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Does Corruption Hamper Bank Lending?
Macro and Micro Evidence

Laurent Weill

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Laurent Weill[+]

Université de Strasbourg and EM Strasbourg Business School

<u>Abstract</u>

The aim of this paper is to analyze the effect of corruption in bank lending. Corruption is expected to hamper bank lending, as it is closely related to legal enforcement, which has been shown to promote banks' willingness to lend. Nevertheless the similarities between the consequences for bank lending of law enforcement and corruption are misleading, as they consider only judiciary corruption. Corruption can also occur in lending and may then be beneficial for bank lending via bribes given by borrowers to enhance their chances of receiving loans. This assumption may be validated particularly in the presence of pronounced risk aversion by banks, resulting in greater reluctance on the part of banks to grant loans. We perform country-level and bank-level estimations to investigate these assumptions. Corruption reduces bank lending in both sets of estimations. However, bank-level estimations show that the detrimental effect of corruption is reduced when bank risk aversion increases, even leading at times to situations wherein corruption fosters bank lending. Additional controls show that corruption does not increase bank credit by favoring only bad loans. Therefore, our findings show that while the overall effect of corruption is to hamper bank lending, it can alleviate firm's financing obstacles.

The aim of this paper is to analyze the role of corruption in bank lending. This investigation is motivated by the widespread evidence showing the beneficial effect of bank lending on economic growth (e.g. Levine and Zervos, 1998; Levine, Loayza and Beck, 2000). In line with this finding, a large body of research has analyzed the determinants of bank lending and has underlined the role of legal institutions such as law enforcement and legal origin (Levine, 1999; Beck, Demirgüc-Kunt and Levine, 2003; Djankov, Mc Liesh and Shleifer, 2007).

However there has been no research done on the impact of corruption on bank lending. This gap is surprising considering the strong link between law enforcement and corruption. Indeed, corruption reduces law enforcement by rendering more difficult the functioning of courts and more generally of public administration taking care of the application of laws.[2] Law enforcement plays a role in bank credit, as the ability of banks to enforce their claims against defaulting borrowers enhances their willingness to lend. Corruption is similarly expected to reduce banks' willingness to lend, as it is associated with greater uncertainty of enforcement of lenders' claims in courts in case of default.

Nevertheless the similarities between the consequences for bank lending of law enforcement and corruption are misleading, as they only consider judiciary corruption. Corruption is not limited to the misuse of public office, as made clear in its usual definition as provided by Transparency International: "the misuse of entrusted power for private gain". It can also take place in lending through bribes given to bank officials to receive a loan, as observed by Beck, Demirgüc-Kunt and Levine (2006) and Barth et al. (2008).

While corruption in public administration is expected to have a negative impact on bank credit, the role of corruption in lending is not straightforward. It can be viewed as an obstacle to finance, as it acts as a tax on loans for borrowers by increasing the cost of the loan. However, this argument assumes that the bribe is required by the bank official and yet the borrower may take the initiative to propose a bribe to enhance his chances to receive the loan. In the latter case, corruption may favor bank lending and hence have a different impact than other legal dimensions such as law enforcement.

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[2] La Porta et al. (1998) include a corruption measure among their indicators of law enforcement.

We examine the validity based on macro and micro evidence of these two contrasting views of the effect of corruption on bank lending. We perform a country-level analysis to investigate the influence of corruption at the macro level, in line with the cross-country papers on the determinants of bank lending (e.g. Djankov, McLiesh and Shleifer, 2007). We can thus check whether corruption exerts a similar impact on bank lending as do other institutional factors.

We then turn to a bank-level investigation to check on and delve deeper into our macro findings. The positive impact of corruption on lending is dependent of the borrowers' willingness to give bribes to obtain a loan. This behavior appears more likely in the presence of greater risk aversion by banks, leading to more rejected loan applications. We therefore test whether the degree of bank risk aversion affects the impact of corruption on bank lending. Furthermore, even if corruption favors bank lending by reducing banks' reluctance to grant loans, it may not be beneficial for economic growth, if it merely expands the volume of bad loans. Indeed borrowers may give bribes to bank officials only to obtain excessively risky loans. As a consequence, we check whether the effect of corruption on bank lending differs according with the quality of loans.

We thereby contribute to the literature on determinants of bank lending, but we also provide a significant contribution to the literature on corruption. Indeed this burgeoning literature has analyzed a wide range of consequences of corruption (e.g. Mauro, 1995, and Méon and Sekkat, 2005, on growth, Lambsdorff, 2003, on productivity, Wei, 2000, on foreign direct investment), but never, to our knowledge, for bank lending. In this literature, the argument that corruption may be positively associated with bank credit can be related to the "grease the wheels hypothesis" according to which corruption may be beneficial in a second best world by alleviating the distortions caused by ill-functioning institutions (Leff, 1964; Huntington, 1968). This hypothesis considers that an inefficient public administration constitutes a major impediment to economic activity and that a dose of "greasing" money may help circumvent. As a consequence, corruption may be less detrimental, or even beneficial, in countries plagued by defective bureaucracy. Under similar reasoning, our investigation checks whether corruption may grease the wheels of banks plagued with excessive risk aversion.

The rest of the paper is organized as follows. Section II presents the elements from the literature that may be related to the impact of corruption on bank lending.

Section III develops our empirical investigation at the country level. In section IV, we report the empirical tests at the bank level. We then provide some concluding remarks in section V.

II. Corruption and bank lending linkages

The key argument as to why corruption should hamper bank credit is based on the law and finance theory pioneered by La Porta et al. (1997). Legal institutions protecting banks and enforcing contracts are likely to encourage greater bank credit, by increasing banks' willingness to grant loans. In case of default by a borrower, the bank may wish to force repayment, to grab collateral or even to take control of the borrower, in the case of a corporate loan. Therefore, the institutions that empower the bank to take such actions exert an influence on the lending behavior. As corruption adds to uncertainty for banks to enforce their claims against defaulting borrowers, it should diminish their willingness to lend.

Empirical evidence supports the role of laws on the books and of law enforcement on bank credit. While La Porta et al. (1997) observe that better legal protection of creditors favors large-size debt markets, Levine (1998, 1999) and Djankov, McLiesh and Shleifer (2007) show that better legal protection of lenders is associated with a higher ratio of bank credit to the private sector to GDP in cross-country analyses. By investigating the legal determinants of loan contract characteristics, Qian and Strahan (2007) also provide some support for this view with the finding that stronger protection of creditors on the books leads to lower loan rates charged by banks.

While the latter argument focuses on judicial corruption, another argument for a detrimental impact of corruption on bank credit deals with corruption in lending. Indeed, corruption can also take place through bribes given to bank officials to receive a loan. Levin and Satarov (2000) notably explain how borrowers gave envelopes filled with cash to bank officials in Russia in the 1990s. Evidence of corruption in lending is widespread. In Russia, Levin and Satarov (2000) report figures on criminal cases launched against employees of Russian banks in the 1990s.[3] Regarding China, Barth et al. (2008) point out that 461 cases of bank fraud, each involving more than one million yuan, were uncovered in 2005. Corruption of bank officials may reduce bank

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[3] In April 2008, the Central Bank of Russia published a black list of bank managers sued for criminal activity and civil liability (Kommersant, April 2, 2008).

credit through its impact on loan demand. By increasing the cost of a loan, it acts as a tax on borrowers and so constitutes an obstacle to finance. The World Business Environment Survey (WBES) by the World Bank provides evidence on this negative effect of corruption in lending, by questioning firm managers as to whether corruption of bank officials is an obstacle for the growth of business in a cross-country survey. Based on this survey, Batra, Kaufmann and Stone (2004) observe that corruption of bank officials is considered a major or moderate obstacle by 20% to 30% of firms in regions of the world other than OECD countries.

The above-mentioned arguments share the presumption that corruption may hamper bank credit. But corruption in lending might also be beneficial for bank credit in some cases. Indeed the argument according to which corruption in lending hiders bank credit considers that the bank official exploits his power in loan granting by demanding a bribe in exchange, which increases the cost of the loan. Nevertheless, the borrower may also be inclined to give a bribe to the bank official to enhance his chances to obtain a loan. In that case, corruption in lending may favor bank credit, as corruption "greases" bank lending.

Borrowers' incentives to offer bribes to obtain bank credit should increase with bank risk aversion. As risk aversion deals with the reluctance of banks to grant loans, greater risk aversion means more rejected loan applications. As a consequence, it increases the likelihood that borrowers would pay bribes to receive loans. A theoretical argument can also be advanced to motivate the positive impact of corruption in lending on bank credit. Stiglitz and Weiss (1981) have indeed shown that adverse selection, resulting from ex ante asymmetry information between bank and borrower causes credit rationing in the sense that borrowers willing to pay greater loan rates than requested have rejected loan applications. The bank is motivated to do so to avoid adverse selection through attracting only bad borrowers. Nevertheless, the existence of credit rationing suggests that some borrowers are willing to pay more than the loan rate to obtain credit. As a consequence, they have incentives to pay bribes to bank officials to obtain the loan. One important point however is that only risky borrowers have an incentive to behave like this, in accord with the adverse selection mechanism. Indeed the safe borrowers are not willing to pay more. In that sense, by circumventing the obstacles to obtain a loan from the bank, corruption in lending might increase bank lending by favoring only bad loans.

We are not aware of any empirical support for this positive influence of corruption on bank credit. Nevertheless, the opposite view of a negative impact can be qualified by the observation of Beck et al. (2006, p.938) that "corruption of bank officials is rated as only minor obstacle" in their investigation based on WBES data on the determinants of financing obstacles in a sample of 80 countries. They notably point out that half of the surveyed firms consider corruption of bank officials not to be an obstacle. While this observation may be interpreted as the absence of corruption in lending, it may also be interpreted as supporting the idea that the presence of corruption of bank officials is not necessarily considered an obstacle to financing.

Consequently, the conflicting arguments stress the question whether the negative effect of corruption can be offset in situations where bank credit is rationed particularly owing to a high degree of bank risk aversion. There is however very little empirical evidence on this issue. In their investigation of the role of foreign bank penetration on bank credit, Detragiache, Tressel and Gupta (2008) include a measure of corruption as a control variable and observe that corruption is negatively associated with private credit. Therefore, we tackle the question of knowing empirically whether corruption fosters or hampers bank credit in the following sections.

III. Country-level analysis

This section examines the empirical impact of corruption on bank credit at the country level. To this end, we proceed to cross-country regressions of bank credit on a set of variables including corruption and a wide range of control variables.

III.1 Estimation approach

The explained variable is *Bank Credit*, defined as the ratio of total credit issued to private enterprises by deposit money banks and other financial institutions to GDP. The data are from Beck, Demirgüc-Kunt and Levine (2000). This variable is widely used in cross-country studies on bank credit (e.g. Beck and Levine, 2004; Djankov, McLiesh and Shleifer, 2007).

The explanatory variable of primary concern is corruption. We alternatively use two measures of corruption: the Corruption Perceptions Index (CPI) provided by Transparency International (*Corruption-CPI*), and the World Bank's index of corruption (*Corruption-WB*). Both indices are commonly used in studies on corruption (e.g. Méon and Sekkat, 2005). They are composite indices aggregating

surveys based on information from risk analysts and residents. As they differ in the sets of basic indicators of corruption that they aggregate and in the aggregation method, they complement each other. The CPI is available directly from the Transparency International website. It ranges from zero, the most corrupt situation, to ten, the least so. For clarity reasons, we use reverse the index scale so that higher values indicate more corruption. The World Bank's index is from Kaufmann, Kraay and Mastruzzi (2007). It ranges from -2.5 to 2.5, with higher values indicating less corruption. We rescale this index from 0 to 10 such that, again, higher values indicate more corruption.

Both of these measures treat corruption as a whole and do not distinguish between judicial corruption and corruption in lending. The World Business Environment Survey however provides information on corruption in lending. As mentioned above, this cross-country survey of firm managers includes a question on the role of corruption of bank officials as an obstacle to the growth of business. While this dataset has been used in some studies to measure corruption in lending (e.g. Beck, Demirgüc-Kunt and Levine, 2006), it suffers from a major limitation for our work, as bank corruption is considered detrimental in the wording of the question. Such a prior is completely at odds with our investigation of the relevance of this assertion, so we cannot use this measure for our estimations.

To assess the strength of the link between corruption and bank credit, we control for other potential determinants of bank credit in our regressions, following the earlier studies. As in the study by Boyd, Levine and Smith (2001) on the effect of inflation on financial development, we include the inflation rate, defined as the consumer price index growth rate (*Inflation*). As Beck, Demirgüc-Kunt and Levine (2003) have shown that latitude helps explain financial development, we include *Latitude*, defined as the country's distance from the equator. Openness to trade is also taken into account by the ratio of trade to GDP (*Trade*), following Beck, Demirgüc-Kunt and Levine (2001). Economic development is controlled with the variable *GDP per capita*, defined as the logarithm of GDP per capita.

Finally, we include variables for legal origin, which has been shown to influence financial development (La Porta et al., 1997). We add dummy variables to indicate whether the legal origin is French, German, Scandinavian, or Socialist. The dummy variable for English legal origin is dropped. We do not include a measure of law enforcement, as this is highly correlated with corruption. Nevertheless, the inclusion

of legal origin variables in the estimations enables control for the impact of law enforcement and law on the books, as legal origin is a determinant of these characteristics (La Porta et al., 1997).

The data are from the World Bank's World Development Indicators, with the exception of legal origin variables, from La Porta et al. (1999). All variables are computed as a 5-year average (2001 to 2005)[4], to smooth out business cycle effects, with the exception of constant variables controlling for latitude and legal origin. Descriptive statistics for all variables are reported in table 1.

III.2 Results

Tables 2 and 3 report the results for the cross-country regressions of bank credit, for indices of corruption from Transparency International and World Bank respectively. We performed four estimations in testing different combinations of country-level variables. The first estimation includes *Inflation*, *Latitude*, and *Trade* (column 1). The second estimation includes additionally legal origin variables. As notably shown by La Porta et al. (1997), legal origin influences law enforcement. The third estimation adds economic development (*GDP per capita*) to the initial set of variables (column 3). As the relationship between corruption and economic development gets strongly support from the literature, there is a risk that the inclusion of this latter variable eliminates the significance of the index of corruption.[5] Finally, the fourth estimation includes all country-level variables (column 4).

The major finding is the negative coefficient of the corruption variable (*Corruption-CPI* and *Corruption-WB*), which is significant at the 1% level in all regressions. The presence of legal origin variables and of economic development in the explanatory variables does not remove the significance of the corruption variable, which indicates the robustness of corruption influence on bank credit. Thus, we support the view that corruption hampers bank credit. This conclusion is in line with earlier studies on the role of legal institutions – law on the books and law enforcement - on financial development (La Porta, 1997, 1998; Levine, 1999; Djankov, Mc Liesh and Shleifer, 2007), according to which bad legal institutions hamper financial development.

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[4] Due to data limitations, both corruption indices are averaged over four years (from 2002 to 2005).
[5] For similar reasons, La Porta et al. (1997) do not include GDP per capita as control variables in their regressions of size of debt and equity markets on legal variables, including the rule of law.

In addition, all control variables are either intuitively signed or insignificant. We observe that *Inflation* is significantly negative, which is in line with the conclusion of Boyd, Levine and Smith (2001) that greater inflation reduces bank lending. *Trade* and *Latitude* are not significant in most estimations. *GDP per capita* is significantly positive, as expected, in accord with the observed link between economic and financial development (e.g Levine, Loayza and Beck, 2000). Finally, the results for legal origin variables show that the amount of bank credit is less in the French legal origin and Socialist legal origin countries than in those with English legal origin, as observed also by La Porta et al. (1997, 1999).

Next, we examine separately developed and developing countries. Corruption may differently impact bank credit in the various stages of economic development. We redo our estimations for both groups of countries, with both corruption variables. The set of control variables does not include *GDP per capita*, as economic development is taken into account with the separation of countries in two groups. We use the World Bank definition of groups of countries to divide our sample. The developed country subsample includes high income and upper middle income countries, while lower middle income and low income countries are classified as developing countries. The results displayed in table 4 suggest that the negative impact of corruption on bank development is not driven by either subsample. Indeed we observe this finding for both groups of countries and so conclude that corruption weakens bank credit in both developed and developing countries.

IV. Bank-level analysis

We have shown above that corruption hampers bank lending at the country level. But corruption in lending could enhance bank lending in some cases. This may indeed result from the eagerness of borrowers to obtain loans. In that case, corruption may contribute to increase bank lending. Such behavior should be particularly relevant in situations in which bank managers are risk-averse, as greater risk aversion reduces borrowers' chances of obtaining loans and thus strengthens their incentive to pay bribes. We now turn to a bank-level analysis to investigate these questions.

IV.1 Estimation approach

The purpose of the bank-level investigation is twofold: to check the relevance of country-level results and to analyze whether the effect of corruption on lending is

dependent on bank risk aversion. We use bank-level data from the Bankscope database of BVD-IBCA. In investigating the propensity of banks to grant loans, the explained variable is the ratio of loans to total assets (*Loans to Assets*). The explanatory variable of primary concern is again corruption, as defined as above. We use three bank-level control variables to control for bank characteristics. The ratio of deposits to total assets (*Deposits to Assets*) is included in the estimations, as the sources of financing can influence banks' lending behavior. Furthermore, we take into account bank size, measured as the logarithm of total assets (*Size*), owing to possible differences in activities between small and big banks.

Risk aversion is proxied by the ratio of bank equity holdings in excess of capital requirements to total assets (*Risk Aversion*). To compute this measure, we used information on the minimum capital to asset ratio requirement from Barth, Caprio and Levine (2004), which was updated for 2005. However capital requirements imply that banks must have a certain amount of capital relative a weighted sum of their risky assets, so that the capital adequacy ratio would be more relevant. But unfortunately this ratio is not available for the vast majority of banks in our database. Our measure of bank risk aversion however represents an improvement vis-à-vis earlier studies such as Maudos and Fernandez de Guevara (2004), which use the ratio of equity to total assets to measure banks' risk aversion. Indeed this latter ratio is a measure of capitalization rather than risk aversion, as it does not take regulation on minimum equity into account. Therefore, we improve this measure of risk aversion by considering only equity in excess to prudential minima.

We also include several country-level variables described above to control for the macroeconomic environment: *Inflation*, *GDP per capita*, and the legal origin variables. Dummy variables for each year are also included, to control for yearly effects. We adopt the Tukey box plot based on interquartile range to eliminate outliers from the sample. Banks with observations outside the range defined by the first and third quartiles that are greater or less than twice the interquartile range were eliminated for each ratio employed (loans to assets, deposits to assets, risk aversion). Our sample then included 30,520 observations (bank-year) on banks located in 98 countries. Descriptive statistics of the bank-level variables are displayed in table 1.

IV.2 Results

We start the bank-level estimations with a series of regressions of bank lending, reported in table 5. We use alternatively both corruption measures and two sets of control variables to check the sensitivity of the results. The key finding is the significantly negative coefficient of the corruption variable, which means that banks in countries with greater corruption have a lower ratio of loans to total assets. This supports, at bank-level, our conclusion for the country-level that corruption induces banks to lend less.

Turning to the control variables, we note the negative coefficient of *Risk Aversion*. This intuitive finding supports the view that the more risk-averse banks lend less. *Size* is significantly negative, suggesting that larger banks have a lower share of loans in their assets. This result is in line with the greater diversification possibilities for large banks. The negative sign of *Deposits to Assets* suggests that banks relying more on deposits are not those that do the most lending. As observed for the country-level, the inflation rate exerts a negative influence on the lending activity of banks, as shown by the negative sign of *Inflation*. Legal origin variables provide an interesting pattern, as they all are significantly positive. Therefore, banks from countries with no English legal origin have a higher ratio of loans to assets. As corruption and risk aversion are controlled, this result may come from the strongest involvement of banks in investment assets in countries with English legal origin where financial markets are generally more highly developed.

We now turn to a second set of estimations, in which we seek to examine whether the degree of bank risk aversion exerts an impact on banks' lending behavior. We consequently add an interaction term between corruption and degree of risk aversion in the estimations displayed in table 6. We observe that the coefficient of *Corruption* is still significantly negative. But the remarkable finding is the positive and significant coefficient of the interaction term *Corruption × Risk Aversion*. This supports the view that the negative impact of corruption on bank lending is reduced when the degree of bank risk aversion is greater. This finding is observed in all of the estimations.

This is a fundamental result, as it tends to qualify the detrimental effects of corruption on bank lending. Indeed, we have mentioned above that corruption in lending may come from borrowers being willing to enhance their chances to obtain a loan. In that sense, such behavior by borrowers should be more likely in the presence

of greater bank risk aversion, resulting in a lower volume of bank loans. Therefore, corruption may grease the bank officials to help borrowers obtain loans and then reduce the detrimental impact of banks' reluctance to grant loans.

A natural question that emerges from this finding concerns the existence of cases in which corruption could foster bank lending. Indeed, as greater bank risk aversion reduces the detrimental effects of corruption on bank lending, risk aversion might be great enough to allow a positive impact of corruption. In this connection, we compute the overall effect of the corruption index on bank lending. The overall coefficient of the corruption index is the sum of the coefficient for *Corruption* and the coefficient for the interaction term *Corruption × Risk Aversion* multiplied by the value of risk aversion.

Let us for instance focus on the estimation with the CPI measure of corruption and the largest set of control variables in table 6, keeping in mind that the results are similar to those for the other specifications. As the coefficient for *Corruption* is -0.009 and the coefficient for the interaction term is 0.169, the overall coefficient for the corruption index is positive for values of *Risk Aversion* greater than 0.009 / $0.169 \cong 0.053$. The analysis of our sample shows that about 17% of the observations have values of *Risk Aversion* greater than this threshold. As a consequence, our results suggest that corruption can be beneficial to bank lending when banks have high risk aversion.

Nevertheless, the observation that corruption can favor bank lending does not mean that it is associated with welfare gains. Indeed, even if bank lending has been shown to favor growth, one wonders whether increased bank lending resulting from corruption is not accompanied by an expansion of bad loans. Namely, bribes given by borrowers may help to obtain loans by circumventing excessively risk-averse bank officials. But they may also favor loans with excessive risk. Risk aversion may be optimal in the sense that bank managers adjust their degree of risk aversion according to the quality of loan applications. Therefore risk aversion could not be excessive in the sense that banks' reluctance to grant loans would result from excessive fear relative to the contents of loan applications. In that case, bank risk aversion would never constitute an impediment to "good" loans. The theoretical predictions of Stiglitz and Weiss (1981) support the view that corruption may increase bank lending by

favoring excessive risk-taking by banks and therefore the share of bad loans in their loan portfolios. As only risky borrowers are willing to pay more than the loan rate proposed by the bank, all borrowers willing to pay a bribe to bank officials to obtain a loan should be risky borrowers. In their analysis of corruption in the Czech Republic, Lizal and Kocenda (2001, p.150) observed that "In the banking sector corruption is associated with the provision of loans for unreasonable or even non-existent projects. Such practices even led to the collapse of several banks." Corruption may therefore favor bank lending by expanding the volume of bad loans.

To investigate this issue, we redo the estimations by considering the ratio of performing loans, i.e. the difference between total loans and nonperforming loans, to total assets (*Performing Loans to Total Assets*) as the explanatory variable. These regressions are displayed in table 7. The sample now includes about 10 000 observations, because of the absence of information on nonperforming loans for many observations in Bankscope. Nevertheless, the size of the sample remains satisfactory and includes enough countries (70) to perform the relevant estimations. We estimate both with and without the interaction term, and we use both measures of corruption and consider the largest set of control variables in all estimations.

The coefficient of the corruption variable is negative and significant in all estimations, meaning that corruption reduces the share of performing loans in assets. This result is in line with our finding that corruption reduces the share of loans in assets. However the key finding again is a positive and significant coefficient for the interaction term between corruption index and bank risk aversion, while the coefficient for the corruption index is significantly negative. This suggests that corruption is less detrimental to the ratio of performing loans to assets when bank risk aversion is greater.

As a consequence, our findings do not support the view that corruption may favor bank lending only by increasing bad loans. Nevertheless, the coefficient of the corruption variable is greater in absolute value in the estimations explaining the performing loans to assets ratio than in those for the loans to assets ratio. This finding suggests that corruption hampers good loans more than bad loans. To dig deeper into these results, we compute the overall effect of the corruption index on the ratio of performing loans to total assets. We again focus on the estimation with the CPI measure of corruption. As the coefficient for *Corruption* is -0.042 and the coefficient for the interaction term is 0.255, the overall coefficient for the corruption index is

positive for values of *Risk Aversion* greater than 0.042 / 0.255 $\cong$ 0.165. Only 1.1% of the observations have values of *Risk Aversion* greater than this threshold. This means that corruption increases the ratio of performing loans to assets for some banks with high risk aversion. Nevertheless, corruption does raise this ratio for far less banks than was the case for the ratio of loans to assets.

This is an important result in terms of welfare, as it supports the view that corruption may favor lending of good loans in the case of great risk aversion. Consequently, as financial development has been shown to promote growth (e.g. Levine, Loayza and Beck, 2000), corruption might facilitate growth in situations with high levels of bank risk aversion. Thus our findings are at odds with the extensive literature on legal institutions and financial development, which supports the view that bad institutions hamper financial development. Our results tend to indicate that corruption can enhance bank lending in situations where banks are strongly reluctant to grant loans, owing to risk aversion. This finding can be related to the "grease the wheels" hypothesis, according to which corruption may be beneficial in a second best world. While this hypothesis is based on the idea that corruption helps circumvent impediments induced by inefficient public administration, we provide support regarding how corruption helps circumvent bank risk aversion to obtain loans. In this sense, corruption greases the wheels of bank lending.

V. Concluding remarks

In this paper, we analyze the effect of corruption on bank lending. This neglected issue is at the crossroad of the literature on the consequences of corruption and that on the determinants of bank credit. As bank lending has been shown to favor growth, such probing furthers our understanding of the potential effects of corruption on economic development.

At first glance, corruption is expected to hamper bank lending, as corruption is associated with less protection of creditors. Nevertheless, this view only considers judicial corruption, while corruption in lending may be beneficial for bank credit if bribes given to bank employees favor the granting of the loan. Corruption greasing the wheels of banks is more likely if banks have great risk aversion, leading to more rejected loan applications.

Country-level estimations are favorable to the view that corruption hampers bank lending. Therefore macro evidence supports a similar influence of corruption on bank credit as one finds for legal determinants such as law on the books or law enforcement (Djankov, McLiesh and Shleifer, 2007). At first glance, bank-level estimations confirm this finding with a negative impact of corruption on bank lending. However additional estimations show a subtler impact, as the detrimental role of corruption is weakened when bank risk aversion increases. Corruption may be beneficial for bank lending for some high levels of bank risk aversion. In addition, we observe that corruption does not increase bank credit by favoring only bad loans.

We obtain empirical results that qualify the consensual view on the negative effects of corruption, by showing that corruption softens the financing constraints resulting from bank risk aversion. This finding that corruption greases bank officials to help borrowers to obtain loans may be related to the "grease the wheels hypothesis", according to which corruption may alleviate distortions caused by ill-functioning institutions. While this hypothesis was developed to explain how corruption may circumvent inefficiencies from defective public administration, our rationale is that corruption helps to obviate possible inefficiencies due to excessively risk-averse banks.

A possible policy implication of our findings is that countries with highly risk-averse banks may benefit in terms of increased bank lending from allowing for an expansion in corruption. This inference is however risky and incorrect. Corruption does not exert an impact on growth solely through bank credit and is thus likely to hamper growth. Furthermore, a high degree of bank risk aversion hampers bank lending and may be influenced by well-designed policies. Therefore, encouraging countries to fight corruption by considering also how to reduce excessive bank risk-aversion constitutes a safer option for enhancing bank lending. Future work could well broaden and deepen our understanding of the impact of corruption on bank lending.

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Table 1
Variables and Summary Statistics

Means and standard deviations of variables used in estimations. Sources: Beck, Demirgüc-Kunt and Levine (2000) for *Bank Credit*; Transparency International website for *Corruption-CPI*; Kaufmann, Kraay and Mastruzzi (2007) for *Corruption-WB*; La Porta et al. (1999) for *Legal Origin*; World Development Indicators for *Inflation*, *Trade Openness, Latitude* and *GDP per capita*; Bankscope for all bank-level variables except for *Risk Aversion*; *Risk Aversion* computed by the authors with bank-level information from Bankscope and information on capital requirements from Barth, Caprio and Levine (2004).

Variable	Description	N	Mean	Std Dev.
Country-level variables				
Bank Credit	Ratio of credit issued to private enterprises by deposit money banks and other financial institutions to GDP, avg for 2001-2005	138	0.4694	0.4299
Corruption-CPI	Corruption Perception Index from Transparency International, rescaled from 0 (most corrupt) to 10 (least corrupt), avg for 2002-2005	135	5.6717	2.1804
Corruption-WB	Corruption Index from the World Bank, rescaled from 0 (most corrupt) to 10 (least corrupt), avg for 2001-2005	138	4.8399	2.0416
Inflation	Consumer price index growth (in %) averaged over 2001-2005	138	5.4717	5.2605
Trade	Ratio of trade to GDP (in %), avg for 2001-2005	138	88.8505	53.4032
Latitude	Distance from equator	138	25.4574	16.9737
GDP per capita	Logarithm of GDP per capita at PPP in 2005 avg values for 2001-2005	137	8.6324	1.2914
French legal origin	Dummy variable equal to one if legal origin is French	138	0.4783	0.5013
German legal origin	Dummy variable equal to one if legal origin is German	138	0.0362	0.1875
Scandinavian legal origin	Dummy variable equal to one if legal origin is Scandinavian	138	0.0362	0.1875
Socialist legal origin	Dummy variable equal to one if legal origin is Socialist	138	0.1377	0.3458
Bank-level variables				
Loans to Assets	Ratio of loans to total assets	30,521	0.5625	0.2208
Deposits to Assets	Ratio of deposits to total assets	30,521	0.8045	0.1425
Size	Logarithm of total assets	30,521	13.3797	1.8724
Risk Aversion	Ratio of excess equity (equity-min capital requirement) to total assets	30,521	0.0051	0.0552
Performing Loans to Assets	Ratio of the difference between total loans and non-performing loans to total assets	10,544	0.5384	0.2011

Table 2
Country regressions with Corruption-CPI

OLS regressions for *Bank Credit*. Definitions of variables appear in table 1. Table reports coefficients with t-statistics in parentheses. *, **, *** denote an estimate significantly different from 0 at 10%, 5% or 1% level.

Explanatory variables	Estimations			
	(1)	(2)	(3)	(4)
Intercept	1.261***	1.099***	0.430	0.356
	(9.91)	(7.10)	(1.39)	(1.12)
Corruption	-0.139***	-0.115***	-0.113***	-0.091***
	(9.70)	(6.44)	(6.59)	(4.48)
Latitude	0.776E-3	0.004*	-0.001	0.001
	(0.47)	(1.92)	(0.84)	(0.65)
Inflation	-0.010**	-0.011**	-0.010**	-0.010**
	(2.15)	(2.26)	(2.10)	(2.24)
Trade	0.388E-3	0.636E-3	0.130E-3	0.336E-3
	(0.84)	(1.32)	(0.29)	(0.70)
French Legal Origin	-	-0.087	-	-0.112**
		(1.59)		(2.08)
German Legal Origin	-	0.219	-	0.190
		(1.64)		(1.46)
Scandinavian Legal Origin	-	-0.240	-	-0.188
		(1.64)		(1.30)
Socialist legal origin	-	-0.241**	-	-0.222**
		(2.49)		(2.36)
GDP per capita	-	-	0.088***	0.082***
			(3.03)	(2.83)
Adjusted R²	0.6089	0.6380	0.6366	0.6611
N	135	135	134	134

Table 3
Country regressions with Corruption-WB

OLS regressions for *Bank Credit*. Definitions of variables appear in table 1. Table reports coefficients with t-statistics in parentheses. *, **, *** denote an estimate significantly different from 0 at 10%, 5% or 1% level.

Explanatory variables	Estimations			
	(1)	(2)	(3)	(4)
Intercept	1.250***	1.108***	0.612*	0.484
	(10.57)	(7.65)	(1.91)	(1.49)
Corruption	-0.156***	-0.131***	-0.132***	-0.106***
	(10.45)	(7.06)	(6.91)	(4.78)
Latitude	-0.250E-3	0.003	-0.002	0.897E-3
	(0.15)	(1.24)	(1.01)	(0.40)
Inflation	-0.009**	-0.010**	-0.009**	-0.010**
	(2.00)	(2.13)	(2.01)	(2.17)
Trade	0.352E-3	0.580E-3	0.177E-3	0.367E-3
	(0.79)	(1.25)	(0.40)	(0.79)
French Legal Origin	-	-0.093*	-	-0.114**
		(1.82)		(2.22)
German Legal Origin	-	0.218*	-	0.196
		(1.68)		(1.54)
Scandinavian Legal Origin	-	-0.180	-	-0.145
		(1.29)		(1.04)
Socialist legal origin	-	-0.212**	-	-0.207**
		(2.26)		(2.25)
GDP per capita	-	-	0.067**	0.067**
			(2.22)	(2.25)
Adjusted R²	0.6297	0.6529	0.6437	0.6667
N	138	138	137	137

Table 4
Country regressions
Developed countries vs. Developing countries

OLS regressions for *Bank Credit*. Definitions of variables appear in table 1. *German Legal Origin* and *Scandinavian Legal Origin* variables have been dropped for estimations on developing countries for multicollinearity reasons. Table reports coefficients with t-statistics in parentheses. *, **, *** denote an estimate significantly different from 0 at 10%, 5% or 1% level.

Explanatory variables	Estimations			
	Corruption-CPI		Corruption-WB	
	Developing	Developed	Developing	Developed
Intercept	0.591***	0.879***	0.675***	0.934***
	(2.53)	(3.40)	(3.16)	(3.74)
Corruption	-0.054*	-0.074**	-0.068**	-0.101***
	(1.85)	(2.34)	(2.35)	(2.71)
Latitude	0.002	0.009**	0.001	0.008*
	(0.70)	(2.35)	(0.51)	(1.92)
Inflation	-0.008*	-0.011	-0.008*	-0.010
	(1.70)	(1.32)	(1.78)	(1.11)
Trade	0.653E-3	0.001	0.459E-3	0.971E-3
	(0.91)	(1.44)	(0.65)	(1.40)
French Legal Origin	0.001	-0.240**	-0.025	-0.223**
	(0.02)	(2.34)	(0.47)	(2.20)
German Legal Origin	-	0.068	-	0.077
		(0.42)		(0.48)
Scandinavian Legal Origin	-	-0.399**	-	-0.366**
		(2.15)		(2.02)
Socialist legal origin	-0.031	-0.7431***	-0.037	-0.686***
	(0.35)	(3.48)	(0.43)	(3.21)
Adjusted R²	0.0656	0.5722	0.0921	0.5861
N	75	60	78	60

Table 5
Bank regressions
Baseline estimations

OLS regressions for *Loans to Assets*. Definitions of variables appear in table 1. Table reports coefficients with t-statistics in parentheses. *, **, *** denote an estimate significantly different from 0 at 10%, 5% or 1% level. Dummy variables for years are included but are not reported.

Explanatory variables	Estimations			
	Corruption-CPI		Corruption-WB	
	(1)	(2)	(3)	(4)
Intercept	1.046***	1.039***	1.027***	1.119***
	(73.16)	(24.95)	(73.04)	(29.62)
Corruption	-0.016***	-0.006***	-0.017***	-0.011***
	(24.67)	(3.37)	(24.92)	(6.68)
Risk Aversion	-0.696***	-0.717***	-0.678***	-0.706***
	(24.97)	(24.91)	(24.28)	(24.48)
Deposits to Assets	-0.182***	-0.204***	-0.177***	-0.205***
	(18.19)	(19.51)	(17.68)	(19.71)
Size	-0.019***	-0.017***	-0.019***	-0.017***
	(26.51)	(22.40)	(26.13)	(22.15)
Inflation	-0.957E-3***	-0.004***	-0.873E-3***	-0.004***
	(9.28)	(9.38)	(8.39)	(8.99)
French Legal Origin	-	0.035***	-	0.039***
		(6.76)		(7.99)
German Legal Origin	-	0.075***	-	0.073***
		(15.58)		(15.27)
Scandinavian Legal Origin	-	0.183***	-	0.180***
		(23.15)		(23.29)
Socialist legal origin	-	0.048***	-	0.059***
		(6.65)		(8.27)
GDP per capita	-	-0.010	-	-0.017***
		(2.75)		(5.22)
Adjusted R²	0.0587	0.0754	0.0590	0.0764
N	30,521	30,058	30,521	30,058

Table 6
Bank regressions
Estimations with the Interaction term

OLS regressions for *Loans to Assets*. Definitions of variables appear in table 1. Table reports coefficients with t-statistics in parentheses. *, **, *** denote an estimate significantly different from 0 at 10%, 5% or 1% level. Dummy variables for years are included but are not reported.

Explanatory variables	Estimations			
	Corruption-CPI		Corruption-WB	
	(1)	(2)	(3)	(4)
Intercept	1.038***	1.088***	1.016***	1.140***
	(72.76)	(26.18)	(72.27)	(30.30)
Corruption	-0.018***	-0.009***	-0.019***	-0.013***
	(27.18)	(5.46)	(27.02)	(8.07)
Corruption × Risk Aversion	0.124***	0.169***	0.127***	0.178***
	(12.96)	(16.56)	(12.36)	(16.17)
Risk Aversion	-1.175***	-1.383***	-1.071***	-1.268***
	(25.40)	(28.01)	(25.35)	(28.13)
Deposits to Assets	-0.181***	-0.198***	-0.175***	-0.197***
	(18.08)	(19.05)	(17.53)	(19.05)
Size	-0.019***	-0.016***	-0.018***	-0.016***
	(25.55)	(21.65)	(25.04)	(21.41)
Inflation	-0.001***	-0.005***	-0.966E-3***	-0.005***
	(9.91)	(12.15)	(9.29)	(12.24)
French Legal Origin	-	0.038***	-	0.041***
		(7.37)		(8.43)
German Legal Origin	-	0.068***	-	0.066***
		(14.21)		(13.71)
Scandinavian Legal Origin	-	0.204***	-	0.200***
		(25.64)		(25.70)
Socialist legal origin	-	0.048***	-	0.056***
		(6.61)		(7.86)
GDP per capita	-	-0.015***	-	-0.020***
		(4.20)		(6.13)
Adjusted R²	0.0638	0.0837	0.0637	0.0844
N	30,521	30,058	30,521	30,058

Table 7
Bank regressions
Estimations with the Performing Loans Ratio

OLS regressions for *Performing Loans to Assets*. Definitions of variables appear in table 1. Table reports coefficients with t-statistics in parentheses. *, **, *** denote an estimate significantly different from 0 at 10%, 5% or 1% level. Dummy variables for years are included but are not reported.

Explanatory variables	Estimations			
	Corruption-CPI		Corruption-WB	
	(1)	(2)	(3)	(4)
Intercept	1.542***	1.521***	1.603***	1.569***
	(26.89)	(26.81)	(29.51)	(29.20)
Corruption	-0.043***	-0.042***	-0.054***	-0.052***
	(18.06)	(18.01)	(20.99)	(20.71)
Corruption×Risk Aversion	-	0.255***	-	0.302***
		(15.14)		(15.88)
Risk Aversion	-1.018***	-2.149***	-0.966***	-2.055***
	(23.20)	(24.88)	(21.99)	(25.32)
Deposits to Assets	-0.478***	-0.471***	-0.462***	-0.454***
	(31.63)	(31.45)	(30.77)	(30.59)
Size	-0.008***	-0.007***	-0.007***	-0.006***
	(7.50)	(6.76)	(7.00)	(6.18)
Inflation	-0.402E-3	-0.856E-3	0.873E-3	-0.642E-3
	(0.69)	(1.47)	(1.50)	(1.10)
French Legal Origin	0.008*	-0.006	0.002	-0.009
	(0.95)	(0.74)	(0.21)	(1.26)
German Legal Origin	0.004	-0.022***	0.020***	-0.004
	(0.49)	(2.95)	(2.67)	(0.55)
Scandinavian Legal Origin	0.063***	0.082***	0.062***	0.082***
	(5.50)	(7.20)	(5.48)	(7.33)
Socialist legal origin	0.078***	0.052***	0.087***	0.057***
	(6.46)	(4.33)	(7.29)	(4.83)
GDP per capita	-0.032***	-0.031***	-0.041***	-0.038***
	(6.53)	(6.34)	(8.46)	(8.08)
Adjusted R²	0.2092	0.2263	0.2176	0.2362
N	10,325	10,325	10,325	10,325

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