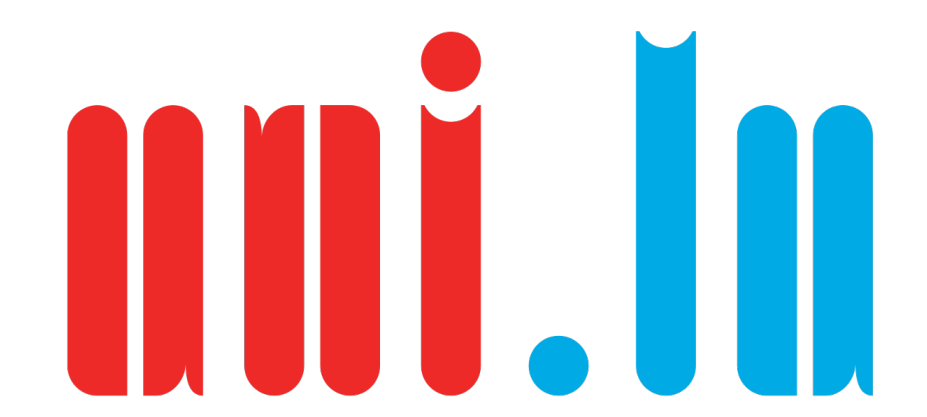




# Low Interest Rates and the Distribution of Household Debt



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## Abstract

We study how changes in interest rates affect the borrowing of households and the distribution of debt within the population. In a model of household borrowing with credit constraints and endogenous house prices, we show that less constrained households with more pre-existing housing wealth increase their borrowing most when interest rates fall. We then use unique loan level data on the universe of household credit in Belgium to document a shift in the distribution of debt over age, with older households borrowing more as interest rates fell in the last decade. First-time borrowers, who are more likely to be constrained, do not contribute to the rise in household debt. To identify the elasticity of household debt to the interest rate, we use regulatory data on foreign exposures of banks and on the location of bank branches. We find that a 1 percentage point fall in the interest rate is associated with a 15% growth in household debt.

## Motivation

As interest rates fell in the last decades, the price of housing and the level of household debt increased substantially in many countries. In the Euro Area and in the United-States, household debt to GDP ratios are now close to their all-time high. In smaller countries like France, Canada or Switzerland, the growth in household debt-to-GDP has been mostly uninterrupted over the last decades (Table 1). High household debt can endanger financial stability and increase the procyclicality of the business cycle (Mian and Sufi, 2014). The rise in household indebtedness has also raised distributional concerns. If lenders impose minimum down-payment constraints, less wealthy households may be unable to borrow (Svensson 2020). Understanding how low interest rates affect the distribution of household debt within the population can therefore help understand whether low rates restrict the access to property for some households. In this paper, we use data from the household credit registry of the National Bank of Belgium to study (1) how changes in interest rates affect borrowing by households and (2) how the sensitivity to interest rates varies across credit constrained and unconstrained borrowers.

Table 1. International household debt to GDP ratios since 1980

Country	Year			Growth 1980-2019
	1980	2000	2019	
Belgium	33	41	62	+88%
Canada	46	59	101	+120%
France	22	34	62	+182%
Switzerland	67	103	129	+93%
United Kingdom	30	64	84	+180%
United States	50	71	75	+50%

## Model

We build a model of household borrowing with endogenous house prices and heterogeneous endowments of capital and labor resources, in the spirit of Stein (1995). Households face a down payment constraint when borrowing so that they fall in two categories. The unconstrained households have substantial wealth relative to their future income and they are able to borrow as much as needed. If households have less wealth relative to future income, they are constrained and borrow the maximum amount possible given the down-payment constraint. The transmission of lower interest rates to higher household borrowing thus differs substantially depending on whether households are credit constrained or not. We show in particular that when housing and labor endowments vary monotonically with age, borrowers in the middle of the age distribution are likely to be the ones that react most to a decline in interest rates.

## Stylized Facts

We find that the share of credit allocated to households between 25 and 35 years of age declined by around 10 p.p. while the share of households above 45 increased by the same amount. While young households aged 25 to 44 years accounted for around 75% of credit in 2006, the distribution is now more evenly distributed across age groups. Figure 1 documents the shift in borrowing towards older age groups. It shows the distribution of debt to income ratio by age groups in 2006 and 2016. The change in the distribution is in line with the predictions of the model: all households increased their indebtedness, and households in the middle of the age distribution increased their indebtedness most.

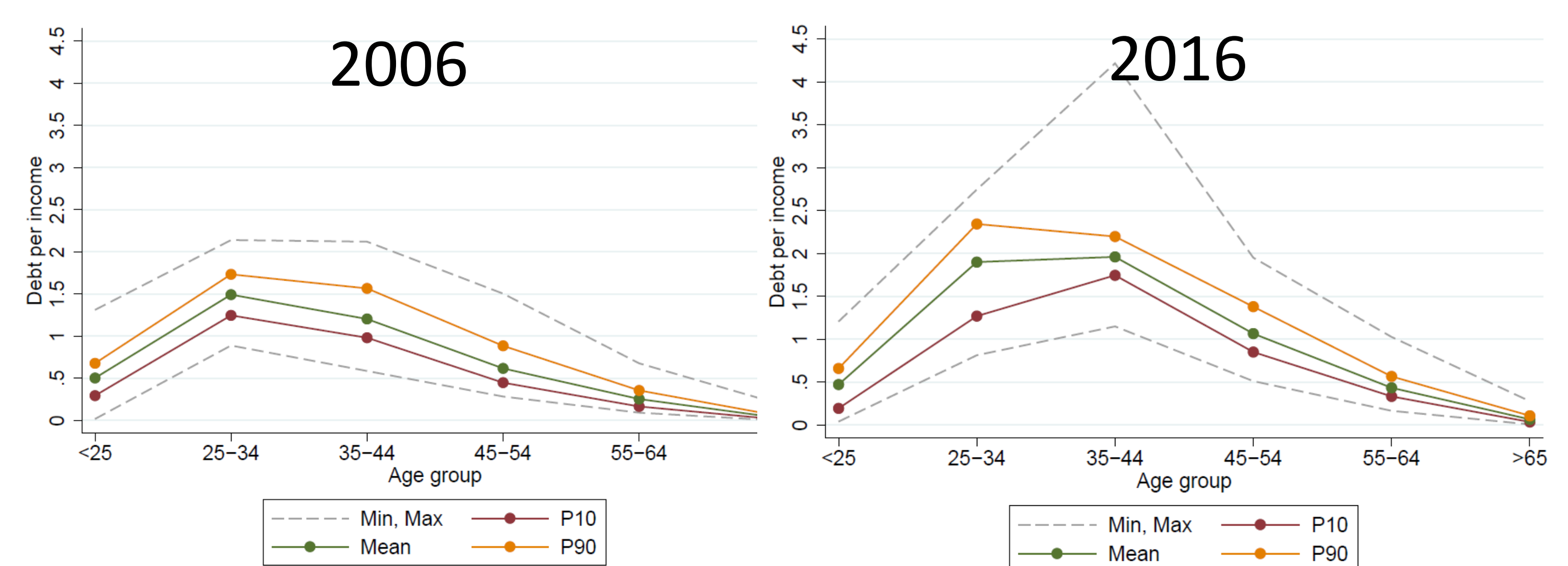


Figure 1. Ratio of mortgage debt to annual income across municipalities in Belgium

## The Interest Rate Channel

To identify the role of the interest rate, we construct an instrument of credit supply shocks using data on foreign exposures of banks combined with data on the location of bank branches across municipalities. If a bank lends to firms in a foreign country, shocks to that economy could influence the local supply of credit while being plausibly independent of local economic conditions. To measure the local interest rate faced by each borrower, we use data on the location of bank branches. This approach relies on evidence from Argyle et al. (2020) that the distance to the closest bank branches is a strong determinant of the credit supply faced by consumers. Figure 2 shows the foreign exposures of Belgian banks and Figure 3 shows the first stage – the relationship between local interest rates and foreign shocks. Our results confirm that a fall in interest rates is associated with a rise in household borrowing (Table 2). The paper includes a number of alternative specifications and the magnitudes are generally large, suggesting that a 1 p.p. decline in the rate leads to a 15% to 20% increase in borrowing.

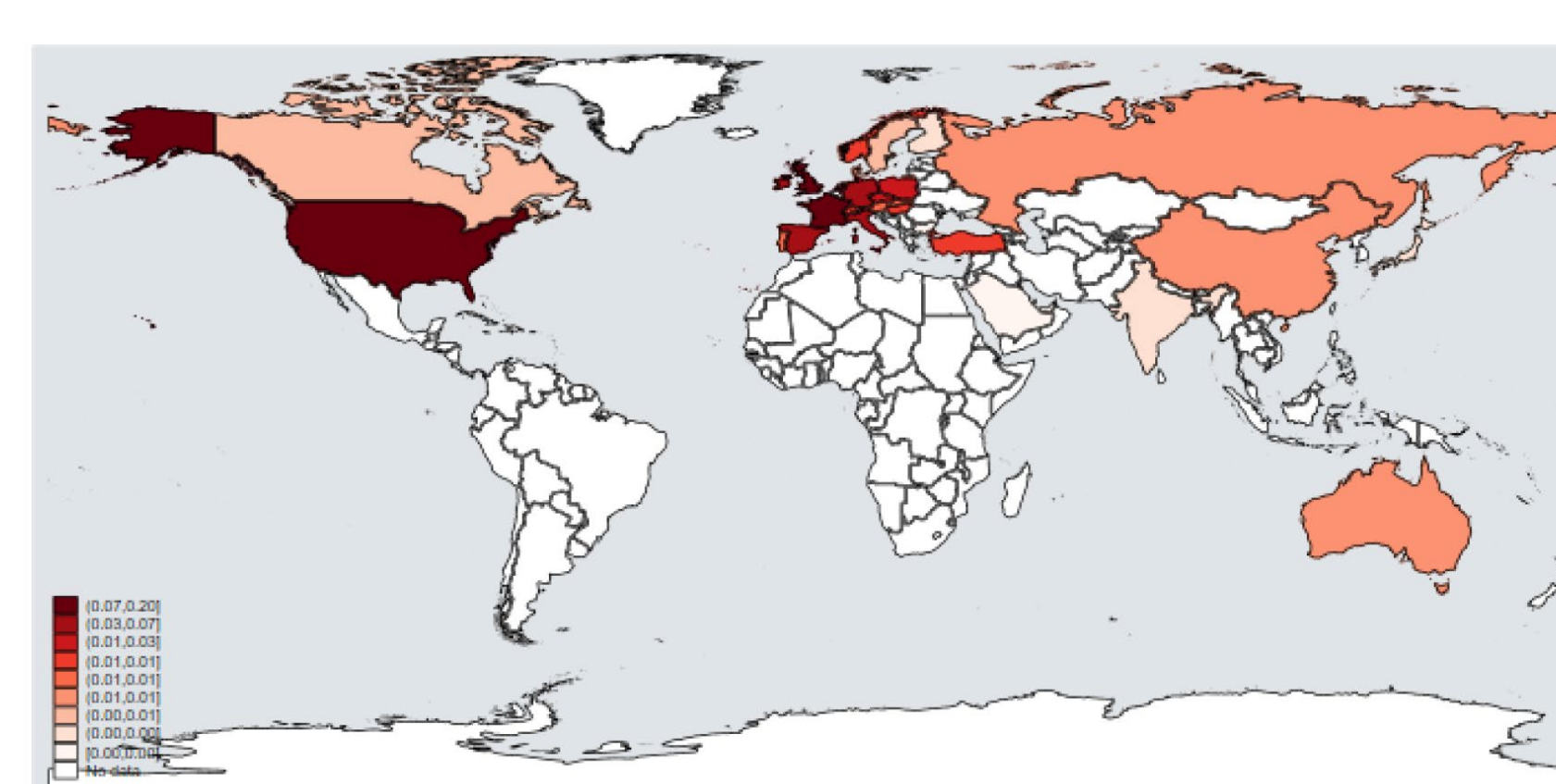


Figure 2. International exposures of Belgian banks

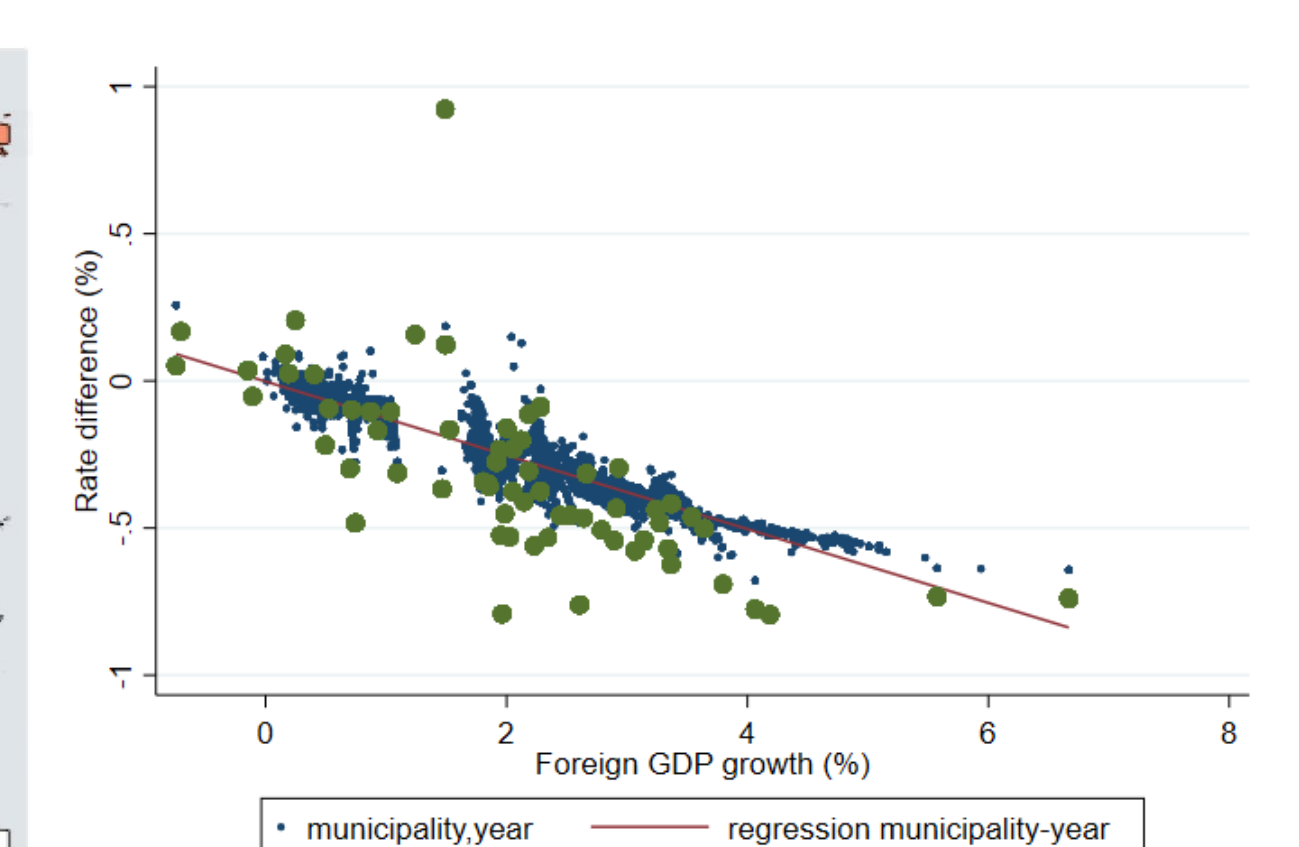


Figure 3. Foreign exposures and interest rates

Table 2. Interest rate sensitivity of household borrowing. The dependent variable is the log of household debt in a year. The interest rate is instrumented using foreign GDP shocks and exposures. Controls include municipality characteristics, age-year interaction effects and borrower fixed effects.

	Log ( Household debt )			
	OLS	IV	IV	IV
Interest rate	-3.2 (0.4)	-23.2 (3.8)	-22.8 (3.7)	-22.8 (3.7)
Controls	YES	YES	YES	YES
Observations	15,698,504	15,698,504	15,698,504	15,698,504

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