The Political Economy of Financial Innovation: Evidence from Local Governments

Christophe Pérignon * Boris Vallée †‡

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Abstract

We present an empirical investigation of the role of political incentives in the use of innovative financial products. We document that the adoption of toxic loans, a new and high-risk type of borrowing for local governments, is highly correlated with higher incentives for politicians to obtain immediate cash-flows. We also show that using toxic loans help politicians getting re-elected, mainly by allowing them to offer relatively lower taxes. Conversely, toxic loan usage is hard to empirically reconcile with politicians' *ex post* claim that they do not understand the transactions. Our findings are supportive of financial innovation amplifying agency costs within the political system.

Keywords: Financial innovation, Political Incentives, Structured debt, Toxic Loans

JEL codes: P16, H74, G11, G32

*HEC Paris - Email: perignon@hec.fr

†Harvard Business School - Email: bvallee@hbs.edu. Address: Finance Department, Harvard Business School, Baker Library 245, Boston MA02163 - Phone: 617-496-4604 (corresponding author)

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"It's a joke that we are in markets like this. We are playing the dollar against the Swiss franc until 2042."

Cedric Grail, CEO of City of Saint Etienne, France (Business Week, 2010)

1 Introduction

The political economy of financial innovation has arguably played an important role in the recent financial crisis (Rajan (2010), Zingales (2015)). The role of political incentives in the development of innovative financial products remains, however, largely debated and difficult to identify empirically. Do politicians exploit innovative financial products for implementing their own political agenda, or as often claimed by politicians afterwards, do they misunderstand these innovations? Anecdotal evidence provides some support for both of these hypotheses. To comply with Eurozone requirements, Greece and Italy entered into OTC cross-currency swap transactions to hide a significant amount of their debt. In the US, municipalities regularly use bond advance refunding that provide them with short-term budget relief at a high cost (Ang et al., 2013). On the other hand, the Libyan government made huge losses on derivatives transactions implemented with Goldman Sachs, which according to legal experts exploited the lack of financial sophistication of its client.[1] The research question we address in this paper is: does the use of high-risk innovative financial instruments by politicians results from their political agenda, or from their misunderstanding of the transactions? A corollary question is: through which channel can these instruments benefit politicians' strategies?

To address these questions we exploit the recent development of an innovative form of borrowing for local governments: structured loans. These loans have three defining

[1] *"It was readily apparent to me that Goldman had unfairly taken advantage of the LIAs [Libyan Investment Authority] lack of financial sophistication [...] and had sold the LIA $1 billion worth of derivative products that the LIA did not properly understand.* Catherine McDougall, Allen and Overy, The New York Times, October 7, 2014.

features: a long maturity, a fixed/low interest rate for the first years of the loan, and an adjustable rate that depends on the value of a given financial index (e.g., Libor, foreign exchange rate or swap rate spreads). The deferral of interest costs from the initial period to certain states of nature during the second period allows a user to shift a large share of its cost of debt in the future, therefore obtaining budget relief for the current political mandate.[2] The structured loan phenomenon has been observed in Europe, Asia, and, to a lesser extent, the US. In France alone, outstanding products represent more than EUR30 billion and bear unrealized losses estimated in the range of EUR5-10 billion (Cour des Comptes, 2011). During the recent financial crisis, as volatility spiked, the interest costs of toxic loan users increased to historically high levels and may remain high for the remainder of their lifetimes. For instance, the City of Saint-Etienne saw the annual interest rate charged to one of its major loans increased from 4% to 24% in 2010, as the latter was indexed on the British pound/Swiss franc exchange rate (Business Week, 2010). The total unrealized losses on Saint-Etienne toxic products reached EUR120 million in 2009, nearly doubling the city's nominal debt level of EUR125 million (Cour des Comptes, 2011).

In this paper, we provide empirical evidence consistent with politicians strategically using risky innovative financial products for their own interest, with four main contributions. First, we document the extent to which politicians have been implementing these risky transactions: structured loans account for more than 20% of local government outstanding debt, and more than 72% of the 300 largest local governments use structured loans. Among these structured loans, 40% can be classified as toxic.

Second, we show that the propensity, the size, and the timing of these transactions vary according to specific political incentives. A cross-section of our data illustrates how

[2]Among these structured products, we define toxic loans as those presenting substantial coupon risk in the second period due to a volatile underlying index (e.g., foreign exchange rate). See Section 2 for more details. These structured loan are termed toxic loans because of their high-risk profile (Erel et al., 2013).

elected representatives from financially distressed local governments are significantly more likely to turn to this type of loan, evidencing a higher incentive to hide the actual cost of debt. We also find that incumbent politicians running in politically contested areas are more inclined to use toxic loans, which is consistent with them seeking immediate savings to aid them in being re-elected. When comparing a treatment group that confronts elections during our sample period (municipalities and counties), to a control group that does not (regions, hospitals, and social housings), we find that structured loan transactions are more frequent shortly before elections than after them.

Third, we explore the real effects of structured loan usage. By instrumenting the use of structured loans with the distance to the closest branch of the leading bank, we show that issuing structured loans helps politicians getting re-elected. We also provide evidence that politicians use the cash flows obtained from structured loans to offer lower local taxes, and not to increase investments.

Finally, we establish two stylized facts that are hard to reconcile with the view that lack of financial sophistication is the main driver of this market development: politicians whose profession requires higher education are more inclined to use toxic loans than politicians from a less educated background, and politicians from large cities are more likely to use toxic loans than the ones from small cities. We also empirically rule out hedging as a possible motive for these transactions. Last but not least, we find evidence suggestive of coordination between politicians; they are more likely to enter into toxic loans if some of their neighbors have done so recently.

Although both global and severe, the toxic loan phenomenon remains underinvestigated. This lack of research primarily results from a lack of comprehensive data. Our analysis relies on two proprietary datasets that contain a wealth of information on local governments' structured loans, which are traditionally hidden from the public view. Another typical challenge for political economy research is also the small size of samples and

low power of country level analysis, which we do not face in our empirical set-up thanks to the large number of French local governments.

Our first dataset contains the entire debt portfolio for a sample of the 300 largest French local governments as of the end of 2007. For each debt instrument, we access information pertaining to the notional amount, maturity, coupon rate, type of product, underlying financial index, and lender identity. The structured debt amounts to 10.4 billion euros for this sample, out of 52 billion euros total debt. Our second dataset includes all of the structured transactions made by Dexia, the leading bank on the French market for local government loans, between 2000 and 2009. This dataset provides loan-level information, including the mark to market and transaction date. This dataset contains information for more than 2,700 local governments, for a total of 23.7 billion euros of outstanding structured loans. We complement the second dataset with detailed accounting data, mayor demographics, and GPS coordinates.

Our methodology relies largely on probit regressions where the dependent variable is an indicator for the use of structured and/or toxic loans. To gain identification, we complement these specifications with a difference-in-differences specification when analyzing the role of election timing, as well as with an instrumental variable analysis for exploring the real effects of structured loan usage.

Our paper relates principally to two streams of literature. First, our work complements studies of the political economy of finance, including political agency problems (Besley and Case, 1995), political incentives and credit (Rajan, 2010), their influence on financial decisions for local governments (Butler et al. (2009) Ang et al. (2013)), or on bank bailouts (Behn et al., 2014). Tightly related to our finding on election timing, Dinc (2005) shows that government banks lend more in election years, while Bertrand et al. (2007) document that politicians influence CEOs to avoid layoffs prior to elections. Halling et al. (2014) document revenue transfers from government owned banks to local

governments. We also complement findings on the economic effects of political uncertainty (Julio and Yook (2012), Julio and Yook (2014)), with a public finance channel. Because toxic loans allow local governments to hide a significant fraction of the cost of debt, our work directly relates to the off-balance sheet borrowing of local governments, mainly through pension fund liabilities (NovyMarx and Rauh, 2011). Our study also offers a non-bank set-up to test collective moral hazard (Farhi and Tirole, 2012).

Second, our paper participates to the debate on the dark side of financial innovation (Simsek (2013), Shiller (2013)), its associated risks (Gennaioli et al., 2012), motives (Célérier and Vallée, 2014), and effects (Rajan, 2006). Similar to the sophisticated mortgage borrowers studied by Amromin et al. (2013), politicians may deliberately exploit certain characteristics of innovative financial products to their own advantage, regardless of the long-term risks that they generate.

Through the alternative explanations we consider, our work also builds on the financial literacy literature (Lusardi and Mitchell, 2011), and studies of hedging policies by corporate firms (Baker et al., 2005).

The paper proceeds as follows. In Section 2, we provide background on the local government market for structured loans, and describe our datasets in Section 3. We then investigate the role of political incentives as motives for implementing these transactions in Section 4, and look into their effects in Section 5. We consider alternative hypotheses in Section 6. We conclude our study in Section 7.

2 The Structured Loan Market

This section provides some background information on structured loans, including a real-life example, and defines toxic loans. These institutional details rely on product term sheets, on the French Congress investigation into the structured loan market (French

National Assembly, 2011), and numerous discussions with professionals from both buy and sell sides.

2.1 Example of a Structured Loan

In this study, a structured loan refers to a bank loan obtained by a local government, in which its coupon formula differs from either a constant fixed rate, or a floating rate such as Libor + a spread (called 'standard loans' throughout this study). Structured loans offer an initial period with a guaranteed low interest rate and a second period during which the interest rate follows a pre-specified formula based on a given underlying financial index. The loan structuring relies on an implicit sale of options on this underlying index by the borrowing local government, with the option premium being subtracted from the interest cost. As in any sale of options, the risk of the transaction increases with its maturity, the volatility of the underlying index, the leverage in the coupon formula, and the cap level.[3]

We present below an actual structured loan subscribed by the Rhône, the French county that comprises the city of Lyon. We observe an eight-year initial period with a low guaranteed coupon of 1.75%, which is significantly lower than the interest rate on an equivalent standard loan (slightly higher than Euribor or 4.50%). This initial low fixed rate is followed by a 12-month Euribor floating rate, coupled with uncapped exposure to CHF appreciation against EUR for the remaining 17 years. At todays levels (as of December 2014), the interest rate on this loan is about 16%. Similar products with higher leverage or strikes result in some local governments currently paying more than a 50%

[3]Structured loans typically exhibit no cap levels, meaning unlimited potential coupons.

interest rate per year.

$$
\begin{aligned}
&Amount: && EUR\ 80\ million \\
&Trade\ Year: && 2006 \\
&Loan\ Maturity: && 2031 \\
&Year\ 2006-2013: && Coupon(t) = 1.75\% \\
&Year\ 2014-2031: && Coupon(t) = EURIBOR\ 12M(t) - 0.80\% + Max(1.40/EURCHF(t) - 1, 0\%)
\end{aligned}
$$

As the equivalent fixed rate at the time of issuance was around 4.50%, and converting the Euribor rate into its fixed rate equivalent, the coupon formula can be rewritten as:

$$
\begin{aligned}
&Year\ 2006-2013: && Coupon(t) = 4.50\% \textbf{ - 2.75\%} \\
&Year\ 2014-2031: && Coupon(t) = 4.50\% \textbf{ - 0.80\%} + Max(1.40/EURCHF(t) - 1, 0\%)
\end{aligned}
$$

This illustrates how the sale of an option on EURCHF during the years 2014-2031 provides the local government with a premium of 2.75% during the first 7 years, and with a 0.80% premium for the remaining maturity.

2.2 Borrower Rationale

Structured loans allow local governments to cosmetically reduce the cost of their debt, and therefore provide a budget relief, for the period during which the coupon is guaranteed. A parallel can be drawn with the reaching for yield phenomenon, where institutional investors improve the yield of their investments by increasing their risk on unobserved dimensions (Becker and Ivashina, 2014).[4] Returning to the previous example, the product provides a 2.75% annual subsidy for 7 years, which is the difference between the rate on an equivalent standard loan and the one on the toxic loan. If the entire debt of the local government consists in this type of financing, the cost of debt may therefore appear less

[4]As local governments are strictly regulated on the assets they can invest in, only the liability side of their balance sheet allows them to implement such strategy.

than half than what it should be. The subsidy provided by the loan appears to be larger during the initial period, which also exhibits no coupon risk. The first potentially higher coupon happens shortly after the next election. The subsidy is repaid in the future in certain states of nature, namely, when the options embedded in the derivative component of the loan end up in the money.

An important aspect of French local government accounting is that they are forbidden to borrow to balance their operating budget.[5] However, the cost of debt is considered under government accounting as an operating expense: funding cheapeners such as structured loans are therefore a possible way of balancing the budget.

2.3 Market Background

The development of the structured loan market was made possible by a combination of three factors: a blind spot in government accounting standards, the quasi-sovereign credit quality of local governments, and banks' appetite for these profitable transactions. First, under most government accounting standards, derivatives (either stand-alone swaps or those embedded within structured loans) are not accounted for at fair value. In many countries, government accounting standards do not even require the disclosure of derivatives transactions. Only the interests that are paid during the accounting year must appear in financial statements; thus, a derivative, regardless of the evolution of its fair value and future cash flows, will generate accounting revenues as long as its flows within a given accounting year are positive for the local government. By construction, this situation always occurs during the initial low-interest period of three to five years, regardless of the market evolution during that time. Losses can appear in financial statements only when the guaranteed period is over. This lack of disclosure makes structured loans

[5]Loans proceeds can only be used for investment purposes.

difficult to detect for voters.[6]

Second, as borrowers, local governments present characteristics that facilitate the structuring process of these transactions. Long-maturity debt is a prerequisite for structuring products with initial periods of low interest rates, and local governments are among the issuers that have the longest horizon, typically ranging from 15 to 30 years. Furthermore, local governments have the credit quality that is necessary for banks to accept such long credit exposure, which cannot be hedged. Until the recent financial crisis, counterparty risk of local governments was considered as low by banks, because of the widespread view that central governments are implicitly guaranteeing these entities. This high perceived credit quality allowed local governments to post no collateral for these derivative transactions. Collateral requirements, typically in place with corporate clients, would hinder structured transactions for local governments, as the negative fair value of a derivative position would lead to margin calls that would be both costly to manage and visible to voters.

Finally, the supply side is likely to be driven by the profitability of these transactions. Discussions with practitioners indicate that these transactions are significantly more profitable than standard loans (approximately 5% of the notional as mark-up for toxic loans on top of standard lending profits). Furthermore, the activity is easily scalable across countries. Indeed, the legal documentation is limited to a three or four-page contract. Structuring mechanics rely on worldwide known indices, such as the US Libor or the EURUSD exchange rate. As global players, financial institutions simultaneously market the same products in different countries.[7]

[6] An indirect way is to observe abnormally low interest rates.

[7] Even if their diffusion is global, market penetration is higher in Europe than in the US, partly because cities and regional governments in Europe receive a larger share of their financing from banks whereas those in the US primarily raise funds by issuing bonds.

2.4 Which Structured Loans Are Toxic?

As many local governments are currently paying double-digit coupon rates on their structured loans, the press have labeled them toxic. Undeniably, some structured loans present unusually high levels of risk, as local government can pay significantly more in interest than the amount borrowed. In this study, we rely on the classification established by the French Government following the first litigations, the Gissler scale, to measure the risk of structured loans and identify toxic loans. Although they all rely on the same mechanism (an implicit sale of options, the premium of which is subtracted from the initial coupon rate), structured loans exhibit diverse risk profiles, which also correspond to different levels of short-term budget relief: the riskier the product, the higher the initial savings. The Gissler scale ranks structured loans according to their risk profile. For more details regarding the different types of structured loans, and the Gissler scale, see the appendix.

We classify a structured product as toxic if it ranks higher than 3 on the Gissler scale. Given this definition, loans that are indexed on the interest rate curve slope, foreign interest rates, or on a foreign exchange rate are classified as toxic. Products that are linked to domestic interest rates or inflation are not considered toxic.

This classification is based on the characteristics of a product at inception and is independent from the market conditions that prevail during the life of the product. A toxic product may have offered a low coupon level to its user *ex post*; nevertheless, the borrower entered into a high-risk transaction that would have created massive losses had the market situation been reversed. Furthermore, toxic products often exhibit swings in their mark-to-market. Structured products that are not classified as toxic still bear more risk than standard financing. The nonlinear payoffs of such loans are also challenging to manage in practice, as they can create sudden increases in the cost of debt.

2.5 Post-crisis developments

The financial crisis led to a spike of volatility in all financial markets, which drove the mark-to-markets up, and in many cases led the options to be in-the-money. Starting in 2010, local governments have been unwilling to pay two-digit interest rates, and have been suing banks for mis-advice and questioning whether these transactions are legal in the first place. Local governments try to obtain the cancellation of the structured loans, especially the toxic ones, or to negotiate an exit at better terms. Court outcomes have been mixed, but initially led to the cancellation of the structured loans that had not properly stipulated the Annual Percentage Rate (APR) when implemented. This decision was later repelled by the higher court of justice in France, and a new law was introduced to ensure the legality of all transactions.[8]

A partial solution was implemented in 2014, in the form of a 50% participation of the central government in the unwinding costs. This government subsidy is financed for half by a new tax on banks' systemic risk contributions. This development represents a partial bail-out, and exhibits a trade-off between having only local taxpayers pay for the toxic loan losses, or sharing the cost nationwide. Moreover, the main player in the market, Dexia, has been nationalized during the crisis. Therefore, forfeiting all the mark-to-markets would be extremely costly for the French central government, and this might have played a role in the new legislation put in place.

3 Data

Our analysis relies on two proprietary datasets that contain a wealth of information on local governments' structured loans, traditionally hidden from the public view.

In most countries, the financial statements of local governments do not present the

[8] http://www.lesechos.fr/idees-debats/cercle/cercle-107127-emprunts-toxiques-le-coup-de-jarnac-a-17-milliards-1031512.php

precise breakdown of debt by instrument, and in particular, they do not make a distinction between standard bank loans and structured loans. Our analysis of structured and toxic loans requires that we know the composition and not just the total amount of the debt portfolio of each local government. We obtain this from two complementary datasets. The first dataset contains the entire debt portfolio for almost all of the 300 largest French local governments (Dataset A) as of December 31, 2007. The second set includes loan level data on all the outstanding structured transactions of Dexia, the leading bank on the market (Dataset B) as of December 31, 2009. We complement these two datasets with detailed financial statements of local governments, and with demographic data on mayors, both provided to us by the French Ministry of the Interior.

3.1 Local Government Level Debt Data (Dataset A)

Our first dataset, which covers precisely 293 French local governments, comes from a leading European financial consulting firm for local governments. This dataset contains the entire debt portfolio, broken down by type of debt, for nearly all the largest local governments: French regions (25 out of 27) and French Counties (96 out of 100) as well as the largest cities (96) and intercity associations (76). Collectively, these local governments have a total debt of EUR52 billion, or 38.2% of the total debt of all French local governments, which includes EUR10 billion of structured debt, or a third of the total outstanding amount in France as estimated by the French Congress. Panel A of Table 1 provides summary statistics on the debt profile of the local governments from the sample.

[Insert Table 1 here]

We observe that virtually all local governments in our sample (95.6%) have debt, and this fraction remains high for all types of local governments. Funding is achieved

through the following channels: standard bank loans, bonds, revolving facilities, and structured debt. Standard bank loans are by far the main source of financing for local governments (constituting 62.9% of outstanding debt, while bonds account for a low 3.3% of outstanding debt).[9] Structured debt represents a significant share of the total debt of local governments, accounting for 20.1% of all outstanding debt and being used by more than 72% of the local governments in our sample. These ratios are particularly high for counties and cities.[10] The fraction of structured debt varies extensively across local governments, with some local governments borrowing almost exclusively through this channel.

Within the structured debt component, we also examine the specific amount of toxic loans, as defined in the previous section.[11] Overall, toxic loans represent 8.4% of total debt in our sample, and are used by 43% of the local governments. Again, there is significant heterogeneity among local governments in their use, with some of the governments having up to 71.7% of their total debt consisting of toxic loans.

3.2 Loan Level Data on Structured Transactions (Dataset B)

Our second dataset contains loan level data for all structured loan transactions implemented with Dexia, the largest player in this market. This second dataset is almost ten times larger than the first one, as Dexia has a 70% market share for public sector-structured loans (French National Assembly, 2011) and an extremely diverse customer base.[12] This internal risk management data was made public by the French newspaper

[9]Bonds are used by only 7.5% of local governments, likely because of the absence of tax incentives for Muni Bonds as opposed to the US, and complex legal documentations. On the opposite, the French Central Governments debt comprises almost only bonds and bills.

[10]See the appendix for the breakdown of Table 1 by type of local government.

[11]A detailed breakdown of structured debt by type of structured product can be found in the appendix. The most popular products are those linked to domestic interest rates, which account for nearly half of the outstanding structured debt (47.7%). Other underlying indices (sorted by decreasing popularity) include the interest rate curve slope (26.8%), foreign exchange (14.8%), inflation (3.4%), and foreign interest rates (2.4%).

[12]There are more than 35,000 municipalities in France, the majority having less than 500 inhabitants.

Libération on its website following an internal leak from the bank. This dataset contains 2,741 different public sector entities: 16 regions (vs. 25 in Dataset A); 66 counties (vs. 96); 539 intercities (vs. 76); 1,588 municipalities (vs. 96); 288 hospitals (vs. zero); 115 social housing entities (vs. zero); and 129 other borrowers, including airports, harbors, chambers of commerce, healthcare cooperatives, public-private joint ventures, schools, research institutes, nursing homes, fair organizers, and charities. The local governments in our sample vary significantly in terms of size; for instance, 37 cities have fewer than 1,000 inhabitants, and 29 cities have more than 100,000 inhabitants.

Panel B of Table 1 provides summary statistics for this dataset.[13] By construction, every local government in this sample uses at least one structured loan, for a total amount of 23 billion euros, or more than two third of the total amount estimated by the French National Assembly. In this sample, more than 13 billion euros of structured loans are considered toxic under our classification. The average amount of structured and toxic loan per local government is much lower than in the previous dataset, mostly due to the larger sample that includes many entities of small size.

The data also contains information on the mark-to-market of the transaction as of the end of 2009. The mark-to-market, which corresponds to the net present value of unwinding the derivative structure, are overwhelmingly negative for local governments in 92% of the cases. This means that local government cannot easily convert their structured debt into standard debt: 72 entities have more than 10 million euros of negative mark to market. The average number of structured transactions is approximately two, but 163 entities have more than five structured loans in their debt portfolio.

The data also includes information on trade inception dates, allowing us to build a data panel to conduct time-series analysis. The aggregated numbers of transactions per

[13]The total debt figures are from matched accounting data, as the dataset only contains structured loan information, which explains the lower number of observations.

quarter are plotted in Figure 1. We observe the rapid development of the market followed by a sharp contraction after 2007. The latter was exacerbated by media coverage of distressed local governments and by Dexia's own difficulties in the last quarter of 2008.[14]

[Insert Figure 1 here]

3.3 Complementary datasets

We complement the previous loan level data with three types of data: detailed accounting data, mayor demographics, and GPS coordinates. The accounting data, provided by the French Ministry of the Interior, include the highest level of detail possible for balance sheet and income statement, at an annual frequency for the period 2000-2012. This accounting data is under French government accounting standards. The second complementary dataset includes information on age, gender, political affiliation, and professional occupation for all the mayors in France since 2001. These datasets are collected by the French Ministry of the Interior and constitute the *Registre National des Elus*. GPS coordinates for municipalities and Dexia branches allow us to calculate distances as the crow flies for the purpose of our instrumental variable analysis. These three datasets are merged together using a national identifier, and then carefully merged by name to the data from Dexia (Dataset B).

4 Political Incentives

In this section, we investigate the potential role of political incentives in fostering the use of structured and toxic loans among local governments. We find that both the propensity

[14]Dexias first bailout did not stem from its local government operations, which remained solvent throughout the crisis, but from losses at its US subsidiary, the monoliner FSA, and from a large loan made to troubled DEPFA bank.

of using these transactions, as well as their size, are higher when politicians have stronger incentives to reduce the cost of debt in the short run.

4.1 Incentives to shift debt interest payments

Politicians have an incentive to hide liabilities to spend money today while shifting the tax burden onto future generations (NovyMarx and Rauh, 2011). Given their accounting treatment, structured products are a discreet way of shifting a large part of the cost of debt to a later time, and in some specific states of nature. We hypothesize that the incentive to do so will be greater for highly indebted local governments, as monitoring by voters and other stakeholders is likely to be closer, and the balancing budget constraint is more likely to bind.

Panel A in Table 2 provides an initial overview of the popularity of structured and toxic loans for the top and bottom indebtedness quartiles of the local governments in Dataset A. The panel shows unconditional statistics that suggest that highly indebted local governments use structured and toxic loans more frequently and to a larger extent. The economic magnitude is particularly large: local governments from the last quartile of indebtedness are more than twice as likely to implement structured and toxic loans, than entities from the first quartile of indebtedness.

[Insert Table 2 here]

We extend the analysis in Table 3 and run several probit regressions on the use of structured and toxic loans by local governments based on Dataset A. In column 1 (respectively 2), the explained variable is an indicator variable that is equal to one if the local government has some structured (respectively toxic) products in its debt portfolio, and zero otherwise. Column 3 presents the coefficients from an ordered probit regression in which the dependent variable takes a value of two if toxic loans are used, one if

structured but not toxic loans are used, and zero otherwise. Column 4 (respectively 5) corresponds to an OLS regression where the dependent variable is the share of structured (respectively toxic) loans as a percentage of the local government total debt. For each specification, we include a large set of control variables: debt average maturity, population, banking relationships (indicator variables for lending relationships with Dexia, Crédit Agricole, Société Générale, and others), territory characteristics (unemployment rate, share of agriculture, and industry in the active population), and local government type fixed effects (regions, counties, intercities, and cities).[15] We cluster standard errors by local government types, as for instance municipality and region budget structures differ. Finally, columns 6 and 7 display the estimated coefficients for specifications as close as possible to columns 1 and 2 's on dataset B enlarged with the accounting data.[16]

[Insert Table 3 here]

All these specifications confirm that a higher level of debt translates into a higher propensity, and a larger magnitude, of structured and toxic loans usage. All coefficients on the debt over population ratio are positive and highly statistically significant. These results are consistent with the existence of greater incentives for highly indebted local governments to shift the actual cost of debt to certain future states of nature, likely due to a closer monitoring of their debt. An alternative explanation for this empirical result would be that indebted local governments turn to toxic loans as last-resort financing when other means of financing are unavailable to them. However, our data is inconsistent with this alternative hypothesis, as numerous highly indebted local governments only have standard loans; thus, a high level of indebtedness does not prevent from accessing standard financing.

[15]Debt average maturity provides us with another important control, as toxic loans require long-maturity debt (recall that these loans rely on an implicit sale of options).

[16]The dependent variable is equal to one if the local government has a structured loan in column 6, or a toxic loan in column 7.

4.2 Political Cycle

We also hypothesize that specific political situation and timing might create higher incentives to implement structured loans. When their re-elections are likely to be contested or when the next election draws closer, incumbent politicians may seek immediate savings for a limited time, possibly corresponding to their political mandate period. One means of achieving this short-term financial release without raising the suspicion of voters is the use of structured loans, which may cause them to be used more frequently in politically contested areas, whereas strongholds should exhibit lower usage. The timing of these transactions may also depend on the date of the next election in a local government, incumbent politicians having higher incentives to implement transactions before the election than after in order to benefit from the immediate savings that they provide during the election campaign.[17]

4.2.1 Politically contested areas

We then test whether local governments with a less established party were implementing more structured and toxic loans transactions than political strongholds. For a subsample of local governments in Dataset B for which past election results are available since 1989, we proxy political stability by the number of years for which the party of the incumbent mayor (or of the highest elected representative) has been in power. We find empirical evidence consistent with this hypothesis. Panel B in Table 2 illustrates how politicians from politically contested areas make a larger use of structured loans than the ones from political strongholds. We also conduct OLS regressions for three different measures of the usage intensity of structured loans: (1) structured debt/total debt ratio, (2) mark-to-market/total debt ratio, and (3) toxic debt/total debt ratio on our proxy for political

[17]These transactions can have such an immediate effect as the cosmetic savings they provide are typically accounted for at the beginning of the period, when projecting the annual budget.

uncertainty. We include controls for political affiliations and the size of local authorities.

[Insert Table 4 here]

The results in Table 4 provide further supportive evidence for a positive effect of political contestation on the use of toxic loans. All of the estimated coefficients on the number of years in power are indeed significantly negative, meaning that strongholds make a lower usage of these products. This finding suggests higher incentives for politicians with challenging re-elections to enter into risky transactions. The rationale may be to implement a form of risk-shifting strategy, or to create a poison pill for the next government, because losses require several years to materialize. Conversely, politicians from a stronghold might have a longer horizon as the party national reputation might also be at stake.

4.2.2 Effect of election timing

We use a difference-in-differences approach to test whether local governments engage more frequently in structured loans prior to an election than after. We compare a treatment group that includes counties, municipalities, and intercities that held elections at the end of 2008Q1, with a control group consisting of regions, whose elections were in 2010, and public entities with no elections (e.g., hospitals and social housing managers). The governing teams of the entities from the treatment group are chosen simultaneously following the same election cycle. Those from the control group are either chosen at a different time, or have management renewals according to idiosyncratic timing. Hospitals and social housing managers are state-owned entities in France, with processes very similar to local governments: these entities fulfill public service while having a budget independent from the central state.[18] Both groups are typically covered by the same department in

[18]For instance, these entities have to follow public procurement regulation.

banks and consulting firms. Using panel conditional logit regressions in a difference-in-differences setup, we examine the likelihood of implementing a structured transaction in a given quarter before and after the election (for periods of 12 and 18 months before and after the election) for both groups, controlling for quarter fixed effects. The exact model specification is as follows:

$$\Pr(Transaction)_{i,t} = Q_t + \alpha_i + \beta \times I_{\{Treatment\ Group\ =\ 1\ \cap\ Pre\ Treatment\ =\ 1\}} + \varepsilon_{i,t}$$

where the dependent variable is the probability that local government i conducts a transaction in quarter t, Q_t are the time fixed effects for each quarter, α_i are individual fixed effects, and the $I_{\{Treatment\ Group\ =\ 1\ \cap\ Pre\ Treatment\ =\ 1\}}$ variable is an interaction term between a dummy variable that is equal to one if local government i is in the treatment group and a dummy variable that is equal to one if quarter t is before the election. The results are shown in Table 5.

[Insert Table 5 here]

When comparing to the control group with no elections in 2008, we observe that the local governments in the treatment group are significantly more likely to implement structured and toxic transactions in the period preceding the election than in the period following it. The results are robust to the time window under consideration, and cannot be explained by a downward trend in the market, due to the identification strategy. We also conduct a placebo analysis in which we randomly select a sample of the same size as our initial treatment group and use it for the interaction term. The coefficients obtained are much lower in magnitude and not significantly different from zero, which is consistent with our previous result being driven by the election cycle.

5 The Effects of Structured Loans Usage

We explore the effects of using structured loans on both electoral outcomes and budget decisions by instrumenting the use of structured loans with the geographic distance to the closest Dexia branch.

5.1 Instrumental Variable Methodology

As described in the previous sections, the decision to enter into structured loan transactions is highly endogenous to variables that are likely to affect both electoral outcomes and budget decisions, such as the level of indebtedness or how politically contested the area is. Adequately measuring the effects of using structured loans therefore calls for an instrumental variable analysis, to control for both observed variables that are jointly determined with structured loan usage and unobserved variables. We instrument the propensity to use structured loans with the geographic distance of the local government to the closest Dexia branch, as the crow flies. Geographic distance is established as an important determinant of lending activity (Degryse and Ongena, 2005). More specifically, Bharath and Dahiya (2009) also instrument lending relationship with distance. Exclusion restriction is unlikely to be violated as Dexia branches opened decades before the beginning of the structured loan market, with no recent change to their geographic position.[19] Geography is largely exogenous in nature, and the distance to Dexia branches is unlikely to impact political outcomes or budget decisions other than through the use of structured loans. We start by testing whether distance to Dexia branches is correlated with structured loan usage. This first stage represents a test of whether the previously documented effect of distance on lending also holds for structured loans. We regress with a probit

[19]Prior to 1996, Dexia was known in France as Crédit Local de France (1987-1996) and as Caisse d'Aide à l'Equipement des Collectivités Locales (1966-1987, which were government-owned banks dedicated to the financing of local governments.

model the propensity to use structured loans on the distance to the closest Dexia branch, controlling for the main determinants of structured loan usage, such as population and indebtedness.[20] Since the dependent variable in the first stage is a binary variable, we follow the same methodology as in Faulkender and Petersen (2006).[21] Results are shown in columns 1 and 2 of Table 6. The negative relationship between distance to agency and propensity to implement structured loans appear both statistically significant and robust to a battery of controls.

INSERT TABLE 6

5.2 Effects on Election Outcome

Using the instrument described in the previous subsection, we can now test whether using structured loans indeed helps local politicians getting re-elected. We run the following regression:

$$Pr(Reelection) = \alpha + \beta * I_{StructuredLoan(Instrumented)} + \gamma * X_i + \epsilon_i \quad (1)$$

where *Reelection* is an indicator variable for having the same political party stay in power after the 2008 municipal election, $I_{StructuredLoan(Instrumented)}$ is the instrumented variable obtained in the first stage, and X_i is a set of controls. Columns 3 and 4 of Table 6 present the results. We observe that an exogenous increase in the propensity of using structured loans lead to an increase in the likelihood of having the same party be re-elected. The coefficient on the instrumented dummy variable for structured loan usage is positive and statistically significant. This result is robust to a battery of controls, and represents evidence consistent with structured loans helping politicians get re-elected in

[20] Controlling for population in the first stage of the IV analysis is however important as agencies are typically located in the largest town of the area.

[21] Wooldridge (2002) shows that this approach yields consistent coefficients and correct standard errors.

the short-run.[22] For comparison purpose, column 5 provides us with the standard probit specification, in which the use of structured loan is not instrumented. We observe that the coefficient is also positive but not significant. This coefficient is therefore consistent with sources of endogeneity weakening the effects of using structured loans on re-election, as their use is typically more frequent in situations more difficult for politicians, for instance when debt is high.

5.3 Effects on budget decisions: Identifying the channel

Another test made possible by the use of the instrumental variable analysis is to assess whether using structured loans have an impact on budget decisions, more specifically on taxes and on investment. As structured loans provide immediate savings, we specifically test two hypotheses regarding the allocation of these cash flows: whether their usage allowed politicians to decrease local taxes and/or to increase investments in equipment. We restrict our sample to municipalities to maximize comparability. We run an OLS regression with the following difference specification, which implicitly controls for local government fixed effects:

$$\Delta_{2002-2007}(Y) = \alpha + \beta * I_{StructuredLoan(Instrumented)} + \gamma * X_i + \epsilon_i \quad (2)$$

where Y is the yearly local tax per inhabitant in columns 1 and 2 of Table 7, and investment in equipment per inhabitant in columns 3 and 4. $\Delta_{2002-2007}$ corresponds to the difference between the beginning to the end of the political mandate for municipalities. When using the variation in tax per inhabitant as the left hand side variable, we find that the coefficient on the indicator variable for structured loan use is negative and statistically significant. This result suggests that politicians have been using the short term savings

[22] However, the observation of no effects would not have ruled out the ex ante motives we document in the previous sections.

provided by structured loans to relatively decrease the amount of tax per inhabitant.[23] This action is consistent with politicians seeking re-election by catering to taxpayers' preference for low taxes, which represents a likely channel for the previous result on effects on re-election. When regressing the variation in equipment expenditures over the course of the political mandate on the instrumented indicator variable for structured loan use, we find that the coefficient is negative and statistically significant. If anything, this results rules out the hypothesis that structured and toxic loans boost local government investments by relaxing the budget constraint.

INSERT TABLE 7

6 Alternative Hypotheses

In this section, we consider two complementary non mutually-exclusive hypotheses for explaining politicians implementations of structured loans: a lack of financial literacy and a hedging motive, as well as a potential amplifier of the phenomenon: coordination between politicians.

6.1 Financial Literacy

In this subsection, we consider the hypothesis that the structured loan market developed due to the exploitation by banks of a lack of financial sophistication from local government politicians.[24] We have two stylized facts that are hard to reconcile with this view: politicians whose profession requires higher education are more inclined to use structured loans than politicians from less educated backgrounds, and this effect is even stronger

[23] As the amount of tax per inhabitant is structurally increasing during the period, this coefficient means that local governments using structured loans have increased less their tax over the period.

[24] Although some of the debt management can be delegated to a civil servant, important decisions such as loan issuances typically requires a signature from the highest ranked elected representative.

for toxic loans. Larger cities are more likely to use both structured and toxic loans than smaller cities.

Local politicians have been vocal *ex post* both in the media and in French Congress about their lack of understanding of the risks embedded in the structured loan transactions they implemented. For instance, in his testimony before the French Congress' committee on toxic loans, the deputy mayor of the city of Saint Etienne, who originally decided to take on some toxic loans, stated that *"[he] was not able to read the information [he] received because [he was] not a financial expert"*. To assess the role of financial sophistication on the use of structured debt, we estimate probit models where the dependent variable takes a value of one if the local government made use of structured debt during our sample period on proxies for financial sophistication.[25] As politicians in larger local governments are likely to benefit from more resources and support from specialized staff and advisors, we use a series of dummy variables for several size brackets. We also use mayor's current or former occupation, age on election date, and education level as explanatory variables. These variables are known to be correlated with financial sophistication (Lusardi and Mitchell, 2011). We first report in Figure 2 the regression coefficients, along with 95% confidence intervals, for the different occupations fixed effects. The results suggest that mayors from more educated backgrounds are more likely to use structured and toxic loans than the others. The six occupations that are associated with the highest point estimates are, in decreasing order, senior civil servants (*haut-fonctionnaires*), politicians, executives, regulated profession (doctors, lawyers), engineers, and A-level civil servants.[26]

[Insert Figure 2 here]

[25]For this purpose, we merge the national registry of mayors with Dataset B on Dexia's client portfolio.

[26] A-level civil servants are defined as roles for which a college degree is required to apply, B-level civil servants are defined as roles for which a high school diploma is required to apply, and C-level civil servants are defined as role for which no degree is required.

Table 8 provides coefficients for probit regressions where the dependent variable is an indicator variable for the use of structured loans in columns 1, 3 and 5, and for the use of toxic loans in columns 2, 4 and 6. We observe that the likelihood to use structured and toxic loans significantly increases with local government size, and decreases with mayor age.[27] When restricting the sample to mayors who are public servants, for which we can estimate their education level, we find that more educated mayors are more likely to have implemented structured and toxic transactions. Overall, these results are hard to reconcile with the picture drawn by the local politicians themselves.

[Insert Table 8 here]

6.2 Hedging

One may wonder whether structured loans have been used as hedging devices. From a theoretical perspective, it appears unlikely that toxic loans are used for hedging purposes. Indeed, as shown in Section 2, the payoffs of structured products are typically nonlinear and convex because of the embedded sale of out-of-the-money options. Therefore, to accomplish hedging through these instruments, a local government needs to have operational cash flows that present a strong surplus during tail events for the structured loan underlying indices, such as EURUSD or the slope of the interest rate curve. To further rule out this alternative explanation, we examine the correlation between French local government revenues and the main indices that are used in structured products: Euribor 3 months, CMS 10Y - CMS 2Y, EURCHF, and EURUSD. Our analysis is based on all French regions, French counties, and the 100 largest cities, and it covers the 1999-2010 period. Overall, we find little if no correlation between revenues and financial indices (results are available in Table A2 in the appendix). We also run a pooled regression of

[27] The average mayors age is 54 years old.

the change in operating revenues for all local governments on the change in the financial indices used to structure the loans while controlling for inflation. The estimated parameters that are associated with the financial indices also remain insignificant. We also perform similar regressions at the local government level and again find no significant results. This additional analysis suggests that structured debt is unlikely to serve as a hedging device for local governments. This conclusion is consistent with empirical evidence of corporations using so-called hedging policies to make directional bets (Baker et al., 2005). Finally, the hedging motive was never suggested during our conversations with buy-side and sell-side practitioners.

6.3 Coordination between politicians

Coordination between local government politicians might amplify the adoption of innovative financial instruments, all the more so as local government members and civil servants belong to strong local and political networks, and as structured transactions typically remain private. We find empirical evidence suggestive of coordination, namely geographic local correlation on the adoption of the innovative products we study, which may come from collective moral hazard, herding, or local shocks. To obtain a sense of the geographic spread of structured debt among French local governments, Figure 3 displays an activity map for the second quarters of four consecutive years (2004-2007). Structured loan usage exhibits geographic clustering.

[Insert Figure 3 here]

To cleanly identify this local correlation, we implement a panel data specification that controls for individual fixed effects. We construct an explanatory variable that is equal to the number of active local governments from the same geographical zone (county level). An active local government is defined as a local government that entered into at

least one structured transaction in the previous quarter (or the previous two quarters). We again use a panel conditional logit model to estimate the effect of the number of active neighbors of a local government on its likelihood of entering into a similar trade in the current period. We also run a panel OLS regression to explain how large the new transactions are. The model specification is as follows:

$$\Pr(Transaction)_{i,t} = Q_t + \alpha_i + \sum_{k \in J(i)} I_{k,t-1,\{Active\,=\,1\}} + \varepsilon_{i,t}$$

where the explained variable is the probability that local government i conducts a transaction in quarter t, Q_t are quarterly fixed effects, α_i are individual fixed effects, $J(i)$ is the set of local governments from the same county as local government i, and the $I_{k,t-1,\{Active\,=\,1\}}$ variable is a dummy that is equal to one if local government k was active in quarter $t-1$. In the OLS specification, the left-hand-side variable is replaced by the aggregated notional amount of transactions implemented by local government i in quarter t. Table 9 displays the conditional logit and OLS regression coefficients. The coefficients on the number of active local governments is positive and statistically significant in all specifications. The likelihood and the extent to which a local government enters into structured debt transactions appears therefore to increase with the number of active neighbors in the previous period. This result cannot be caused by a time trend, as we use quarter fixed effects. This effect shows relatively low persistence, as the estimated coefficients decrease when we consider two quarters.

[Insert Table 9 here]

There are three main possible explanations for this evidence of coordination. The first one is that politicians coordinate to decrease their reputation costs in case the transactions go wrong (Scharfstein and Stein, 1990), or to increase the likelihood of a bail-out by the central government, which would represent a form of collective moral hazard, as

rationalized in Farhi and Tirole (2012). Second, the local correlation can also stem from a purely behavioral herding, where politicians are intrigued or reassured by other politicians following the same strategy. A final explanation for this correlation in borrowing choices would be the existence of regional shocks on the supply side. However, as Dexia covered the entire French territory before the inception of the structured debt market, this finding cannot be driven by new branch openings. The arrival of a highly convincing salesperson in a given region might also create such local shock, although this appears unlikely due to the long-term relationships within the industry and the low employee turnover.

7 Conclusion

In this paper, we present an empirical investigation of the role of political incentives in the use of innovative financial products. Although it is commonly believed that users of innovative products do not have sufficient information or understanding of the risks involved, we show in this paper that local governments make a strategic use of such products through their debt management. We find that most local governments use structured loans and that these types of loans account for a surprisingly high 20% of their total outstanding debt. While the cross-section of their usage is hard to reconcile with a lack of financial sophistication from users, we find that such loans are utilized significantly more frequently within local governments that are highly indebted, which is consistent with their greater incentives to hide the actual cost of debt. Incumbent politicians from politically contested areas are more likely to use structured debts, and transactions are more frequent before elections than after elections. Structured loan users also appear to exhibit geographic local correlation. Using clean identification, we finally show that using structured and toxic loans help politicians get re-elected by offering lower local tax to their voters.

During the subprime crisis, securitization facilitated a political agenda of easy access to home ownership. Similarly, we show that financial institutions have innovated to design financial securities that are aligned with the political incentives of local government elected representatives. Our results convey potential regulatory implications. Rather than banning structured loans, we suggest imposing strict public disclosure requirements on transactions by local governments to increase reputation risk and facilitate monitoring by voters. Furthermore, changing public accounting standards to account for mark-to-market losses and gains should curb the incentives at play by increasing transparency, as observed in comparable markets (Jenter et al., 2011). Such changes would limit the use of toxic loans while maintaining the autonomy of local governments in terms of financial decisions. However, the greatest risk of toxic loans likely lies in outstanding transactions and the accompanying non-realized losses. The recent bailout answers only partially to this challenge.

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8 Figures

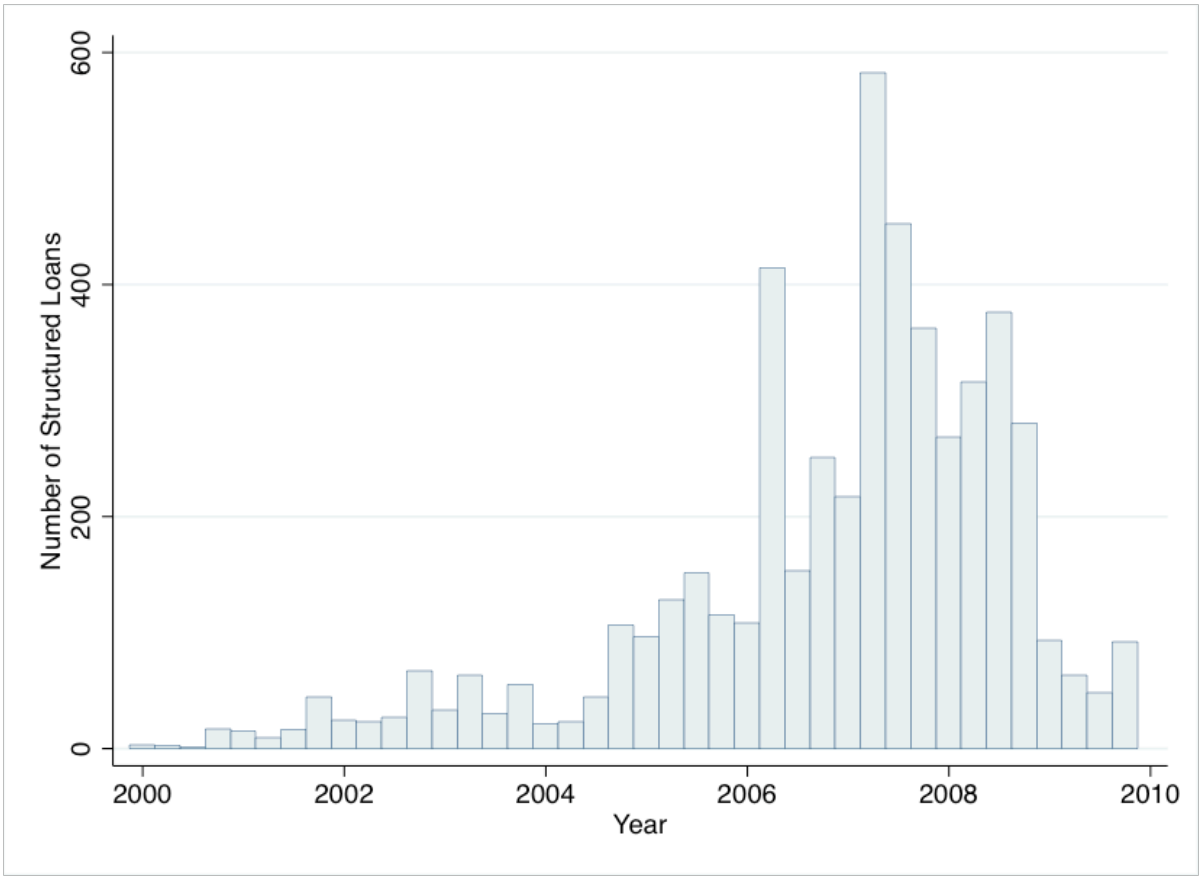

Figure 1: Number of Structured Debt Transactions per Quarter

Note: This figure displays the number of structured loans initiated during a given quarter by local governments in France for the 2000-2009 period. The data are obtained from Dexia's client portfolio (Dataset B).

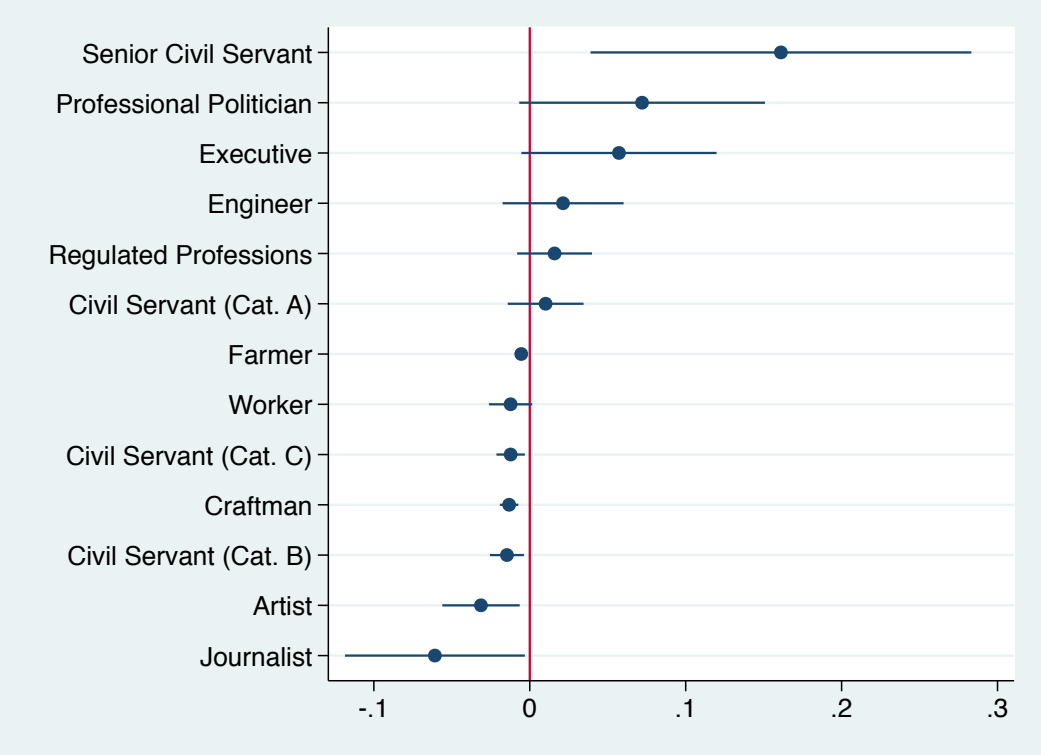

Figure 2: Occupation Fixed Effect

Note: This figure displays the estimated coefficients on mayor occupation title fixed effects from a probit regression of using structured loans on local government characteristics and elected mayor demographic variables. The data is from dataset B merged with data provided by the French Ministry of the Interior. The sample is restricted to municipalities. Dots represent the coefficients, and lines the 95% confidence interval, using standard errors clustered at the county level.

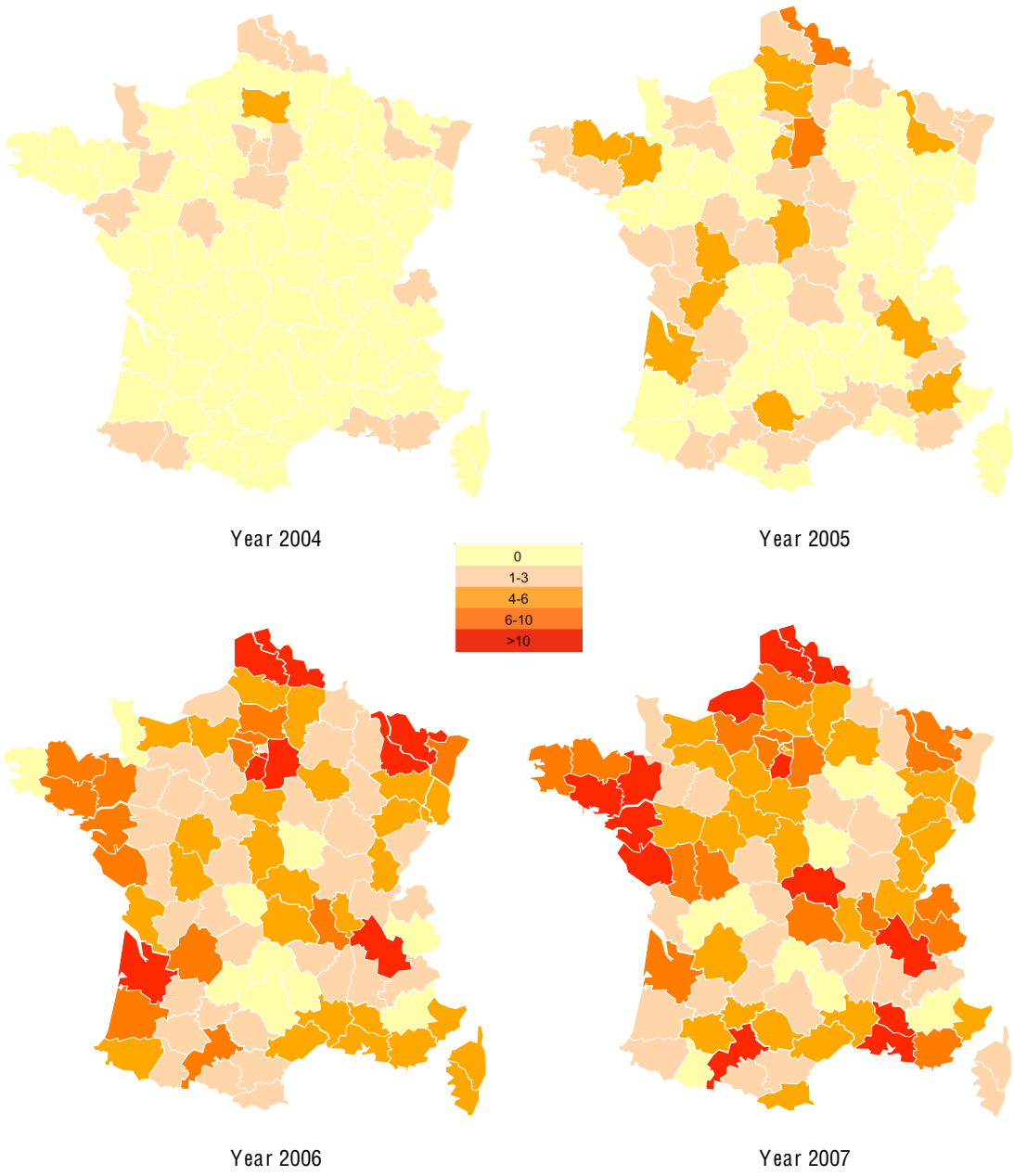

Figure 3: Geographical Evolution of Structured Debt Activity

Note: This figure displays the number of active local governments, which are defined as those that have implemented at least one structured debt transaction in the second quarter of the displayed years (from 2004 to 2007). Q2 is the period in which the recently voted budget is financed. Map division is at the French county level. The data are obtained from Dexia's client portfolio (Dataset B).

9 Tables

Table 1: Debt Profile of Local Governments

				Amount		% Total Debt	
(in Million Euros)	N	Aggregate	% Use	Mean	Max	Mean	Max
Dataset A: Local Government Debt Portfolios							
Total Debt	293	51,994.7	95.6%	177.5	1,850.5	-	-
Standard Loans and Bonds	293	34,611.5	94.9%	118.1	1,265.6	66.6%	100%
Revolving Facilities	293	6,953.2	58.4%	23.7	646.2	13.4%	100%
Structured Loans	293	10,429.9	72.4%	35.6	648.3	20.1%	95.5%
Toxic Loans	293	4,372.0	43.0%	14.9	509.9	8.4%	71.7%
Dataset B: Loan Level Data on Structured Loans							
Total Debt	1,579	33,423.1	100.0%	21.2	1,870.50	-	-
Structured Loans	2,742	23,680.0	100.0%	8.6	459.3	49.7%	-
Toxic Loans	2,742	13,462.0	42.7%	4.9	459.3	28.3%	-
Negative MtM	2,742	3,884.1	99.1%	1.4	147.4	8.1%	-
# Structured Loans	2,742	-	-	1.9	20	-	-

Note: This table contains summary statistics on debt profile for two samples of French local governments. All debt figures are expressed in millions of euros. Dataset A is obtained from a survey conducted by a specialized consulting firm as of December 31, 2007, and includes 25 regions, 96 counties, 76 intercities, and 96 municipalities. Dataset B is obtained from Dexia and covers the entire client portfolio of this bank as of December 31, 2009. Including overseas territories, France is divided into 27 regions, 100 departments, and 36,700 municipalities. Each of these divisions possesses a governing body that is elected by its population. Cities are defined as municipalities with a population exceeding 10,000 inhabitants. France contains a total of 950 cities. Intercities are associations of cities and surrounding municipalities that share some common expenses, such as transport or sports equipment. The mayors of the associated municipalities elect the president of the intercity. The sample aggregated total debt represents 38% of all-local-government aggregated total debt. Source: *Conseil des Communes et Regions d'Europe* (2007).

Table 2: Toxic Loan Usage and Political Incentives

	Debt Hiding Incentives (A)			**Political Stability (B)**		
	First Quartile Indebted	Last Quartile Indebted	Test	Strongholds	Non-Strongholds	Test
% of use: Struct.	41.00%	89.60%	***	n.a.	n.a.	
% of use: Toxic	19.30%	54.50%	***	n.a.	n.a.	
Structured/Total	14.50%	26.30%	***	23.40%	29.10%	***
Toxic/Total	5.10%	9.90%	**	13.10%	16.50%	*
MtM/Total	n.a.	n.a.		3.40%	4.80%	***
Observations	83	77		163	173	

Note: This table contains summary statistics regarding the frequency and the extent of structured and toxic loan usage for sub-samples of the local government survey data (Panels A and B) as well as for Dexia's client portfolio (Panel C). In Panel A, the first (last) quartile of the indebted sample includes the 25% least (most) indebted local governments. In Panel B, the stronghold sample includes local governments that have been ruled by the same party for more than 20 years, whereas the non-stronghold sample includes local governments that have been ruled by the same party for fewer than 10 years. % of use: Struct (% of use: Toxic) denotes the percentage of local governments in the sub-sample that have at least one structured (toxic) loan in their debt. Structured/Total is the mean value of structured debt over total debt, whereas Toxic/Total is the mean value of toxic debt over total debt. MtM is an abbreviation for mark-to-market, which is the amount that a local government must pay to the bank to unwind the derivative component of a structured debt (i.e., to convert it into standard debt). Therefore, Mtm/Total denotes the mark to market over total debt. The Test columns display the level of statistical significance of a t-test between the mean values of the right column minus the left column. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 3: Incentives to Hide Cost of Debt

	Dataset A					**Dataset B**	
	Probit		Ordered	Magnitude		Probit	
	Structured	Toxic	Probit	Structured	Toxic	Structured	Toxic
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Debt/Population	2.081***	0.679***	0.817***	12.831***	0.021**	0.329***	0.255***
	4.29	7.53	8.07	7.71	4.32	3.13	3.18
Equipment Expenditure/Pop.	-0.004***	-0.001*	-0.002***	-0.02	-0.000**	-0.001	0.000
	-3.71	-1.67	-2.88	-2.08	-3.29	-0.90	-0.08
Wages/Operating Expenditure	3.809***	0.965	2.350***	-0.592	0.006	-0.462	0.409
	5.51	0.94	4.38	-0.04	0.23	-0.65	0.39
Debt Average Maturity	0.075***	0.057***	0.083***	1.204**	0.004**	-	-
	2.99	3.05	4.94	3.65	3.75		
Log (Population)	0.070***	0.085***	0.082***	1.110**	0.003**	1.514***	1.533***
	3.56	8.13	18.87	5.5	4.97	28.55	19.77
Lender Relationship FE	Yes	Yes	Yes	Yes	Yes	-	-
Local Government Type FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County FE	-	-	-	-	-	Yes	Yes
Pseudo R2 / R2	0.304	0.181	0.129	0.243	0.259	0.432	0.438
Number of Observations	275	275	275	263	263	25,033	22,296

Note: This table contains the probit, ordered probit and OLS regression coefficients using debt portfolio data from a sample of local governments (Dataset A) for column 1 to 5, and data from Dexia's client portfolio (Dataset B) for columns 6 and 7. The dependent variable is a dummy variable for the use of structured products for columns 1 and 6, and a dummy variable for the use of toxic loans (as defined in section 2) for columns 2 and 7. In column 3, the dependent variable is equal to one if the local government has structured loans but no toxic loans, and equal to two if the local government has a toxic loan. For column 4 and 5, the dependent variable is equal to the ratio structured debt over total debt, and toxic debt over total debt. Standard errors of the coefficients are clustered by types of local governments, and z/t-statistics are reported in brackets. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 4: Politically Contested Areas

	Structured Debt /Total Debt		Mark to Market /Total Debt		Toxic Debt /Total Debt	
	(1)	(2)	(3)	(4)	(5)	(6)
Years in Power	-0.1683*	-0.1761**	-0.0401**	-0.0373**	-0.0785*	-0.1245***
	-2.97	-4.94	-5.37	-6.9	-3.1	-9.91
Right-Wing Dummy		1.5221***		0.0204		2.8585**
		9.52		0.48		7.3
Log (Population)		-5.9739*		-0.8441*		-3.2835*
		-3.42		-2.91		-3.37
Local Gov. Type FE	Yes	Yes	Yes	Yes	Yes	Yes
R2 / Pseudo R2	0.1267	0.1603	0.0513	0.0614	0.0507	0.0665
Observations	389	389	389	389	389	389

Note: This table contains cross-sectional OLS regression coefficients using data from Dexias client portfolio (Dataset B). The dependent variable is the measure of structured loan use intensity as indicated in the column header. Years in power refers to the number of years during which the political party of the incumbent (as of December 31, 2009) has been managing the local government. Standard errors of the coefficients are clustered by types of local governments, and t-statistics are reported in brackets. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 5: Difference-in-Differences Estimation of Election Timing Effects

	C-logit Structured Trade		Placebo C-logit	
	+\- 18 months	+ \- 12 months	+ \- 18 months	+ \- 12 months
	(1)	(2)	(3)	(4)
Pre-Election*Treatment	0.3522***	0.3350***	0.0275	0.0262
	2.88	3.28	0.39	0.26
Quarter Fixed Effects	Yes	Yes	Yes	Yes
Regression Type	Panel	Panel	Panel	Panel
R2 / Pseudo R2	0.0815	0.0545	0.0805	0.0534
Number of Periods	12	8	12	8
Observations	2,741	2,741	2,741	2,741

Note: This table contains the conditional logit (C-logit) regression coefficients that are estimated using data from Dexia's client portfolio (Dataset B). The dependent variable is an indicator variable of a structured trade for a given local government in a given quarter. In columns 1 and 2, the explanatory variable is an interaction variable between a dummy for the treatment group (local governments having an election at the end of 2008Q1) and a dummy for the pre-election period. Columns 3 and 4 present a placebo analysis in which the treatment group dummy that is used in the interaction term has been replaced by a dummy on a random sample of similar size; the regressions include individual public entity fixed effects. Standard errors are clustered by type of public entity. Z-statistics are reported into brackets. The time window is 18 months before and after the election (the end of March 2008) for columns 1 and 3, and the window is 12 months for columns 2 and 4. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 6: Political Effects of Structured Loan Usage: IV Analysis

	Structured Loan Usage		Reelection		
	First Stage		IV		Probit
	(1)	(2)	(3)	(4)	(5)
Distance to Dexia Agency	-0.007***	-0.002**			
	-3.219	-2.175			
Use of Structured Loan Indicator			4.889**	1.634***	0.032
			2.511	2.965	0.475
Debt per Inhabitant		0.141***		-0.007	0.012
		4.226		-1.034	1.514
Political Party FE	-	Yes	-	Yes	Yes
Dexia Branch FE	-	Yes	-	Yes	Yes
Mayor Profession FE	-	Yes	-	Yes	Yes
Population Category FE	-	Yes	-	Yes	Yes
Pseudo R2	0.025	0.363	0.002	0.108	0.107
N	34,231	25,190	26,319	24,420	24,728

Note: This table contains the coefficients for an instrumental variable analysis, using distance to the closest Dexia branch as an instrument for structured loan usage. Columns 1 and 2 present probit coefficients for the first stage, where the dependent variable is an indicator variable equal to one if the local government has borrowed with a structured loan between 2002 and 2007. Columns 3 and 4 display the coefficient of the second stage, where the dependent variable is a dummy equal to one if voters elect in 2008 a politician from the same party as the one elected in 2002, and the indicator variable for structured loan usage is instrumented as per the first stage. Column 5 shows the coefficient of a simple probit regression, with no instrumental analysis. Sample is restricted to municipalities. Standard errors are clustered at the Dexia branch level. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 7: Political Effects of Budget Decisions: IV Analysis

	Δ Local Tax per Inhabitant		Δ Investment per inhabitant	
	(1)	(2)	(3)	(4)
Structured Loan Usage (IV)	-61.320*		-365.062***	
	-1.977		-3.084	
Toxic Loan Usage (IV)		-287.284***		-974.867***
		-3.737		-4.32
Debt per inhabitant	1.317*	2.585***	2.433	5.352***
	1.775	3.013	1.264	3.138
Population Category FE	Yes	Yes	Yes	Yes
R2	0.007	0.007	0.002	0.003
N	32,860	32,860	32,901	32,901

Note: This table contains the coefficients for an instrumental variable analysis, using distance to the closest Dexia branch as an instrument for structured loan usage. The first stage is realized using probit regressions, while the second stage is conducted with OLS regressions. The dependent variable of the second stage is the variation in local tax per inhabitant between year end 2002 and year end 2007 in columns 1 and 2, and the variation in tangible assets investments per inhabitant, between year end 2002 and year end 2007 in columns 3 and 4. Sample is restricted to municipalities. Standard errors are clustered at the Dexia branch level. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 8: Financial Sophistication

	Probit					
	Structured (1)	Toxic (2)	Structured (3)	Toxic (4)	Structured (5)	Toxic (6)
1,000 < Pop < 5,000	0.558***	0.142*				
	10.365	1.792				
5,000 < Pop < 10,000	1.721***	1.300***				
	30.216	14.575				
10,000 < Pop < 50,000	2.104***	1.774***				
	22.978	16.012				
50,000 < Pop < 100,000	2.537***	2.494***				
	10.203	10.892				
100,000 < Pop < 200,000	2.256***	2.226***				
	6.211	5.99				
200,000 < Pop	3.027***	2.880***				
	4.578	5.159				
Age at election			-0.004*	-0.008**		
			-1.89	-2.166		
Senior Civil Servant					0.945***	4.586***
					2.577	10.024
College Degree					0.455**	4.442***
					1.973	15.69
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Population Control	No	No	Yes	Yes	Yes	Yes
Cluster	County	County	County	County	County	County
Pseudo-R2	0.28	0.275	0.333	0.327	0.458	0.439
N	35,712	31,084	26,068	20,027	765	768

Note: This table presents coefficients from probit regressions, where the dependent variable is an indicator variable equal to one if the local government has borrowed with at least one structured loan in columns 1, 3 and 5, and with at least one toxic loan in columns 2, 4 and 6, during the period 2002-2007. Explanatory variables X < Pop < Y represents indicators on whether the local government population is between X and Y. Sample is restricted to municipalities. Age at election represents the mayor's age when elected in the 2001 elections. Columns 5 and 6 further restricts the sample to municipalities whose mayor is a civil servant. *Senior Civil Servant* is an indicator variable for the mayor being a *Haut Fonctionnaire*, a highly selective status associated with graduating from Elite schools. *College Degree* is an indicator variable for the mayor having a civil servant status requiring a college degree (*Categorie A*). Standard errors are clustered at the county level. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 9: Local Correlation in the Borrowing Choices of Politicians

	C-logit Structured Trade		OLS (Structured Debt Notional)	
	(1)	(2)	(3)	(4)
# of Active Neighbors (Previous Quarter)	0.0183***		10.3991***	
	5.53		3.03	
# of Active Neighbors (Previous Semester)		0.0064**		4.3144*
		1.91		1.81
Quarter Fixed Effects	YES	YES	YES	YES
Regression Type	PANEL	PANEL	PANEL	PANEL
R2 / Pseudo R2	0.155	0.1486	0.0101	0.0098
Number of Periods	40	39	40	39
Number of Public Entities	2741	2741	2741	2741

Note: This table contains the conditional logit (C-logit) and OLS panel data regression coefficients that are estimated using data from Dexia's client portfolio (Dataset B). The dependent variable is an indicator variable of a structured trade for a given local government in a given quarter (or semester) for the conditional logit regressions and the incremental exposure on structured debt entered into by a public entity in a given quarter (or semester) for the OLS regressions. The explanatory variable is the number of active public entities in the same geographical zone (county level), which is defined as the number of public entities that have implemented at least one structured transaction in the previous quarter (or semester). The regressions include individual public entity fixed effects. Standard errors are clustered by type of public entity. *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Appendix A - Types of French Local Governments

Regions *(Régions)*: Metropolitan France is divided into 22 administrative regions, which are in turn divided in 2 to 8 counties *(Départements)*. Regions were created in 1982, and do not possess separate legislative authority. One of their primary responsibility is to build high schools, and regional transport infrastructures. In 2004, the median population of a region in metropolitan France was 2.3 million inhabitants. Regions are funded partly by the central government, partly by local taxes. Regions are governed by a directly elected council, the *Conseil Régional*, which in turn elects the council president.

Counties *(Départements)*: Metropolitian France is divided into 96 counties. They were created in 1791 following the French Revolution, and do not possess separate legislative authority. One of their primary responsibility is to build junior high schools, and county-level transport infrastructures. In 2004, the median population of a county in metropolitan France was 520,000 inhabitants. Counties are funded partly by the central government, partly by local taxes. Counties are governed by a directly elected council, the *Conseil Général*, which in turn elects the council president.

Municipalities *(Communes)*: Metropolitian France is divided into 36,681 municipalities. Municipalities were created in 1789, at the beginning of the French Revolution. Municipalities build primary schools, touristic equipment, and local transport infrastructure. Municipalities population varies widely, from 10 inhabitants to 2.2 million in Paris. Municipalities are funded partly by the central government, partly by local taxes. Municipalities are governed by a directly elected council, the *Conseil Municipal*, which in turn elects the mayor.

Intercities *(Communautés de Communes/d'Aglomération)*: Intercities are association of municipalities. Intercities typically cover a commuting zone. Their primary motive is to finance infrastructure that covers several municipalities, for instance swimming pools and public transport. Intercities are mainly funded by its members, which are municipalities. Intercities are governed by a council that comprises the mayors and counsellors of the participating municipalities. The council in turn elects the intercity president.

Social Housing Entities *(Organismes HLM)*: Social housing entities in French own and manage more than 4 millions housing units, or 17% of primary residences in France. The board members are appointed by local governments (counties or municipalities) and the French central government. The board nominates a CEO, who has a significant autonomy.

Hospitals *(Centres Hospitaliers)*: Hospitals in France are state-owned, have a general interest mission and non-profit. Hospitals are funded by health insurance organisms, local governments, and the central government. Their CEOs are appointed by the Health Ministry.

Appendix B - Structured Loan Types

Products are presented by increasing level of risk according to the Gissler classification. For each type of products, summary statistics are provided in Table A2.

Barriers on Domestic Rate (Gissler Scale: 1)
These products lower cost of funding as long as the underlying index is above/under a predefined barrier. Subsidy comes from the premium of the options sold, which could be interest rate caps or floors. An example is the implicit sale of a floor:

$$coupon(t) = \begin{cases} US\ Libor(t) - x\ bps & if\ US\ Libor(t) > 3\% \\ 3\% & otherwise. \end{cases}$$

The underlying index is a very liquid interest rate. Coupon structure does not include any leverage effect. Both the subsidy offered to client and the bank margin are low ($\leq$ 0.50% of notional). Barriers were the first products to enter the market in the late 1990s. Their coupon formula can be broken down into its standard loan component and an embedded short put option:

$$Standard\ loan\ coupon: \quad US\ Libor(t)$$

$$Sale\ of\ a\ put\ with\ a\ 3\%\ strike: \quad \begin{cases} -\ x\ bps & if\ US\ Libor(t) > 3\% \\ 3\% - US\ Libor(t) & otherwise. \end{cases}$$

Inflation Products (Gissler Scale: 2):
This type of products is usually based on a barrier, or on an inflation spread. They often include leverage to provide with sufficient subsidy, as inflation volatility is very low. A standard payoff is:

$$Coupon(t) = Midswap(t) - 50\ bps + 2 \times Max(French\ Inflation(t) - Euro\ Inflation(t),\ 0\%).$$

This illustrates the client's view that the French inflation rate should remain below the European inflation rate, which could be caused by entrance of new EU members from Eastern Europe with historically higher inflation.

Steepeners (Underlying Risk Level: 3):
In a Steepener structure, the coupon is indexed to the Constant Maturity Swap (hereafter CMS) curve slope and decreases the cost of funding when the slope of the curve is steep; but increases the cost when the curve is flat or inverted. The CMS curve is built with the equivalent fixed rates obtained when swapping Libor for all possible maturities. They are based on different measures of the slope: [20-year swap rate two-year swap rate], [30-year swap rate one-year swap rate], and in most cases [10-year swap rate two-year swap rate]. An example of payoff is:

$$Coupon(t) = 7\% - 5 \times (CMS\ 10Y(t) - CMS\ 2Y(t)).$$

Entering into a Steepener transaction represents a bet against the realization of forward levels, which typically anticipate a flattening of the swap curve. The risk profile of these products is higher than the one of Barrier products. This is mainly due to the introduction of leverage in the coupon formula, usually without any cap.

Quantos (Gissler Scale: 4):
They represent variable interest rate products that are indexed on a foreign interest rate with an affine formula. They exploit low spot rates and higher forward levels. Risk is moderate as leverage is generally low and the underlying foreign interest rate has low volatility. They are mainly structured on indices from countries with low interest rates, such as Japan or Switzerland. A standard Quanto payoff is:

$$Coupon(t) = 2 \times JPY\ Libor(t) \quad or \quad Coupon(t) = 1.5 \times CHF\ Libor(t) + 1\%.$$

FX Products (Gissler Scale: Out of Scale):
FX products are also based on an implicit sale of options. However FX options premiums are much higher due to the high volatility of foreign exchange rates and remain high even when strike levels are far from spot prices. This comes from the absence of mean-reversion of foreign exchange rates in banks pricing models. This feature allows to structure products with seemingly unreachable strikes, especially when historical levels bias the clients view. An example of payoff for an FX product is:

$$Coupon(t) = 3\% + 50\% \times Max(1.44 - EURCHF(t),\ 0\%).$$

These products offer very strong coupon subsidy, especially on long maturity loans when they bear no caps. One example is the 0% coupon loan by Depfa with Ville de Saint Etienne on a 32-year maturity loan. The coupon is set at 0% for 9 years and remains at this level afterwards as long as EURCHF is above EURUSD.

Cumulative Structures: (Gissler Scale: Out of Scale)
Cumulative structures can be structured on any underlying: domestic/foreign interest rates, FX rates, or inflation rates. They are based on an iterating coupon formula. Coupon degradations therefore add up to each other. The formula often includes a click feature that makes all degradations permanent; hence their nickname: snow balls. Cumulative instrument structuring is based on selling a portfolio of forward-start options. A typical coupon profile is:

$$Coupon(t) = Coupon(t-1) + 2 \times Max(USD\ Libor\ 12M(t) - 6\%,\ 0\%).$$

Due to the iterating definition of the coupon, frequency of coupon payment is key for the risk profile of the product. For a given leverage level, a quarterly cumulative structure is four times more aggressive than an annual one. These products have been dramatically impacted by the increase in volatility during the financial crisis, as they bear no cap. They are usually more sensitive to volatility than to market direction (i.e., vega dominates delta).

Appendix C - Appendix Tables

Table A1: Structured-Debt Breakdown

	Notional					Notional / Local Gov. Total Debt				
	All	Regions	Counties	Intercities	Cities	All	Regions	Counties	Intercities	Cities
Aggregate	10429.9	1128.5	4801.9	1334.7	3164.9					
1. Barriers										
Aggregate	4970.7	532.3	1959.8	746.8	1731.8					
Share in %	47.70%	47.20%	40.80%	56.00%	54.70%					
Mean	17	21.3	20.4	9.8	18	10.20%	6.50%	8.80%	9.90%	12.70%
Stdev	33.3	29.2	33.3	24	39.7	14.10%	8.70%	11.90%	17.20%	14.60%
Max	342	99.2	161.7	167.9	342	95.50%	33.30%	67.90%	95.50%	69.90%
% of use	57.70%	56.00%	60.40%	44.70%	65.60%					
2. Steepeners										
Aggregate	2794.8	301.1	1417.5	329.4	746.7					
Share in %	26.80%	26.70%	29.50%	24.70%	23.60%					
Mean	9.5	12	14.8	4.3	7.8	5.20%	3.50%	5.80%	4.90%	5.30%
Stdev	25.4	33.8	33.5	10.1	21	9.70%	11.20%	8.80%	9.30%	10.50%
Max	275.8	162.4	275.8	54.4	151.4	70.50%	54.10%	41.60%	44.70%	70.50%
% of use	39.90%	32.00%	51.00%	31.50%	37.50%					
3. FX										
Aggregate	1543.9	87.2	968.3	152.5	335.8					
Share in %	14.80%	7.70%	20.20%	11.40%	10.60%					
Mean	5.3	3.5	10.1	2	3.5	2.10%	1.10%	2.50%	2.50%	1.80%
Stdev	24.1	11.4	38.4	7.2	14.2	7.40%	3.80%	7.70%	9.40%	6.20%
Max	240.8	52.9	240.8	47.4	112.6	66.70%	17.60%	44.00%	66.70%	36.80%
% of use	14.00%	12.00%	18.80%	13.20%	10.40%					
4. Inflation										
Aggregate	357.8	102.3	120.2	30.7	104.5					
Share in %	3.40%	9.10%	2.50%	2.30%	3.30%					
Mean	1.2	4.1	1.3	0.4	1.1	0.60%	1.40%	0.40%	0.30%	0.70%
Stdev	6.6	12.4	7	2.1	6.4	3.50%	5.50%	1.70%	1.50%	4.90%
Max	64.4	49	64.4	12.9	60	46.10%	27.00%	11.90%	8.70%	46.10%
% of use	7.20%	16.00%	8.30%	3.90%	6.30%					
5. Quantos										
Aggregate	249.4	33.5	89.4	28.6	98					
Share in %	2.40%	3.00%	1.90%	2.10%	3.10%					
Mean	0.9	1.3	0.9	0.4	1	0.50%	0.40%	0.40%	0.30%	0.80%
Stdev	3.5	4.2	3.4	2.4	4	1.90%	1.20%	1.30%	1.20%	2.70%
Max	33.2	15.8	25.6	20.7	33.2	16.40%	1.20%	8.10%	7.80%	16.40%
% of use	12.30%	12.00%	12.50%	6.60%	16.70%					
6. Cumulative										
Aggregate	33.4	13	7.4	0	13					
Share in %	0.30%	1.20%	0.20%	0.00%	0.40%					
Mean	0.1	0.5	0.1	0	0.1	0.00%	0.10%	0.00%	0.00%	0.00%
Stdev	1	2.6	0.8	0	0.8	0.30%	0.40%	0.30%	0.00%	0.30%
Max	13	13	7.4	0	7.1	3.20%	2.00%	3.20%	0.00%	1.90%
% of use	1.70%	4.00%	1.00%	0.00%	3.10%					
7. Others										
Aggregate	300.9	30	143.6	28.9	98.5					
Share in %	2.90%	2.70%	3.00%	2.20%	3.10%					
Mean	1	1.2	1.5	0.4	1	0.80%	0.30%	1.00%	0.50%	1.00%
Stdev	4	4.4	4.6	2	4.5	3.70%	1.00%	3.70%	2.90%	4.50%
Max	35.8	20	23.6	12.9	35.8	36.10%	3.40%	27.90%	22.10%	36.10%
% of use	8.50%	8.00%	11.50%	3.90%	9.40%					

Note: This table contains summary statistics on the different types of structured debt for a sample of French local governments. The data are obtained from a survey conducted by a specialized consulting firm as of December 31, 2007 (Dataset A). The left panel of this table displays statistics on aggregated and local government-level amounts of debt. Figures are in millions of euros, except for share in % and % of use. Aggregate denotes the sum of the debt notional amount over all local governments. Share in % represents aggregated amount of a given debt instrument in the sample divided by aggregated total structured debt of the sample. The right panel displays statistics on the relative breakdown by debt instruments at the local government level. For instance, a local government whose debt consists in EUR70m of standard bank loans and EUR30m of FX linked debt will be considered as a local government with 30% of FX linked debt.

Table A2: Hedging

	Pooled Regression			Individual Regressions			
	Coefficient	St. Err.	P-value	Mean Coeff.	St. Dev. Coeff.	% Coeff > 0 at 10% signif.	% coeff <0 at 10% signif.
Euribor 3m	-0.0162	0.0168	0.436	0.0122	0.047	3.98%	0.00%
CMS 10y - CMS 2y	-0.0601	0.0504	0.355	-0.0193	0.0404	13.72%	1.33%
EURCHF	-0.112	0.0963	0.364	0.237	0.3277	15.49%	3.54%
EURUSD	0.1681	0.1577	0.398	0.0982	0.2713	3.98%	0.00%

Note: This table contains summary statistics on regression coefficients between the annual percentage change in revenues and the percentage change in several financial indices. The pooled regression is run on the four indices, controlling for inflation and with local authorities type fixed effects. Standard errors of coefficients are clustered by type of local authorities. Individual regressions are conducted for each local government on each individual index, also controlling for inflation. Euribor 3m is the 3-month Euro interbank offered rate and CMS stands for Constant Maturity Swap and corresponds to the fixed rate obtained by swapping a Euribor coupon. For CMS 10y - CMS 2y, we use the first difference. The sample includes all French regions, departments, as well as the 100 largest cities (226 French local authorities in total) for which we have revenue data between 1999 and 2010. Index data are from Datastream and local authorities revenues are from the French Finance Ministry.