences (-0.090) and spread ratios (-0.030). There is a significant positive relation between deal amounts and tranches (0.186). There is a significant negative relation between the efficiency of debt markets and tranches (-0.071). Similarly, there is a significant positive relation between tranches and creditor rights as expected, but not the relation with spreads. The correlations generally do not support predictions for institutional investors, common law, and corruption, respectively. These are univariate tests only, and the next section provides further assessment below. The other correlations in Table 5 highlight relations between variables and problem areas of potential collinearity for our multivariate analyses in the next section.

[Insert Table 5 Here]

4. Multivariate Analysis

To assess what determines tranching in the syndicated loan market, we examine two dimensions: the extent of tranching and the degree of heterogeneity of tranches in terms of rates from the lowest quality tranches relative to the highest quality tranches. For consistency, we only examine the degree of heterogeneity of tranches for the subsample of deals that are actually tranched. For the first approach, we use the actual number of tranches of any given loan. Results of these Poisson regressions are provided in Table 6 and discussed in Subsection 4.1. We use Poisson regressions because the distribution of the dependent variable is extremely consistent with the Poisson distribution. For the second approach, we use the difference in rates charged between the highest quality tranche and the lowest quality tranche. We use OLS methods, and find alternative methods to account for fractional dependent variables such as a logistic transformation yielded consistent estimates. Further, we compute ratios of the highest quality to lowest quality tranches of a given deal, and explicitly show those results as a robustness check. We discuss the results from this

second approach in Subsection 4.2. Finally, in Subsection 4.3 we show some differences for developed versus developing countries. All of our regressions use clustered standard errors by year.[6]

4.1. The Extent of Tranching

Table 6 provides the Poisson regressions for the extent of tranching. The table has seven different models with alternative explanatory variables to show robustness. In support of the asymmetric information argument, borrowers that do not have a public listing are approximately 18% more likely to have an extra tranche in each of the models, and these estimates are significant at the 1% level in every model. Investment grade companies issue loans that are 40% less likely to have an extra tranche, consistent with the borrower risk argument. Also, the data support the transaction costs explanation for tranching, as expected. A one-standard deviation increase in loan size increases the probability of an extra tranche by 9%.

[Insert Table 6 Here]

Table 6 provides little support for the institutional investors argument, which pertains to institutional investors. Only Models 4 and 5 have a significant coefficient, and at the 10 and 5% levels, respectively. Model 5 indicates a one-standard deviation increase in the importance of institutional investors that increases the probability of an extra tranche by 4.6%.

[6] We considered two-way clustering based on procedures on Mitchell Petersen's webpage; see http://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/se/se_programming.htm. However, there does not exist procedures for two-way clustering for Poisson regressions, such as by year and country; two-way clustering with OLS was considered and the results were consistent with OLS with single clustering, but OLS is inappropriate given the distribution of the dependent tranching variable.

Legal conditions have a very strong impact on tranching in all the models. Common law countries are more likely to have an extra tranche, and the estimates are significant at the 1% level in all models, consistent with the prediction that common law legal systems help reduce asymmetric information costs. The economic significance for common law ranges from 8.3% in Model 3 to 12.9% in Model 7. Countries with more efficient debt markets are less likely to originate loans with an extra tranche, where a one-standard deviation increase in efficiency lowers the probability of tranching by 7%, as expected. This result is significant at the 1% level in all models. Countries with stronger creditor rights are more likely to have an extra tranche (consistent with the transaction costs argument of better regulations), and all models show a significant coefficient at the 1% level. A one-standard deviation increase in creditor rights increases the probability of an extra tranche by approximately 4.7%. Finally, countries with less corruption (indicated by higher values of the corruption index) have more tranches, as expected from the transaction costs argument of better regulations. This latter effect is significant at the 5% level in Model 6 and the 1% level in Model 7. The economic significance is such that a one-standard deviation increase in the corruption index increases the probability of an extra tranche by 3% in Model 6 and 6% in Model 7.

The control variables include dummy variables for major industry groups and special purpose dummy variables. As well, we include dummy variables for borrowers that are corporations and where ratings are not available. We also consider excluding observations for non-companies as well as non-rating observations (and vice-versa), and the results discussed above are not materially different. Further, the results are robust to controls for market conditions with MSCI returns around the prior month of the deal date (and the results are robust to considering alternative horizons), as well as GDP per capita in each country-year.

4.2. The Structure of Tranching

We provide OLS regressions for the difference in interest rates between the highest quality tranche and lowest quality tranche in Table 7. Table 8 presents ratio analyses to complement the results in Table 7. The results are generally consistent with the extent of tranching as reported in Table 6 and discussed in Subsection 4.1. First, consistent with the view that private firm exhibit greater asymmetric information, Table 7 shows that public companies have a smaller spread by about 19 basis points between the lowest and highest quality tranches, and this difference is significant at the 1% level in all specifications. Similarly, Table 8 shows that public companies have a smaller ratio by approximately three, and again the estimates are significant at the 1% level in all specifications.

[Insert Tables 7 and 8 Here]

Investment grade loans have a spread that is approximately 64 basis points lower in all models in Table 7, and these estimates are all significant at the 1% level. Likewise, the ratio in Table 8 is lower by approximately 6.5, and this difference is significant at the 1% level in all models in Table 8.

The evidence shows differences in rates between tranches are greater for larger loans. Similarly, loans with more tranches have a wider range of spreads. We do not explicitly control for the number of tranches in view of the control for loan size, but either way, the other results pertaining to the hypotheses are robust. The data do not show any relation between range of spreads and the importance of institutional investors.

Common law countries have a significantly lower range of rates (by about 14-20% in Table 7, or a ratio of 7.5 to 9.3 in Table 8) in all models, with the sole exception of Model 7 in Table 8. There is some support for the legal efficiency argument in Models 5 and 7 of Table 7, and Model 7 of Table

8, as more efficient debt markets associate with a lower range of spreads. The economic significance is such that a one-standard deviation decrease in efficiency raises the range of spreads by approximately eight basis points in Table 7 (or by a ratio of approximately two in Table 8). Creditor rights relate statistically and positively to the diversity of spreads in Tables 7 and 8. A one-standard deviation increase in creditor rights increases the range of spreads by about 6% in Table 7 and by a ratio of roughly four in Table 8. Also, there is support in Tables 7 and 8 for the view that corruption affects the spread of tranches. The data show less corrupt countries have higher ranges and ratios of spreads, implying that countries with less corruption price riskier tranches higher. In other words, the data indicate that in more corrupt countries lenders are less likely to originate heterogeneous tranches with wider spreads as there would be less investor interest for the riskiest ones.

Our findings are robust to a large number of control variables, as discussed in Subsection 4.1. We considered other controls but they did not materially affect the reported results. For example, we did consider a control variable for the number of tranches in Tables 7 and 8, and this variable slightly lowered the p-values of some of the reported results, but overall did not materially impact the inferences drawn from the data and discussed above. We do not report the specifications with the number of tranches as an explanatory variable in Tables 7 and 8 because this variable is arguably endogenous, and suitable instrumental variables are difficult to justify in this context. Other specifications are available on request. The next subsection presents some of these additional robustness checks.

4.3. Further Robustness Checks

In this section, we explicitly show robustness to subsets of the data for developed versus developing countries in Table 9, as well as investment grade versus non-investment grade in Table 10.

As pointed out by La Porta et al. (1998) and Bae and Goyal (2009), more developed countries tend to better enforce their laws but have weaker creditor rights. This finding raises the question of whether enforceability/efficiency and creditor rights are substitutes. Moreover, developed countries are more likely to have more sophisticated investors, which can lead to differentiated effects on tranches between developed and developing countries. Table 9 highlights a number of interesting findings. First, regarding the asymmetric information argument, the data show that the effect of a public listing on tranching in developing countries is approximately 33% larger than in developed countries. At the same time, loan prices in poor countries are completely insensitive to whether or not the company has a public listing. This evidence highlights inefficiencies in the tranching market among developing countries.

[Insert Table 9 Here]

Second, regarding the effect of being investment grade, it is approximately 59% larger in developed countries than developing countries in terms of tranching (Models 2 versus 4) and 290% larger in terms of pricing (Models 6 versus 8). These findings are consistent with the idea that there are institutional frictions among developing countries.

Third, the effect of deal size on tranching (the transaction costs argument) is approximately 69% larger in developing countries. Fourth, the effect of institutional investors on tranching is not only substantially larger in developing countries, but also the effect has the wrong sign for the subset of developed countries. One explanation for these results is that institutional investors play a big role in facilitating tranches for developing countries, and tranches are much more effective for larger loans in developing countries.

Table 9 shows that the effect of common law is larger for tranching in developing countries, but common law does not affect the pricing of spreads in developing countries (Models 5, 6, 9, and 10), unlike developed countries (Models 7, 8, 11, and 12). The efficiency of debt markets has a larger effect on tranching in developed countries than developing countries, and has an effect on the range of spreads only in developed countries and not developing countries. Creditor rights have a stronger effect of tranches in developing countries, but only in developed countries do creditor rights affect the range of spreads (there is only weak evidence in Model 10, significant at the 10% level, for an effect of creditor rights on spreads in developing countries). Corruption matters more for setting up tranches in developed countries than developing countries in ways expected, and corruption also matters more to the range of pricing spreads in developed countries, but in developing countries corruption is completely insensitive to pricing tranches.

In sum, at a broad level, Table 9 shows that spreads in developing countries are much less sensitive or statistically invariant to the variables that affect the range of interest rates in developed countries. By contrast, tranches are simply much less likely to be set up in the first place, and whether or not tranches are set up in developing countries depends in a much more pronounced way (relative to developed countries) on whether or not the company is publicly listed, the deal size, and the presence of institutional investors.

Table 10 presents differences between subsets of the data for investment grade versus non-investment grade loans in the data. The majority of loans in the data are non-investment grade. Our analysis of these subsamples is motivated by the fact that investment grade borrowers may enjoy little benefits from tranching, in contrast to risky borrowers. The effect may then be asymmetric between these two types of borrowers. The regressions in Table 10 highlight the fact that there is strong support for all of the hypotheses for non-investment grade loans, and the findings are consistent with those discussed above. Indeed, we expect effects to be economically stronger for

riskier borrowers that have the capacity to set up loan tranches that are more dissimilar. This capacity in turn makes tranching more likely and differences between tranches bigger.

[Insert Table 10 Here]

Unlike the findings for non-investment grade loans, for investment grade loans the results are for the most part either economically smaller or insignificant. First, note that for investment grade loans the number of tranches depends to a much smaller degree on whether or not the company is publicly listed (as a measure of asymmetric information): the coefficients in Models 3 and 4 are roughly one-fourth the size of those for Models 1 and 2. Also, relative spreads for tranches of investment grade loans is statistically insensitive to whether the company is publicly listed (only Model 12 has a marginally significant coefficient at the 10% level, and it is the wrong sign). Second, note that tranching is approximately 15% less sensitive to deal size for investment grade loans relative to non-investment grade loans. Third, all of the legal variables are insignificant for investment grade loans (with the sole exception of Model 3 where common law is marginally significant at the 10% level and has the wrong sign, and this effect is not supported in Model 4). Overall, therefore, the evidence on the extent of tranching and the relative range of spread results apply to the subset of non-investment grade loans and not investment grade loans.

5. Conclusions

In this paper, we present new hypotheses and empirical evidence pertaining to the extent of loan tranching and the range of spreads on tranches for over 100,000 loans over the years 1995–2009 for 115 countries. As in the literature on structured finance and security design, the data highlight the role of information asymmetry and corporate risk in establishing and pricing separate

tranches within the same syndicated loan. Private companies and companies without investment grade ratings have substantially fewer tranches and much greater variation in spreads.

We further show that the differences in legal origin, creditor rights, corruption and the efficiency of debt markets have are important for understanding international differences in loan tranching. Tranching is more frequent and spreads are narrower in common law countries. Creditor rights facilitate tranches and increase spreads. Debt market efficiency reduces tranching and reduces heterogeneity in spreads. Corruption reduces tranching and the heterogeneity in spreads.

We empirically show that a majority of tranched syndicated loans are for non-investment grade loans. The findings and hypotheses in this paper are supported for non-investment grade loans. For investment grade loans the results are either statistically insignificant or significant but much economically smaller relative to that for non-investment grade loans.

The mechanisms that drive tranching and spreads of tranches work much more efficiently in developed rather than in developing countries. The evidence highlights inefficiencies of debt markets in developing countries. In developing countries tranches are simply much less likely to be set up in the first place. Relative to developed countries, whether or not tranches are set up in developing countries depends in a much more pronounced way on whether or not the company is publicly listed, the deal size, and the presence of institutional investors. For tranched loans in developing countries, the relative range of spreads is much less sensitive to our proxies for risks and information asymmetries relative to that which is observed for loans originated in developed countries.

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TABLE 1: Definition of Variables

Information on the dependent variables, deal-specific variables, and company variables are from the LPC DealScan database.

Dependent Variables:	
Number of Tranches	Integer variable that gives the number of tranches the considered loan has.
Spread Range	Difference in basis points between the lowest quality tranche and the highest quality tranche of a given loan (only defined for the subset of the tranched loans).
Spread Ratio	Ratio of basis points of the lowest quality tranche over the highest quality tranche of a given loan (only defined for the subset of tranched loans).
Deal-specific Variables:	
Deal Amount (in USD million)	Total amount of the loan (in USD million); sum of the different tranches.
Specific Purpose: Real Estate (dummy)	Dummy variable equal to one if the purpose of the loan is to purchase real estate, and zero otherwise.
Specific Purpose: Project Finance (dummy)	Dummy variable equal to one if the purpose of the loan is for realizing project finance, and zero otherwise.
Specific Purpose: Work. Cap. (dummy)	Dummy variable equal to one if the purpose of the loan is for working capital, and zero otherwise.
Specific Purpose: Corp. Purposes (dummy)	Dummy variable equal to one if the purpose of the loan is for corporate purposes (i.e., investment), and zero otherwise.
Specific Purpose: Debt Repay. (dummy)	Dummy variable equal to one if the purpose of the loan is to repay other debt, and zero otherwise.
Specific Purpose: Other (dummy)	Dummy variable equal to one if the purpose of the loan is for any other expenses, and zero otherwise.
Company-specific Variables:	
Borrower has Public Listing (dummy)	Dummy variable equal to one if the borrower is listed on a public stock market, and zero otherwise.
Borrower is a Corporation (dummy)	Dummy variable equal to one if the borrower is a (non-financial) corporation, and zero otherwise.
Investment Grade (dummy)	Dummy variable equal to one if the borrower's senior debt has an investment grade (i.e., its S&P rating is BBB or higher), and zero otherwise
Borrower's Rating is not Available (dummy)	Dummy variable equal to one if the borrower's rating on its senior debt is unavailable, and zero otherwise.
Market Variables:	
Importance of Institutional Investors in Borrower's Country	Financial assets held by institutional investors as a fraction (not percentage) of the country's GDP in the country of the borrower (Source: OECD Market Database - Financial Market Trends 2008).
Real GDP per Capita in Borrower's Country	Real GDP per capita in the country of the borrower at time of deal close date.
Market Return 1 Month Prior to Deal Close Date	One month return of the MSCI Index in the borrower's country at deal close date; when country index is not available, the regional MSCI Index is used.

Legal Variables:	
Common Law (English) Origin of Borrower	Dummy variable equal to one if the borrower is located in a common law country, and zero otherwise.
Efficiency of debt markets in Borrower's Country	Efficiency measure of the borrower's country debt markets, as defined in equation (1) of Djankov et al. (2008); this index ranges from 1.2 to 96.1 and increases with the efficiency in debt markets. The index reflects whether or not the company continues as a going concern, the cost of maintaining the company as a going concern, and the time to resolve insolvency.
Creditor Rights	Index aggregating creditor rights, following La Porta et al. (1998), this index ranges from 0 to 4, with higher values implying stronger creditor rights. A score of one is assigned when each of the following rights of secured lenders are defined in laws and regulations: First, there are restrictions, such as creditor consent or minimum dividends, for a debtor to file for reorganization. Second, secured creditors are able to seize their collateral after the reorganization petition is approved, i.e., there is no automatic stay or asset freeze. Third, secured creditors are paid first out of the proceeds of liquidating a bankrupt firm, as opposed to other creditors such as government or workers. Finally, if management does not retain administration of its property pending the resolution of the reorganization. This index is also used in Djankov, McLeish, and Schleifer (2007) with time variation for the years 1978–2002; however, for the years 1995–2002, the only countries with time variation include Kazakhstan, Lithuania, and the Russian Federation (and these countries comprise a trivial proportion of our data; see Table 4). Our sample comprises the years 1995–2009. An examination of creditor rights for possible time variation for the major countries in our data set does not change in a way that has material impacts on our results.
Corruption	Transparency International Corruption Perceptions Index, which ranks countries in terms of the degree to which corruption is perceived to exist among public officials and politicians (Source: http://www.transparency.org/policy_research/surveys_indices/cpi/2008); this index ranges from 0 to 10 and varies over time and across countries, with higher values implying less corrupt countries.

TABLE 2: Summary of Factors tested and Variables Used to Test

Factor	Variable Used	Expected Effect on Extent of Loan Tranching	Expected Effect on Price (Lowest Quality versus Highest Quality Spread) of Tranches within Same Loan
Asymmetric Information	A dummy variable equal to one for whether the borrower is listed on a stock market.	Negative: less of a need to tranche as more information is available about the company.	Negative: less of a need to make dissimilar debt structures with less asymmetric information.
Borrower Risk	A dummy variable equal to one if the borrower's senior debt is investment grade.	Negative: less of a need to tranche and separate out riskier assets for investment grade.	Negative: less of a need to make dissimilar debt strictures with a less risky borrower.
Transaction Costs	The size of the total syndicated loan.	Positive: transaction costs are fixed, and larger loans make tranching relatively less costly.	Ambiguous
Investor Type and Prioritization	Financial assets held by institutional investors in a country as a percentage of that country's GDP.	Positive: more sophisticated investors can understand tranches.	Ambiguous
Legal Origin	A dummy variable equal to one for common Law countries (La Porta et al., 1998).	Positive: English common law systems are better able to accommodate more complicated tranching structures.	Negative: less of a need to make dissimilar debt structures with less asymmetric information, which implies a lower price or narrower spread between tranches.
Efficiency of Debt Markets	Efficiency of debt markets (Djankov et al., 2008). Higher values imply more efficient markets.	Negative: less asymmetric information with more efficient debt markets, so less of a need to tranche.	Negative: less of a need to make dissimilar debt structures with less asymmetric information, which implies a lower price or narrower spread between tranches.
Creditor Rights	Creditor Rights (La Porta et al., 1998; Djankov et al., 2007). Higher values imply stronger creditor rights.	Positive: greater likelihood of repayment, even for riskier or unusual tranches.	Positive: greater likelihood of repayment, even for riskier or unusual tranches, which lowers the price of riskier tranches.
Corruption	Corruption Perception Index from Transparency International. Higher values imply less corruption.	Positive: especially for loans that do not qualify as investment grade, lower quality tranches are less attractive to investors when they originate from corrupt countries.	Positive: especially for loans that do not qualify as investment grade, lower quality tranches with higher spreads are more attractive to investors only when they originate from less corrupt countries.

TABLE 3: Summary Statistics

All the variables are defined in Table 1.

Variables	Expected sign	Full Sample		Sub-sample of Deals that are not Tranched (*Number of Tranches* = 1)		Sub-sample of Deals that are Tranched (*Number of Tranches* > 1)		P-value: Tranched versus Non-Tranched
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	
Number of Tranches		1.567	1.221	1.000	0.000	2.709	1.238	- -
Spread Range		61.094	129.749	- -	- -	61.094	129.749	- -
Spread Ratio		7.248	50.710	- -	- -	7.248	50.710	- -
Borrower has Public Listing (dummy)	(+)	0.280	0.449	0.296	0.457	0.296	0.456	0.927
Investment Grade (dummy)	(-)	0.101	0.301	0.114	0.318	0.088	0.284	0.000
Deal Amount (in USD million)	(+)	317.326	917.967	245.016	649.289	520.894	1436.157	0.000
Borrower is a Corporation (dummy)		0.633	0.482	0.610	0.488	0.740	0.439	0.000
Borrower's Rating is not Available (dummy)		0.121	0.326	0.093	0.290	0.124	0.329	0.000
Importance of Institutional Investors in Borrower's Country	(+)	1.451	0.618	1.452	0.616	1.555	0.579	0.000
Real GDP per Capita in Borrower's Country		10.096	1.056	10.167	0.948	10.101	1.123	0.000
Market Return 1 Month Prior to Deal Close Date		0.009	0.043	0.009	0.043	0.008	0.042	0.000
Common Law (English) Origin of Borrower	(+)	0.735	0.441	0.723	0.448	0.820	0.384	0.000
Efficiency of debt markets in Borrower's Country	(-)	80.068	18.236	81.034	17.641	79.588	17.104	0.000
Creditor Rights	(+)	1.540	1.011	1.499	0.944	1.629	1.141	0.000
Corruption	(+)	8.307	1.296	8.364	1.186	8.285	1.355	0.000
Specific Purpose: Real Estate (dummy)		0.028	0.165	0.034	0.182	0.012	0.111	0.000
Specific Purpose: Project Finance (dummy)		0.034	0.181	0.024	0.154	0.034	0.181	0.000
Specific Purpose: Work. Cap. (dummy)		0.101	0.301	0.113	0.317	0.080	0.271	0.000
Specific Purpose: Corp. Purposes (dummy)		0.446	0.497	0.498	0.500	0.292	0.454	0.000
Specific Purpose: Debt Repay. (dummy)		0.137	0.344	0.130	0.336	0.157	0.364	0.000
Specific Purpose: Other (dummy)		0.255	0.436	0.201	0.400	0.425	0.494	0.000
Nbr. Observations		104344		71707		22162		

TABLE 4: Tranching Practices by Country, grouped by Legal Origin

This table reports the statistics based on all syndicated loan transactions (not facilities) included in the LCP DealScan database. For the calculation of average Spread Range and Spread Ratio, we only use deals that are tranched.

Panel A. Statistics for Each Country, grouped by Legal Origin

Common Law

Country	Number of Deals	Mean Number of Tranches	Median Number of Tranches	Average Spread Range	Average Spread Ratio
Australia	5989	1.87	1	79.02	5.34
Bahamas	39	1.31	1	9.00	1.25
Bahrain	109	1.21	1	14.00	1.35
Bangladesh	19	2.37	1	18.75	1.07
Barbados	2	1.00	1	- -	- -
Bermuda	339	1.35	1	44.36	1.72
Botswana	1	2.00	2	- -	- -
British Virgin Islands	49	1.63	1	10.00	1.04
Brunei	5	1.20	1	0.00	1.00
Canada	3184	1.49	1	47.25	2.52
Cayman Island	81	1.79	1	13.38	1.11
Cyprus	36	1.31	1	0.50	1.02
Egypt	111	1.68	1	- -	- -
Estonia	41	1.29	1	- -	- -
Ethiopia	3	1.33	1	- -	- -
Fiji	1	1.00	1	- -	- -
Ghana	41	1.10	1	98.33	1.71
Gibraltar	5	1.00	1	- -	- -
Guyana	1	1.00	1	- -	- -
India	1064	1.73	1	26.14	1.78
Iran	69	1.29	1	- -	- -
Iraq	6	1.00	1	- -	- -
Ireland	426	1.52	1	74.99	8.06
Israel	70	1.73	1	41.50	1.16
Jamaica	13	1.69	2	233.19	7.57
Kenya	14	1.36	1	200.00	1.57
Laos	8	6.38	5.5	655.00	4.85
Lesotho	1	1.00	1	- -	- -
Liberia	31	1.39	1	9.38	1.07
Libya	4	1.25	1	- -	- -
Malaysia	1868	2.70	2	26.16	3.00
Maldives	2	1.50	1.5	- -	- -
Malta	20	1.20	1	327.50	2.55
Mauritius	11	1.18	1	7.50	1.25
Myanmar	3	1.00	1	- -	- -
Namibia	5	1.00	1	- -	- -

Nepal	1	3.00	3	- -	- -
New Zealand	655	2.13	2	20.08	1.60
Nigeria	42	1.43	1	81.67	1.51
Pakistan	111	2.23	2	21.51	2.05
Palestine	1	1.00	1	- -	- -
Papua New Guinea	21	2.95	3	10.83	1.11
Qatar	125	1.54	1	3.15	1.23
Saudi Arabia	136	1.79	1	23.50	1.36
Seychelles	4	2.00	2	66.67	1.30
Singapore	1515	2.33	2	16.98	1.14
Slovakia	234	1.29	1	46.49	16.03
Sri Lanka	50	1.68	1	12.50	1.07
Swaziland	3	1.00	1	- -	- -
Tanzania	7	1.00	1	- -	- -
Thailand	1322	2.39	2	12.91	1.25
Trinidad	19	1.89	2	23.13	1.42
Uganda	2	2.50	2.5	- -	- -
United Arab Emirates	295	1.49	1	29.63	1.71
United Kingdom	5030	1.78	1	119.51	27.84
United states	59819	1.45	1	60.26	5.84
Yemen	2	7.50	7.5	- -	- -
Zambia	13	1.38	1	0.00	1.00
Zimbabwe	10	1.00	1	- -	- -
Total (Common Law)	83353	1.57	1	60.84	6.63

French Legal Origin

Country	Number of Deals	Mean Number of Tranches	Median Number of Tranches	Average Spread Range	Average Spread Ratio
Albania	5	2.4	2	- -	- -
Algeria	20	2.55	1	0.00	1.00
Andorra	1	2.00	2	2.50	1.13
Angola	19	1.95	2	0.00	1.00
Argentina	470	1.26	1	60.15	1.61
Belgium	266	1.88	1	101.77	26.01
Bolivia	7	1.43	1	12.50	1.04
Brazil	730	1.27	1	41.54	1.33
Burkina Faso	4	1.00	1	- -	- -
Cambodia	8	1.38	1	300.00	1.75
Cameroon	10	1.5	1	0.00	1.00
Cape Verde	1	1.00	1	- -	- -
Chile	371	1.25	1	15.97	1.19
Colombia	148	1.20	1	23.66	1.15
Congo	4	1.00	1	- -	- -

Costa Rica	9	1.33	1	0.00	1.00
Dominican Republic	14	1.57	1	25.00	1.10
Ecuador	11	1.09	1	- -	- -
El Salvador	18	1.33	1	37.50	1.19
Equatorial Guinea	1	1.00	1	- -	- -
France	2436	2.14	1	110.69	20.29
Gabon	2	2.00	2	0.00	1.00
Greece	362	1.41	1	50.28	1.35
Guatemala	16	1.31	1	255.00	4.30
Guinea	4	2.75	3	0.00	1.00
Honduras	19	1.37	1	0.00	1.00
Indonesia	1516	2.00	1	16.24	1.34
Italy	976	2.02	1	82.52	10.38
Ivory Coast	22	1.23	1	58.33	1.42
Jordan	18	1.22	1	- -	- -
Kuwait	105	1.21	1	2.13	1.03
Lebanon	2	1.00	1	- -	- -
Lithuania	45	1.27	1	19.00	1.20
Luxembourg	236	1.99	1	53.87	7.68
Madagascar	1	1.00	1	- -	- -
Mali	13	1.62	1	50.00	1.18
Mauritania	1	2.00	2	0.00	1.00
Mexico	725	1.43	1	32.56	1.33
Monaco	6	1.33	1	100.00	1.40
Morocco	16	2.06	1	37.50	1.38
Mozambique	3	1.33	1	- -	- -
Netherlands	1243	1.86	1	120.93	22.31
Nicaragua	2	1.50	1.5	- -	- -
Oman	74	1.50	1	19.17	1.31
Panama	134	1.49	1	44.17	1.39
Paraguay	3	1.33	1	- -	- -
Peru	94	1.28	1	68.75	1.59
Philippines	818	2.41	2	15.34	1.67
Portugal	162	1.87	1	21.72	1.32
Romania	131	1.53	1	29.21	1.16
Senegal	6	1.00	1	- -	- -
Spain	1444	1.75	1	62.57	10.18
Syria	1	1.00	1	- -	- -
Tunisia	35	1.51	1	0.00	1.00
Turkey	626	1.29	1	46.79	2.19
Uruguay	16	1.38	1	37.50	1.63
Venezuela	88	1.45	1	49.04	1.35
Vietnam	133	1.89	1	14.81	1.17
Total (French)	13464	1.79	1	63.37	9.77

German Legal Origin

Country	Number of Deals	Mean Number of Tranches	Median Number of Tranches	Average Spread Range	Average Spread Ratio
Austria	123	1.36	1	86.53	23.93
Bosnia	3	1.67	2	- -	- -
Bulgaria	59	1.93	1	132.80	110.93
China	1341	2.07	2	9.02	1.13
Croatia	138	1.38	1	35.00	1.25
Czech Republic	168	1.38	1	28.45	1.27
Germany	1825	1.95	1	120.89	37.01
Hong Kong	6450	2.03	1	7.75	1.45
Hungary	226	1.43	1	37.67	9.38
Japan	12107	1.20	1	22.22	5.49
Korea (South)	3447	1.76	1	41.24	4.87
Latvia	59	1.05	1	31.25	1.17
Macau	27	2.67	2	54.46	1.16
Macedonia	7	1.43	1	0.00	1.00
Montenegro	1	3.00	3	- -	- -
Poland	212	1.45	1	11.31	1.24
Serbia	11	1.73	2	35.00	1.30
Slovakia	96	1.13	1	51.00	1.22
Slovenia	105	1.22	1	9.38	1.14
Switzerland	446	1.64	1	74.75	18.13
Taiwan	2735	2.12	2	21.26	1.86
Yugoslavia	1	2.00	2	- -	- -
Total (German)	29587	1.63	1	27.36	5.62

Scandinavian Legal Origin

Country	Number of Deals	Mean Number of Tranches	Median Number of Tranches	Average Spread Range	Average Spread Ratio
Denmark	226	1.60	1	112.08	26.42
Finland	309	1.56	1	93.09	13.17
Iceland	145	1.21	1	15.06	1.22
Norway	745	1.32	1	92.62	16.07
Sweden	759	1.41	1	131.23	36.10
Total (Scandinavian)	2184	1.46	1	96.21	20.61

Socialist Legal Origin

Country	Number of Deals	Mean Number of Tranches	Median Number of Tranches	Average Spread Range	Average Spread Ratio
Armenia	3	1.67	2	- -	- -
Azerbaijan	39	1.82	2	56.25	2.40
Belarus	25	1.44	1	2.50	1.01
Georgia	9	1.78	2	85.00	1.45
Kazakhstan	193	1.30	1	31.40	1.26
Kyrgyzstan	1	1.00	1	- -	- -
Moldova	1	2.00	2	- -	- -
Mongolia	4	1.25	1	- -	- -
Russia	1073	1.39	1	29.46	5.68
Tajikistan	4	1.75	2	- -	- -
Turkmenistan	4	1.50	1.5	- -	- -
Ukraine	168	1.27	1	49.46	1.42
Uzbekistan	23	1.17	1	0.00	1.00
Total (Socialist)	1547	1.38	1	31.38	4.55

Panel B: Comparison Tests for Differences in Tranching Practices by Legal Origin

Legal Origin	Mean Number of Tranches	Median Number of Tranches	Average Spread Range	Average Spread Ratio
Common Law (English Legal) Origin	1.57	1	60.84	6.63
French Legal Origin	1.79	1	63.37	9.77
German Legal Origin	1.63	1	27.36	5.62
Scandinavian Legal Origin	1.46	1	96.21	20.61
Socialist Legal Origin	1.38	1	31.38	4.55
Tests of Means:				
English versus Civil Law	-11.79 ***	- -	31.00 ***	-3.52 ***
English versus French	-16.01 ***	- -	-3.09 ***	-9.52 ***
English versus German	-6.96 ***	- -	71.44 ***	5.31 ***
English versus Scandinavian	4.06 ***	- -	-16.25 ***	-14.86 ***
English versus Socialist	8.52 ***	- -	30.55 ***	3.72 ***
French versus German	10.15 ***	- -	41.73 ***	11.69 ***
French versus Scandinavian	11.24 ***	- -	-14.31 ***	-10.97 ***
French versus Socialist	16.06 ***	- -	26.52 ***	8.24 ***
German versus Scandinavian	6.25 ***	- -	-31.39 ***	-15.78 ***
German versus Socialist	10.84 ***	- -	-4.01 ***	1.87 *
Scandinavian versus Socialist	2.45 **	- -	27.59 ***	14.80 ***

TABLE 5: Correlation Matrix

All the variables are defined in Table 1. Correlations with "Spread Range" and "Spread Ratio" are done only with deals that are tranched (i.e., the variable "Number of Tranches" > 1). Significance level: * for 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Number of Tranches	1.000														
(2) Spread Range	0.281*	1.000													
(3) Spread Ratio	0.162*	0.426*	1.000												
(4) Borrower has Public Listing (dummy)	-0.083*	-0.039*	-0.018*	1.000											
(5) Borrower is a Corporation (dummy)	0.022*	0.080*	0.039*	0.231*	1.000										
(6) Log(Deal Amount)	0.186*	0.092*	0.029*	0.153*	0.192*	1.000									
(7) Investment Grade (dummy)	-0.070*	-0.090*	-0.030*	0.307*	0.107*	0.301*	1.000								
(8) Borrower's Rating is not Available (dummy)	0.143*	-0.127*	-0.043*	-0.165*	-0.338*	-0.123*	-0.132*	1.000							
(9) Importance of Institutional Investors in Borrower's Country	-0.065*	0.106*	0.000	0.226*	0.250*	0.116*	0.132*	-0.404*	1.000						
(10) Log(Real GDP per Capita in Borrower's Country)	-0.111*	0.120*	0.041*	0.169*	0.239*	0.035*	0.097*	-0.419*	0.390*	1.000					
(11) Market Return 1 Month Prior to Deal Close Date	-0.010	0.010	0.000	0.024*	-0.018*	0.000	0.010	-0.030*	0.010	0.000	1.000				
(12) Common Law (English) Origin of Borrower	-0.034*	0.068*	-0.010	0.267*	0.146*	0.129*	0.130*	-0.199*	0.566*	0.309*	0.027*	1.000			
(13) Efficiency of debt markets in Borrower's Country	-0.071*	0.036*	0.000	0.065*	0.117*	-0.052*	0.030*	-0.130*	0.248*	0.733*	0.000	0.284*	1.000		
(14) Creditor Rights	0.121*	-0.072*	0.015*	-0.245*	-0.225*	-0.075*	-0.126*	0.369*	-0.511*	-0.385*	-0.024*	-0.334*	-0.098*	1.000	
(15) Corruption	-0.070*	0.107*	0.049*	0.165*	0.188*	0.046*	0.096*	-0.345*	0.358*	0.748*	0.010*	0.329*	0.603*	-0.238*	1.000

TABLE 6: Determinants of the Extent of Tranching

The dependent variable in all the specifications is "Number of Tranches", which gives the number of tranches for a given loan. Because this variable is an integer, the method of estimation is the Poisson regression. Values of coefficients reported are marginal effects. All the variables are defined in Table 1. Standard errors are clustered by year. Significance levels are *** for 1%, ** for 5%, and * for 10%.

Variables	Expected sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Borrower has Public Listing (dummy)	(-)	-0.182 ***	-0.190 ***	-0.172 ***	-0.179 ***	-0.164 ***	-0.181 ***	-0.180 ***
Investment Grade (dummy)	(-)	-0.400 ***	-0.400 ***	-0.398 ***	-0.397 ***	-0.396 ***	-0.399 ***	-0.395 ***
Log(Deal Amount)	(+)	0.159 ***	0.157 ***	0.157 ***	0.154 ***	0.156 ***	0.159 ***	0.153 ***
Borrower is a Corporation (dummy)		0.030 **	0.031 **	0.029 **	0.029 **	0.023	0.029 **	0.027 **
Borrower's Rating is not Available (dummy)		0.564 ***	0.585 ***	0.546 ***	0.566 ***	0.592 ***	0.568 ***	0.583 ***
Importance of Institutional Investors in Borrower's Country	(+)	0.012	0.015	0.032	0.043 *	0.075 **	0.009	0.036
Log(Real GDP per Capita in Borrower's Country)		-0.062 ***	-0.019	-0.053 ***	-0.001	-0.002	-0.079 ***	-0.024
Market Return 1 Month Prior to Deal Close Date		0.004	0.011	0.008	0.015	0.015	0.007	0.021
Common Law (English) Origin of Borrower	(+)	0.094 **	0.129 ***	0.083 **	0.123 ***		0.092 **	0.129 ***
Efficiency of Debt Markets in Borrower's Country	(-)		-0.004 ***		-0.004 ***	-0.003 ***		-0.006 ***
Creditor Rights	(+)			0.037 ***	0.046 ***	0.048 ***		0.046 ***
Corruption	(+)						0.021 **	0.044 ***
Major Industry Group Dummies included?		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Specific Purpose Dummies included?		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations		105016	104872	104332	104190	104319	105013	104190
Log Pseudo-Likelihood		-143608	-143369	-142607	-142347	-142599	-143590	-142295

TABLE 7: Determinants of Heterogeneity in Tranching (Range between Highest and Lowest Spread)

The dependent variable in all the specifications is "Spread Range", which measures the difference in basis points between the lowest quality tranche and the highest quality tranche of a given loan (only defined for the subset of loans that are tranched). The method of estimation is OLS. Regression (5) considers syndicated loan transactions for borrowers of emerging market countries only, and Regression (6) of developed countries. All the variables are defined in Table 1. Standard errors are clustered by year. Significance levels are *** for 1%, ** for 5%, and * for 10%.

Variables	Expected sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Borrower has Public Listing (dummy)	(-)	-19.641 ***	-19.798 ***	-18.331 ***	-18.477 ***	-19.467 ***	-19.578 ***	-18.480 ***
Investment Grade (dummy)	(-)	-64.150 ***	-64.284 ***	-63.187 ***	-63.292 ***	-63.598 ***	-64.098 ***	-63.241 ***
Log(Deal Amount)	(?)	8.003 **	8.013 **	7.523 **	7.511 **	7.955 **	7.959 **	7.453 **
Borrower is a Corporation (dummy)		-0.24	-0.093	-0.588	-0.405	2.657	-0.446	-0.667
Borrower's Rating is not Available (dummy)		-24.287 ***	-24.109 ***	-26.146 ***	-25.946 ***	-28.298 ***	-23.857 ***	-24.965 ***
Importance of Institutional Investors in Borrower's Country	(?)	-1.541	-1.549	1.968	2.309	-0.998	-2.108	1.259
Log(Real GDP per Capita in Borrower's Country)		11.788 ***	13.292 ***	13.132 ***	15.480 ***	15.600 ***	10.314 ***	14.139 ***
Market Return 1 Month Prior to Deal Close Date		10.862	11.670	9.374	10.362	12.170	10.965	10.993
Common Law (English) Origin of Borrower	(-)	-18.244 ***	-15.914 **	-20.563 ***	-16.844 **		-18.233 ***	-14.220 *
Efficiency of debt markets in Borrower's Country	(-)		-0.157		-0.243	-0.477 ***		-0.394 ***
Creditor Rights	(+)			5.536 **	5.953 **	5.422 **		5.971 **
Corruption	(+)						1.945	3.576 *
Major Industry Group Dummies included?		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Specific Purpose Dummies included?		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations		22321	22305	22201	22185	22204	22321	22185
Adjusted R-squared		7.0%	7.1%	7.1%	7.1%	7.0%	7.1%	7.2%

TABLE 8: Determinants of Heterogeneity in Tranching (Ratio between Highest and Lowest Spread)

The dependent variable in all the specifications is "Spread Ratio", which measures the ratio of basis points of the lowest quality tranche over the highest quality tranche of a given loan (only defined for the subset of loans that are tranched). The method of estimation is OLS. All the variables are defined in Table 1. Standard errors are clustered by year. Significance levels are *** for 1%, ** for 5%, and * for 10%.

Variables	Expected sign	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Borrower has Public Listing (dummy)	(-)	-3.339 ***	-3.330 ***	-2.549 ***	-2.568 ***	-3.097 ***	-3.284 ***	-2.572 ***
Investment Grade (dummy)	(-)	-6.652 ***	-6.655 ***	-6.084 ***	-6.101 ***	-6.288 ***	-6.605 ***	-6.071 ***
Log(Deal Amount)	(?)	0.483	0.475	0.191	0.187	0.427	0.444	0.153
Borrower is a Corporation (dummy)		1.058	1,051	0.825	0.849	1.207	0.872	0.690
Borrower's Rating is not Available (dummy)		-4.186 **	-4.218 **	-5.284 ***	-5.266 ***	-6.541 ***	-3.813 **	-4.689 ***
Importance of Institutional Investors in Borrower's Country	(?)	-3.583	-3.587	-1.058	-1.016	-2.741	-4.089	-1.652
Log(Real GDP per Capita in Borrower's Country)		2.469 ***	2.321 ***	3.379 **	3.651 **	3.707 **	1.140 **	2.827 **
Market Return 1 Month Prior to Deal Close Date		3.604	3.627	3.017	3.163	4.181	3.664	3.513
Common Law (English) Origin of Borrower	(-)	-7.459 *	-7.854 *	-9.302 *	-8.931 *		-7.450 *	-7.338
Efficiency of debt markets in Borrower's Country	(-)		0.018		-0.027	-0.152 *		-0.118 **
Creditor Rights	(+)			3.688 **	3.740 **	3.475 **		3.753 **
Corruption	(+)						1.750 *	2.173 **
Major Industry Group Dummies included?		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Specific Purpose Dummies included?		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations		22288	22272	22168	22152	22171	22288	22152
Adjusted R-squared		1.8%	1.8%	2.1%	2.1%	1.9%	1.9%	2.2%

TABLE 9: Developed versus Under-developed Countries

The dependent variable in all the specifications is "Number of Tranches" for Regressions (1) – (4), "Spread Range" for Regressions (5) – (8), and "Spread Ratio" for Regressions (9) – (12). The method of estimation is OLS for "Spread Range" and "Spread Ratio", and Poisson for "Number of Tranches". For the Poisson regressions, marginal effects are reported as coefficient estimates. All the variables are defined in Table 1, including the three dependent variables. Standard errors are clustered by year. Significance levels are *** for 1%, ** for 5%, and * for 10%.

		Dep. Var. = Number of Tranches (Poisson)				Dep. Var. = Spread Range (OLS)				Dep. Var. = Spread Range (OLS)			
Variables	Expected signs	Poor Countries		Rich Countries		Poor Countries		Rich Countries		Poor Countries		Rich Countries	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Borrower has Public Listing (dummy)	+ Tranches - Range	-0.190 ***	-0.214 ***	-0.161 ***	-0.161 ***	-6.072	-5.960	-19.463 ***	-17.684 ***	-2.017	-2.190	-3.041 ***	-2.204 ***
Investment Grade (dummy)	- Tranches - Range	-0.302 ***	-0.247 ***	-0.396 ***	-0.393 ***	-24.376 ***	-21.919 ***	-64.895 ***	-63.626 ***	-1.755 *	-1.061	-6.394 ***	-5.710 ***
Log(Deal Amount)	+ Tranches ? Range	0.223 ***	0.222 ***	0.148 ***	0.141 ***	6.995 ***	7.032 ***	7.890 ***	6.850 **	0.646	0.688	0.347	-0.146
Borrower is a Corporation (dummy)		-0.096 *	-0.092 *	0.052 ***	0.048 ***	-5.421 *	-4.712 *	0.703	-0.494	0.869	0.918	0.888	0.303
Borrower's Rating is not Available (dummy)		0.795 ***	0.760 ***	0.357 ***	0.417 ***	-17.529 ***	-19.235 ***	-25.922 ***	-22.011 ***	-1.517 **	-1.782 **	-5.263 ***	-3.786 **
Importance of Institutional Investors in Borrower's Country	+ Tranches ? Range	0.206 ***	0.198 ***	-0.035	-0.037 *	1.097	1.143	-24.277 **	-21.095 **	-0.100	-0.257	-9.405 *	-7.379 *
Log(Real GDP per Capita in Borrower's Country)		0.015	-0.004	-0.126	-0.042	0.278	-0.189	96.155 ***	107.773 ***	-0.095	-0.295	20.475 ***	25.440 ***
Market Return 1 Month Prior to Deal Close Date		-0.428	-0.439	0.033	0.054	-55.554 *	-63.794 **	31.35	36.088	-8.846	-9.163	7.478	9.210

TABLE 9 (Continued)

		Dep. Var. = Number of Tranches (Poisson)				Dep. Var. = Spread Range (OLS)				Dep. Var. = Spread Range (OLS)			
Variables	Expected signs	Poor Countries		Rich Countries		Poor Countries		Rich Countries		Poor Countries		Rich Countries	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Common Law (English) Origin of Borrower	+ Tranches - Range	0.178 **	0.191 **	0.071 *	0.126 ***	4.510	6.198	-34.558 ***	-21.301 **	0.936	0.650	-12.227 **	-7.850 *
Efficiency of Debt Markets in Borrower's Country	- Tranches - Range		-0.004 ***		-0.008 ***		-0.117		-0.944 ***		-0.029		-0.334 ***
Creditor Rights	+ Tranches + Range		0.041 **		0.033 ***		1.213		11.800 ***		0.549 *		5.743 ***
Corruption	+ Tranches + Range		0.027 ***		0.077 ***		-0.458		8.774 **		0.348		4.826 ***
Major Industry Group Dummies included?		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Specific Purpose Dummies included?		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations		13225	13124	91791	91066	2748	2735	19573	19450	2726	2713	19562	19439
Adjusted R-squared		.	.	.	.	6.4%	6.5%	7.4%	7.9%	4.4%	4.6%	2.2%	3.0%
Log Pseudo-Likelihood		-20807	-20645	-122043	-120904	.	.		.	.	.	.	.

TABLE 10: Investment Grade Deals versus Non-Investment Grade Deals

The dependent variable in all the specifications is "Number of Tranches" for Regressions (1) – (4), "Spread Range" for Regressions (5) – (8) and "Spread Ratio" for Regressions (9) – (12). The method of estimation is OLS for "Spread Range" and "Spread Ratio", and Poisson for "Number of Tranches". For the Poisson regressions, marginal effects are reported as coefficient estimates. All the variables are defined in Table 1, including the three dependent variables. Standard errors are clustered by year. Significance levels are *** for 1%, ** for 5%, and * for 10%.

		Dep. Var. = Number of Tranches (Poisson)				Dep. Var. = Spread Range (OLS)				Dep. Var. = Spread Ratio (OLS)			
Variables	Expected signs	Non-Investment Grades		Investment Grades		Non-Investment Grades		Investment Grades		Non-Investment Grades		Investment Grades	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Borrower has a Public Listing (dummy)	+ Tranches - Range	-0.191 ***	-0.188 ***	0.054 **	-0.048 **	-21.963 ***	-20.630 ***	6.507	6.966	-3.720 ***	-2.795 ***	0.880 *	0.848 *
Log(Deal Amount)	+ Tranches ? Range	0.162 ***	0.156 ***	0.133 ***	0.135 ***	9.281 ***	8.726 ***	-6.175 ***	-6.102 ***	0.678 *	0.326	-1.121	-1.159
Borrower is a Corporation (dummy)		0.037 ***	0.034 **	-0.014	-0.017	0.083	-0.390	-13.882	-13.424	1.029	0.599	0.260	0.308
Borrower's Rating is not Available (dummy)		0.588 ***	0.608 ***	- -	- -	-22.835 ***	-23.184 ***	- -	- -	-4.149 **	-4.534 ***	- -	- -
Importance of Institutional Investors in Borrower's Country	+ Tranches ? Range	0.014	0.041	-0.037	-0.032	-1.882	1.212	1.082	1.091	-3.811	-1.595	-0.714	-0.872
Log(Real GDP per Capita in Borrower's Country)		-0.062 ***	-0.021	-0.065 ***	-0.114 ***	11.429 ***	14.023 ***	10.749 **	6.123	2.483 ***	2.874 **	1.054	1.332
Market Return 1 Month Prior to Deal Close Date		-0.010	0.009	0.095	0.063	11.199	11.463	-7.617	-3.603	5.161	5.294	-11.251	-11.714

TABLE 10 continued

		Dep. Var. = Number of Tranches (Poisson)				Dep. Var. = Spread Range (OLS)				Dep. Var. = Spread Ratio (OLS)			
Variables	Expected signs	Non-Investment Grades		Investment Grades		Non-Investment Grades		Investment Grades		Non-Investment Grades		Investment Grades	
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Common Law (English) Origin of Borrower	+ Tranches - Range	0.107 **	0.141 ***	-0.048 *	-0.046	-17.503 **	-13.053 *	-14.050	-20.195	-7.946 *	-7.988 *	-0.879	-0.591
Efficiency of Debt Markets in Borrower's Country	- Tranches - Range		-0.006 ***		-0.0001		-0.442 ***		0.295		-0.130 **		-0.015
Creditor Rights	+ Tranches + Range		0.049 ***		-0.013		6.122 **		-1.823		4.018 **		0.280
Corruption	+ Tranches + Range		0.043 ***		0.036		3.917 *		1.671		2.394 **		0.008
Major Industry Group Dummies included?		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Specific Purpose Dummies included?		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations		94385	93654	10631	10536	20347	20225	1974	1960	20318	20196	1970	1956
Adjusted R-squared		.	.	.	.	6.5%	6.7%	5.2%	5.4%	1.8%	2.3%	2.7%	2.7%
Log Pseudo-Likelihood		-130728	-129530	-12689	-12572	.	.		.	.	.	.	.