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Why Larger Lenders obtain Higher Returns: Evidence from Sovereign Syndicated Loans

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Abstract

Lenders that fund larger shares of a syndicated loan typically receive larger percentage upfront fees than smaller lenders. This paper studies sovereign syndicated loan contracts in the period 1982-2006 to explore this fact. In our dataset of 288 contracts large lenders obtain on average an 8.5 percent higher return on their funds than small lenders who join the syndicate. Our analysis shows that the *return premium* large lenders receive is positively affected by anticipated future liquidity problems of the borrower and by the number of banks. Our analysis also reveals that the return premium is not used to control the number of banks that join the syndicate. We interpret our findings as indicating that the fee structure on syndicated loans incorporates anticipated costs associated with a borrower illiquidity, notably the costs of coordinating the workout and providing liquidity insurance, but that the fee structure does not serve the additional purpose of curbing these costs by reducing the number of lenders in the syndicate.

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1 Introduction

A syndicated loan is a loan financed by multiple banks.[1] Syndicated loans form the most important source of external finance for corporations and an important source of funding for sovereign borrowers in developing countries. Research on syndicated lending has picked up since the start of the new millennium. Its most important agenda has been to establish the link between borrower characteristics (such as the riskiness of borrower, or borrower opacity, etc.) on the pricing of syndicated loans, the decision whether to syndicate, and the structure of the syndicate (Dennis and Mullineaux (2000), Pichler and Wilhelm (2001), Lee and Mullineaux (2004), Coleman, Esho and Sharpe (2006), Sufi (2007), Gatev and Strahan (2008), Ivashina (2008), and Wittenberg-Moerman (2008)).

In this paper we document and analyze a feature of syndicated lending that has so far not been discussed in the literature: large lenders typically earn more than small lenders in syndicated lending arrangements. Although the interest spread received by syndicate members is the same, banks also receive fees at the time the contract is signed and these typically differ across banks. Some of these *upfront fees* are linked to specific services offered by the lenders, such as for example the arranging fee, the agent fee, or underwriting fees. Yet, other upfront fees are essentially simply paid for providing the funds, for example the participant, management, and lead management fee. In this paper, when using the term "upfront fees" (or presenting statistics about it) we only refer to the latter type of upfront fees, which are not clearly identifiable with any services offered by

[1] We will use the terms "banks" and "lenders" interchangeably. Although the set of lenders that are active in the syndicated loan market is diverse (banks, finance companies, insurance companies, etc) the most important participants are commercial banks.

the banks who receive them. These upfront fees usually increase in discrete steps in the committed amount. For example, the upfront fee may be 20 basis points for banks that commit between $5 and $10 million, 30 basis points for banks who commit between $10 and $20 million, and 35 basis points for banks that commit more than $20 million. In our dataset of 288 syndicated loans issued or guaranteed by developing countries in the period November 1982 – December 2006, the upfront fees associated with the largest and the lowest possible commitments differ on average by 20 basis points. We compute that this means that lenders in the largest bracket receive an annual rate of return (interest spread plus "annualized" upfront fee) which is on average 8.5 percent higher than lenders in the smallest bracket. While risk-aversion can perhaps explain why lenders demand a higher return for a greater commitment, the really relevant question is why borrower are willing to pay larger lenders more.

We look into one possible reason that may explain the phenomenon that large lenders obtain a higher return than small lenders. We analyze whether the return premium of large lenders can be attributed to anticipated liquidity problems of the borrower. Borrower illiquidity[2] implies costly renegotiations and rational borrowers and lenders would therefore price in such costs. Furthermore, in a context with multiple lenders banks may not carry the renegotiation costs proportionally to their funding shares. The main hypothesis we test in this paper is whether larger lenders receive higher returns because they carry a disproportionately large share of the burden of such renegotiation costs. This hypothesis has its roots in the literature on *relationship lending*. In the context of

[2] In a sovereign lending context borrowers are said to be illiquid if they attempt to renegotiate the terms of the loan rather than to repudiate the contract outright (which is termed insolvency).

corporate loans one of the functions of a borrower's *relationship lender* or *hausbank* is to act as a liquidity insurer in situations of liquidity shortages (e.g. Boot (2000) and Elsas and Krahnen (1998)). Additional evidence shows that the key element that explains whether a bank views itself as a borrower's relationship lender is the relative size of the bank's share of the borrower's externally attracted funds (Elsas (2005)). Large lenders may play a similar role in sovereign syndicated lending.

A second hypothesis we test is inspired by the observation that borrowers and lenders who appreciate the possibility of future liquidity problems will structure the loan contract so as to minimize the expected damage of disorderly workouts. Bolton and Scharfstein (1996) explain theoretically that disorderly workouts are more likely to happen as the *number of lenders* increases because of a hold-out problem between them. However, they note that smooth workouts can be counter-productive as well because the borrower may not exert sufficient effort and default for strategic reasons. Thus Bolton and Scharfstein argue that the optimal number of lenders balances the effect of the hold-out problem against the default deterrence effect of more lenders. Consistent with this Ongena and Smith (2000) show that weak creditor rights and poor legal enforcement are associated with more lending relationships, and Esty and Megginson (2003) show that the number of lenders involved in project finance is larger in constituencies with weaker creditor rights. None of these papers discusses the *mechanism* that is used to target the number of lenders, and the upfront fee schedule in syndicated loans may well be instrumental in this context. By granting higher rewards for larger commitments lenders may be incentivized to commit to higher shares of the loan, thus reducing the number of lenders in the syndicate. The second hypothesis we test is therefore that sovereign

borrowers offer a higher rate of return for greater funding commitments with the aim of reducing the number of lenders in the syndicate.

We selected our dataset to comprise loans where the problems associated with anticipated illiquidity can be expected to be large *a priori*. First, our dataset comprises syndicated loans, thus contracts with *multiple* lenders. This brings in scope for coordination problems and hold-outs between banks in workouts.[3] Furthermore, we consider *sovereign loans* and this means that defaults and work-outs are not governed by structures akin to bankruptcy codes in a corporate debt context. Sovereign loan contracts and defaults are complicated furthermore by *sovereign immunity* which results in the inability of the creditors to collateralize the assets of the sovereign debtors.[4] The sovereign loans in our dataset are all issued by, or guaranteed by, developing countries.

In our empirical model our endogenous variables are the *return premium* (of large lenders over small lenders) and the *number of joining banks*, the number of banks of non-mandated banks that join the syndicate. Our main empirical model incorporates the possibility that the causality between these two variables may be bi-directional. The return premium may be chosen in light of the anticipated number of joining banks, while it also influences commitment amounts, thus generally also affects the number of joining banks. We obtain the following results. First, we find that the upfront fee differential is

[3] As in the Bolton and Scharfstein (1996) argument. See also Morris and Shin (2004) for the context of sovereign debt markets. Preece and Mullineaux (1996), Bolton and Freixas (2000), and Brunner and Krahnen (2008) show the empirical relevance of coordination costs in terms of pricing and institutional response.

[4] Sovereign borrowers in default are however subject to at least two risks, namely the risks to loose access to international capital markets and international trade disruption which is impeded if lenders no longer grant letters of credit (e.g. Eaton and Gersovitz (1981); Cole, Dow and English (1995); Grossman and Han (1999); and Rose (2005)). Bulow and Rogoff (1989) challenged the reality of sovereign immunity and also claimed that sovereign debt is not sustainable unless creditors have the right to seize the debtor's cash and assets available abroad. See Eaton and Fernandez (1995) for a survey.

positively influenced by our proxies for the likelihood of liquidity problems. Furthermore we find that the return premium is positively affected by factors that tend to aggravate coordination problems of lenders in case of renegotiation. These factors are the number of lenders, and the presences of informational issues between the lenders and the borrower. The probability of borrower insolvency, which is of course very important for the pricing of loans, does not explain the return range. These finding suggest that large banks are compensated upfront for potential services provided ex post, including liquidity insurance and coordinating workouts. These services are usually associated with relationship lending in a corporate lending context. Turning to the second hypothesis, our estimates do *not* support that the return premium is used as an instrument to affect the number of banks that join the syndicate. The number of joining banks is essentially explained by the size of the loan and by the amount of liquidity in the credit market.

The most closely related paper to ours is Gatev and Straham (2008), who study the impact of anticipated liquidity needs of borrowers on the composition of loan syndicates. They conclude based on their analysis of corporate syndicated loans that "syndicate participants specialize in liquidity-risk management while lead banks manage lending relationships." Our main result that anticipated borrower illiquidity are reflected in the loan pricing is consistent with these findings even though "liquidity needs" of borrowers may have quite different consequences in corporate and sovereign debt markets. Corporate loan facilities are frequently *loan commitments* and the borrower draws on them in case of liquidity needs. In contrast, in our dataset of sovereign syndicated loans to developing countries *term loans* are the most frequently encountered. In this case liquidity needs of borrowers, if severe enough, translate into defaults and

renegotiations. Hallak (2008) is the first paper to show that the pricing of loans is affected by the likelihood of illiquidity of the borrower in a sovereign debt context. While his analysis confirms the findings of existing research that anticipated liquidity problems do not affect the loan spreads of sovereign debt contracts, he also finds that proxies of liquidity problems do affect the upfront fees banks. Our paper builds on Hallak's findings using a syndicated loan dataset. It is the first to analyze why large lenders earn more than small ones.

The rest of the paper is organized as follows. In the next section we describe our dataset of sovereign syndicated loans and document the characteristics of the fees received by banks. We present the empirical strategy in Section 3. Section 4 presents the main results and Section 5 several robustness tests. The last section concludes.

2 The Data and the Return Premium of Large Lenders

Our main data source for the syndicated loan contracts is *Thomson One Banker*. We selected all foreign-currency denominated syndicated loans issued or guaranteed by sovereign borrowers from developing countries[5] between November 1982 and December 2006. The start of this time period is marked by the starting date of dataset *Thomson One Banker*. Sovereign borrowers are central governments, ministries, or central banks. In our dataset, in case of guarantees by sovereigns, the beneficiaries are local authorities or state-owned firms often utility firms, grain boards, and import-export banks. Almost all loans are in US dollars.

In the sample period, sovereign entities from developing countries issued or

[5] The World Bank defines *developing countries*, countries in which 2006 Gross National Income per capita is less than $11,116.

guaranteed 1,549 loans. Of these 1,549 loans, 1,314 were reported as completed and publicly syndicated. Of these 1,314 observations, we kept variable interest rate loans only. This is the standard approach in the literature on syndicated loans as it avoids that the researcher has to judge which part of the interest rate reflects the risk-premium applied to the borrower. We removed all loans with insufficient information regarding variables we use in our analysis, namely interest spread, loan amount, lifetime, upfront fees (but see below), and the identity of the banks in the syndicate. In this last step we lost many observations.

Unfortunately, *Thomson One Banker* suffers from lack of accuracy when it comes to documenting the composition of the syndicate and the upfront fee schedule in most contracts.[6] The electronic report of upfront fees and banks is often poor and unreliable. For instance, frequently only the highest or the lowest upfront fee is reported and errors have been made in labeling the many reported fees. We therefore manually checked each observation that was left over using various issues of the *International Financing Review*, i.e. the most important professional magazine on syndicated lending for practitioners, as well as several news databanks such as Dow Jones' *Factiva* and *Lexis Nexis*. In the process of our check we managed to extract the necessary information on a few loan contracts which were not reported in *Thompson One Banker*. On the other hand, our screening led to the loss of quite a few non-representative observations such as those that were part of renegotiation packages (e.g. Brazilian loans issued in the 1980's). We also screened out loans that were not publicly syndicated after all (so-called "club loans"), and

[6] This problem is common to other frequently-used datasets such as LPC *DealScan* and Euromoney *Loanware*. We actually believe that *Thomson One Banker* provides the best quality reports in terms of our variables of interest.

those we found out to be "sponsored" or partially guaranteed by firms from developed countries.

Perhaps the most important reason for manually checking the observations was to determine when exactly the banks had joined the syndicate. Let us clarify a minute why this is important by describing the stages of a syndication process. Usually loan syndications proceed in two stages (see e.g. Rhodes (2004)). During the *pre-mandate stage* the borrower searches for an arranger or a set of arrangers trying to secure a draft lending agreement or mandate. In the *post-mandate stage* or *general syndication stage*, the arrangers of the loan actively search for additional syndicate members. The general syndication stage ends when the borrower and all banks in the completed syndicate sign the loan contract.[7]

The upfront fees schedule is announced at the start of the general syndication stage. It contains the details of the fees banks will receive if they commit funds. Thus, the banks that join during this stage receive an upfront fee purely based on the fact that they provide funds. In contrast, at least some arrangers are actively involved in activities such as screening the borrower, arranging the loan, and often also underwriting the loan. We are interested in finding out why the pay of banks that join in the syndication stage increases in the amounts they commit. Thus, returning to our manual check of the observations, the main reason for manually checking each observation was to determine whether banks had joined in the pre-mandate phase or rather during the general syndication stage. Usually this is clear from the titles awarded to the banks. For example,

[7] What has been described is an outline of a typical process prior to the signing of a syndicated loan agreement. Sometimes enough syndicate members are found by the end of the pre-mandate stage so that a contract can be signed immediately. These loans are called "club loans". It also happens that there are two general syndication stages.

managers, co-managers, and participants always join the syndicate after the fee structure is made public. However, for example, co-arrangers usually join the syndicate in the syndication stage, but sometimes also beforehand. Our dataset eventually includes 288 loans issued by sovereign borrowers from 32 developing countries.

Table 3 describes several statistics of the contracts in the final sample. There is no need to discuss each variable but let us point out a few stylized facts. First of all, the average loan size of $181.3 mln (about $260 million in 2008 USD) is quite substantial. Second, the *lifetime* of the loan and the *average lifetime* (essentially the duration of the principal repayments) are 5.7 and 4.3 year, respectively, with quite a bit of variation across loans. Third, the average bank syndicate is quite sizable both in terms of the number of banks that join during the general syndication stage (19.6 banks, on average), as well as measured by the total number of banks (23.5, on average) who sign the contract with the borrower.

Next let us discuss the facts on the compensation of banks. For the vast majority of observations, the interest spread represents the spread over the 6-month USD Libor. The upfront fees are quite substantial. The minimum and maximum upfront fees (received by the smallest and largest banks who join the syndicate during the general syndication stage) are on average 32 and 52 basis points, respectively. Upfront fees have a quite notable impact on the all-in margins obtained by lenders. To compute the minimum and maximum all-in margin, the minimum and maximum upfront fees have essentially been spread out over the average lifetime of the loan (i.e. “annualized”), and the result is added to the interest spread. We can compute that the lowest and highest “annualized” upfront fees constitute on average 12.2 and 20.7 percent of the minimum

all-in-margin, respectively. This range lies a little bit below the 25 percent that Hallak (2008) finds in his dataset of (non-syndicated) sovereign loans. Yet, observe that in Hallak (2008) the lenders provide services ex ante, besides funds.

Finally, the *return premium* is the difference between the maximum and minimum all-in margins expressed as a fraction of the minimum all-in margin, that is, we define for each facility:

$$\text{Return premium} = \left(\frac{\text{all - in margin}_{\text{high}} - \text{all - in margin}_{\text{low}}}{\text{all - in margin}_{\text{low}}} \right)$$

The *return premium* represents the difference in the rate of returns of those lenders who make a commitment in the highest bracket and those who make a commitment in the lowest bracket. The average *return premium* is 8.52%. This means that the largest lender in the syndicate receives 8.52% more than the smallest lenders, annually. The *return premium* varies substantially across observations. The lowest *return premium* is 0.86% while the highest is 45.84%.

3 The empirical strategy

As explained in the introduction we would like to test two hypotheses. In this section we state and discuss these hypotheses. We then present our empirical model.

3.1 Hypotheses

Hypothesis 1: *The return premium compensates lenders who commit large amounts for a set of services traditionally associated with relationship lending, for example, providing liquidity insurance, and coordinating the lenders in time of liquidity shortages.*

Hypothesis 1 has been inspired by evidence from corporate credit with multiple

lenders. In corporate loan markets the monitoring role is associated with the borrower's *relationship lender(s)* or *hausbank(s)*. Liquidity insurance is also a principal service provided by relationship banks (e.g. Elsas and Krahnen (1998) and Boot (2000)). In a multivariate empirical analysis, Elsas (2005) finds that the main factor explaining whether a bank is identified by itself and by others as the borrower's relationship lender is whether this bank carries the largest share of the borrower's debt. The time length of the lending relationship is not a significant determinant.

Empirical studies on *syndicated* loans also emphasize a role for the lead banks in the bank syndicate in terms of screening and monitoring the borrower (Dennis and Mullineaux (2000); Lee and Mullineaux (2004); Sufi (2007)). For example, the lead banks of the syndicate hold a larger share of the loan as the amount of information about the borrower is smaller and credit risk is relatively higher. These studies also document evidence that the banks that hold the largest stake of the loan have a monitoring function over the lifetime of the syndicated loan.

All studies above focus on corporate credit in a context of multiple lenders. However, in sovereign debt markets the same forces likely play a role and likely to a greater extent as defaults and work-outs are not governed by structures akin to bankruptcy codes in a corporate debt context. Furthermore our dataset only contains loans to developing countries. We therefore have:

Empirical implication 1: *Anticipated liquidity shortages tend to positively affect the return premium.*

Based on Hypothesis 1 we would additionally predict that the anticipated number of banks that join the syndicate positively affects the return premium. While the

anticipated number of banks does not necessarily increase the *likelihood* of liquidity problems of the borrower, it does tend to increase coordination costs between the syndicate members *if* the borrower and the lenders ever renegotiate the loan.[8] Under Hypothesis 1 large lenders carry more of the burden of these coordination costs than small lenders such that:

Empirical implication 2: *The (anticipated) number of banks that join the syndicate tends to positively affect the return premium.*

The word "anticipated" has been put in brackets in Empirical implication 2. Hypothesis 1 really bears on the *anticipated* number of banks that will join the syndicate, a variable we do not observe. However, as long as the *anticipated* number of joining banks carries at least some weight towards explaining the *actual* number of joining banks, then we can use the latter variable as a proxy for the former and we have obtained a testable prediction.

Our second hypothesis is inspired by the observation that borrowers and lenders that recognize the possibility of future liquidity problems may structure the loan contract to as to minimize the expected damage of disorderly workouts. This suggests the relationship between the number of banks and the return premium may be bi-directional.

Hypothesis 2: *The return premium is aimed at targeting the number of banks that join the syndicate.*

The evidence of Petersen and Rajan (1994), Ongena and Smith (2000), Esty and

[8] Petersen and Rajan (1994), Ongena and Smith (2000), Esty and Megginson (2003), and Brunner and Krahnen (2008). However, Schure, Scoones, and Gu (2005) posit that syndicates for better risk diversification *within* industries, and they show that this aligns the interests of banks if borrowers default.

Megginson (2003), and Brunner and Krahnen (2008) points to the importance of the number of banks in determining coordination costs (besides other institutions, such as bankruptcy legislation, or "bank pools" in Germany). However, there is no research that touches upon the mechanism through which the number of lenders is targeted and this is a non-trivial issue in the context of syndicated lending. The upfront fee schedule may possibly play a role in this context. Specifically, borrowers who wish to reduce the number of lenders may do so by inviting greater commitments by increasing the upfront fee offered in return for large commitments. The prediction would hence be that the return range and the number of lenders tend to move in opposite directions when controlling for loan size and other factors. Note that this possible role for the return range is complementary with its potential role according to Hypothesis 1.

Empirical implication 3: *Higher values of the return premium tend to reduce the number of banks that join the syndicate.*

3.2 The empirical model

Our main model looks as follows:

$$\begin{aligned} Log(Return\ premium_{i,j,t}) \;=\; & Constant1 + \psi_1\, Number\ of\ joining\ banks_i \\ & + \psi_2\, Reserves/Short\text{-}term\ debt_{j,t} + \psi_3\, Std.\ Dev.\ income\ growth_{j,t} \\ & + \psi_4\, Long\text{-}term\ debt/GNP_{j,t} + \psi_5\, GDP\ growth_{j,t} + \psi_6\, Investment_{j,t} \\ & + \psi_7 Political\ stability_{j,t} + \psi_8\, log(GDP_{j,t}) + \psi_9\, Government\ size_{j,t} \\ & + \Psi_{10}\, Dummies1_{j,t} + Error1_{i,j,t} \end{aligned} \quad (1)$$

$$\begin{aligned} Log(Number\ of\ joining\ banks_{i,,j,t}) \;=\; & Constant2 + \varphi_1 Return\ premium_i \\ & + \varphi_2\ Credit\ market\ illiquidity_i + \varphi_3 Log(Loan\ size_{\ i}) \\ & + \Phi_4\, Dummies2_{\ i} + Error2_{i,j} \end{aligned} \quad (2)$$

In Equations 1 and 2 subscripts *i* are used for observations at the loan facility level,

subscripts *j* to indicate the country of the sovereign borrower, and *t* the year. Lower-case Greek letters indicate scalars, while the two upper-case letters represent vectors of coefficients.

The *number of joining banks* is the number of banks that joined the syndicate during the general syndication phase.[9] According to Hypothesis 1 the sign of the *number of joining banks* in Equation 1 is positive, i.e. $\psi_1>0$ (Empirical implication 2).

All other variables in Equation 1 are macroeconomic and political indicators at the country level. The choice of the macroeconomic indicators and their interpretation is in line with the literature on international sovereign debt, e.g., Boemer and Megginson (1990), Cline (1995), Eichengreen and Mody (2000), Block and Vaaler (2004), Hale (2007), Ciarlone, Piselli, and Trebeschi (2008), and Hallak (2008). *Reserves/Short-term debt* is the amount of foreign currency reserves available to the government and central bank of the sovereign borrower divided by the outstanding amount of public and publicly guaranteed debt denominated in foreign currencies and with a lifetime less than a year (i.e. short-term). *Reserves/Short-term debt* is a standard proxy for borrower liquidity because an increase improves the ability of the sovereign borrower to weather temporary financial troubles, thus reducing the likelihood that the borrower needs to renegotiate its outstanding debt. According to Hypothesis 1 we would expect *Reserves/Short-term debt* to have a negative impact on the *return premium* ($\psi_2<0$). Another variable which may affect the likelihood of short-term liquidity shortages is *St. Dev. GDP growth*, that is, the standard deviation of the GDP growth rate in the five years prior to year the loan is

[9] The description of the variables below is not fully comprehensive, however the reader is hereby referred to Tables 1 and 2 which does contain a comprehensive listing plus references to the data sources.

issued. Generally greater values of *St. Dev. GDP growth* mean a greater likelihood of a temporary liquidity shortage. Hypothesis 1 would thus suggest its coefficient is positive ($\psi_3>0$). In Lee (1991) *St. Dev. GDP growth* is used as a proxy for potential informational issues, rather than illiquidity. For reasons explained below (see the discussion surrounding our explanatory variable *GDP*), the expectation regarding the sign of the coefficient of *St. Dev. GDP growth* would also be positive if Lee's (1991) interpretation is correct.

Having discussed illiquidity, let us next turn to the variables that attempt to capture the likelihood of *insolvency*, in which cases the sovereign borrower feels its long-term prospects do not justify debt repayment and decides to repudiate the contract. The empirical literature has demonstrated over and over again that insolvency is an important determinant for the interest spread and the all-in margin. However, Hypothesis 1 and 2 have no clear prediction as to impact of insolvency on the *income premium*. Our model includes the insolvency variables as a checks-and-balance. Were we to find a distinct impact of the likelihood of insolvency on the *income premium* this might signal we have missed a hypothesis. For instance, it could be that the borrower needs large lenders for the provision of a particular service above and beyond the services they offer in workouts (Hypothesis 1), and that at the same time attracting large lenders requires higher compensation in light of risk-aversion.

Equation 1 contains the following proxies for borrower insolvency. *Long-term debt/GNP* is the ratio of the total amount of public and publically guaranteed long-term debt to GNP (denominated in a foreign currencies). *GDP growth* is the average growth rate of GDP in constant local currency unit over the previous five years. *Investment* is the

investment share of GDP of the country of the sovereign borrower. *Political stability* is the number of years that have passed since the most recent political regime change (think of for example, a transition from a dictatorship to democracy). Regime shifts increase the chance that governments repudiate their outstanding sovereign debt, which suggests the variable is inversely related to the likelihood of insolvency.

Finally, let us discuss the other controls we have included. The theoretically most important control is *GDP*, the GDP of the sovereign's country in constant 2000 US dollars. There are two reasons why there may be a negative relationship between *GDP* and the return premium ($\psi_8<0$). Both have to do with the fact that developing countries with a higher *GDP* tend to feature more prominently in the international capital markets. First, bigger players may be better known, and therefore suffer less from potential informational issues, just as borrower size is often associated with fewer information asymmetries in corporate credit markets (e.g. Diamond and Verrecchia (1991) or Bharat et al. (2007). See also the discussion by Sufi (2007)). We know from Morris and Shin (2004) and Brunner and Krahnen (2008), among others, that informational issues make coordination problem between agents worse, hence renegotiations more costly. In sum, greater *GDP*, thus few informational issues suggests $\psi_8<0$. A second reason why the relationship between *GDP* and the return premium may be negative is that countries with higher *GDP* are more prone to tap the international debt markets frequently such that default (be it to renegotiate or to repudiate) is more costly for such countries. Greater GDP thus improves fiscal discipline, reducing anticipated renegotiation costs and return premiums.

Government Size is the government's share of GDP of the country. *Government*

size may be relevant, for instance because a country with a larger *Government size* may be less likely to be willing to, or able to, raise taxes to service debt. If this, arguably far-fetched story were true, greater values of *Government size* would be associated with a greater likelihood of insolvency; but also a greater likelihood of illiquidity, thus greater values of the return premium. The *Dummies* in Equation 1 are a vector of dummy variables comprising *dFirm*, indicating whether the borrower is a (publicly guaranteed) firm; *dTax Spare*, indicating whether the interest payments received by the banks are not subject to taxation (in some countries); *dWorld Bank Co-financing*, indicating the World Bank finances or co-finances a tranche of the loan; *dTrade*, indicating the purpose of the loan is trade finance; *dGrace*, indicating the borrower has been granted a grace period; and *d1982-1983* for the years (Latin American sovereign debt crisis). These dummies were included because there are either theoretical considerations why the dummies would potentially matter, or because our estimations repeatedly showed the dummies were significant and raised the explained variation in the data.

Next let us discuss the variables of Equation 2. *Credit market illiquidity* is the yield spread in basis points between representative portfolios of US 30-year Corporate BAA Bonds and 30-year US Treasury Bonds. A larger value of the yield spread indicates that, on the whole, lenders are more cautious in terms of increasing their credit risk exposure. Such "unwillingness" to lend may mean smaller individual commitments, so that we anticipate *Credit market illiquidity* has a positive effect on the *number of joining banks* ($\varphi_2>0$). *Loan size* is the size of the loan facility expressed in 1995 US dollars. Petersen and Rajan (1994), Ongena and Smith (2000) and Machauer and Weber (2000) have shown that the loan size is an important determinant of the number of lenders, so

that we predict $\varphi_3>0$. We added two dummies, namely *d1982-1983* (see above) and *dRefinance*, with becomes 1 if our data indicates the purpose of the funds is to refinance an existing loan which is about to mature. Borrowers that refinance their loans have a tendency to work with (a subset of) their existing lenders.

3.3 Estimation

Above we presented theoretical arguments that suggest that our two endogenous variables *return premium* and *number of joining banks* may be co-determined. However, Hausman tests for endogeneity failed to reject that the Number of joining banks is exogenous in Equation 1, and that Return premium is exogenous in Equation 2. We have therefore estimated Equations 1 and 2 both as a system of equations, as well as using two separate OLS estimations. We use 2SLS as our systems estimator because it is more robust to potential specification errors than 3SLS (see e.g. Wooldridge (2002, pages 198-199). The 2SLS results are in the first two, and the OLS results in the last two columns of Table 4. We will discuss the regression results in the next section.

4 Results

4.1 Anticipated liquidity problems and the return premium

According to Empirical implication 1 of Hypothesis 1 the *return premium* depends positively on proxies for anticipated liquidity problems of the sovereign borrower when adequately controlling for other relevant factors. Our findings in Table 4 are consistent with this prediction. Both the 2SLS and the OLS results suggest that *Reserves/Short-term debt* (our measure for liquidity) and *St. Dev. GDP growth* (illiquidity) are significant and have the right sign. The values of the coefficients are almost the same for the 2SLS and

OLS estimation.

Empirical implication 2 predicts that the (anticipated) number of joining banks tends to increase the return premium, since an increase in the number of banks generally increases the cost to coordinate workouts; a cost which is carried disproportionally much by larger banks according to Hypothesis 1. Our findings are also in support of this prediction of Hypothesis 1. Table 4 makes clear that the *number of joining banks* has a significant positive coefficient. The estimated coefficients with 2SLS and the OLS are all of the same order of magnitude. Our estimates furthermore suggest that information asymmetries increase the income range. Indeed, Log(GDP), which, so we explained above, has an inverse relationship with the information asymmetry between the borrower and the lenders, has a negative and statistically significant coefficient. This finding is consistent with Morris and Shin's (2004) analysis and the findings of Brunner and Krahnen (2008) that show that informational issues increase coordination problems between lenders.

In sum, our results show strong support for Hypothesis 1. Lenders appear to anticipate potential liquidity problems of borrowers and recognize that large lenders will step up in case of renegotiations and carry a disproportionally large share of the costs associated with renegotiation. Though syndicated lending arrangements do not explicitly bind larger lenders to become relationship lender(s), these lenders may have the incentives to take the lead, analogous to the standard public goods result that agents with a large stake tend to provide a disproportionally large share of a public good. It may furthermore be that large lenders may be in a better position to pressure other banks and the borrower into signing a new agreement. Lending is a repeated game and larger

lenders who respond in a way that is inconsistent with their perceived role of "special" lender may lose reputational capital (see e.g. Sharpe (1990) or Panyagometh and Roberts (2008)).

One particular expectation the "market" seems to hold about larger syndicate members seems to be coordination of workouts with the borrower. This story is consistent with past experience of sovereign bank debt renegotiation. For instance, JP Morgan helped coordinate lenders Korean Government in 1997 (see e.g., Morris and Shin, 2004). And Citibank Vice Chairman, William R. Rhodes, chaired most of the "London Clubs" of Latin American countries in the 1980's (Cline, 1995).

4.2 The return premium and the number of joining banks

Hypothesis 2 suggests that the number of banks that join the syndicate depends negatively on the *return premium* when adequately controlling for other relevant factors (Empirical implication 3). However, Column 2 of Table 4 shows that 2SLS yields a *positive* (albeit statistically insignificant) estimated coefficient of the *return premium*. The OLS results reported in Column 4 seem to even suggest that the *return premium* has a significant and positive impact on the *number of joining banks*. However, such an causal interpretation would be premature at best, in light of our earlier findings in support of Hypothesis 1 that predicts a positive correlation between these two variables.

Either way, the 2SLS estimation leads us to reject Hypothesis 2. This result is *not* to be interpreted as suggesting that arranger(s) do not target the size of syndicates, and it does not go against the accepted wisdom that informational issues and lender coordination are mitigated by entertaining fewer banking relationships (e.g., Petersen and Rajan (1994), Ongena and Smith (2000), Esty and Megginson (2003), Brunner and

Krahnen (2008)). The correct interpretation of our failure to accept Hypothesis 2 is simply that our findings do not support the hypothesis that the *return premium* is the instrument that is used to target the size of the syndicate. This leaves open whether or not arrangers target a given syndicate size.

Our 2SLS and OLS results point in the same direction as to the other coefficients of Equation 2. First, $\varphi_2>0$: *Credit market illiquidity* has a positive effect on the *number of joining banks*. Second, $\varphi_3>0$: the size of the facility has positive impact. Both these findings suggest that banks are risk-averse and limit their exposure to any particular sovereign borrower. Furthermore, we find that $\varphi_4<0$, that is, refinancings of loans are associated with a decrease in the number of banks. One potential reason for this finding may be that refinancings are associated with improved track records of borrowers (who after all pay off their old debt). If this interpretation is correct, then refinancings are associated with lower risk, such that risk-averse banks tend to increase their commitments. The finding that $\varphi_4<0$ would thus again be consistent with risk-aversion of the lenders.

5 Robustness analysis

5.1 General discussion

How robust are the regression results of the previous section? We have tried out a variety of alternative specifications, each time excluding or including some variable(s). This exercise tended to yield similar estimates for the remaining coefficients. In cases where certain estimated coefficients changed drastically this coincided either with the omission of variable that was important in terms of its contribution to the R^2, or it concerned a

variable for which we found it intuitive to expect a substantial degree of correlation with the variable(s) the coefficient(s) of which underwent substantial change.

We also estimated Equation 1, our main equation, using the robust regression option *rreg* of *STATA*, that is, the estimator by Hamilton (1991) which is based on an iterative procedure whereby observations with high residuals in early iterations are assigned lower weights in the final regression that yields the estimates. The results of the *rreg* estimation are reported in the first column of Table 5. A comparison of the *rreg* estimates to the Equation 1 estimates in Table 4 (first and third columns) shows that the estimated coefficients usually do not differ more than 20 percent of their 2SLS and OLS estimates. In all cases the signs of the coefficients stay the same, and significant coefficients remain significant and insignificant ones insignificant.

Finally, we estimated Equation 1 using a reduced sample of observations. In our original estimates we used dummy variables to control for the presence of the World Bank co-financing in tranches of the credit facility and/or the inclusion of tax-spare clauses. However, there are merely 24 loans for which one of these dummies becomes 1 in our dataset and we found these observations to be somewhat idiosyncratic and were generally associated with somewhat higher residuals. The results without these 24 observations are reported in the second column of Table 5. They are similar to the results reported in Column 3 of Table 4.

5.2 The indicator for borrower illiquidity

The liquidity indicator *Reserves/Short-term debt* plays a key role in our analysis. While this variable is the most commonly-used measure of liquidity in the sovereign debt literature, some studies have used a liquidity indicator based on the amount of debt

serviced by the country over a given period. Substituting *Reserves/Short-term debt* by *Debts service/Exports*, i.e. the ratio of total external debt service to exports of good and services of the country of the sovereign borrower, does not materially affect our results. In the third column of Table 5 we report the estimation results of a specification which is identical to Equation 1 apart from the chosen liquidity proxy. Observe that the estimated coefficients are quite similar to the estimates reported in the first and third columns of Table 4.

5.3 Beyond the number of joining banks

The idea behind Hypothesis 2 was that contracting parties who appreciate the possibility of liquidity problems of the borrower, structure the loan contract so as to minimize the expected negotiation and coordination costs of workouts. Bolton and Scharfstein (1996) and others have argued that reducing the number of lenders is one possibility to reduce the costs of workouts. Hypothesis 2 thus investigates whether the *return premium* is the instrument the arranger or arrangers use to target the number of banks that join the syndicate and our analysis fails to support this hypothesis. However, it could be that the *return premium* does not so much target the number of joining banks, as well as the overall size of the bank syndicate (i.e. including the arrangers and the agent bank). In line of this reasoning we substituted the endogenous variable in Equation 2 by the *total number of banks*. The OLS estimates of this model are found in the last column of Table 5. The estimated coefficients are remarkably similar to the OLS estimates of Equation 2 (Last column of Table 4). We have also substituted the *number of joining banks* in Equations 1-2 by the *total number of banks* and estimated this system using 2SLS. This also yielded similar results as the ones reported in columns 1 and 2 or Table 4. Thus,

there is a close resemblance between explaining the number of banks that join the syndicate and the total size of the syndicate, even in terms of magnitudes of the effects of variables.

Does a careful choice of the return range perhaps target something other than the number of lenders? While in Bolton and Scharfstein (1996) coordination costs are reduced by reducing the number of lenders, it is a small step to extend that logic to argue that a greater *concentration* of the committed amounts by banks will also achieve lower coordination costs. Presumably the power of lenders in workouts increases in their share of the syndicated loan. Thus, workouts would tend to run smoothly as long as a select number of large banks represent a high enough fraction of the loans. Holmström and Tirole (1997) and Carletti (2004) show theoretically that only part of a firm's debt needs to be financed by "monitoring firms" to deter strategic default. The remaining external capital may carry "soft" constraints. Furthermore, the evidence in this paper indicates that the larger lenders in the syndicate carry a relatively large share of the burden when it comes to coordinating banks and providing liquidity insurance in workouts.

Consequently, the actual target of the return premium may perhaps not be so much to target the number of banks, but instead a certain degree of concentration of the loan commitments. The prediction would be that higher return premiums tend to imply higher values of a concentration index such as, for example, the Herfindahl-Hirschman Index which is used in Esty and Megginson (2003), Lee and Mullineaux (2004), and Sufi (2007). Unfortunately, however, we have too few observations for which we observe the committed amounts of the banks to permit an analysis based on a concentration index.

6 Concluding remarks

The rate of return offered to banks that decide to join a bank syndicate increases in the amount they are willing to commit. This paper is the first to report and study this phenomenon. In our dataset of 288 sovereign syndicated loans to developing countries we show that the largest commitments during the general syndication stage are associated with an on average 8.5 percent higher promised annual return than the smallest commitments. It is puzzling that borrowers are willing to pay substantially more to larger lenders seen that these larger lender, or really none of the banks that join the syndicate during the general syndication stage, seem to do more than providing funds.

Our main goal in the paper was to examine the hypothesis that the return premium is a compensation for a set of services that larger lenders are implicitly expected to provide in case the borrower faces liquidity problems before the loan matures and attempts to renegotiate the contract. Such services, such as liquidity provision and lender coordination, are typically associated with relationship lenders in corporate debt markets. Our results strongly support this hypothesis: the return premium is indeed explained by the likelihood of liquidity shortages. This result is consistent with Gatev and Strahan (2008) who conclude based on their analysis of corporate syndication arrangements that in syndicates the arrangers maintain lending relationships but that participants provide liquidity insurance. We find furthermore that proxies of insolvency are not related to the return premium, but that information asymmetries are. This latter result is consistent with the existing literature that points out that information asymmetries exacerbate coordination problems amongst lenders. Taken together, the results of Gatev and Strahan (2008) and those in this paper suggest that the services traditionally associated with

relationship lenders are not provided by a single bank in the syndicate. The arranger(s) is an active participant and offers services such as screening the borrower and underwriting the deal. In all likelihood the arranger(s) stays actively involved throughout the lifetime of the loan. However, our analysis has shown that the arranger is no longer the only active bank when it comes to a workout. Our analysis has shown that large lenders offer liquidity insurance and assist in coordinating workouts.

We also looked into the hypothesis whether the return premium is used as an instrument to target the number of banks that join the syndicate. We fail to accept this second hypothesis. The main determinants of the number of joining banks are the loan size and credit market illiquidity. This finding suggests banks care to limit their exposure to individual sovereign borrowers.

There are two natural directions for future research. First, in this paper we have expressly selected our dataset to comprise loans where the anticipated liquidity problems can be expected to be large. We included only loans to sovereigns, meaning defaults are not governed by any bankruptcy code. Also we only included the relatively risky loans to sovereigns of developing countries. It would be interesting to see if the phenomenon that larger lenders earn more is significant in a corporate syndicated lending as well. An initial step in this direction has been undertaken by the authors and the initial findings suggest the return premium is indeed significant in a corporate syndicated lending context as well. However, the analysis is impeded by data problems similar to the ones that the authors tackled in the course of this study.

Our analysis has focused on merely one explanation for the return range, albeit a very interesting and important one, namely anticipated liquidity problems of the

borrower. A second direction for future research is to study other possible determinants for the choice of the return range or, more generally, the upfront fees schedule. The choice of the upfront fees schedule may, for example, affect the probability that the loan is successfully syndicated, or alter the speed with which the syndicate is brought together.

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Table 1: Description of Endogenous Variables.

Source of data: *Thomson One Banker*, Thomson Reuters.

Variable	Description
Endogenous variables in Equations (1) and (2).	
Note: Both endogenous variables are based on banks that joined the syndicate during the general syndication stage. That is, we made sure in a manual check of each loan to exclude mandated arrangers and/or underwriters as well as their respective fee payments.	
Return premium	Difference in the yearly return between the largest and the smallest syndicate members expressed as a fraction of the yearly return of the smallest members: $\frac{\text{all-in margin}_{high} - \text{all-in margin}_{low}}{\text{all-in margin}_{low}}$. *all-in margin*$_{high}$ is the sum of the interest spread and the annualized highest upfront fee. The annualization is done over the average lifetime of the loan, while the interest spread takes into account possible variations over the lifetime of the loan whenever indicated (e.g., 20bp over libor during years 1-2 and 30bp years 3-5). Annualized *all-in*$_{low}$ is the sum of the interest spread and the annualized *lowest* upfront fee.
Number of joining banks	Number of banks in the syndicated loan that were not mandated arrangers and/or underwriters.
Endogenous variables used for robustness analysis, Equation (2') in Table 5.	
Total number of banks	Total number of banks participating in the syndicate, i.e. *Number of joining banks* plus the number of participating mandated arrangers and underwriters.

Table 2: Description of Exogenous Variables.

Variable	Description
Variables affecting the likelihood of illiquidity/renegotiation	
Reserves/Short-term Debt	Ratio of the country's foreign currencies reserves relative to the amount of foreign-currency-denominated public and publicly guaranteed (PPG) debts with a lifetime of a year or less. Source: *Global Development Finance*, World Bank.
St. Dev. GDP Growth	Five years standard deviation of GDP growth (in constant local currency) in the issuing economy. For country i, year $j = 0$, $\text{St. Dev. GDP Growth}_{i,j} = \sqrt{\sum_{i=-4}^{0} \frac{(\text{GDP Growth}_{i,j} - \text{Average GDP Growth}_{0})^2}{5}}$ Source: *World Development Indicators*, World Bank.
Debt Service/Exports	Ratio of total foreign debt service relative to exports of goods and services. Source: *Global Development Finance*, World Bank.
Variables affecting the likelihood of insolvency/repudiation:	
Long-term Debt/GNP	Ratio of foreign-currency-denominated PPG debt with a lifetime of more than a year and GNP. Source: *Global Development Finance*, World Bank.
GDP Growth	Yearly growth rate of GDP in constant local currency, average over the previous five years. Source*: World Development Indicators*, World Bank.
Investment	Investment share of GDP. Source: *Penn World Data*, University of Pennsylvania.
Political Stability	Political Stability. Number of years since the most recent political regime change in the country. Source: *The Polity IV Project*, Center for Systemic Peace.
Other variables:	
GDP	GDP of the country in constant US dollars. Source: *World Development Indicators*, World Bank.
Government Size	Government Share of GDP. Source*: Penn World Tables*, University of Pennsylvania.

Table 2 (continued): Description of Exogenous Variables.

Variable	Description
Other Variables (continued):	
Credit Market Illiquidity	Yield spread between 30-year US Corporate BAA bonds and the 30-year US Treasury yield, average over the first 20 working days after the mandate date. Source: Board of Governors of the Federal Reserve System and Datastream International.
Loan size	Size of the facility in millions of 1995 US dollars. The computation is based on monthly U.S. consumption prices inflation figures provided by the U.S. Department of Labor.
Dummy Variables:	Source: Based on *Thomson One Banker* data
dRefinance	The loan refinances a previous loan (not renegotiation).
dFirm	The borrower is a firm (which is guaranteed by a sovereign).
dTax Spare	The loan includes a clause that partially or fully exempts interest payments of withholding tax.
dWorld Bank Co-financing	The loan is co-financed (but not guaranteed) by the World Bank.
dTrade	The primary purpose of the loan is "export-import financing."
dGrace	The loan includes a grace period.
d1982-1983	The loan was mandated in 1982 or in 1983.
dOversubscribed	The loan was oversubscribed.

Table 3: Descriptive Statistics of the Sample

Variable definitions are reported in Table 1 and 2.

Variable	Number of Observations	Mean	Standard Deviation	Minimum	Maximum
Loan size (millions of 1995 USD)	288	181.3	167.1	7.16	1118
Lifetime (years)	288	5.7	3.6	0.25	17.5
Average lifetime (years)	288	4.3	2.5	0.25	12.0
Number of joining banks	288	19.6	14.9	2	76
Total number of banks	288	23.5	16.2	3	81
Interest Spread (basis points)	288	94.4	81.7	3.13	450
Minimum upfront fee (bps.)	288	32.0	30.5	3.13	225
Maximum upfront fee (bps.)	288	52.0	37.3	10	275
Minimum all-in margin (bps.)	288	107.8	91.5	4.5	480
Maximum all-in margin (bps.)	288	115.9	97.1	6.5	500
Return premium (%)	288	8.52	7.81	0.86	45.84

Table 4: Main Empirical Results

The specifications of the models are found in Equation 1 and 2 in the main text. Variables are defined in Tables 1 and 2. The first two columns report the two-stage least squares (2SLS) estimates of Equations 1 and 2, and the last two columns the ordinary-least squares (OLS) estimates of Equation 1 and Equation 2, respectively. *p-values* are given in brackets and *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. Regression results for the dummies *dTrade*, *dGrace* and *d1982-1983* are not reported.

Specification:	Equations 1-2		Equation 1	Equation 2
Dependent variable:	*Log (Return Premium)*	*Log(Number of joining banks)*	*Log(Return Premium)*	*Log(Number of joining banks)*
Log(Return Premium)		0.122 [0.159]		0.193*** [0.000]
Log(Number of joining banks)	0.246** [0.017]		0.299*** [0.000]	
Reserves/Short-term Debts	-0.069*** [0.008]		-0.067*** [0.009]	
St. Dev. GDP Growth	4.974* [0.057]		5.150** [0.048]	
Long-term Debts/GNP	0.293 [0.409]		0.321 [0.362]	
GDP Growth	-0.495 [0.794]		-0.545 [0.773]	
Investment	0.007 [0.392]		0.006 [0.455]	
Political Stability	-0.006 [0.133]		-0.006 [0.107]	
Log(GDP)	-0.105** [0.013]		-0.102** [0.015]	
Government Size	0.014** [0.026]		0.015** [0.016]	
Credit Market Illiquidity		0.222*** [0.002]		0.221*** [0.002]
Log(Loan Size)		0.471*** [0.000]		0.470*** [0.000]
dRefinance		-0.345*** [0.001]		-0.327*** [0.002]
dFirm	0.198** [0.040]		0.214** [0.021]	
dTax Spare	0.940*** [0.000]		0.946*** [0.000]	
dWorld Bank Co-financing	-0.292 [0.194]		-0.297 [0.186]	
Constant	-1.264 [0.294]	0.408 [0.210]	-1.500 [0.191]	0.607** [0.013]
R-squared	32.1	44.1	32.3	44.7
Number of Observations	288	288	288	288

Table 5: Robustness Analysis

Variables are defined in Tables 1 and 2. The first column reports estimates of Equation 1 using the robust estimation method suggested by Hamilton (1991). Column 2 reports OLS estimates of Equation 1 using a dataset without the loans with either World Bank co-financing or a tax-spare clause. Column 3 reports OLS estimates of an equation obtained by replacing *Reserves/Short-term Debts* by *Debt service/Exports* in Equation 1. Column 4 reports OLS estimates of a model obtained by replacing the endogenous variable of Equation 2 by the *Total Number of Banks*. *p-values* are given in brackets and *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively. Regression results for the dummies *dTrade*, *dGrace* and *d1982-1983* are not reported.

Specification:	Equation 1	Equation 1	Equation 1'	Equation 2'
Dependent variable:	*Log(Return Premium)*	*Log(Return Premium)*	*Log(Return Premium)*	*Log(Total Number of Banks)*
Log(Return Premium)				0.151 *** [0.000]
Log(Number of Joining Banks)	0.310 *** [0.000]	0.294 *** [0.000]	0.284 *** [0.000]	
Reserves/Short-term Debts	-0.056 ** [0.032]	-0.068 *** [0.010]		
Debt service/Exports			0.017 *** [0.001]	
St. Dev. GDP Growth	5.388 ** [0.043]	4.917 * [0.065]	6.994 *** [0.009]	
Long-term Debts/GNP	0.222 [0.538]	0.425 [0.259]	0.209 [0.555]	
GDP Growth	-0.976 [0.614]	-0.346 [0.859]	0.456 [0.808]	
Investment	0.003 [0.726]	0.005 [0.535]	0.009 [0.277]	
Political Stability	-0.007 * [0.051]	-0.007 * [0.081]	-0.005 [0.160]	
Log(GDP)	-0.0868 ** [0.044]	-0.105 ** [0.016]	-0.115 *** [0.006]	
Government Size	0.017 *** [0.009]	0.014 ** [0.032]	0.014 ** [0.026]	
Credit Market Illiquidity				0.158 *** [0.007]
Log(Loan Size)				0.459 *** [0.000]
dRefinance				-0.327 *** [0.000]
dFirm	0.201 ** [0.034]	0.212 ** [0.027]	0.199 ** [0.031]	
dTax Spare	0.943 *** [0.000]	N/A	0.990 *** [0.000]	
dWorld Bank Co-financing	-0.331 [0.149]	N/A	-0.300 [0.179]	
Constant	-1.901 [0.106]	-1.406 [0.239]	-1.792 [0.103]	0.886 *** [0.000]
R-squared	-	29.5	33.4	52.0
Number of Observations	288	264	288	288