

Appendix D: Imbalance Indicators

As part of its toolkit for examining the cyclical position of the economy, the Council uses a “modular” approach. While estimates of the output gap and potential output are useful summary measures, 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.

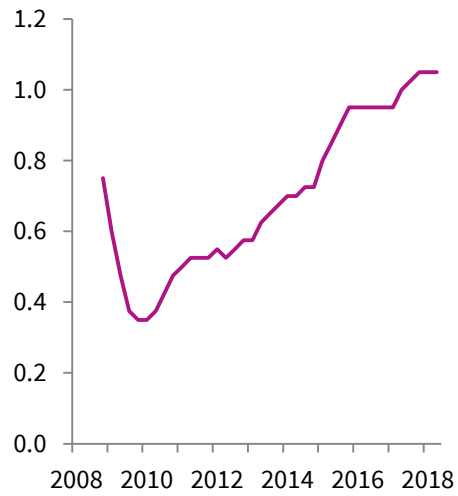
This appendix assesses some indicators of potential imbalances in the Irish economy. Within each module, a number of indicators are examined. Forecasts from *Budget 2019* are also included, where available. Four modules are shown here, namely:

- (i) the labour market and prices;
- (ii) external balances;
- (iii) investment and housing;
- (iv) credit conditions.

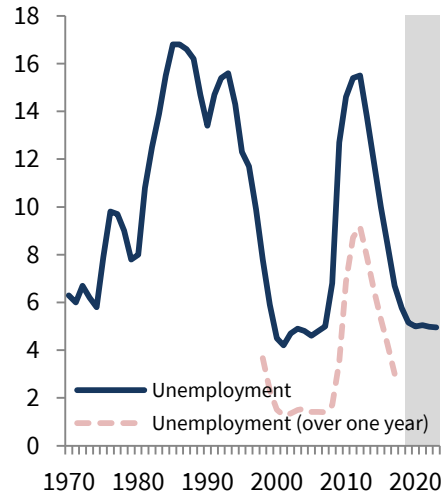
While this modular approach ensures that many potential sources of imbalance are examined, there are difficulties in assigning/estimating the relative importance (or weights) to attach to each of these imbalance indicators. Historical data may be a good guide to variables that explain previous business cycles, but not necessarily current or future ones.

Figure AD.1: Labour market and prices indicators

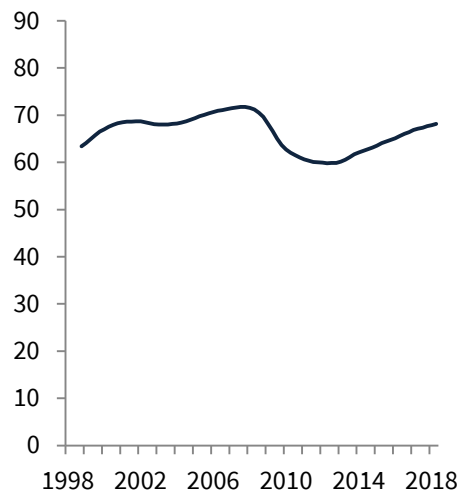
A. Private sector job vacancy rates¹
Percentage of private sector employment



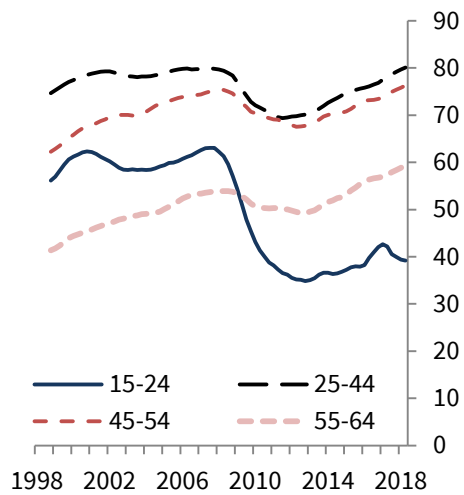
B. Unemployment rates²
Percentage of labour force



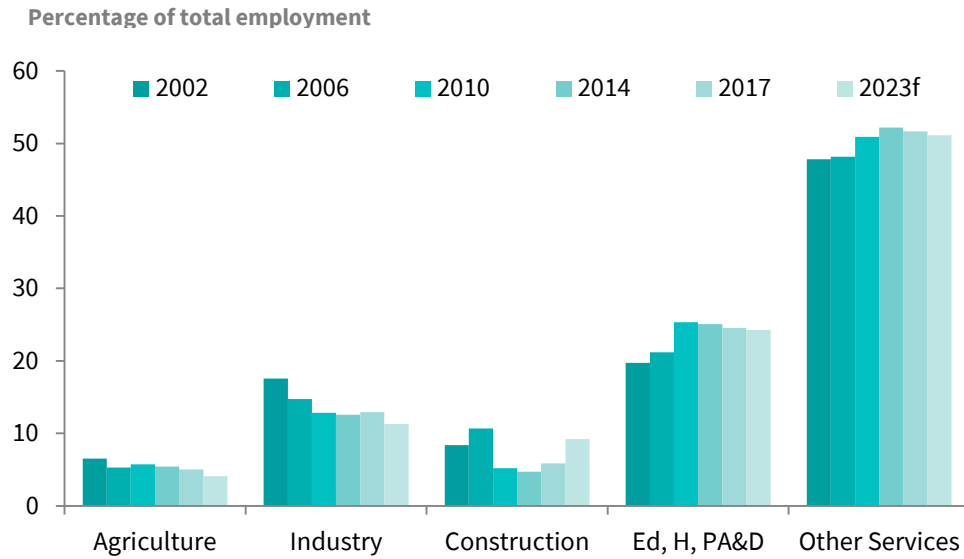
C. Employment rate (age 15–64)³
Percentage of population



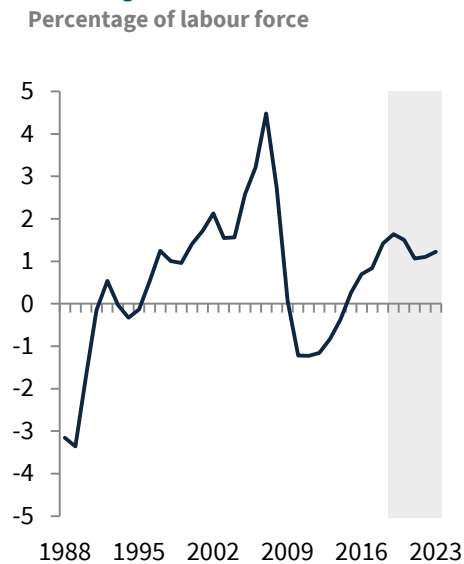
D. Employment rates by age³



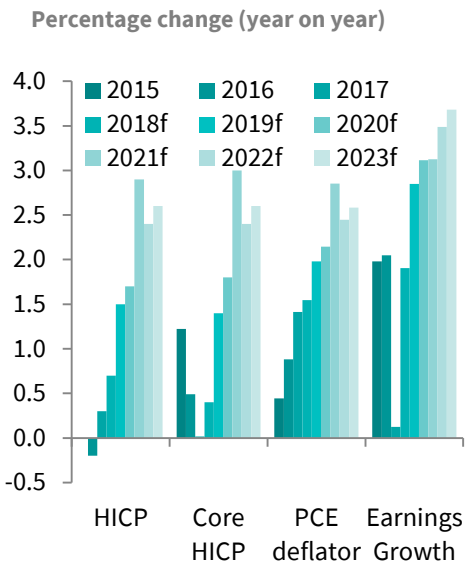
E. Sectoral employment concentration⁴



F. Net migration⁴



G. Inflation measures⁵



Sources: Central Statistics Office; Department of Finance; European Commission, AMECO.

Notes:

¹ Rates show the four-quarter moving average percentage of vacancies.

² Combined historical data from AMECO and CSO, including *Budget 2019* forecasts for 2018–2023.

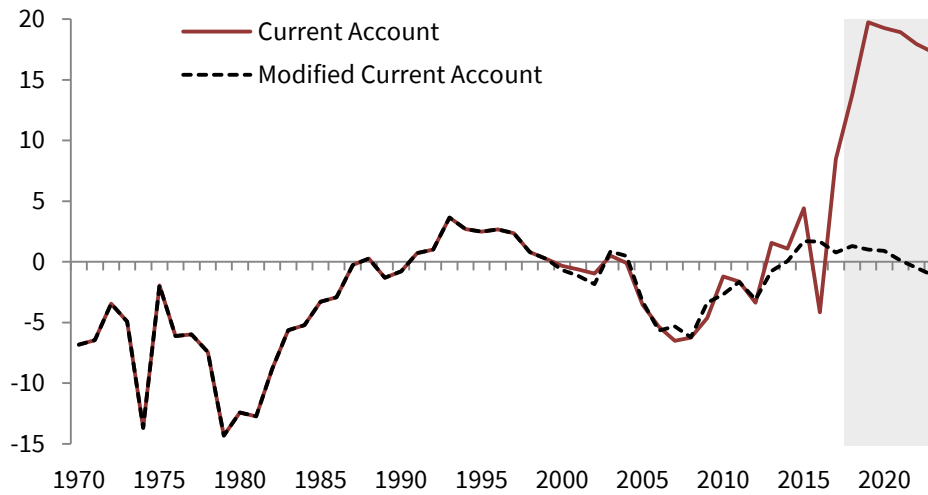
³ A four-quarter moving average is shown for employment rates. Employment rates by age grouping for 15–24 years, 25–44 years and 55–64 years are calculated as an average of quarterly employment rates (by five- or ten-year age groups), weighted by annual population estimates by corresponding age group.

⁴ Positive net migration indicates immigration exceeded emigration. Figures E and F include *Budget 2019* forecasts for 2018–2023.

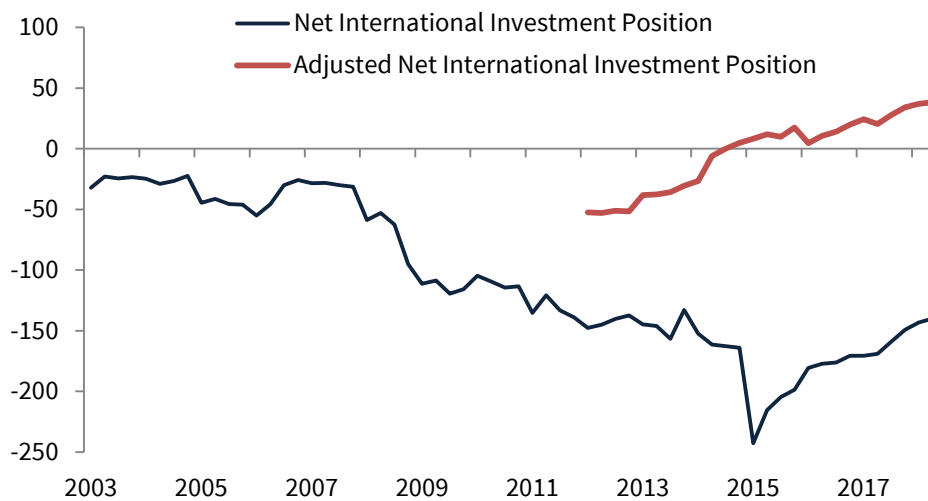
⁵ Earnings growth shown is a per-hour national accounts measure, based on compensation of employees and annualised employee hours. *Budget 2019* forecasts for 2018–2023 are included.

Figure D.2: Indicators of External Balances

A. Current account and modified current account balances
Percentage of GNI*



B. Net international investment position
Percentage of GDP



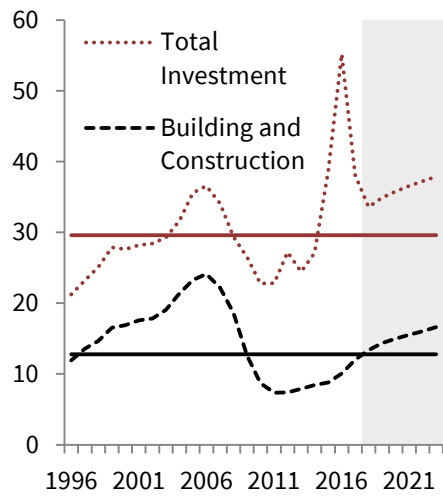
Sources: CSO; Eurostat and internal IFAC calculations.

Note: The modified current account balance excludes the estimated impact of redomiciled PLCs, depreciation on research & development related intellectual property (IP) imports, depreciation on aircraft leasing, imports of R&D services by foreign owned MNCs, and acquisitions of IP assets and aircraft for leasing. Adjusted measure of net international investment position excludes activities of the International Financial Services Centre and Non-Financial Corporations.

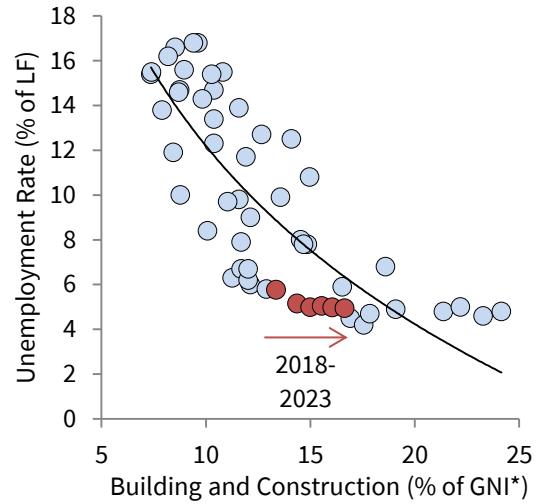
Figure D.3: Investment and Housing Indicators

A. Investment

Percentage of GNI*



B. Construction activity and employment



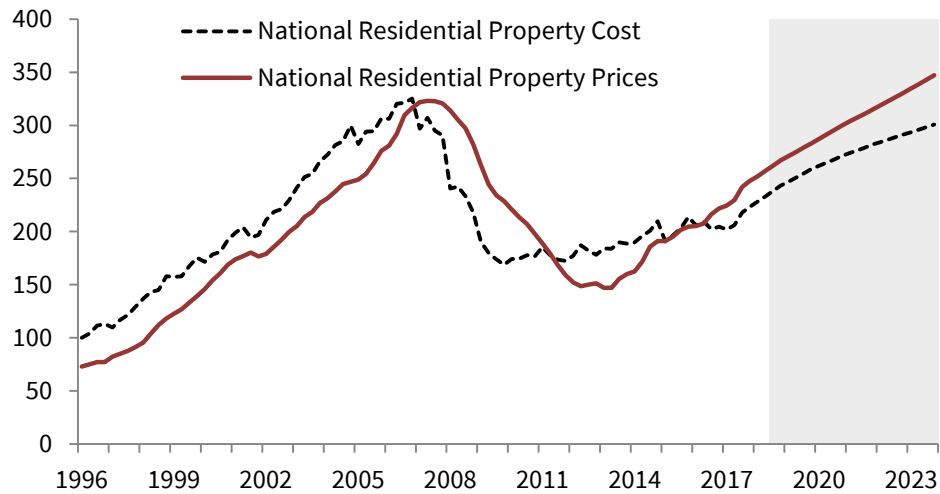
Sources: CSO; AMECO; Department of Finance; internal IFAC calculations.

Notes: Historical averages for investment ratios for 1970–2017 shown as horizontal lines in Panel A.

In panel B, forecasts (2018–2023) are shown in red.

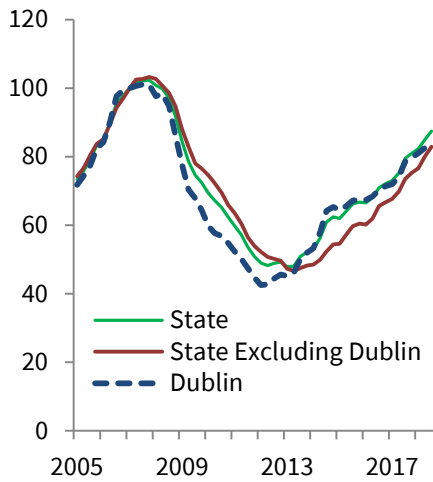
C. Irish residential property: prices and implied production costs

Euro, thousands

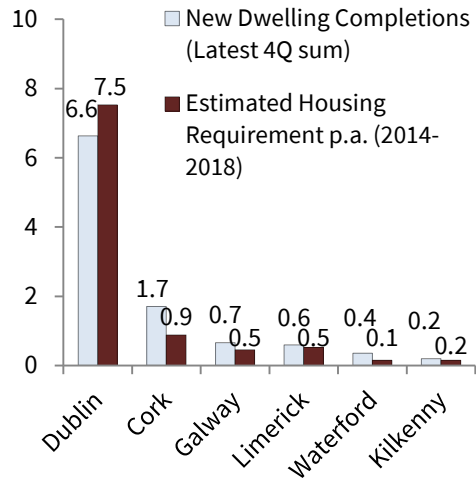


Sources: CSO; Society of Chartered Surveyors of Ireland; and internal IFAC calculations.

D. Real residential property prices (HICP adjusted)
Q1 2007 = 100

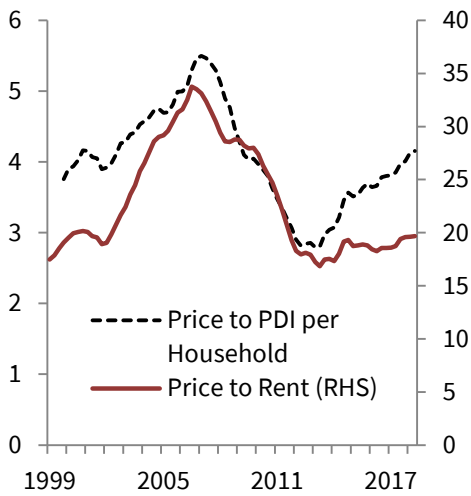


E. Estimated housing requirements and completions
Thousands

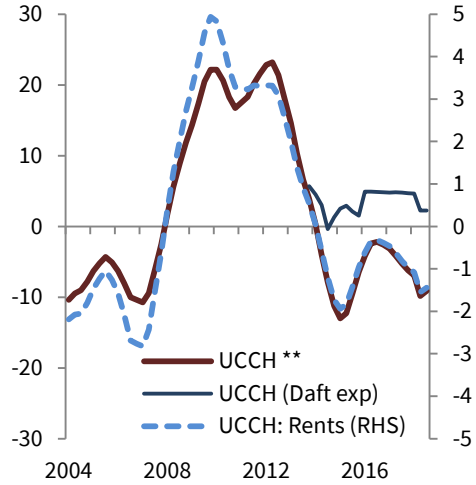


Sources: CSO, ESRI/PTS, Housing agency estimates and Department of Housing, Planning, Community and Local Government; and internal IFAC calculations.

F. Housing valuation ratios
Ratio

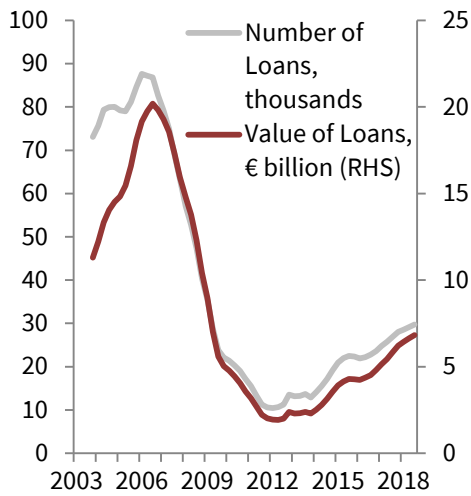


G. User cost of capital for housing (UCCH)



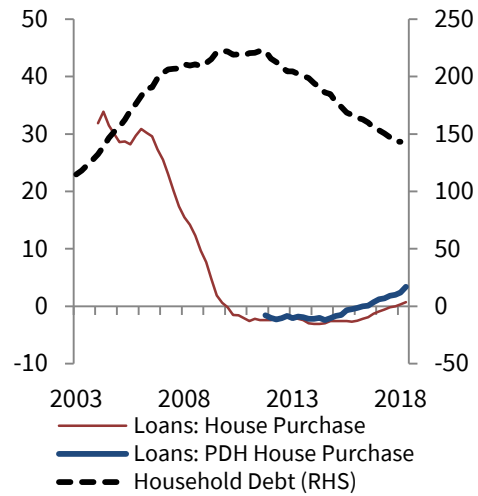
Sources: CSO, Residential Property Price Index; ESRI/PTS House Price Index; RTB, The RTB Rent Index Quarter 4 2017; Housing agency estimates and Department of Housing, Planning, Community and Local Government; and internal IFAC calculations.

H. Annualised residential mortgage lending (first-time buyer and mover purchase loans)



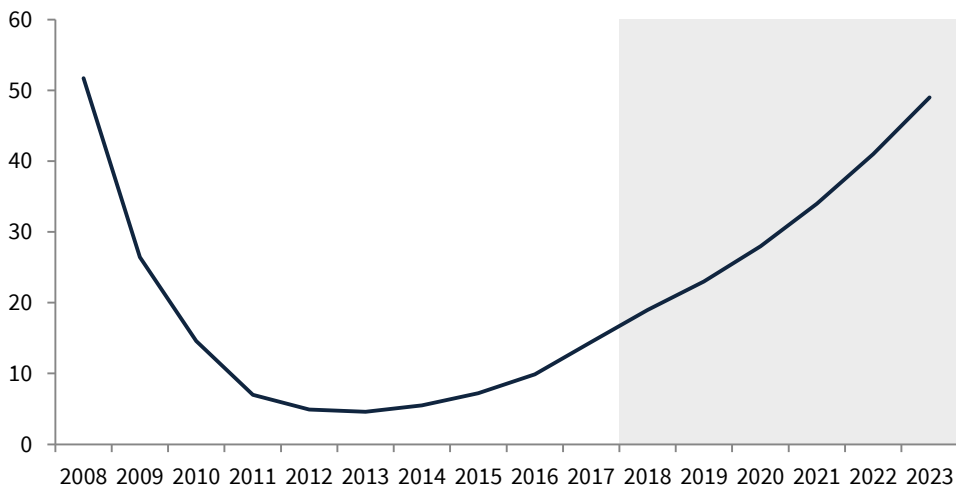
I. Loans to Irish households for house purchase

Percentage change (LHS) and percentage of gross disposable income (RHS)



J. Housing completions

Thousands



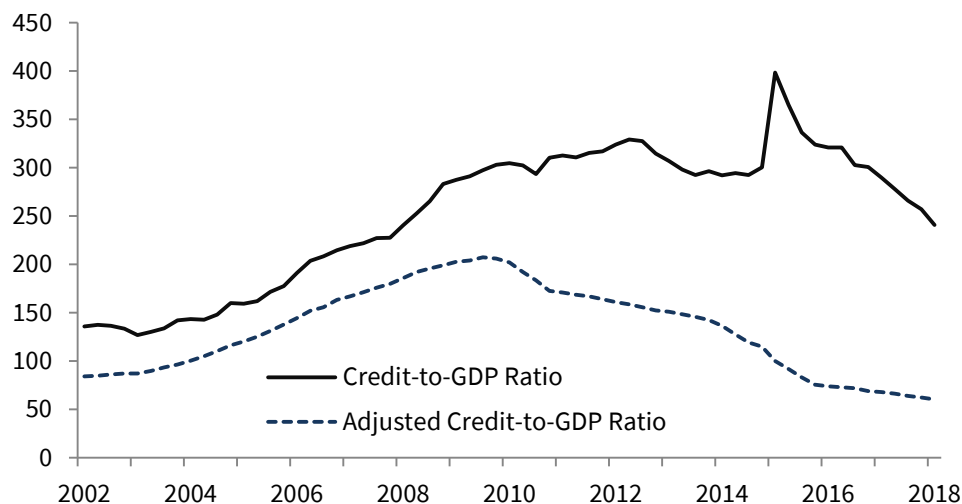
Sources: CSO, ESRI/PTSB, Central Bank of Ireland, IBF Mortgage Market Profile, Department of Housing, Planning, Community and Local Government; and internal IFAC calculations.

Note: Price to disposable income per household corresponds to average house prices divided by moving 4-quarter sum of adjusted personal disposable income per household – households are forecast based on population growth and assuming a constant share of households relative to population from Q1 2016 onwards. UCCH simple proxy corresponds to new mortgage rates less annual price change for the past 4 Qs. UCCH** includes first-time buyer taxes/subsidies; down-payments; depreciation/maintenance. UCCH (Daft exp) uses Daft.ie 12 month price expectations. Housing stock is proxied by Long-term loans; ESA-95 basis pre-2012.

Figure D.4: Credit Indicators

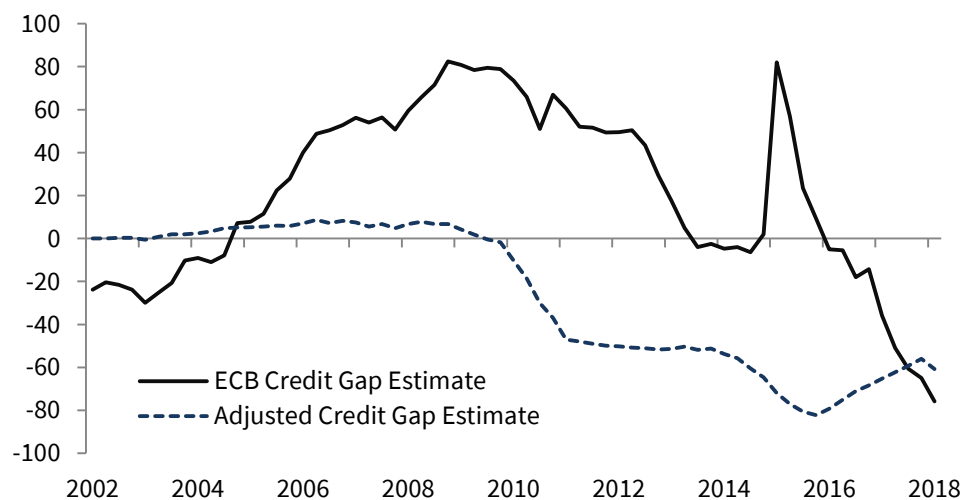
A. Private sector credit-to-GDP ratios

Per cent of GDP



B. Private sector credit-to-GDP gaps

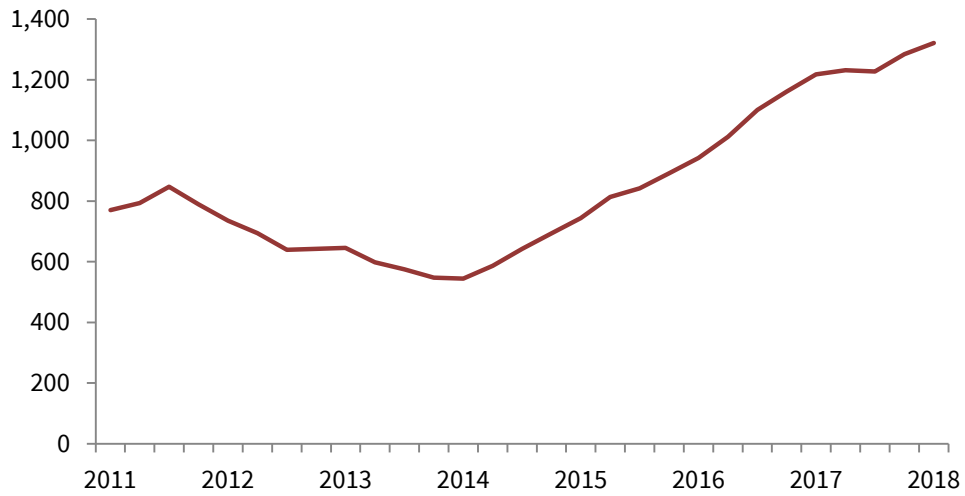
Per cent of GDP



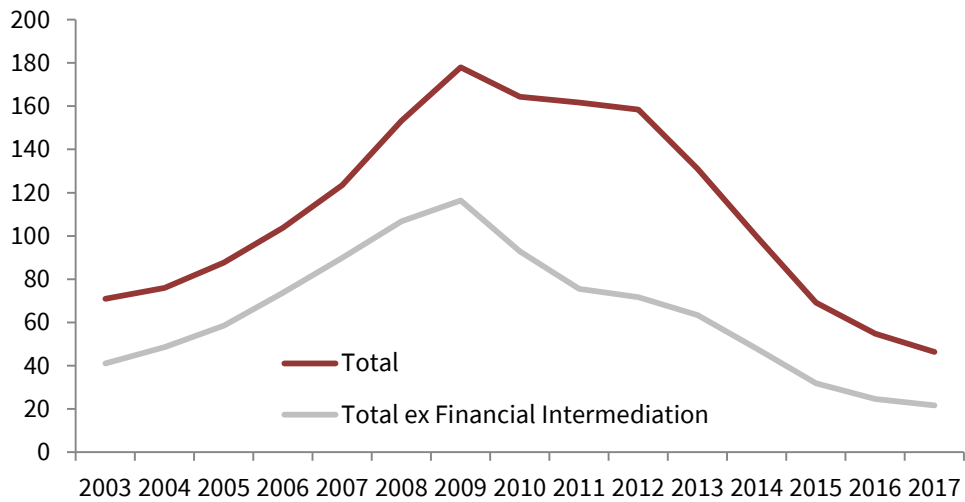
Sources: CSO; Central Bank of Ireland and internal IFAC calculations.

Notes: Adjusted ratios are constructed as Irish resident private sector enterprise credit (excl. financial 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: $GAP_t = RATIO_t - TREND_t$.

C. New credit advanced to Irish resident small- and medium-sized enterprises
 € billion (excluding financial intermediation, four-quarter sum)



D. Credit advanced to Irish resident private-sector enterprises
 Per cent of GNI*



Sources: CSO; Central Bank of Ireland and internal IFAC calculations.