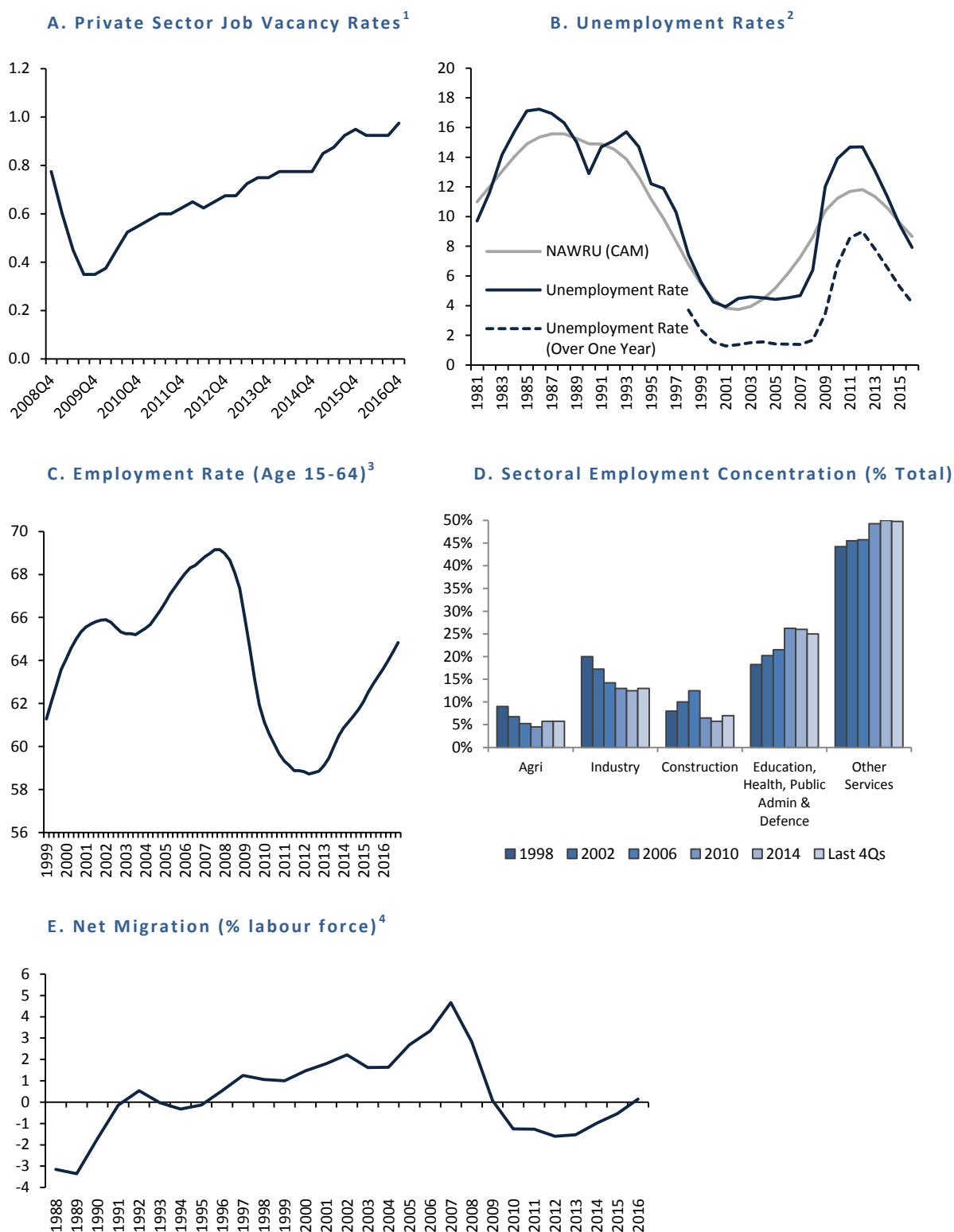## Appendix C: Imbalance Indicators

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 AC.1: Labour Market Indicators
Rates (%)

A. Private Sector Job Vacancy Rates[1]

B. Unemployment Rates[2]

- NAWRU (CAM)
- Unemployment Rate
- Unemployment Rate (Over One Year)

C. Employment Rate (Age 15-64)[3]

D. Sectoral Employment Concentration (% Total)

Agri | Industry | Construction | Education, Health, Public Admin & Defence | Other Services

■1998 ■2002 ■2006 □2010 □2014 □Last 4Qs

E. Net Migration (% labour force)[4]

Source: CSO; European Commission; internal IFAC calculations.

[1] Rates show % of vacancies + occupied jobs. Four quarter moving average of job vacancy rate shown.
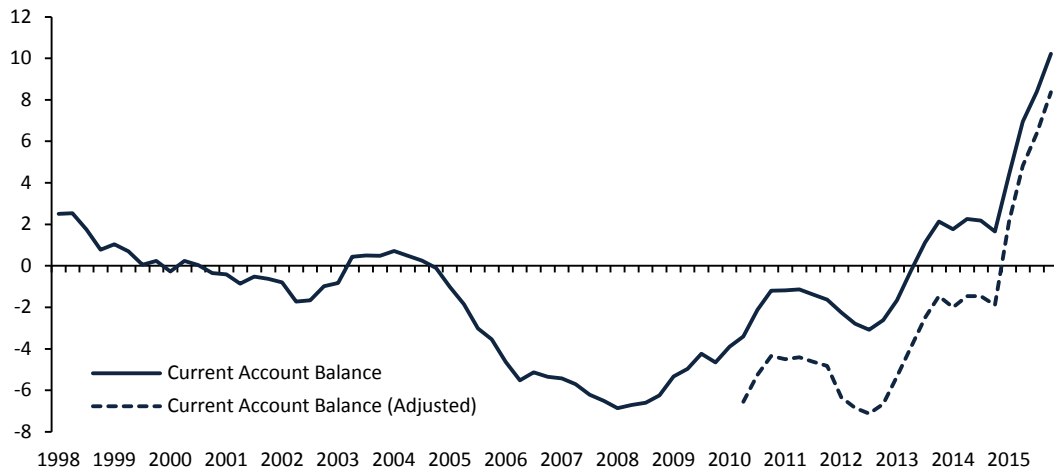
[2] The NAWRU estimates shown are that of the European Commission as based on the Commonly Agreed Methodology.

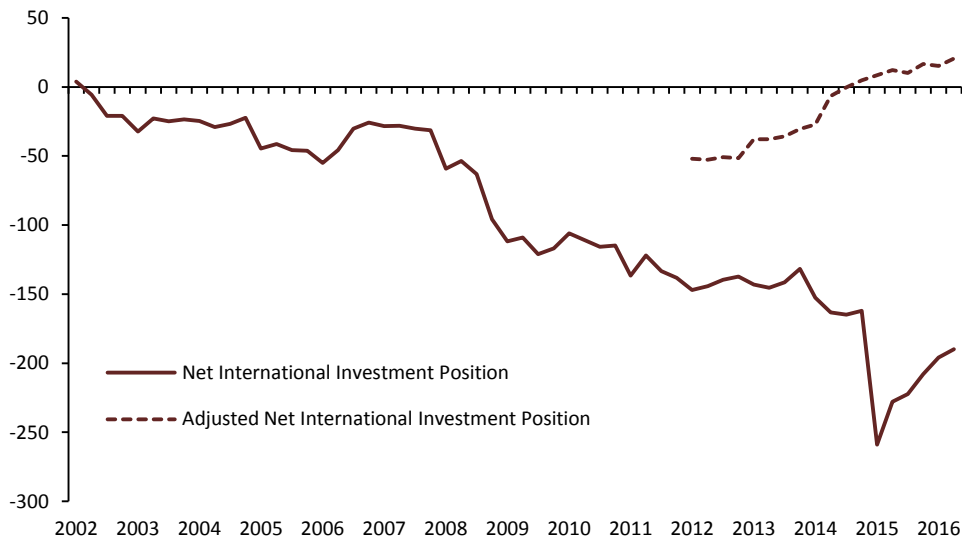[3] 4 quarter moving average shown for employment rates.

[4] Positive net migration indicates immigration exceeded emigration.

Figure AC.2: Indicators of External Balances
(% GDP)

### A. Current Account Balance (% GDP)

B. Net International Investment Position (% GDP)

Sources: CSO; Eurostat and internal IFAC calculations.
Note: Adjusted current account balance excludes estimated impact of redomiciled PLCs. Adjusted measure of net international investment position excludes activities of the International Financial Services Centre and Non-Financial Corporations.
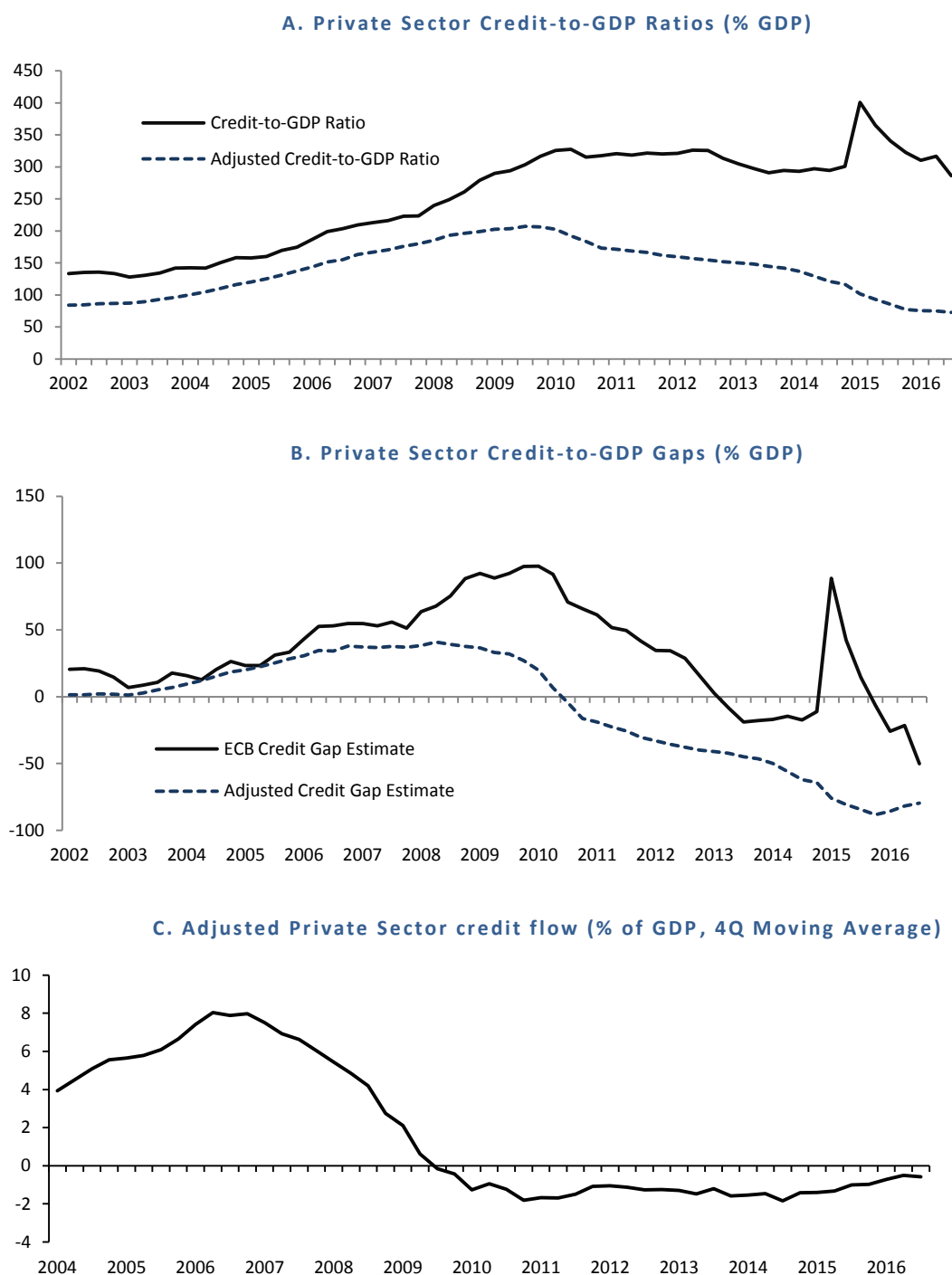
Figure AC.3: Investment Indicators
(% GDP)

A. Investment (% GDP)

B. Construction Activity & Unemployment
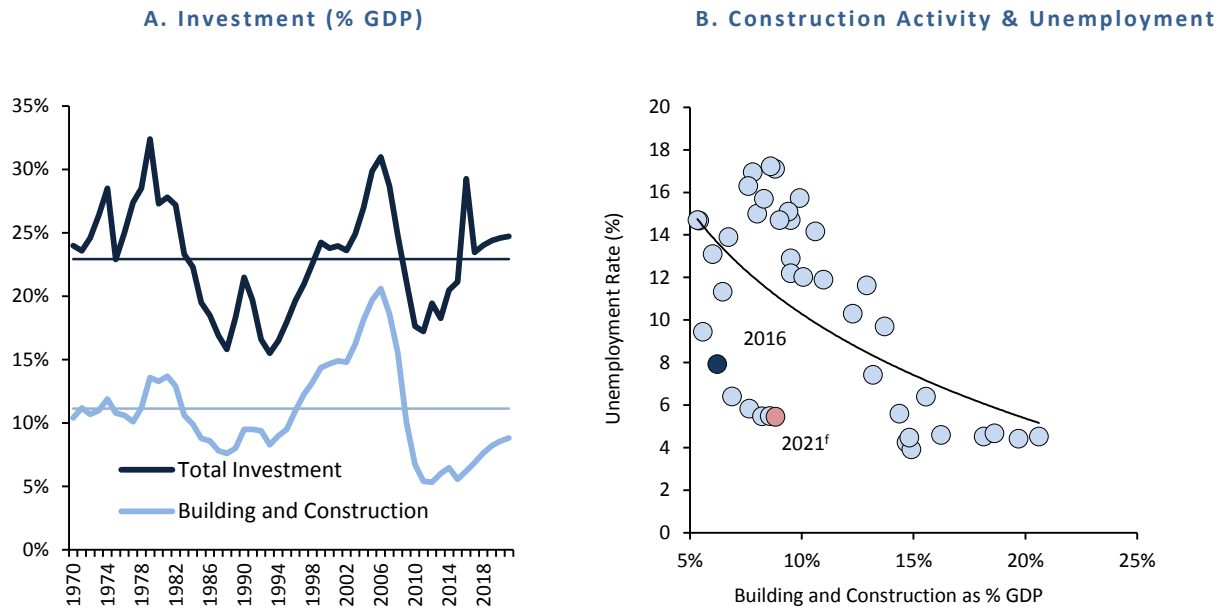
Sources: CSO; AMECO; Department of Finance; internal IFAC calculations.

Notes: Historical averages for investment ratios for 1970-2016 shown as horizontal lines in Panel A.

Figure AC.4: Credit Indicators
(% GDP)

A. Private Sector Credit-to-GDP Ratios (% GDP)

Credit-to-GDP Ratio

Adjusted Credit-to-GDP Ratio

B. Private Sector Credit-to-GDP Gaps (% GDP)

ECB Credit Gap Estimate

Adjusted Credit Gap Estimate

C. Adjusted Private Sector credit flow (% of GDP, 4Q Moving Average)

Sources: Central Bank of Ireland; CSO; Central Bank of Ireland Money, Credit and Banking and Quarterly Financial Accounts (transaction series used) and internal IFAC calculations.
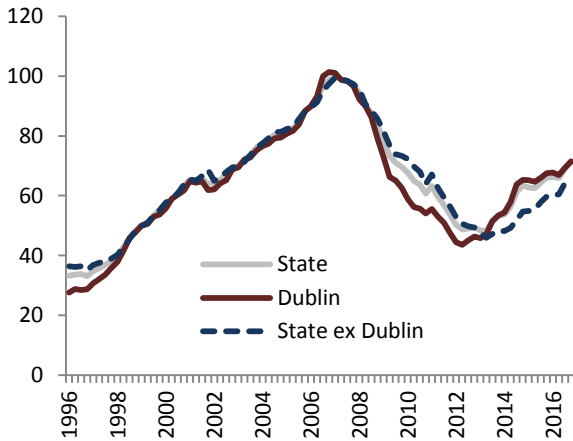
Notes: Adjusted ratios are constructed as Irish resident private sector enterprise credit (ex fin. intermediation) plus total loan liabilities of Irish households to adjust for the impact of multinational non-financial corporations given that associated credit is often sourced outside of Ireland (e.g., Box 6: Macro-Financial Review 2015:I, Central Bank of Ireland). A similar methodology to that in ESRB recommendation (18/06/2014) on guidance for countercyclical buffer rates is used to specify a credit ratio as: $(CREDIT_t / (GDP_t + GDP_{t-1} + GDP_{t-2} + GDP_{t-3})) \times 100\%$. 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: $GAP_t = RATIO_t - TREND_t$.
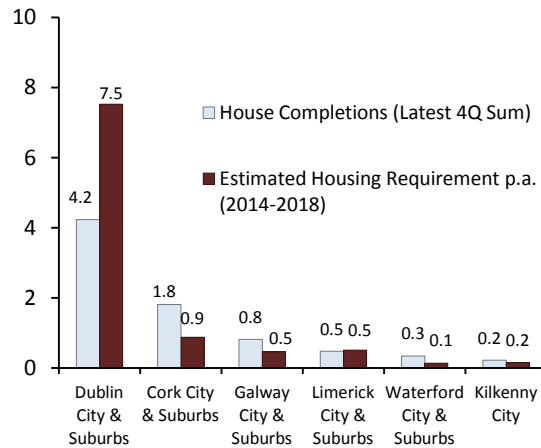
Figure AC.5: Housing Market Indicators

A. Irish Residential Property: Nominal Prices and Implied Production Costs (Index: Q1 2005=100)
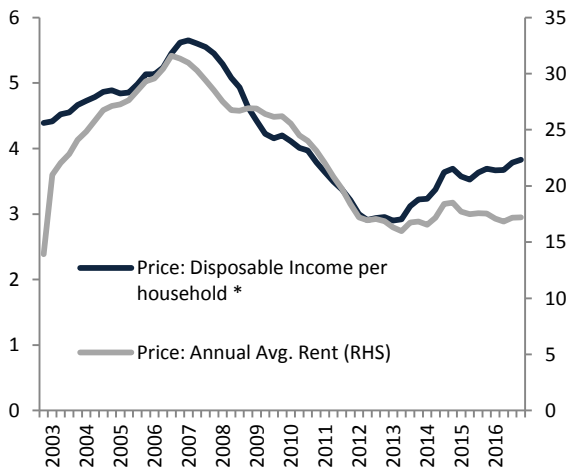

National Residential Property Prices

Implied Residential Building Production Deflator
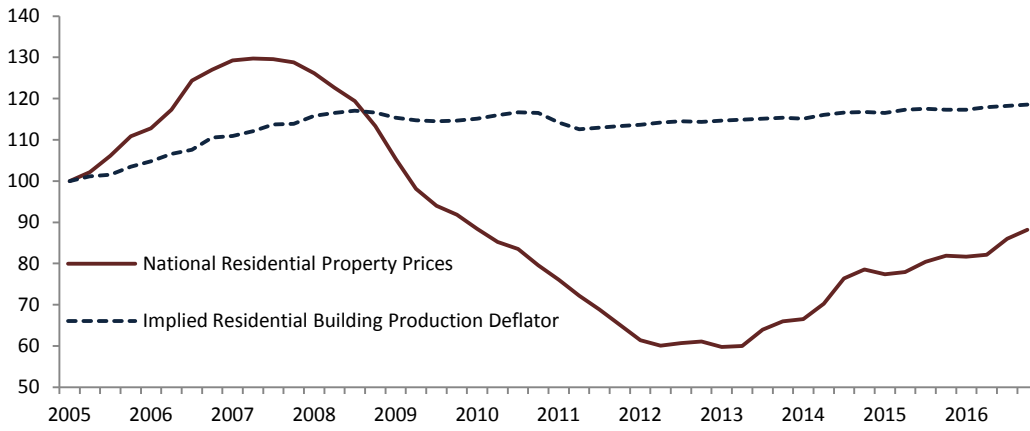
B. Real Residential Property Prices (HICP Adjusted) Index: Q1 2007 =100)

State
Dublin
State ex Dublin

C. Estimated Housing Requirements and Completions (000s)

House Completions (Latest 4Q Sum)

Estimated Housing Requirement p.a. (2014-2018)

D. Housing Valuation Ratios

Price: Disposable Income per household *

Price: Annual Avg. Rent (RHS)

E. User Cost of Capital for Housing (UCCH)

UCCH Simple Proxy *   UCCH **

UCCH (Daft exp)
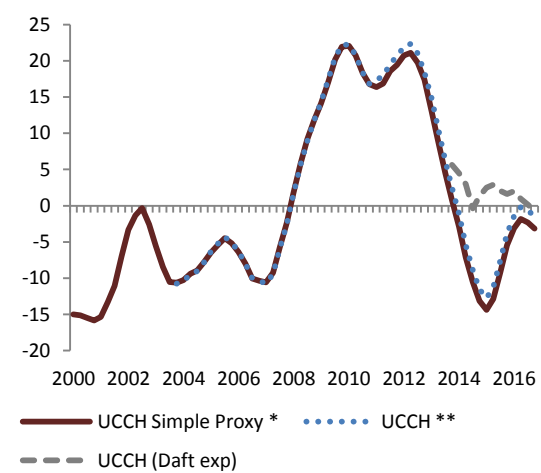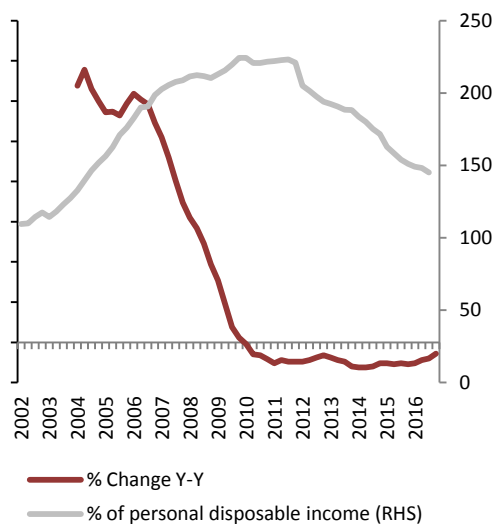
Sources: CSO, Housing agency estimates and Department of Housing, Planning, Community and Local Government; and internal IFAC calculations.

Note: Housing stock is proxied by Long-term loans; ESA-95 basis pre-2012.
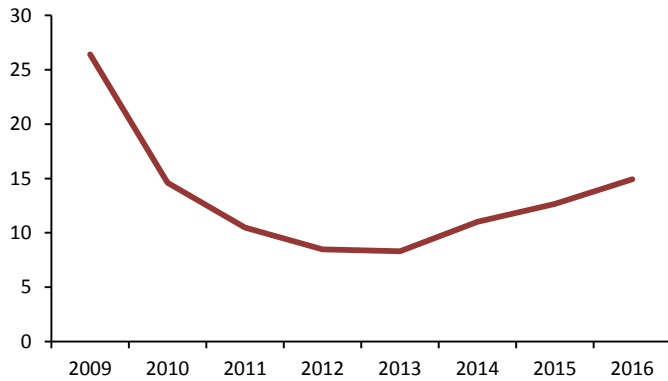
F. Annualised Residential Mortgage lending (first-time buyer & mover purchase loans)

Number of loans, '000s

Value of loans, €bn (RHS)
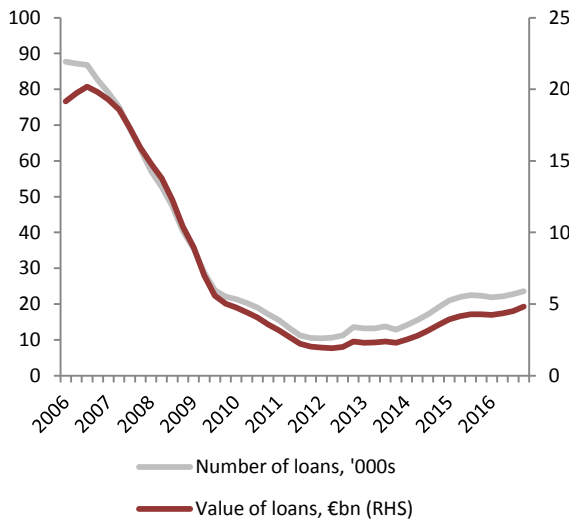
G. Loans to Irish Households for House Purchase

% Change Y-Y

% of personal disposable income (RHS)

H. Housing Completions (000s)

Sources: Central Bank of Ireland; CSO; IBF/PwC Mortgage Market Profile; Department of Housing, Planning, Community and Local Government.