The Effects of Local Government Financial Distress: Evidence from Toxic Loans

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ABSTRACT

We examine the response from both local governments and their voters to a sudden increase in public debt burden. We exploit plausibly exogenous variation in the ex post cost of toxic loans, a notorious financial innovation adopted by a large number of local governments. A large increase in the debt burden of a local government results in a significant reduction in its investments, but leaves expenses and taxes mostly unchanged. This effect is dampened for local governments that are more politically contested. An increase in public debt reduces the likelihood of re-election for incumbent mayor and its political party. Overall, these findings support the existence of a public debt overhang effect, which binds differently depending on the political context as contested mayors strive to maintain investments.

Keywords: Public debt, public investments, political contestation, toxic loans.

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1 Introduction

High levels of local government indebtedness are ubiquitous and increasing among developed countries. In the US, state and local governments have a combined balance of debt of $3.9 trillion, and another $1.5 trillion in unfunded liabilities.[1] In addition, this aggregate burden is distributed heterogeneously, with a large share of it falling disproportionately on a fraction of local governments (Myers, 2020). Local public debt has accumulated despite local governments being typically forbidden by law to run a budget deficit. The Covid-19 outbreak has resulted in further pressure on local government balance sheet.

Despite the massive increase in local public debt in the past decades, surprisingly little is known about its effects on local governments actions. While Reinhart et al. (2012) suggests the existence of a form of debt overhang in public finance, there is not yet convincing empirical evidence supportive of such a phenomenon. On the other hand, an increase in public debt might discipline government actions, for instance by leading to cost reductions or discourage from inefficient investments, as is the case for firms (Hart and Moore, 1995). More specifically, the effects of large debt burden on government investments, spending and revenue policies, on constituents behaviors, and on the local economy is largely unknown, due to the empirical challenge of teasing out these effects from local government characteristics or policies that led to the high level of indebtedness in the first place. In addition to this unobserved variable bias, a naive regression between public debt and government policies might suffer from reverse causality.

There are several important differences between local governments and firms. First, the economic nature of a financial constraint is less clear for local governments, given their ability to raise tax, and the frequent implicit guarantee from the central government they benefit from. Second, although both entities suffer from a principal agent problem, this problem is more acute with local governments as the principal is made of voters which are likely to

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[1]Source: https://www.wsj.com/articles/covid-19-pandemic-drives-municipal-borrowing-to-10-year-high-11610447402 and Center for Retirement Research at Boston College, Public Plans Data.

have both multi-dimensional and heterogenous objectives, as opposed to shareholders who mostly aim to maximize firm value. Third, local governments cannot raise equity.

Therefore the mechanism linking debt with investments, and possibly other financial decisions, likely differ between firm and local governments. As is frequent with government decisions, reelection considerations might play a powerful role, although its extent is largely unknown.

In this study, we attempt to fill these gaps by exploiting a sharp and exogenous variation in the debt burden of a large number of French local governments, which addresses previously mentioned empirical challenges. This study should bear external validity to economies of comparable development where local governments are forbidden to run a deficit, such as in the United States. This setting allows us to measure the causal impact of an increase in public debt on government actions, as well as to explore how this impact varies depending on the political context, thereby linking financial and political frictions.

We find that when experiencing an increase in their debt burden, local governments significantly reduce investments, while modestly reducing expenditures and leaving taxes mostly unchanged. The reduction in investment is less pronounced for local governments where political contestation is high, which suggests that the constraint that high debt imposes is not fully binding, and that politicians that are facing a difficult reelection are less willing to follow it.

Last, an increase in debt reduces the likelihood of being re-elected, possibly due to the associated reduction in investments.[2]

Our identification is based on the plausibly exogenous choice of the exposure embedded in the structured loans implemented by a large group of French local governments. Among the various exposure these exotic instruments offered, a significant share of these loans where indexed to a Swiss Franc foreign exchange, either vs. the Euro or the US. As the Swiss

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[2]Public investments appear to exhibit a cyclicality that follows the political cycle, with a peak the year before the election, which suggests that incumbents perceive investments as a way to improve the likelihood of their re-election.

Franc significantly strengthened in the wake of the financial crisis, particularly so after the Swiss National Bank unpegged it from the Euro, local governments that had such loans on their balance sheet faced a sharply increased debt burden, relative to local governments that issued structured loans with a different exposure. Within structured loan users, we therefore instrument the public debt burden with the quantity of CHF-linked loans municipalities issued prior to 2009, while precisely controlling for government characteristics, to study its causal effect on government and constituents' actions.

Our identification strategy is made possible by a rich dataset, which builds on the one used in Perignon and Vallee (2017). We exploit detailed information on structured loan usage by local governments in France combined with detailed panel data of government financial statements, election and population outcomes obtained from the French statistical office and covering the period 2008 to 2018.

Our results contribute to the longstanding literature on the role and effects of public debt, starting with Ricardo (1951) and Barro (1979). Alesina and Tabellini (1990) argue that government debt is a strategic variable used by policymaker to influence the choices of his successors. Turning to the local level, Cornaggia et al. (2018) and Adelino et al. (2017) exploit Moody's ratings recalibration of credit ratings to study the impact of a relaxation of municipalities' financial constraints on their bond prices, and government spending and local employment, respectively. Public liabilities are growing in part due to large pension liabilities, as documented by Novy-Marx and Rauh (2011), which jointly affects spending, tax and borrowing decision of governments (Myers, 2020) . Our study contributes to this literature by both documenting real effects of high public indebtedness, namely a drop in public investments, and speaks to forces disciplining the increase in public debt: financial constraint, and voter preferences (or the beliefs over voter preferences by elected officials).

Our analysis also connects with recent studies estimating the real effects of high level of indebtedness on investment and spending of different economic agents. Agarwal et al. 2016, Di Maggio et al. (2017) and Ganong and Noel (2019) find that households who ex-

perience debt payment reductions have a lower probability of default and increase spending on durables. Closer to our setting, Verner and Gyongyosi (2020) exploit variation in exposure to household foreign currency debt during Hungary's late-2008 currency crisis and document a rise in default and a collapse in spending, which amplify the recession locally. In the corporate sector, Gilje (2016) finds a reduction in investments as firms exogenously approach financial distress. Whereas these authors study the economic effects of debt burden for households and firms, we study the economic effects of debt burden to local governments.

Last, this study also speaks to the costs of financial innovation gone wrong. When the innovation reaches sufficient scale to become systemic, it can have acute financial consequences, as documented in Perignon and Vallee (2017), and lead to a broad range of real effects, including political (Sartre et al. (2020), Gyongyosi and Verner (2020)). This study looks at the consequences of a nefarious innovation on governments economic policy, and speaks to comparable episodes implemented at different levels of government (e.g. Gromb and Peress (2018)).

The rest of the paper is organized as follows. Section II presents the empirical setting. Section III describes the results. Section IV concludes.

2 Empirical Setting

2.1 Background

We exploit a quasi-exogenous variation in the debt burden of French local governments over the 2009-2018 period, resulting from the combination of local governments entering into derivative transaction creating a short exposition to the Swiss Franc during the 2000's, and the sharp 2015 Swiss Franc appreciation (see for instance Auer et al. (2021)).

2.1.1 Structured Loans

Structured loans, later relabelled *Toxic Loans* by the media, are a type of loans used by local governments in Europe during the 2000's, which embed large sale of options with various underlying assets: interest rates, inflation, interest rate spreads, or foreign-exchange rates. The use of these speculative instruments was widespread in Europe and particularly so France during the 2000's, with thousands of French local governments using structured loans, and more broadly in Europe. The sale of options allowed local governments to borrow at a "cheaper" rate as long as the options stayed out of the money.[3] A subset of these loans were designed with a short exposure to CHF exchange rates: if a given foreign exchange rate, typically EURCHF or USDCHF, dropped below a certain level K, the interest rate paid annually on the loan would increase by c x (Exchange rate - K)%, where c is typically 0.5 or 1. Once in the money, an appreciation of the CHF vs the other currency of 0.01 therefore raises the interest rate by 0.5 or 1%. Such transactions therefore create a large and long-lasting exposure to the CHF appreciation, as the loan maturity can go up to 30 years.

2.1.2 The CHF Unpeg from the Euro

On September 6, 2011, the Swiss National Bank (SNB) announced a floor on EURCHF exchange rate of 1.20, which brought a stable EURCHF exchange rate throughout 2014. However, at the end of 2014, foreign developments, including market participants' anticipation of a large-scale quantitative easing program in the euro area, led to a large flight to safety phenomenon into CHF denominated securities, in turn prompting the SNB governing board to unexpectedly abandon the minimum exchange rate on January 15, 2015. This policy change led to a sudden and large exchange rate appreciation when compared to typical short-term exchange-rate fluctuations in advanced economies. Relative to December 2014, the EUR/CHF appreciated by more than 20% in January 2015, and while partly reversed, the gap remained large in the following years. Figure 1 displays the evolution of the

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[3]For more details on these financial instruments, see Perignon and Vallee (2017).

EURCHF parity.

2.1.3   A sharp rise in public debt burden

The combination of a large stock of structured loans embedding massive short exposure to the CHF, and its strong appreciation in 2015 led to a sharp rise in the debt burden of a group of municipalities. There are several key aspects of this episode to consider. First, the CHF unpeg translated into a sharp rise in interest rates on the exposed structured loans, some of them reaching annual interest rates over 50%. Relatedly, the unwind cost for exiting the CHF exposure rocketed, due to the long maturity of the loans. As many municipalities were unable or unwilling to make the interest payments, a program was put in place by the central government to assist local governments to unwind the structures and finance around half of the unwind cost.[4] This program made payments starting in 2016, and covered 578 local governments, including virtually all CHF-linked issuers. As of end of 2016, EUR 1.2bn of participation to unwind costs had been attributed to municipalities.[5] For the majority of CHF-loan users, the CHF appreciation led to a short-term rise in interest rates followed by a long term increase in the level of debt.[6]

Second, only a fraction of structured loan users were exposed to the Swiss Franc.[7] Because other exposures embedded in structured loans did not face such massive changes in market conditions, non-CHF structured loan issuer represent a natural control group for the purpose of studying the effect of an exogenous increase in the debt burden of local governments.[8]

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[4]The shock would have been substantially more acute in the absence of such bail-out.

[5]Source: http://proxy-pubminefi.diffusion.finances.gouv.fr/pub/document/18/22323.pdf.   The list of beneficiaries is not public.

[6]Economically the two impacts are similar: the local government faces higher debt payments in the future. For simplicity, and due to the transitory nature of the interest cost rise, we focus our analysis on the change in debt.

[7]In our sample, 16% of structured loan users have Swiss Franc exposure.

[8]A parallel can be drown between this empirical setting for local governments and the ones for households of adjustable rate mortgages, as used in Gupta (2019), or foreign currency denominated loans, as in Verner and Gyongyosi (2020).

While Perignon and Vallee (2017) document that the decision to borrow through structured loan is correlated with government characteristics, including indebtedness at the time of the innovation, as well as to how politically contested the areas are, among structured loan users, the exact exposure embedded in the loan is mostly orthogonal to government observable characteristics. Column 1 and 2 of Table 1 displays the balances for CHF-linked loan issuers and other structured loans issuers. Within the pool of municipalities holding structured loans in 2009, those with and without exposure to the CHF are broadly similar on observable dimensions, though CHF-exposed municipalities are larger. In our empirical analysis, we explicitly account for these differences in observable characteristics.

INSERT TABLE 1

We plot in figure 3 the location of structured loan users in France and in the Paris region, identifying the ones that borrow with CHF-linked loans. These figures do not suggest geographic clusters in terms of the underlying exposure of structured loans.

INSERT FIG 3

2.2 Data

Structured Loan data

We rely on two proprietary datasets, as in Perignon and Vallee (2017), which contain detailed information on structured loan usage in France the entire debt portfolio for the 300 largest French local governments as of the end of 2007, as well as all of the structured transactions made by Dexia, which has a 70% market share for such transactions in France, between 2000 and 2009. Both these datasets contain information that are typically undisclosed to the public. For maximum comparability, we focus on municipalities and drop regions, departements and other entities from the sample. Together, these datasets allow us to identify 1,554 municipalities having issued structured loans, out of which 59 have done so with a bank other than Dexia.

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Local government financial statements

We obtain detailed municipalities financial statements for the period 2005 to 2018 from the data sharing website of the French Interior Ministry.[9]

Election data

We obtain election data for the municipal elections of 2008, 2014, and 2020 from the same source. The data includes candidate names, demographic characteristics, party affiliation and votes received for each election, including the runoff if there was one.

We merge this three datasets together using local government unique identifiers and build a comprehensive panel data set covering around 21,000 observations for which our main outcome and control variables are non-missing. More than 65% of municipalities over 10,000 inhabitants issued structured loans, and our final sample covers 40 percent of the French population.

2.3   Identification Strategy

Our empirical analysis is centered on an instrumental variable analysis in a panel setting, where we instrument local government level of debt (per capita) with the quantity of CHF-linked loans interacted with an indicator variable for being after the unpeg of the Swiss Franc.[10]

Our main identification assumption is therefore that the change in outcome $Y_{m,t}$ in municipalities with structured loans but without exposure to the CHF is a valid counterfactual for municipalities with structured loans exposed to the CHF, had those municipalities not been exposed to the CHF appreciation through the debt they own. The threat to identification is therefore a time-varying, municipality-specific shock in 2015 that affects $Y_{m,t}$ and is correlated with exposure to CHF debt.

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[9]Source: https://www.data.gouv.fr/en/datasets/comptes-individuels-des-communes-fichier-global-a-compter-de-2000/

[10]Our results are robust to using a reduced form specification.

To maximize the internal validity of our tests, and address potential concerns over selection effects associated the decision of using structured we focus our study on municipalities with more than 1,000 inhabitants that borrow with any form of structured loans. The municipality fixed effects of our panel specification, as well controls for time-varying characteristics, further alleviate concerns over such composition effects.

2.4 First Stage

We first confirm that the debt burden of local governments increases proportionally to the quantity of CHF-linked loan they have on their balance-sheet as the CHF appreciates following the 2015 unpeg. CHF-linked loans affect both the total amount of debt, when local governments unwind the position with a mark-to-market strongly against them, and the amount of interest paid before the structured loan is unwound.[11] We regress debt over population over our instrument for the period 2011 to 2018.

$$Debt/Pop_{m,t} = \alpha + \beta CHF/Pop \times PostShock + \lambda' x_{m,t} + \gamma_m + \mu_t + \varepsilon_{m,t}$$

where $Debt/Pop_t$ is the amount of debt of municipality m in year t, divided by its population that year. $PostShock$ is an indicator variable for being after the CHF unpeg, e.g. after 2015. CHF/Pop represents the amount of CHF-linked debt outstanding for the municipality as of 2009, divided by the municipality population. γ_m and μ_t are municipality and year fixed effects. $x_{m,t}$ are additional time-varying controls at the municipality level. We progressively introduce controls and present regression coefficients in columns 1 to 4 Table 2.

The magnitudes are particularly large: €1,000 of CHF-linked loan per inhabitant is associated with an increase of €560 of debt per inhabitant. These estimates are robust to a

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[11]The unwind costs are financed for slightly more than half their amount by the central government, as part of a partial bailout, the rest falling on the local government. All of the interest rates due prior to the unwind are born by the local government.

rich set of controls, including population quintiles-year fixed effects, and departement-year fixed effects. This magnitude is consistent with an unwind cost larger around 120% of the initial loan notional, as ca. half of the unwind was born by the central government.

As a robustness, and to study the potential existence of pre-trends, we use the quantity of CHF index debt over population interacted with yearly dummies in columns 5 to 8. The regression coefficients illustrate the absence of pre-trends in terms of debt evolution prior to the unpeg, and the sharp and significant increase in debt per inhabitant it caused.

INSERT TABLE 2

3   Results

Equipped with the instrument previously described, we turn to studying the causal effect of the increased debt burden on municipality budget decisions, and on local political outcomes.

3.1   Effect on Local Government Investments

Motivated by the notion of public debt overhang, we first look into the effect of a higher debt burden on the investments of the municipalities. We implement a 2SLS analysis by instrumenting the level of debt per inhabitant in a panel specification with local government and year fixed effects. The exact specification is as follows:

$$Investment/Pop_{m,t} = \alpha + \widehat{Debt/Pop}_{m,t} + \lambda' x_{m,t} + \gamma_m + \mu_t + \varepsilon_{m,t}$$

where $\widehat{Debt/Pop}_{m,t}$ is instrumented with $CHF/Pop \times PostShock$. Regression coefficients are displayed in table 3. We observe that an increase in debt results in significantly reduced investments. The magnitude is large: an increase of debt by €1000 per inhabitant leads to a reduction by €170 of investments in a given year.

This result is robust to the different specifications that progressively add population quintile-year fixed effects, and department-year fixed effects. These fixed effects aim at

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capturing potential different (non-linear) trends among municipalities of similar population or geographic zone. This result suggests the existence of a "public debt overhang" effect. Interestingly such phenomenon appears to be of comparable magnitude as the one present for corporate firms (see for instance Hennessy (2004)). While public investments is reduced, we do not take a stance on the welfare impact of this reduction, due to the lack of data on the type of investments and its associated benefits and costs, and the numerous assumptions such a stance would require us to take.

INSERT TABLE 3

In terms of aggregate magnitude, the estimates imply that the aggregate EUR 1.5bn of notional value of CHF-based structured loans owned by French municipalities translated into a cumulative shortfall of EUR 1bn in affected local governments' investments over the period 2015-2018, abstracting from general equilibrium effects. This represents 13% of these local governments' aggregate investment over the period.

3.2   Effect on Expenses and Revenues

We implement a similar analysis to study the potential effect of the increase in debt on operating expenses and local taxes in tables 4 and 5. We observe a small reduction in operating expenses when debt increases, but no effect on local taxes, which represent the only source of revenues over which the municipality has some control. Taken together with the previous result, these elasticities suggest the existence of a pecking order to address capital shortfall: debt burdened municipalities first reduce investment, then expenses, and leave taxes unchanged if possible. Such pecking order likely results from a combination of the lower rigidity of investments, and (perceived) voter preferences over spending reductions and tax increases.

INSERT TABLE 4 AND TABLE 5

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3.3 Debt, Investment, and the Political Cycle

When plotting the average amount of investment per inhabitant over time, a cyclicality emerges: municipal investment peaks the year before or the year that municipal elections are held. Figure 3 illustrates this pattern, which holds both for the whole sample of municipalities, and for structured loan users. Such cyclicality suggests that elected officials might perceive supporting investments as improving their re-election likelihood. A natural implication is that mayors that are facing a challenging re-election prospects might be more reluctant to the reduction in investments that the increase in debt calls for.

INSERT FIG 3

We therefore explore the heterogeneity of our central result along proxies for political contestation. In Panel A of Table 6, we reproduce our 2SLS panel specification while splitting our sample between local governments whose mayor was elected without a runoff in 2014, which suggests low political contestation, and the ones elected during the runoff. Importantly, the municipal elections of 2014 precede the unexpected 2015 Swiss Franc shock that we use for identification. In Panel B, we split our sample along the vote margin between the elected candidate and the closest losing candidate, and whether such margin is below or above median.

We observe that the negative effect of debt on investments that we previously document is originating mostly from local governments with a low level of political contestation, according to both proxies. This heterogeneity is consistent with the prediction that the reduction in investment triggered by an increase in debt is weakened when political contestation is elevated. In turn, this result speaks to how political contestation might foster debt accumulation, as it appears to relax the disciplining effect of debt.

INSERT TABLE 6

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3.4 Effect on Election Results: voting with your ballot

We now turn to investigate whether an increase in the debt burden affects the likelihood of re-election of the current mayor. While at first sight it is difficult to rationalize how an increased debt burden might help getting re-elected, the direction and the magnitude of the impact on election result is an empirical question for several reasons. First, the debt increase is mostly exogenous to the current mayor actions during its current mandate, as the loans have been put in place long typically long before the current mayor was elected, and as the mayor has no control over the SNB decision. Second, previous results document that politicians respond to such a shock heterogeneously across their re-election prospect. Such heterogeneity in reaction to the shock could therefore attenuate or even offset the possible impact on election outcomes. Last, voters might not be sensitive or attentive to the local government financial standing, and ignore all these aspects altogether.

We therefore run the following cross-sectional specification, with a particular attention on the magnitude:

$$(IncumbentWin = 1) = \alpha + CHF/Pop + \lambda' x_m + \varepsilon_m$$

Columns 1 of Table 7 presents the regression coefficients where $(IncumbentWin = 1)$ represents the same individual, column 2 where $(IncumbentWin = 1)$ corresponds to the same political party. This reduced form specification illustrates that having issued CHF-linked loans reduces the re-election prospect of the politician elected in 2014, i.e. long after the implementation of such transactions, after their public disclosure, but before the increase in the debt burden resulting from the CHF unpeg. The magnitude of this effect is large: the average quantity of CHF-linked loans for a treated municipality in our sample is associated with a 7 percentage point reduction in the likelihood of the incumbent mayor to be re-elected. This result includes both extensive and intensive margin: the effect of incumbents deciding not to run, which is an endogenous decision, and the lower share of vote obtained if deciding

to run.

We confirm this result by looking at the effect of the CHF-linked loan burden on the share of vote obtained in the first round by the 2014 election winner, in both 2014 and 2020, which allows us to absorb time-invariant unobserved characteristics of the local government which could correlate with re-election prospects. We run a two period panel model with municipality and year fixed effects, as well controls for geographic and size trends. The model is specified as follows:

$$Share of 2014 winner vote in First round = \alpha + CHF/Pop \times PostShock + \lambda'x_{m,t} + \gamma_m + \mu_t + \varepsilon_{m,t}$$

Results are displayed in columns 3 and 4 of Table 7. In column 3 the sample is restricted to municipalities where the incumbent mayor runs in 2020 (or the incumbent party has a candidate in 2020 for column 4). We focus on the initial election and not the runoff to maximize comparability of vote shares. Consistent with the previous result, we observe a significant reduction in the vote share at the initial election for mayors of municipalities affected by the exogenous increase in debt burden.

<div align="center">INSERT TABLE 7</div>

4   Conclusion

We examine the response from both local governments and their voters to a sudden increase in public debt burden triggered by the use of exotic financial instruments and the Swiss Franc unpeg from the Euro. A large increase in the debt burden of a local government results in a significant reduction in its investments, but leaves expenses and taxes mostly unchanged. This effect is dampened for local governments that are more politically contested, as measured with two different proxies. In turn, an increase in public debt reduces the likelihood of re-election for the incumbent mayor.

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5 Figures
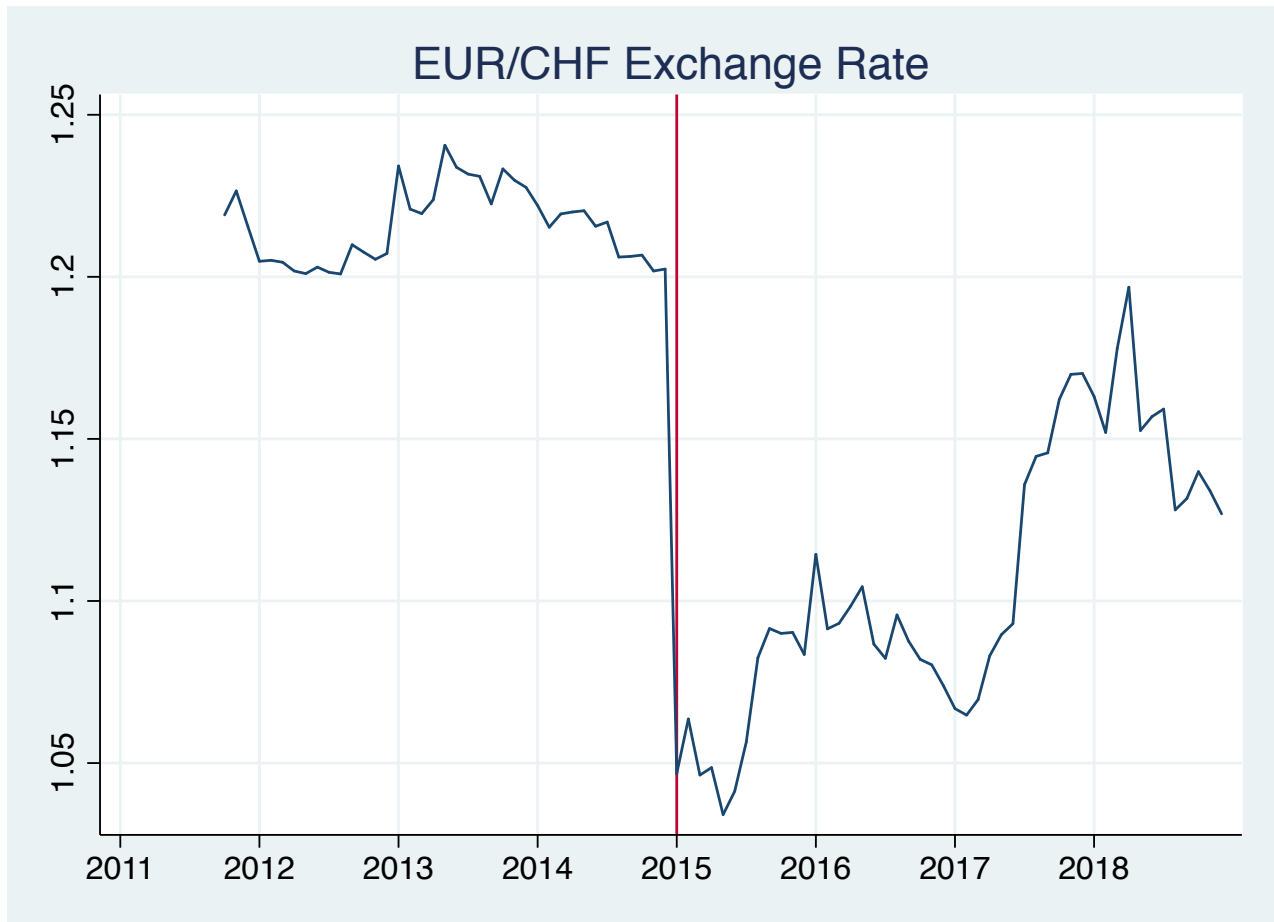
Figure 1

Euro-Swiss Franc exchange rate

Note: This figure plots the EUR/CHF exchange rate at the monthly frequency over the sample period 2011-2018. The vertical red line indicates the large and sudden appreciation of the Swiss franc (CHF) following the Swiss National Bank unexpected decision to abandon its minimum EUR/CHF exchange rate policy on January 15, 2015.

Panel A. France
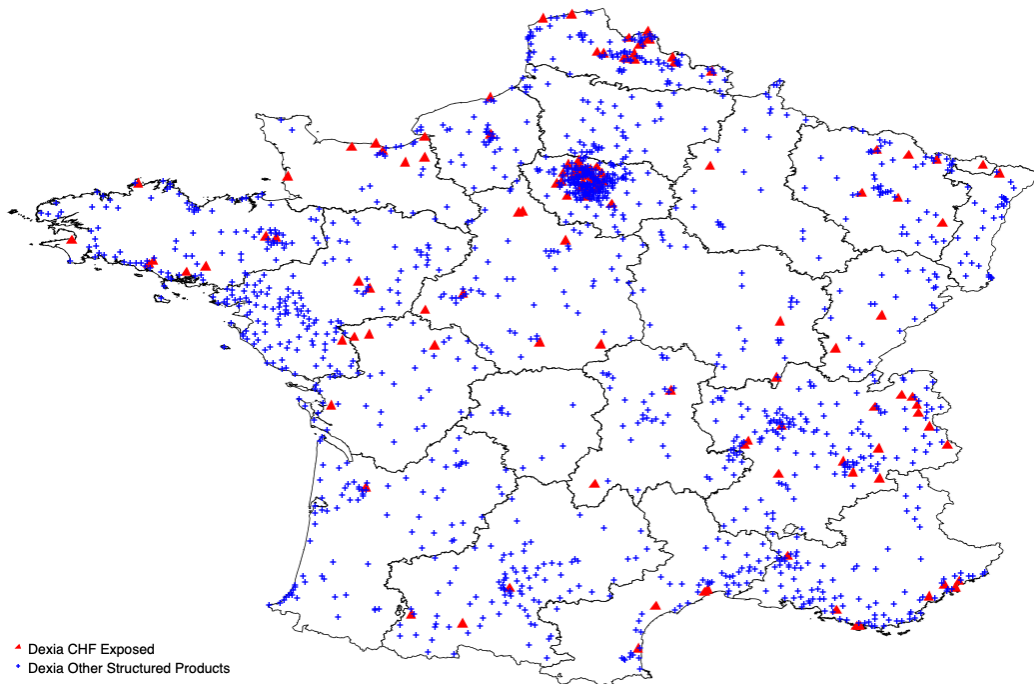
Panel B. Zoom on Ile de France
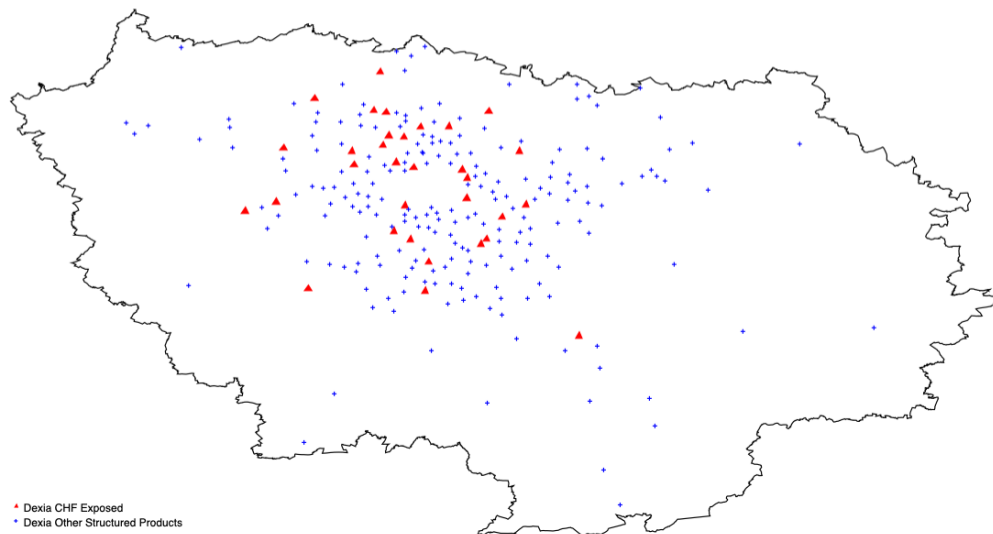
Figure 2
Map of CHF-Exposed Municipalities

Note: This figure presents the geographical position of each French municipality with structured loans in 2009, separately for those with and without CHF exposure. Panel B zooms in the region surrounding Paris.

Figure 3

Municipal Investments Over the Political Cycle

Note: This figure plots aggregate local public investment across all French municipalities, expressed in thousand euros per inhabitants, for the sample period 2000-2018.

6   Tables

Table 1
Descriptive Statistics

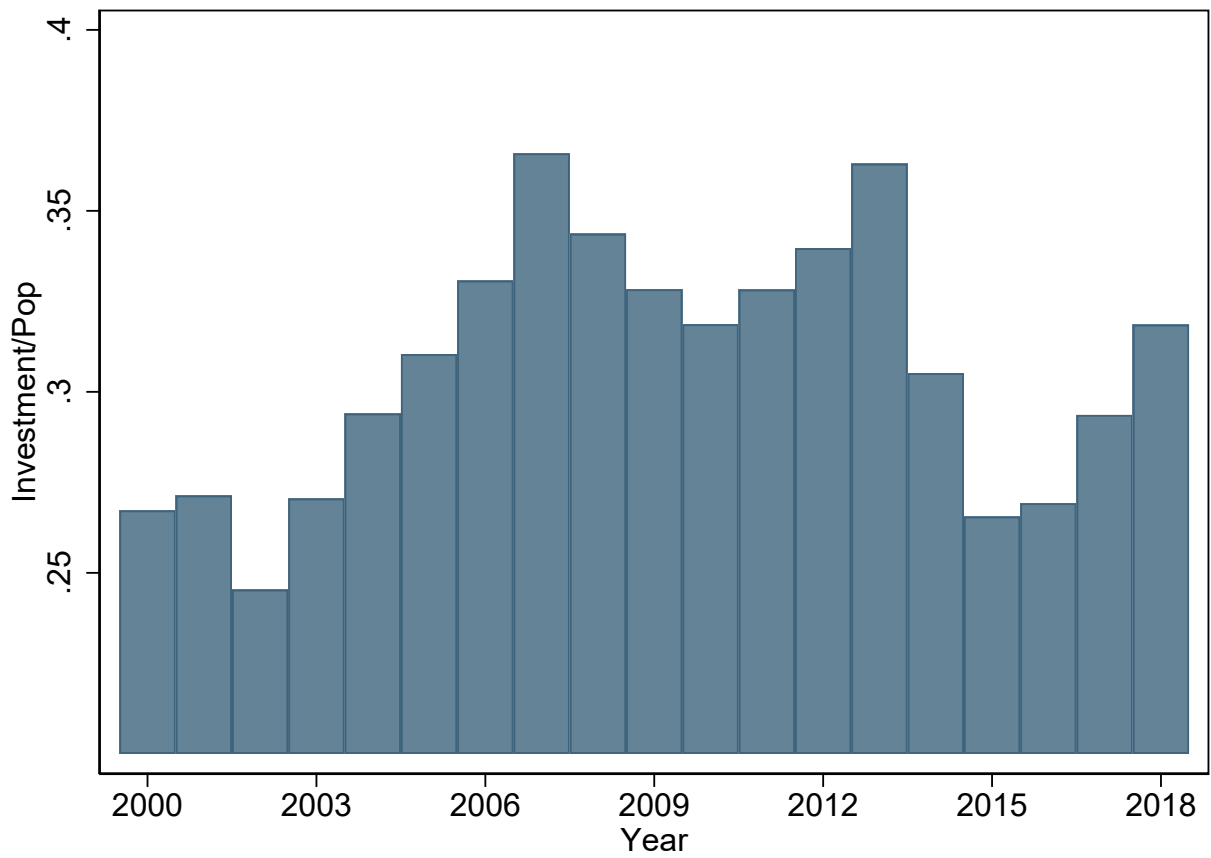| Municipality-level in 2011	Main Sample			All Municipalities		
				Treated+		
	Treated	Controls	Equality test	Controls	Other	Equality test
	N=238	N=1,241	P-value	N=1,471	N=34,383	P-value
CHF DEBT/POP	0.500	0.000	0.000	0.080	0.000	0.000
OTHER STRUCTURED DEBT/POP	0.690	0.410	0.360	0.450	0.000	0.000
TOTAL DEBT/POP	1.360	1.060	0.000	1.100	0.500	0.000
POPULATION	26919	15122	0.000	16947	1096	0.000
INVESTMENT/POP	0.340	0.340	0.870	0.340	0.340	0.250
EXPENSES/POP	0.900	0.750	0.000	0.770	0.400	0.000
LOCAL TAXES/POP	0.620	0.540	0.000	0.550	0.310	0.000
Δ TOTAL DEBT/POP	0.240	-0.060	0.000	-0.010	0.040	0.000
$\sum$ INVEST/POP	2.560	2.700	0.190	2.680	2.780	0.010
$\sum$ EXPENSES/POP	7.540	6.440	0.000	6.610	3.560	0.000
$\sum$ LOCAL TAXES/POP	5.360	4.730	0.000	4.820	2.780	0.000

Notes: This table presents descriptive statistics for the municipalities included in our sample. All variables, except population, are expressed in thousand euros per 2011 inhabitants. Treated municipalities indicate those with CHF-linked loans. Control municipalities indicate those with any form of other structured loans. Other municipalities indicate those without structured loans. The sample is restricted to municipalities with at least 1,000 inhabitants.

Table 2
First Stage: Panel

	DEBT (t) / POP (2011)							
	Baseline (Post x Treatment)				Granular			
CHF DEBT/POP11 × POST SHOCK	0.596***	0.562***	0.563***	0.582***				
	(0.072)	(0.072)	(0.072)	(0.069)				
CHF DEBT/POP11 × 2012					-0.034	-0.036	-0.035	-0.036
					(0.027)	(0.027)	(0.027)	(0.026)
CHF DEBT/POP11 × 2013					-0.055*	-0.059*	-0.054	-0.051
					(0.033)	(0.033)	(0.034)	(0.032)
CHF DEBT/POP11 × 2014					-0.057	-0.062*	-0.054	-0.051
					(0.035)	(0.035)	(0.036)	(0.035)
CHF DEBT/POP11 × 2015					0.160***	0.152***	0.157***	0.164***
					(0.062)	(0.058)	(0.057)	(0.056)
CHF DEBT/POP11 × 2016					0.247***	0.238***	0.238***	0.252***
					(0.063)	(0.059)	(0.058)	(0.057)
CHF DEBT/POP11 × 2017					0.437***	0.426***	0.431***	0.449***
					(0.096)	(0.089)	(0.089)	(0.089)
CHF DEBT/POP11 × 2018					0.401***	0.394***	0.398***	0.417***
					(0.088)	(0.083)	(0.084)	(0.087)
EXPENSES/POP (t-1)				0.654***				0.651***
				(0.064)				(0.064)
LOCAL TAXES/POP (t-1)				-0.085				-0.076
				(0.058)				(0.059)
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Pop Terciles × Year FE	N	Y	Y	Y	N	Y	Y	Y
Department × Year FE	N	N	Y	Y	N	N	Y	Y
Observations	21,441	21,401	21,400	19,794	21,441	21,401	21,400	19,794
R²	0.866	0.868	0.871	0.887	0.865	0.868	0.870	0.887

Notes: The sample period is 2011-2018. Standard errors presented in parentheses are clustered at the municipality-level. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

Table 3
2SLS Panel: Effect on Investments

	INVESTMENTS (t) / POP (2011)							
	Baseline IV				Granular IV			
DEBT/POP	-0.179***	-0.216***	-0.205***	-0.171***	-0.219***	-0.238***	-0.222***	-0.184***
	(0.048)	(0.054)	(0.052)	(0.048)	(0.061)	(0.064)	(0.062)	(0.057)
EXPENSES/POP (t-1)				0.133***				0.142***
				(0.050)				(0.054)
LOCAL TAXES/POP (t-1)				0.081**				0.080**
				(0.032)				(0.033)
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Pop Terciles × Year FE	N	Y	Y	Y	N	Y	Y	Y
Department × Year FE	N	N	Y	Y	N	N	Y	Y
Observations	21,352	21,313	21,312	19,712	21,352	21,313	21,312	19,712

Notes: Standard errors presented in parentheses are clustered at the municipality-level. *, **, and ***
denote significance at the 10%, 5%, and 1%, respectively.

Table 4
2SLS Panel: Effect on Operating Expenses

	EXPENSES (t) / POP							
	Baseline IV				Dynamics IV			
DEBT/POP	-0.052*	-0.059*	-0.066**	-0.056*	-0.063**	-0.067**	-0.072**	-0.057*
	(0.029)	(0.031)	(0.032)	(0.029)	(0.031)	(0.033)	(0.033)	(0.030)
INVESTMENT/POP (t-1)				0.043***				0.043***
				(0.010)				(0.010)
LOCAL TAXES/POP (t-1)				0.174***				0.174***
				(0.016)				(0.017)
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Pop Terciles × Year FE	N	Y	Y	Y	N	Y	Y	Y
Department × Year FE	N	N	Y	Y	N	N	Y	Y
Observations	20,598	20,563	20,561	19,002	20,598	20,563	20,561	19,002

Notes: Standard errors presented in parentheses are clustered at the municipality-level. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

Table 5
2SLS Panel: Effect on Local Taxes

	LOCAL TAXES (t) / POP							
	Baseline IV				Dynamics IV			
DEBT/POP	0.019	-0.011	-0.001	0.018	-0.030	-0.051	-0.044	-0.020
	(0.036)	(0.040)	(0.040)	(0.036)	(0.054)	(0.056)	(0.056)	(0.051)
INVESTMENT/POP (t-1)				-0.003				0.008
				(0.012)				(0.016)
EXPENSES/POP (t-1)				0.214***				0.235***
				(0.029)				(0.036)
Municipality FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Pop Terciles × Year FE	N	Y	Y	Y	N	Y	Y	Y
Department × Year FE	N	N	Y	Y	N	N	Y	Y
Observations	20,789	20,754	20,753	19,183	20,789	20,754	20,753	19,183

Notes: Standard errors presented in parentheses are clustered at the municipality-level. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

Table 6
Heterogeneous Effects - Investment/Pop

	Political Contestability							
	Low				High			
DEBT/POP	-0.208***	-0.245***	-0.249***	-0.226***	-0.141	-0.159	-0.159	-0.103
	(0.059)	(0.066)	(0.067)	(0.066)	(0.111)	(0.114)	(0.115)	(0.090)
EXPENSES/POP (t-1)				0.177**				0.106
				(0.074)				(0.095)
LOCAL TAXES/POP (t-1)				0.046				0.035
				(0.046)				(0.058)
Observations	12,744	12,728	12,728	11,774	5,119	5,119	5,105	4,717
	Vote difference in 2014							
	Above-Median				Below-Median			
DEBT/POP	-0.233***	-0.271***	-0.260***	-0.229***	-0.119*	-0.156**	-0.169**	-0.131*
	(0.065)	(0.075)	(0.074)	(0.070)	(0.070)	(0.075)	(0.076)	(0.067)
EXPENSES/POP (t-1)				0.150**				0.116
				(0.068)				(0.073)
LOCAL TAXES/POP (t-1)				0.037				0.155***
				(0.043)				(0.053)
Observations	12,290	12,256	12,255	11,338	9,062	9,057	9,043	8,361

Notes: Standard errors presented in parentheses are clustered at the municipality-level. *, **, and ***
denote significance at the 10%, 5%, and 1%, respectively.

Table 7
Effect on Election Outcomes: Reduced form

	2014 INCUMBENT WINS IN 2020	2014 INCUMBENT PARTY WINS IN 2020	% VOTE INCUMBENT IN 1ST ROUND	% VOTE INCUMBENT PARTY IN 1ST ROUND
CHF DEBT/POP IN 2011	-0.133*	-0.142**	-	-
	(0.074)	(0.058)		
CHF DEBT/POP IN 2011 × POST SHOCK			-7.175*	-8.585**
			(3.708)	(3.598)
Population Quintile (-year) FE	Y	Y	Y	Y
Department FE	Y	Y		
Municipality FE			Y	Y
Cluster	Dep	Dep	Municipality	Municipality
Observations	1,498	1,498	1,564	1,878
R^2	0.099	0.119	0.794	0.771

Notes: The lower number of observation for column 3 is due to the fact that not every incumbent runs. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.