

Cheap Credit, Expensive Houses?

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Introduction

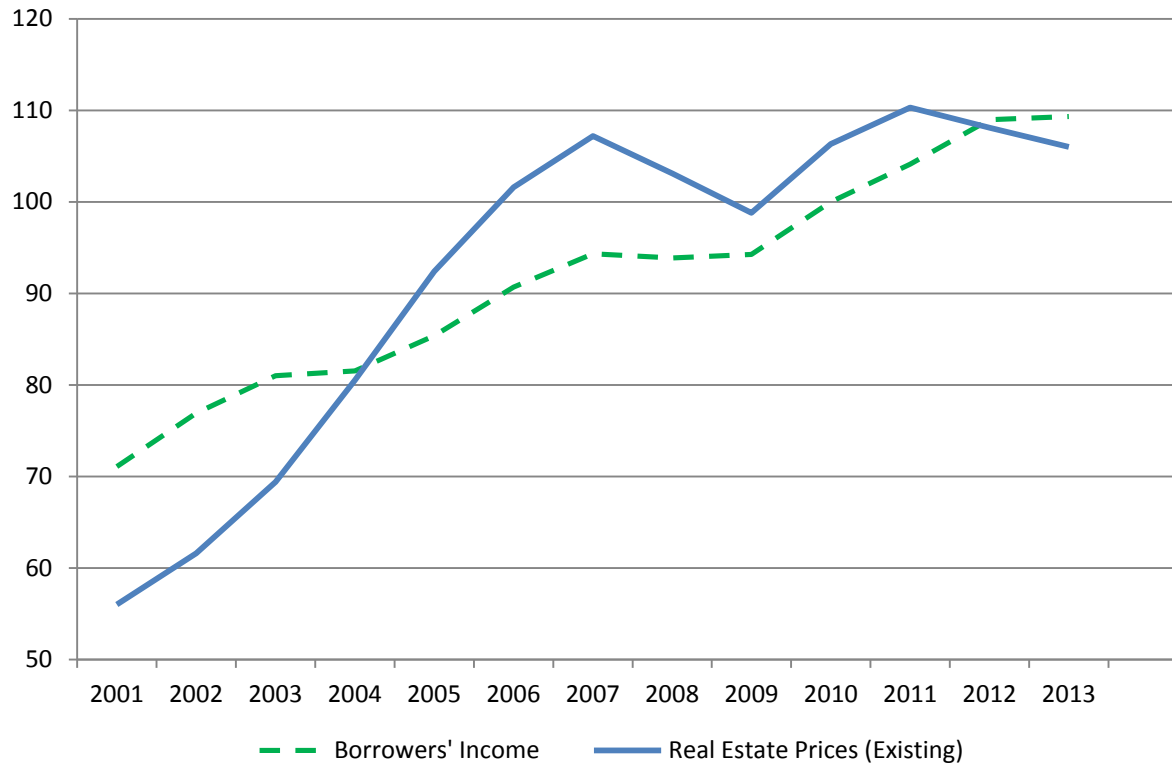


Figure 1 – Real Estate Prices and Housing Credit Borrowers' Income in France, 2001-2013. 2010=100

Source: INSEE, banks data, authors' computations

Introduction

- ❑ **Interaction of two public policies:**
 - Housing: spending represents 2% of GDP (40 billion €)
 - Financial stability: macroprudential authority, LTV/DSTI caps

- ❑ ***Prêt à Taux Zéro* at the intersection of those policies**
 - Interest free loan
 - Easing credit to spur access to home-ownership
 - Using the same transmission channel as macropru policy

- ❑ ***Prêt à Taux Zéro* is a credit shock that can help us trace the impact of credit on real estate prices and homeownership accession**

Contribution

We study a housing credit supply shock, its transmission to real estate prices and impact on housing market access, benefiting from a loan-level database.

Our identification strategy relies on *Prêt à Taux Zéro* variations across housing policy zones and its 2009, 2010 and 2011 reforms.

Outline

1. Interest-Free Loans policy
2. Data
3. Methodology
4. Results – credit shock and house prices
5. Results – credit and homeownership accession

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Prêt à Taux Zéro (PTZ)

- ❑ Part of the **homeownership** policy
- ❑ Targets first-time buyers of their main residence
- ❑ Eligibility conditions, amounts and reimbursement schemes are conditional on
 - income,
 - household size,
 - house location (along housing policy zones),
 - price
 - good being new or existing
- ❑ Loans are distributed by traditional banks – which manage credit risk – compensated for the absence of interests by fiscal reductions

Housing policy zones

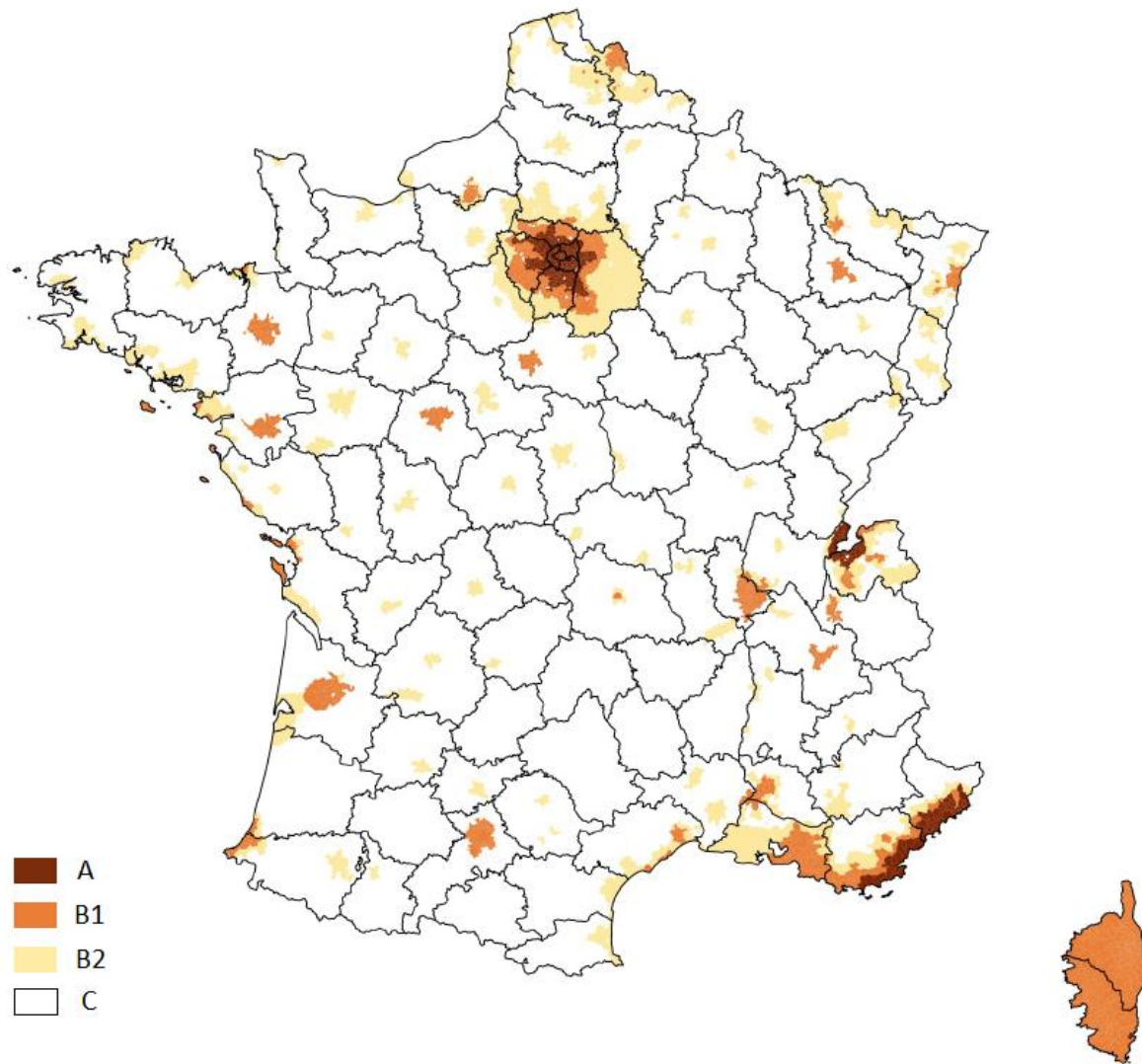


Figure 2 - Housing Policy Areas in France, 2011

Prêt à Taux Zéro reforms

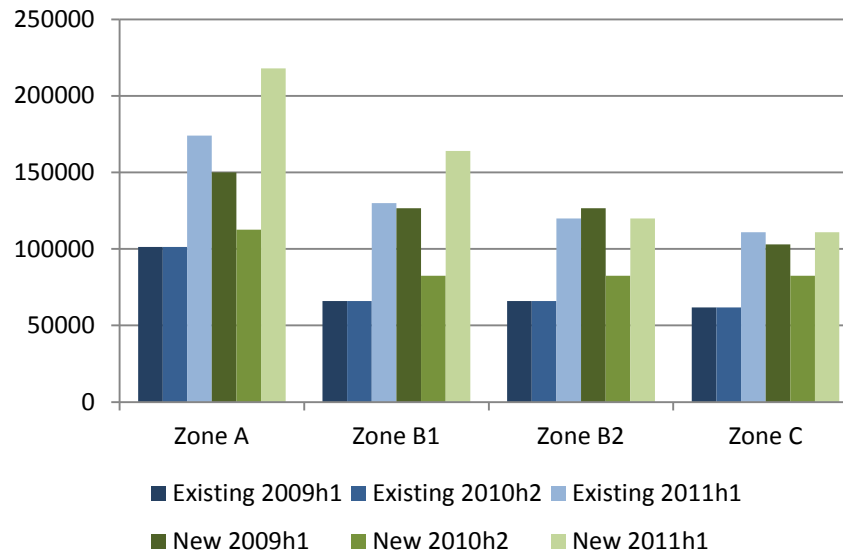


Figure 3 – PTZ amounts available

- **2005:** First introduction of the Prêt à Taux Zéro in its present form
- **2009:** Amounts are doubled for new housing
- **2010:** Prolongation until June, then +50% until December
- **2011:** General reform: existing and new housing, eligibility condition
- **2012:** Reintroduction of eligibility conditions based on income

Share of PTZ in new operations

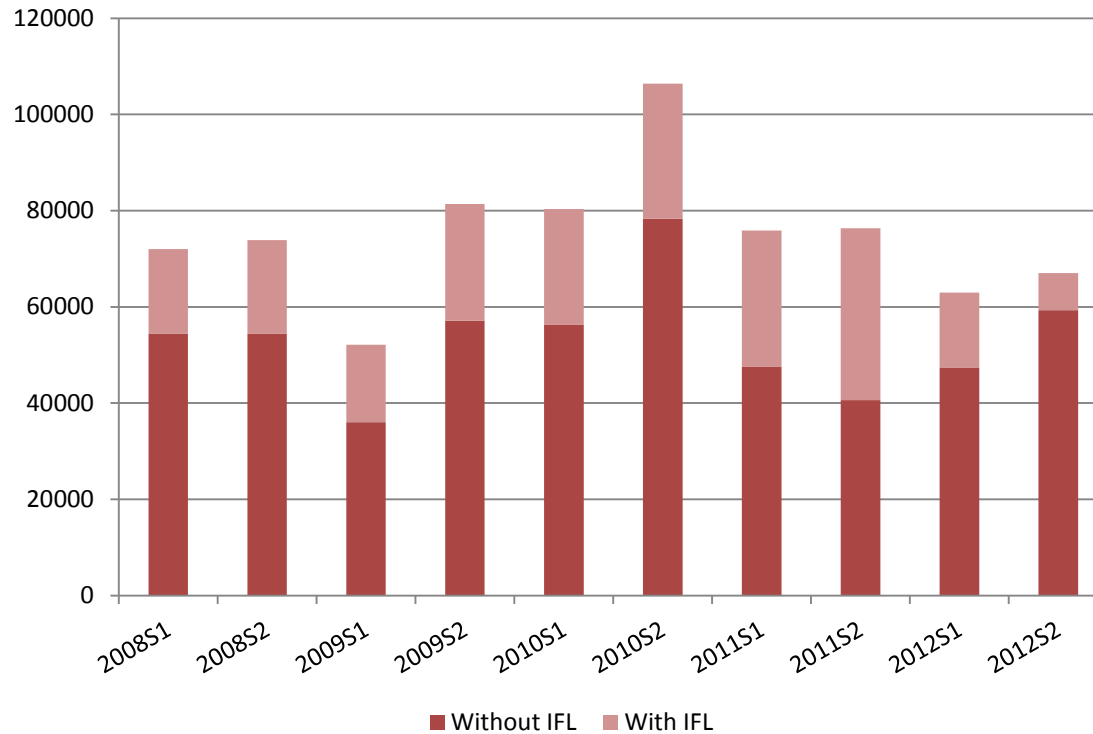


Figure 4 – New operations financing main residence observed, 2008-2012

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Data: loan-level database

□ Collection

- Ad-hoc request
- Survey of banks and housing credit guarantors
- Loans from all major French banks

□ Coverage

- Focus on 2009-2011, three different PTZ context
- Build half-yearly observations
- Main residence financing
- Metropolitan France

Loan-level database

- House location, at the ZIP-code level
- House price
- Loans characteristics: Amount, LTV, DSTI, PD rating
- Borrowers characteristics: Age, Income

Other sources

- DGFIP data for average fiscal income in the ZIP-code
- Other ad-hoc collection: house size at the ZIP-code level
- Aggregate housing credit interest rate
- INSEE data on housing characteristics

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Specification

Channel from IFL (PTZ) to credit

$$M_{z,t} = \beta^{(1)} IFL_{amount,z,t} + \gamma^{(1)} X_{z,t} + \mu_z + \varepsilon_{z,t} \quad (1)$$

Channel from IFL (PTZ) to real estate prices

$$P_{z,t} = \beta^{(2)} IFL_{amount,z,t} + \gamma^{(2)} X_{z,t} + \eta_z + \epsilon_{z,t} \quad (2)$$

Elasticity between housing prices and credit - instrumentation thanks to (1)

$$P_{z,t} = \beta^{(3)} M_{z,t} + \gamma^{(3)} X_{z,t} + \nu_z + \xi_{z,t} \quad (3)$$

- $P_{z,t}$ - average real estate price in zip-code z at date t (log),
- $M_{z,t}$ - average credit (log),
- $X_{z,t}$ - set of controls: age, borrowers income, average income in the zip-code, PD rating, aggregate interest rate
- μ_z , η_z and ν_z ZIP-code fixed effects

Instrumentation: computation

$$IFL_{amount,z,t} = E_{z,t} * IFL_{existing,z,t} + (1 - E_{z,t}) * IFL_{new,z,t}$$

- ❑ **Average of maximum amount available for a 2-person household**
- ❑ **Weighted by $E_{z,t}$, share of existing housing in the ZIP-code**
 - Two calibrations according to the exogeneity assumption
 - Transactions observed in the database (flow)
 - Stock of existing housing in the ZIP-code (census data 2011)
 - Very high correlation (0,97)

Instrumentation: exogeneity

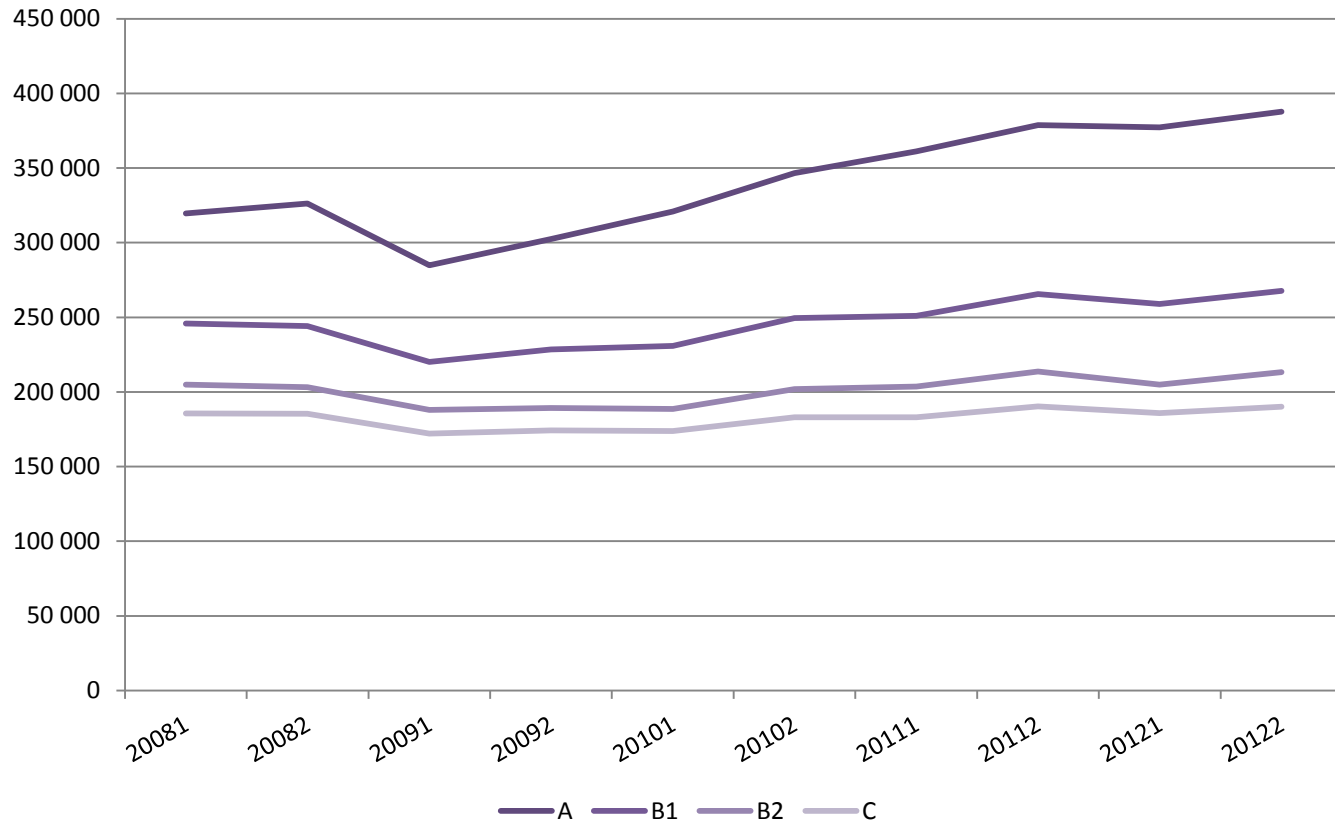


Figure 5 – Real estate prices evolution through time, according to the IFL area

Instrumentation - exogeneity

IFL classification is weak close to the borders: Cour des Comptes (2012)

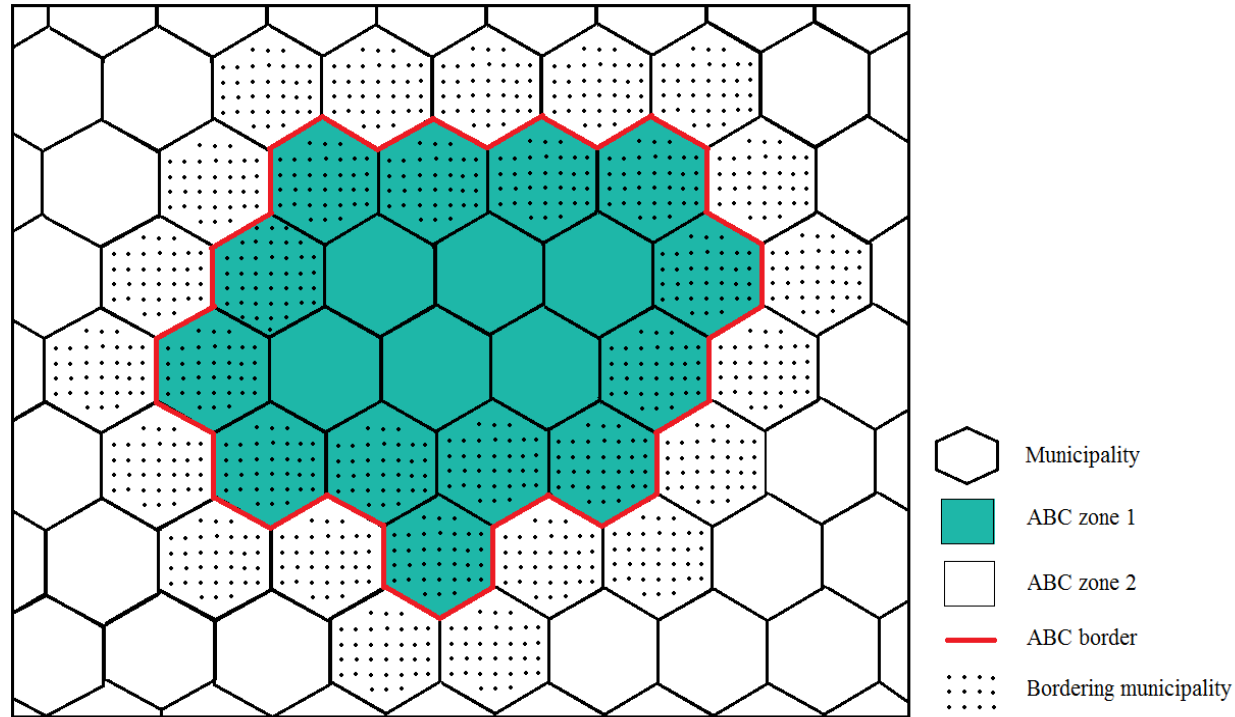


Figure 6 - Selection of ZIP codes adjacent to an IFL border

Note to the reader: Each hexagon represents a municipality. Green municipalities are in a given IFL area while white ones are in a different zone. The so-formed IFL border is delimited in red. When restrict the analysis to bordering municipalities when considering only shaded municipalities.

Instrumentation: exogeneity

Comparable municipalities across borders:

- Prices difference across borders: less than 0,4%
- Maximum price observed in 'cheapest' zone: about 70% of borders
- Average price is higher in 'cheapest' zone: more than 40% of borders

After selecting bordering ZIP-codes:

- Price segmentation according to the housing policy areas loses strength (40%)
- Huge drop in class homogeneity (ratio of inter-class to intra-class variance) – decreases by 80%

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Credit and Prices: Reduced form

2010h1-2011h1	Housing prices (log)		
	(1)	(2)	(3)
Credit (log)	0.536*** (0.020)		
IFL amount (stock)		0.063*** (0.010)	
IFL amount (transactions)			0.074*** (0.011)
Observations	4,546	4,546	4,546
R-squared	0.455	0.074	0.076
# ZIP codes	1,596	1,596	1,596
Cluster	ZIP code*Time	ZIP code*Time	ZIP code*Time

Standard errors in parentheses (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$). Controls, ZIP-code fixed effects and constant included but not reported. Controls include borrowers' income (log), ZIP code average income (log), borrowers' age, the aggregate interest rate and the PD rating.

Table 1 - Reduced form of the baseline specification

House prices elasticity to credit

2010h1-2011h1	(1)	(2)
First stage: Credit (log)		
IFL amount (stock)	0.093*** (0.012)	
IFL amount (transactions)		0.104*** (0.013)
Second stage: Housing Prices (log)		
Credit (log)	0.675*** (0.065)	0.716*** (0.060)
Observations	4,464	4,464
Cluster	ZIP code*Time	ZIP code*Time
R2 first	0.151	0.152
R2 second	0.428	0.410
F stat	66.05	60.04

Standard errors in parentheses (***) $p < 0.01$, ** $p < 0.05$, * $p < 0.1$). Controls, ZIP-code fixed effects and constant included but not reported. Controls include borrowers' income (log), ZIP code average income (log), borrowers' age, the aggregate interest rate and the PD rating.

Table 2 – Housing price and credit – IV Estimation

Robustness: house surface

- ❑ **Price data quality issue: buy more expensive houses? A bigger house? Accounting for the quality of the house?**

- ❑ **Analysis at the ZIP-code level:**
 - averaging out within ZIP-code quality variation
 - ZIP code fixed effects for between ZIP-codes quality variation

- ❑ **Use of ZIP-code level data on house surface (number of square meters)**
 - Another bank loan-level dataset
 - Not main specification: smaller ZIP code and time coverage
 - Add as additional control in former specifications

Robustness: House surface

2010h2-2011h2	(1)	(2)
First stage: Credit (log)		
IFL amount (stock)	0.093*** (0.016)	
IFL amount (transactions)		0.095*** (0.016)
House surface (log)	0.038** (0.019)	0.039** (0.019)
Second stage: Housing Prices (log)		
Credit (log)	0.500*** (0.093)	0.575*** (0.109)
House surface (log)	0.004 (0.010)	0.001 (0.010)
Observations	2,584	2,584
Cluster	ZIP code*Time	ZIP code*Time
R2 first	0.149	0.147
R2 second	0.452	0.456
F stat	34.08	35.63

Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1). ZIP-code fixed effects included but not reported. Controls include borrowers' income, ZIP code average income, borrowers' age, the interest rate on housing markets (aggregate) and the PD rating.

Table 3 – Instrumentation - controlling for house surface – 2010-2011

Robustness: growth rates

- ❑ **House quality control**

- ❑ **Time series properties of the house price or credit variables**
 - No unit root (panel data tests)
 - Detrending: growth rate and fixed effects
 - Inclusion of time fixed effects

- ❑ **We can no longer use the comparison of our two IVs – stock and flows. Verification to not rely on share of transactions in existing housing variance:**
 - Employment areas (zone emploi) specific time trends: geographic areas within which most inhabitants both reside and work and in which firms can find most of the labor required to fill available jobs
 - Share of existing housing as control

Robustness: growth rates

2010h2-2011	(1)	(2)	(3)
First stage: Credit (growth rate)			
IFL amount - growth rate	0.280*** (0.085)	0.211** (0.085)	0.211** (0.085)
Existing houses (% - first difference)		-0.061 (0.039)	-0.061 (0.039)
Second stage: Housing Prices (growth rate)			
Credit - growth rate	0.437*** (0.162)	0.503** (0.223)	0.503** (0.223)
Existing houses (% - first difference)		0.017 (0.036)	0.017 (0.036)
Observations	3,461	3,461	3,461
Absorbed	EZ*time ZIP code	EZ*time ZIP code	EZ*time ZIP code
Cluster	ZIP-code	ZIP-code	ZIP-code
Est	2SLS	2SLS	LIML
R2 first	0.252	0.253	0.253
F stat	10.83	6.220	6.220

Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1).ZIP-code fixed effects included but not reported. Controls include the down payment rate (first difference), the debt service to income ratio (first difference), the borrowers' age, the borrowers' income (growth rate) and the ZIP code average income (growth rate).

Table 4 – Instrumentation – growth rate specification – 2010-2011

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Credit and Homeownership

- ❑ **Primary goal of the PTZ: spur households' homeownership**

- ❑ **LTV and DSTI ratios as guide to grant (or not) credit**
 - Financially weak households cannot access the credit market
 - Interaction with macroprudential tools (LTV/DSTI caps)

- ❑ **Parallel exercise**
 - Dependent variable: proxy for selection on the credit market
 - Interest variable: DSTI or LTV
 - Same instrumentation strategy

Selection on the credit market

- ❑ We observe only households which *did* manage to enter the credit market to buy a house

- ❑ We compare:
 - borrowers' incomes
 - average **fiscal** income in each ZIP-code

- ❑ We compute the (positive) percentage difference between borrowers' income and the average income in the ZIP-code
 - Our proxy for credit market selection

Selection on the credit market

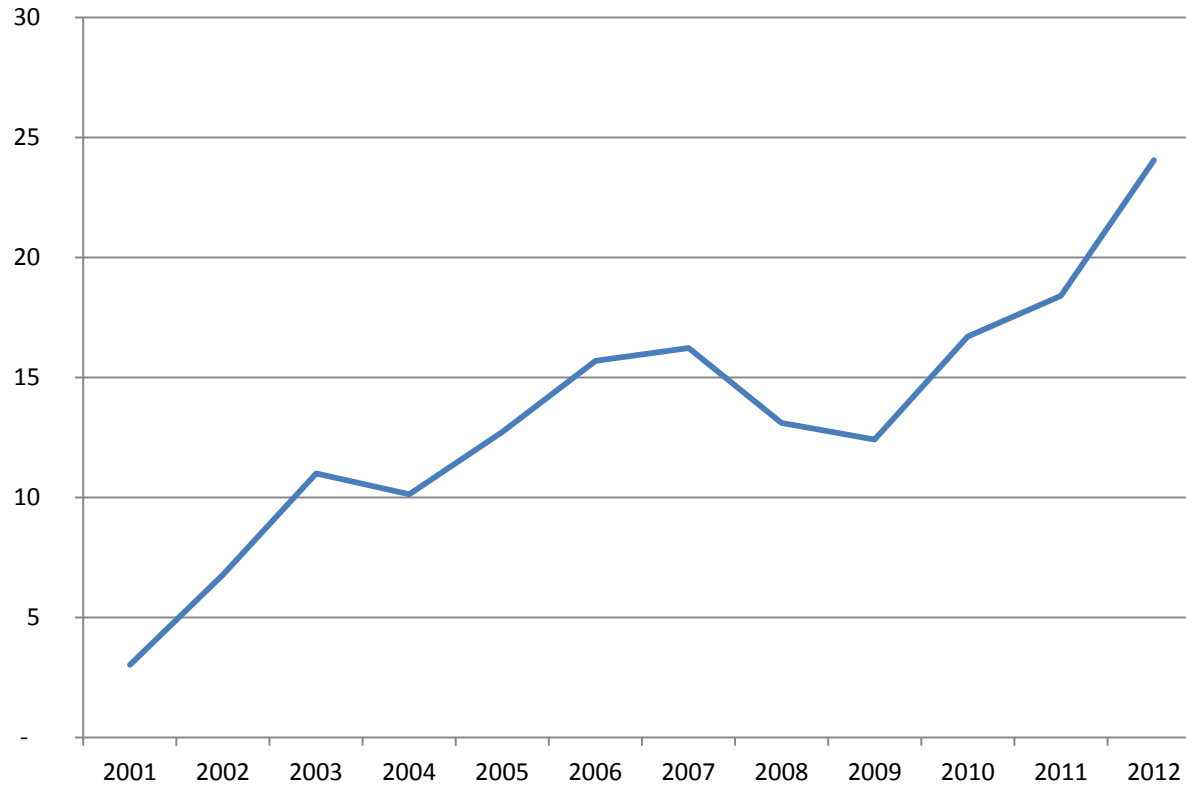


Figure 7 – Difference between borrowers' income and average *available* income (as percentage of average *available* income)

Source: DGFIP, banks data, authors' computations

Specification

$$LTV_{i,z,t} = \beta^{(4)} IFL\ amount_{z,t} + \gamma^{(4)} X_i + \rho_z + \xi_i \quad (4)$$

$$Income\ difference_{i,z,t} = \beta^{(5)} LTV_{i,z,t} + \gamma^{(5)} X_i + \mu''_z + \xi_i \quad (5)$$

- ❑ **Same strategy as before**
 - use (4) as a first stage to instrument $LTV_{i,z,t}$ in (5)
 - Zip-code selection for exogeneity

- ❑ **Loan-level observations (not ZIP-code) to avoid masking individual heterogeneity by averaging**

- ❑ **Clustering of the variance-covariance matrix at the ZIP-code level.**

Reduced form

2010h1-2011h1	Income difference >0 (logit)					
	(1)	(2)	(3)	(4)	(5)	(6)
LTV	1.965*** (0.138)	1.983*** (0.146)				
IFL amount (census)			-0.147*** (0.038)	-0.155*** (0.038)		
IFL amount (bank)					-0.148*** (0.041)	-0.157*** (0.041)
Maturity		-0.004 (0.003)		0.015*** (0.002)		0.015*** (0.002)
Observations	30,646	30,646	30,655	30,655	30,655	30,655
R-squared	0.126	0.126	0.080	0.082	0.080	0.081
Cluster	ZIP code	ZIP code	ZIP code	ZIP code	ZIP code	ZIP code

Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1). ZIP-code fixed effects included but not reported. Not reported controls include borrowers' age, the aggregate interest rate on housing credit and PD rating.

Table 5 – Reduced form, homeownership accession – 2010h1-2011h1

Credit and Homeownership

2010h1-2011h1	(1)	(2)	(3)	(4)
First stage	LTV			
IFL amount (census)	0.017*** (0.004)	0.012*** (0.004)		
IFL amount (bank)			0.018*** (0.005)	0.012*** (0.005)
Maturity at origination		0.009*** (0.000)		0.009*** (0.000)
	Second stage	Income difference > 0 (logit)		
LTV	-8.670** (3.384)	-12.889** (5.929)	-8.217** (3.316)	-12.769** (6.141)
Maturity at origination		0.137** (0.057)		0.136** (0.059)
Observations	30,646	30,646	30,646	30,646
Cluster	ZIP code	ZIP code	ZIP code	ZIP code
R2 first	0.204	0.241	0.204	0.241
F stat	15.13	7.872	14.97	7.253

Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1). ZIP-code fixed effects included but not reported. Not reported controls include borrowers' age, the aggregate interest rate on housing credit and PD rating.

Table 6 – Instrumented specification, homeownership accession – 2010h1-2011h1

Conclusion

- ❑ The *Prêt à Taux Zéro* (interest-free loan) is a housing policy tool using the credit channel.
- ❑ It can be used to trace the impact of credit into housing prices and its impact on homeownership accession, thanks to various reforms and variations across housing policy zones.
- ❑ The *Prêt à Taux Zéro* allows a positive credit supply shock that is channeled into housing prices. We find a high elasticity of housing prices to credit: between 0.4 and 0.7 depending on the estimation strategy.
- ❑ By alleviating the loan-to-value constraint, the IFL also facilitates entry on the housing market, approximated by the difference between borrowers' (home buyers) and average income.