

Background document for DNBulletin “Consumptie in Nederland hangt sterk samen met de huizenprijs”

We estimate the following equation in order to assess the link between private consumption and changes in real house prices in the short-run:¹

$$\Delta \log(c_t) = \alpha + \beta_0 \Delta \log(hp_{t-1}) + \beta_1 \Delta \log(y_t) + \beta_2 \Delta un_t + \beta_3 \Delta r_t + \beta_4 \Delta \log(stk_t) + \beta_5 \Delta \log(vix_t) + e_t \quad (1)$$

Where c is real private consumption, hp is real house prices, y is real labour income², un is the unemployment rate, r is the real short term interest rate, stk is real stock prices, vix is the financial market volatility index that proxies for financial market uncertainty, and e is the error term.³ Δ represents first differences and subscript t denotes time.

Data (quarterly) cover the period 1995-2016. As we use quarterly data, changes in house prices enter with a first lag; while consumption is a continuous variable, the information on house price changes is available with a certain lag (see also Kharroubi and Kohlscheen, 2017; Catte et al, 2004). The sample consists of nine euro area countries⁴ together with Sweden, the US, and the UK. We run the same equation (1) for each country separately in order to allow for heterogeneity across countries.

Inevitably, the correlation between house prices and consumption may also be driven by an unobserved macroeconomic factor, which is particularly difficult to rule out convincingly when employing aggregate data. However, a growing body of literature employing micro data and instrumental variables suggests that a non-negligible part of the correlation between house prices and consumption reflects homeowner borrowing (Campell and Coco, 2007; Mian and Sufi, 2011).

¹ The methodology builds on Kharroubi and Kohlscheen, “Consumption-led expansions”, BIS Quarterly Review, March 2017. In addition to this BIS analysis, we add the unemployment rate and stock prices to the analysis, in line with the short term consumption equation in DELFI, DNB’s Macroeconomic Policy Model of the Netherlands.

² We use labour income due to data availability as it allows us to cover a longer time period.

³ All nominal variables except for interest rates are deflated by personal consumption deflator. Nominal interest rates are deflated by consumer price index.

⁴ DE, FR, IT, ES, NL, BE, AT, IE, PT.

Results

Broadly, two groups of countries emerge: One with a relatively strong relationship between private consumption and house prices, and another with relatively weak or sometimes insignificant link.⁵ The Netherlands, Sweden, Ireland, the United States, Spain, and the United Kingdom belong to the first group, whereas Italy, France, Belgium, Austria and Portugal belong to the second. The results are robust to a number of changes to the specification of equation (1). In particular, the two sets of countries appear stable when income and stock prices are included with their first lags instead; when consumption growth enters the equation with its first lag (to account for possible autocorrelation); when all explanatory variables (i.e. also house price variable) enter the equation contemporaneously; or when all explanatory variables enter the equation with their first lags. For the Netherlands, the coefficient's point estimate suggests that a 1% increase in real house prices is associated with a 0.18% increase in real private consumption in the short run. This would imply that more than 40% of the cumulative consumption growth since 2014Q1 could be attributed to house price increases.

For Germany, we find a significant and negative relationship between consumption and house prices. We do not include Germany in either of the two groups of countries we identified above as this result does not appear stable. In particular, when we include house prices contemporaneously, the sign of the coefficient becomes positive and large. Yet, a recent paper on Germany by Geiger et al. (2016) also finds a negative and significant relationship. Given the characteristics of the German financial and housing markets (i.e. conservative lending standards, relatively high down payments, low level of home-ownership and the effective absence of home equity withdrawal), a negative relationship does not appear implausible.

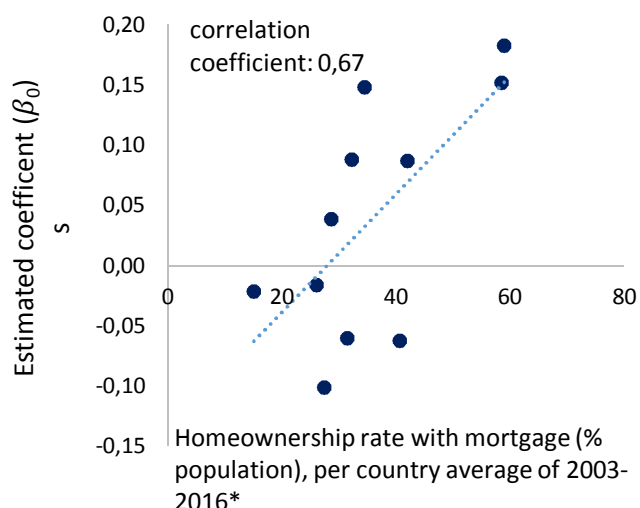
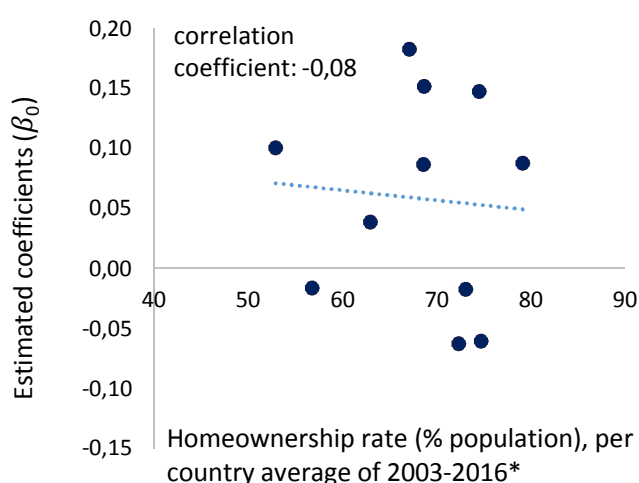
⁵ We say "sometimes" as these are the results that emerged after we have run a number of robustness checks.

In order to test the significance of the correlations that emerge from the scatterplots below, we run the following two bivariate regressions:

$$b_i = \alpha_0 + \alpha_1 ho_i + e_i \tag{2}$$

$$b_i = \alpha_0 + \alpha_2 hom_i + e_i \tag{3}$$

where b is estimated β_0 from equation (1) above, ho is the total homeownership rate (the sum of homeownership rate with and without a mortgage), hom is the homeownership rate with mortgage and e is the error term. Although we only have 11 observations, α_2 turns out positive and significant whereas α_1 appears insignificant.



Bron: Eurostat, own calculations.

Noot: *Data availability differs across countries. For the Netherlands the data are available for the period 2005-2016. Due to data issues, the US is not included in these figures.

References:

- Campell, J. Y. and J.F. Cocco (2007), “How do house prices affect consumption? Evidence from micro data”, *Journal of Monetary Economics*, 54 (3), 591-621
- Geiger, F., J. Muellbauer and M. Rupperecht (2016), “The housing market, housing portfolios and the German consumer”, *ECB Working Paper*, No. 1904
- Mian, A. and A. Sufi (2011), “House prices, home equity-based borrowing, and the US household leverage crisis”, *The American Economic Review*, 101 (5)
- OECD Economic Outlook, June 2004, No. 75. Pages 131-142