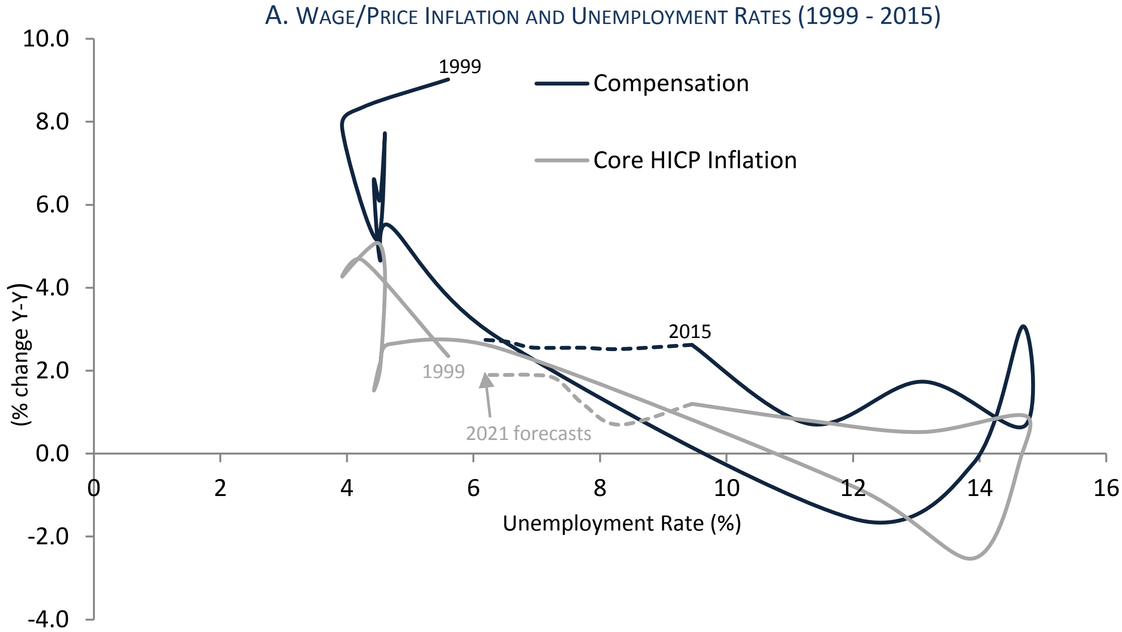
## Appendix C: Summary Indicators of Economic Imbalances

As previously highlighted IFAC (2015b), the Council, as part of its toolkit for examining the cyclical position of the economy use a modular approach. While univariate filters and other potential output measures are useful, there is a danger that they may not reflect all available economic information which may point to possible imbalances in the economy. Specifically in response to the financial crisis, Borio et al (2014) developed methods of estimating potential output using financial indicators, which capture the effect of the financial sector on the business cycle. This approach can be applied to other variables which may provide useful information on the cyclical position of the economy. With this in mind, this appendix shows some potential sources of imbalances. Within each module, a number of indicators are examined.

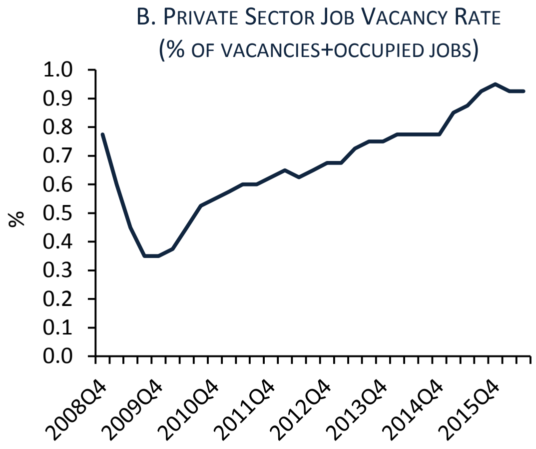
While this modular approach ensures that many potential sources of imbalance are examined, there are difficulties in choosing/estimating weights for each of these imbalance indicators. Historical data may be a good guide to variables that explain previous business cycles, but not necessarily current or future ones. Five modules are shown here, namely the labour market, the external sector, investment indicators, credit ratios/gaps and housing indicators.

Figure C.1: Labour Market

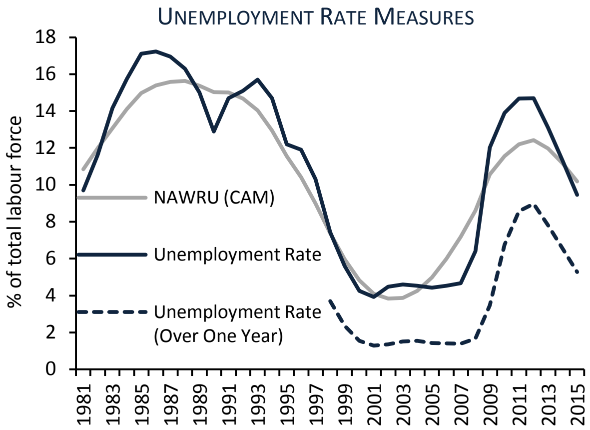
A. Wage/Price Inflation and Unemployment Rates (1999 - 2015)



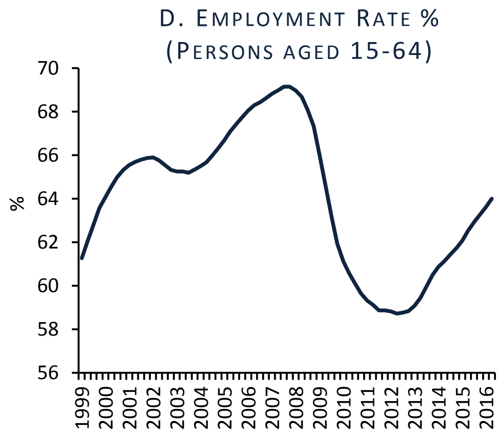

*Source:* CSO; *Budget 2017* projections and internal IFAC calculations.
*Note:* NIE compensation per QNHS employee hour is used as compensation measure.



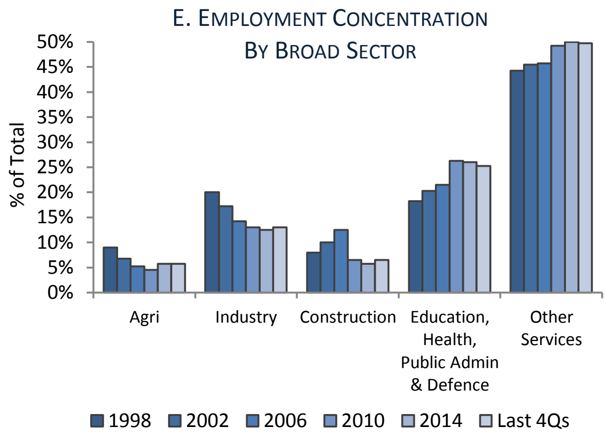

*Source:* CSO; internal IFAC calculations.
*Note:* Four quarter moving average of job vacancy rate shown.



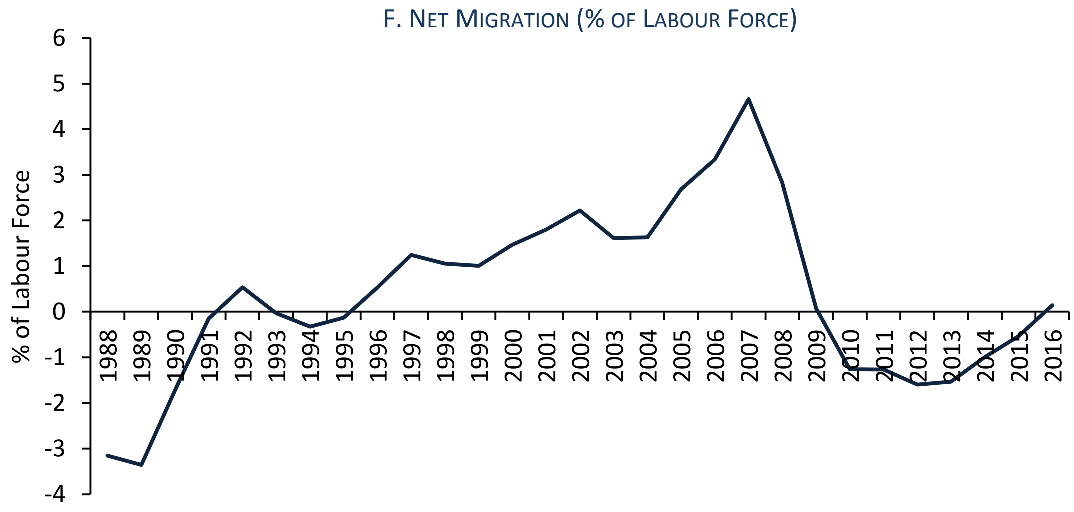

*Source:* European Commission estimates (Commonly Agreed Methodology); CSO




*Source:* CSO; internal IFAC calculations.
*Note:* 4 quarter moving average shown.

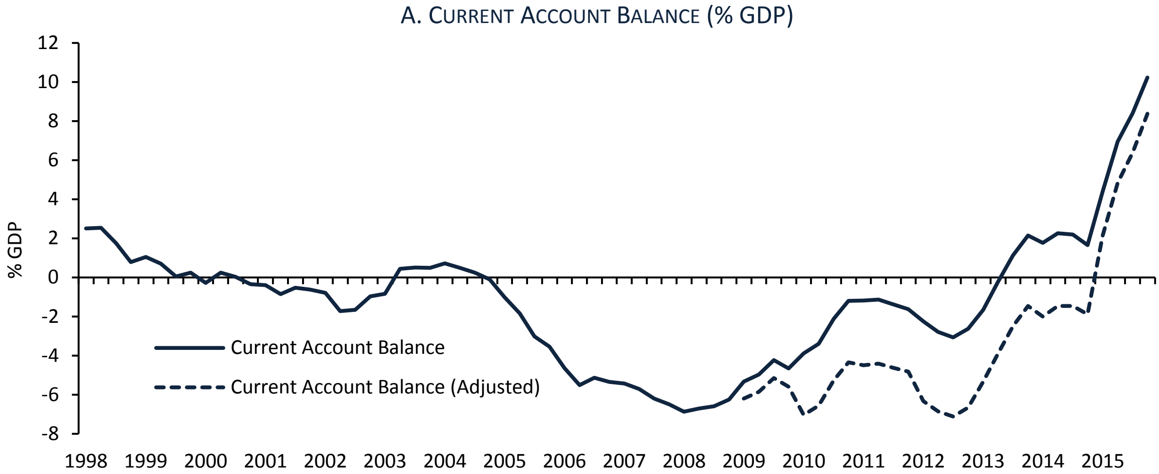



*Source:* CSO; internal IFAC calculations.

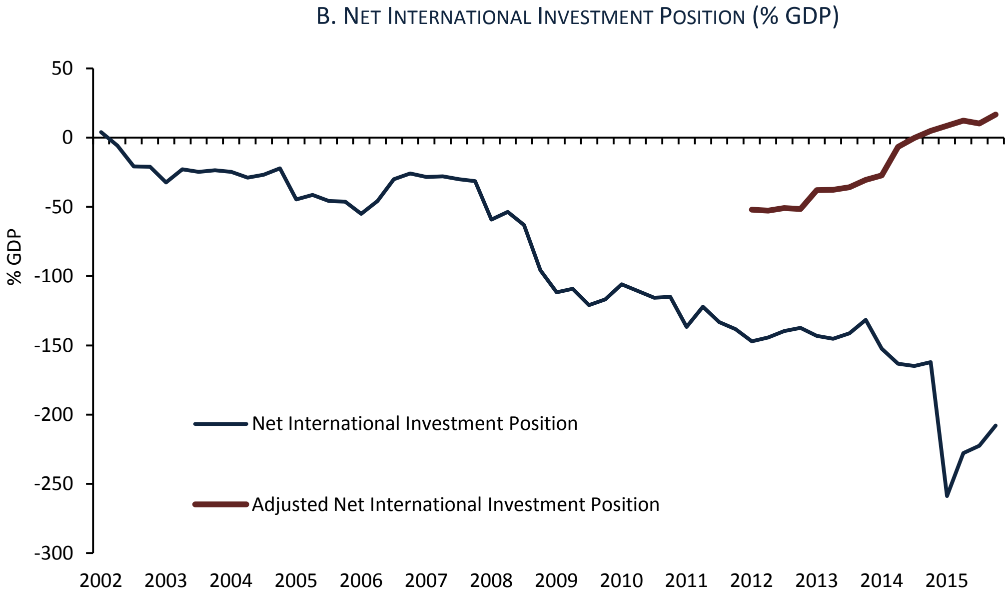



*Source: CSO;* Internal IFAC calculations.
Note: Positive net migration indicates immigration exceeded emigration.

FIGURE C.2: EXTERNAL BALANCES



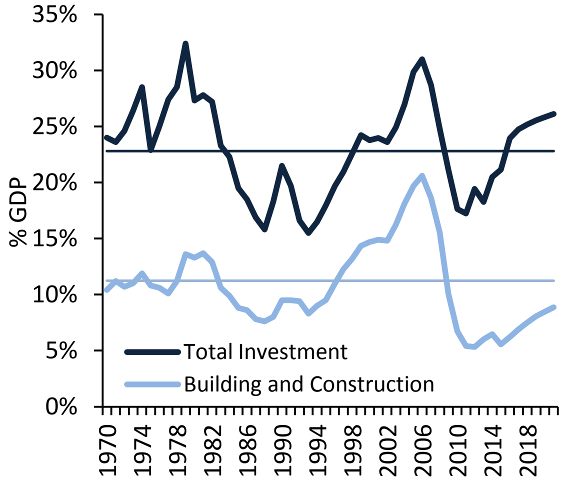

*Source:* CSO; internal IFAC calculations.
*Note:* Adjusted measure excludes estimated impact of redomiciled PLCs.




*Source:* CSO; Eurostat and internal IFAC calculations.
*Note:* Adjusted measure excludes IFSC activities and NFC's.

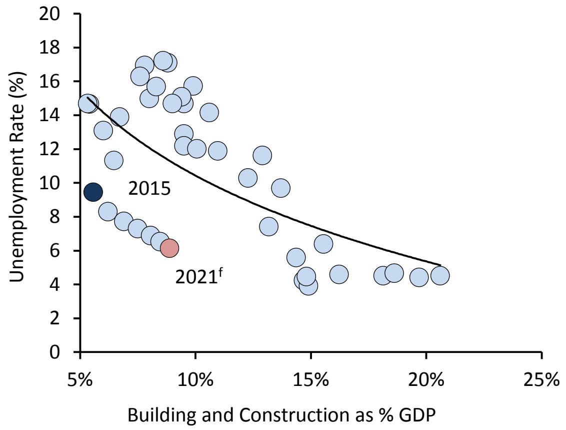
## Figure C.3: Investment Indicators

A. Investment Ratios




*Sources*: CSO; AMECO; Department of Finance.
*Notes:* Horizontal lines = historical avg (1970-2015).

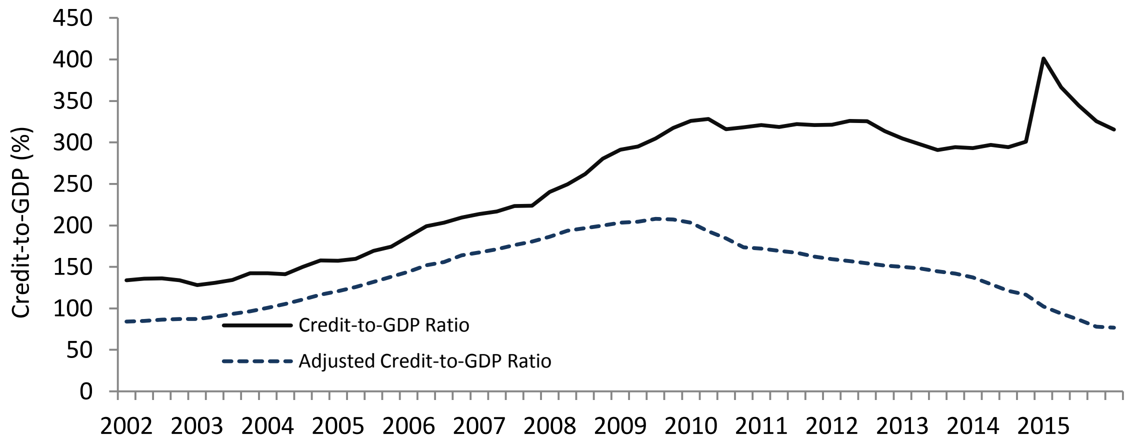
B. Unemployment Rate and Building and Construction as % GDP




*Source:* CSO; Department of Finance projections & internal IFAC calculations.

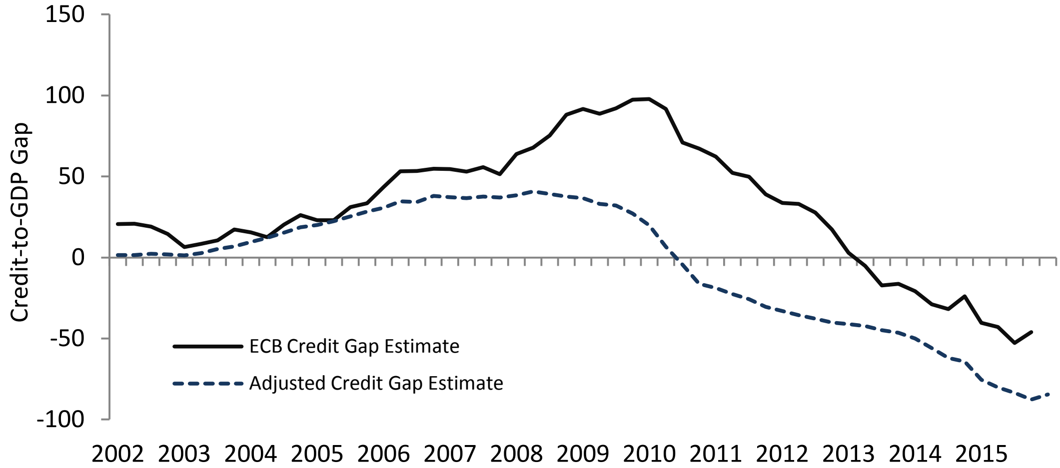
## Figure C.4: Additional Credit Indicators

A. Private Sector Credit-To-GDP Ratios



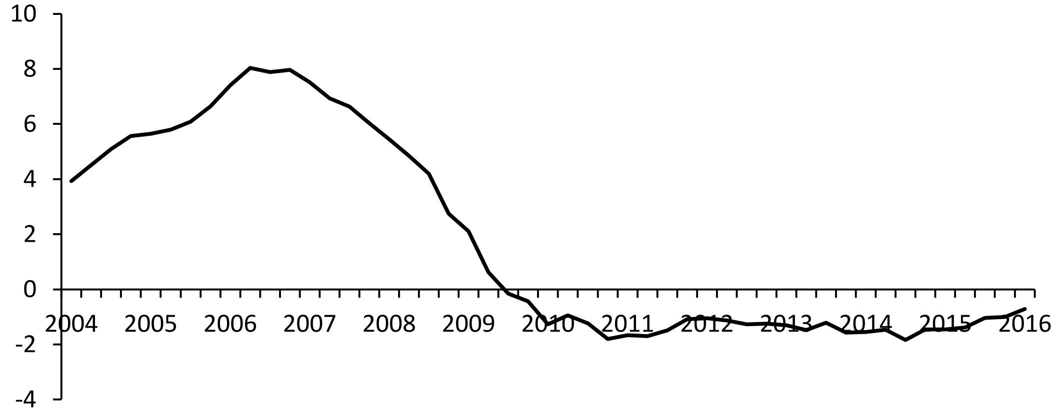

*Sources:* Central Bank of Ireland; CSO; internal IFAC calculations.
*Notes:* The adjusted credit-to-GDP gap ratio is constructed as Irish resident private sector enterprise credit (ex fin. intermediation) plus total loan liabilities of Irish households. It is intended to adjust for the impact of multinational non-financial corporations on the aggregate ratio given that associated credit is often sourced outside of Ireland (for a similar approach, see Box 6: Macro-Financial Review 2015:I, Central Bank of Ireland). The ratio is calculated following a similar methodology to that in ESRB recommendation (18 June 2014) on guidance for setting counter-cyclical buffer rates (ESRB/2014/1). This specifies a credit ratio as: $(CREDIT_t / (GDP_t + GDP_{t-1} + GDP_{t-2} + GDP_{t-3})) \times 100\%$.

B. PRIVATE SECTOR CREDIT-TO-GDP GAPS




*Sources:* Central Bank of Ireland; CSO; ECB; internal IFAC calculations.
*Notes:* The adjusted credit gap is calculated following a similar methodology to that in ESRB recommendation (18 June 2014) on guidance for setting counter-cyclical buffer rates (ESRB/2014/1). For the underlying trend credit ratio, a recursive Hodrick-Prescott filtered trend ratio is specified, with smoothing parameter lambda = 400,000 to capture the long-term trend in the behaviour of the credit-to-GDP ratio. The credit-to-GDP gap is given by: $GAP_t = RATIO_t - TREND_t$.

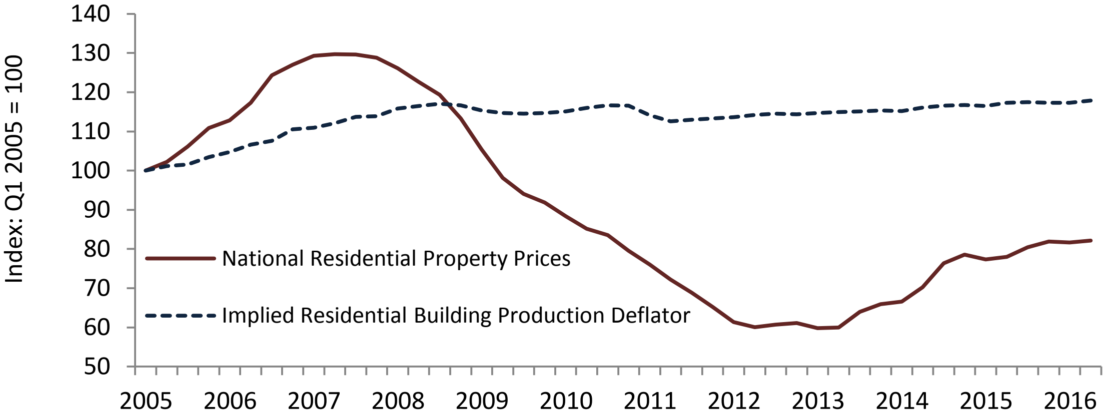
C. ADJUSTED PRIVATE SECTOR CREDIT FLOW (% OF GDP)




*Note: 4 Q moving average.*
*Source:* Central Bank Money , Credit and Banking and Quarterly Financial Accounts (transaction series used) and internal IFAC calculations

## Figure C.5: Housing Indicators

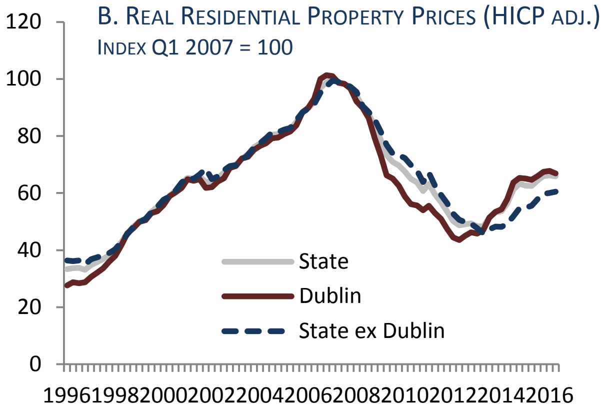
### A. Irish Residential Property: Nominal Prices and Implied Production Costs




*Sources:* CSO; internal IFAC calculations.

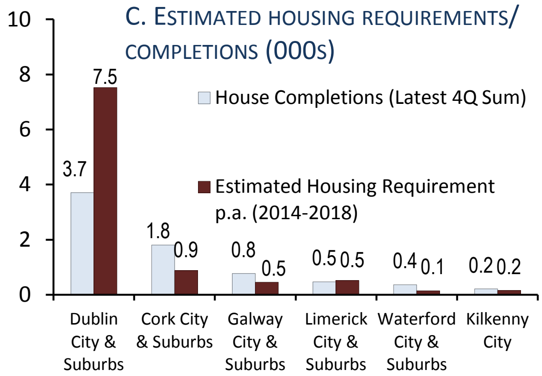
### B. Real Residential Property Prices (HICP adj.)

Index Q1 2007 = 100



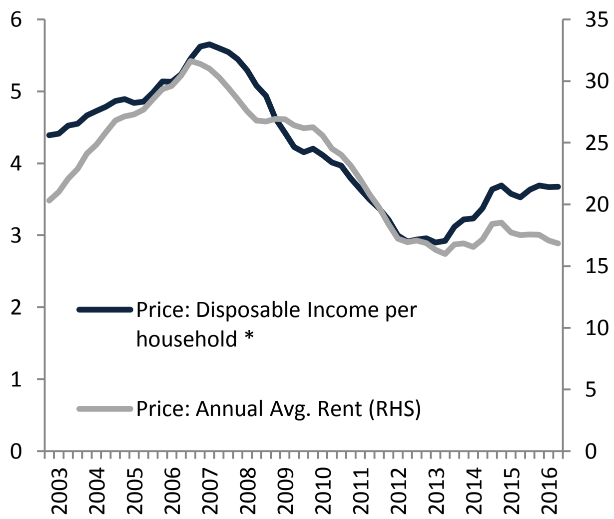

*Sources:* ESRI/PTSB; CSO

### C. Estimated housing requirements/ completions (000s)

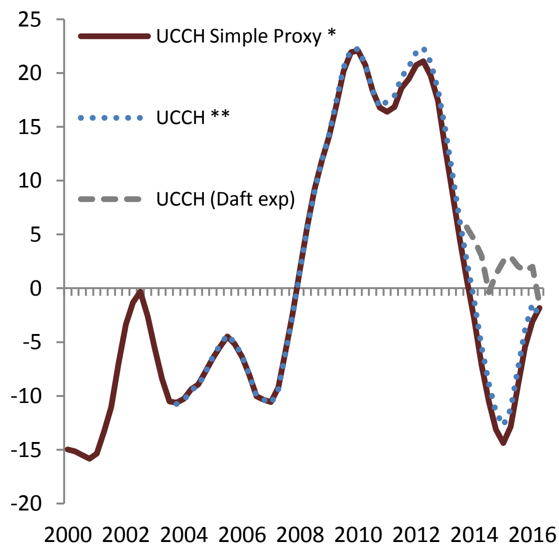



*Sources*: Housing Agency; DoECLG.
*Note:* Completions cover rural + urban settlements; requirements only cover settlements of 1,000.

### D. Housing Valuation Ratios

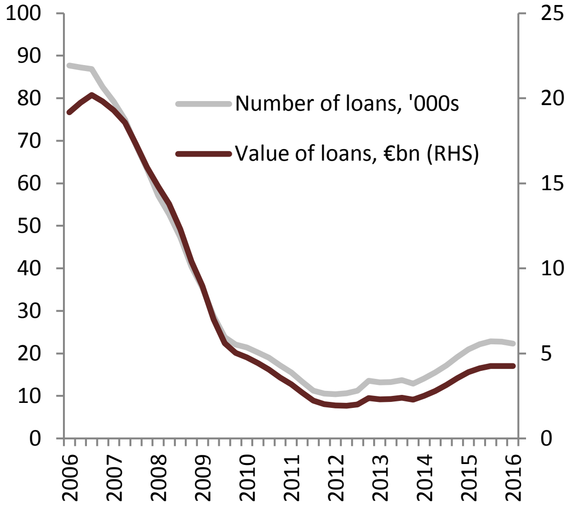



### E. User Cost of Capital for Housing (UCCH)



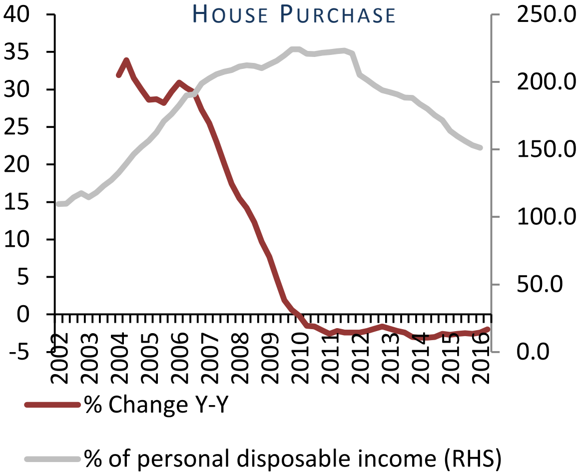
F. Annualised Residential Mortgage Lending

*First-time buyer and mover purchase loans*




*Sources*: IBF/PwC Mortgage Market Profile.

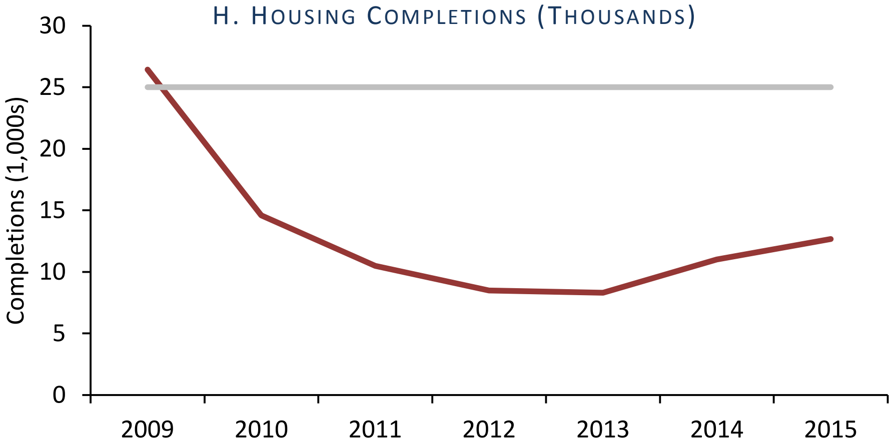
G. Loans to Irish Households for House Purchase




*Sources*: Central Bank of Ireland; CSO.

Note: Stock is proxied by Long-term loans; ESA-95 basis pre-2012.

H. Housing Completions (Thousands)




*Note: Grey line indicates the equilibrium level of completions needed for new household*