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.

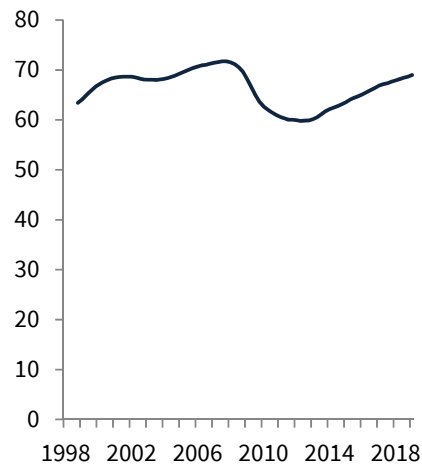## Appendix Figure D.1: Labour market and prices indicators

A. Private sector job vacancy rates[1]
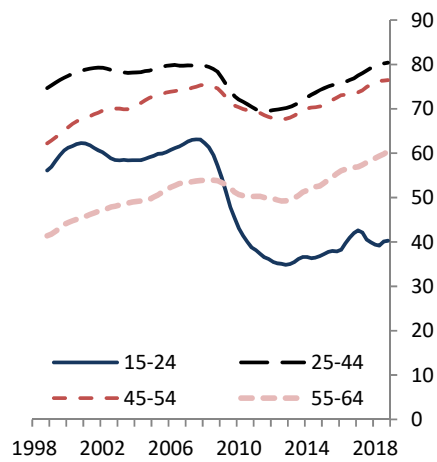**Percentage of private sector employment**
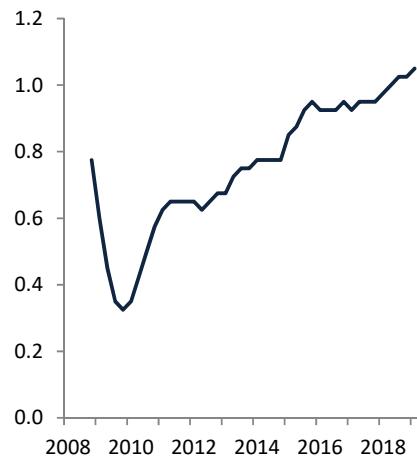
B. Unemployment rates[2]
Percentage of labour force

Legend:
- Unemployment
- Long-term unemployment (> one year)
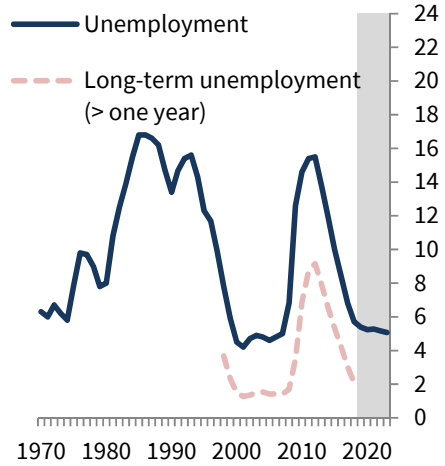
C. Employment rate (age 15–64)[3]
Percentage of population

D. Employment rates by age[3]

Legend:
- 15-24
- 25-44
- 45-54
- 55-64

E. Sectoral employment concentration[4]
Percentage of total employment

Legend: 2002, 2006, 2010, 2014, 2018, 2023f

Categories: Agriculture, Industry, Construction, Ed, H, P&AD, Other Services
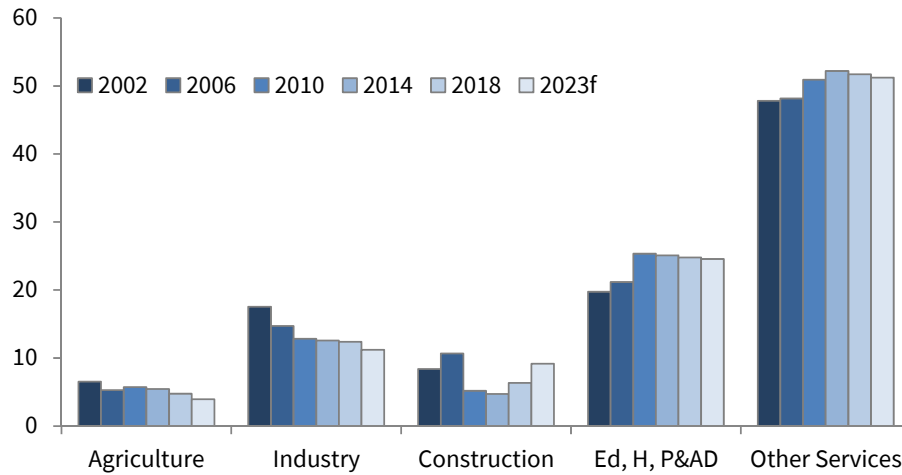
F. Net migration[4]
Percentage of labour force

x-axis: 1988, 1995, 2002, 2009, 2016, 2023
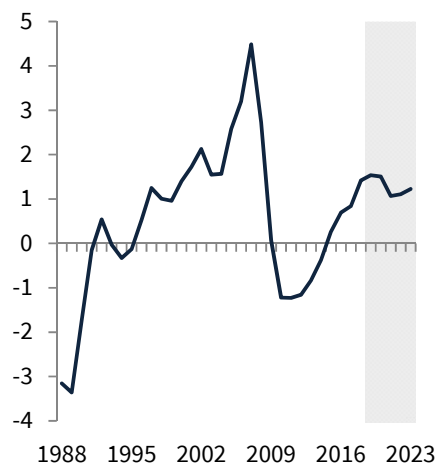
G. Inflation measures[5]
Percentage change (year on year)

Legend: 2015, 2016, 2017, 2018, 2019f, 2020f, 2021f, 2022f, 2023f

Categories: HICP, Core HICP, PCE Deflator, Earnings Growth
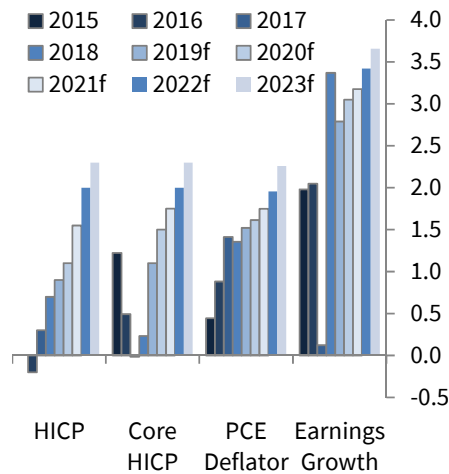
Sources: Central Statistics Office; Department of Finance; European Commission, AMECO.

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.

Appendix Figure D.2: Indicators of External Balances

A. Current account and modified current account balances
Percentage of GNI*
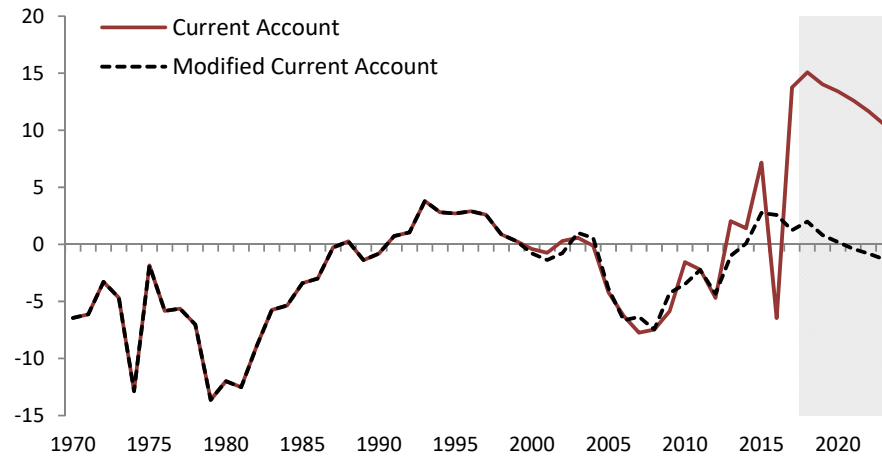
B. Net international investment position
Percentage of GDP
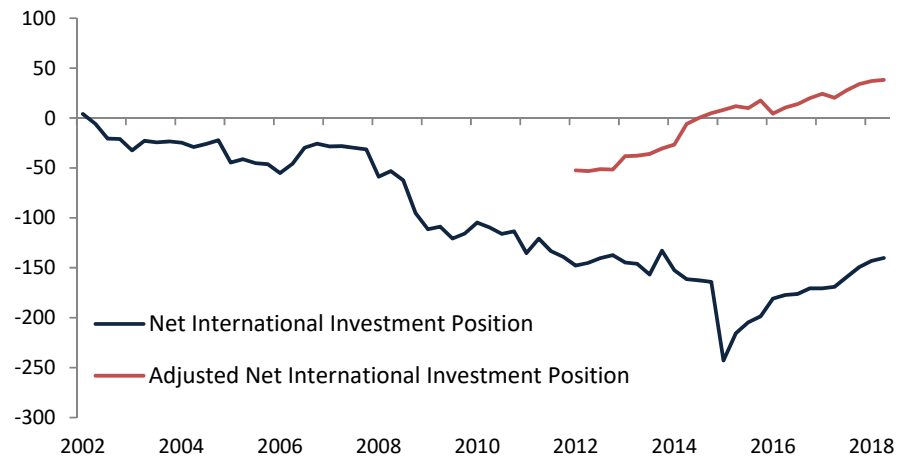
Sources: CSO; Eurostat and internal IFAC calculations.
Note: The modified current account balance excludes the estimated impact of redomiciled PLCs, depreciation on research & development related intellectual property (IP) imports, depreciation on aircraft leasing, imports of R&D services by foreign 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.
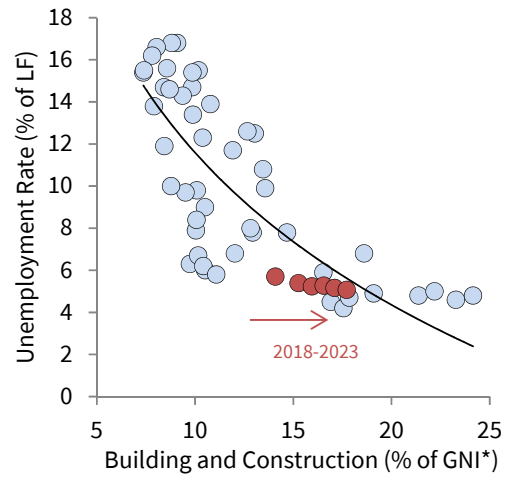
Appendix Figure D.3: Investment and Housing Indicators

A. Investment
Percentage of GNI*
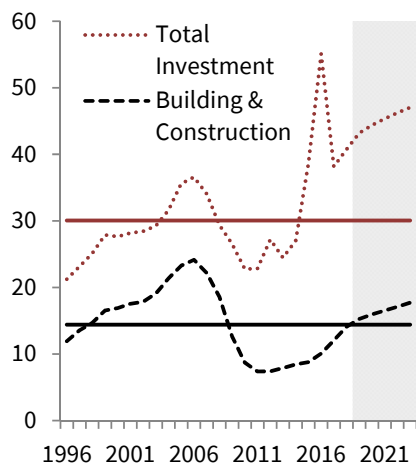
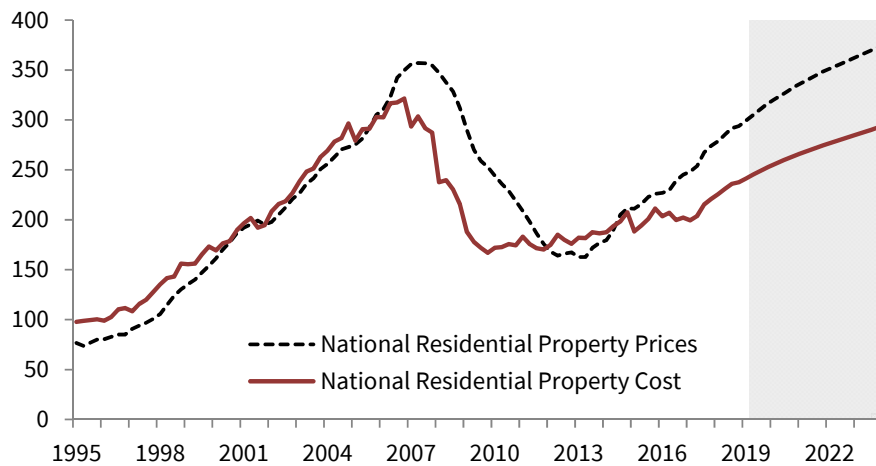**B. Construction activity and employment**

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

Notes: Historical averages for investment ratios for 1970–2018 shown as horizontal lines in Panel A.

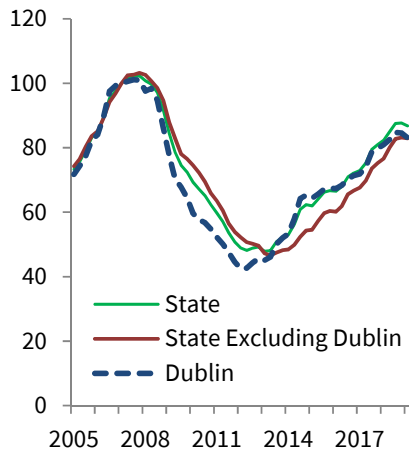In panel B, forecasts (2019–2023) are shown in red.

C. Irish residential property: prices and implied production costs
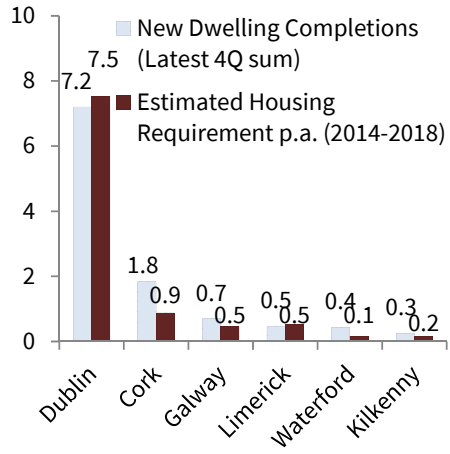Euro, thousands

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

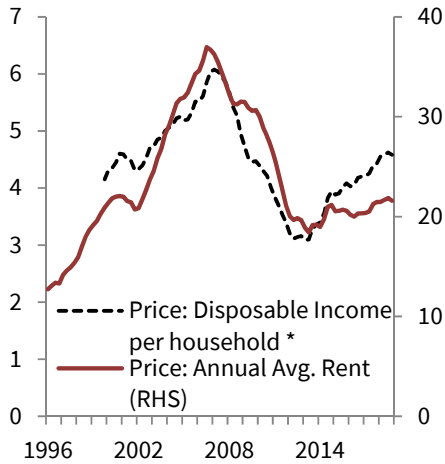**D. Real residential property prices (HICP adjusted)**
Q1 2007 = 100

120
100
80
60
40
20
0

State
State Excluding Dublin
Dublin

2005   2008   2011   2014   2017

E. Estimated housing requirements and completions
Thousands

10
8
6
4
2
0

New Dwelling Completions (Latest 4Q sum)
Estimated Housing Requirement p.a. (2014-2018)

7.2   7.5
1.8   0.9
0.7   0.5
0.5   0.5
0.4   0.1
0.3   0.2

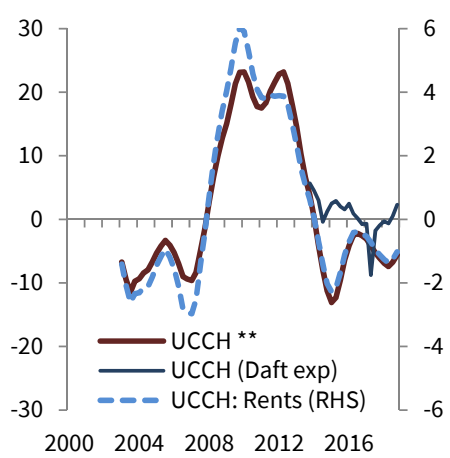Dublin   Cork   Galway   Limerick   Waterford   Kilkenny

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

F. Housing valuation ratios
Ratio

7
6
5
4
3
2
1
0

40
30
20
10
0

Price: Disposable Income per household *
Price: Annual Avg. Rent (RHS)

1996   2002   2008   2014

G. User cost of capital for housing (UCCH)

30
20
10
0
-10
-20
-30

6
4
2
0
-2
-4
-6

UCCH **
UCCH (Daft exp)
UCCH: Rents (RHS)

2000   2004   2008   2012   2016

Sources: CSO, *Residential Property Price Index*; ESRI/PTSB *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)
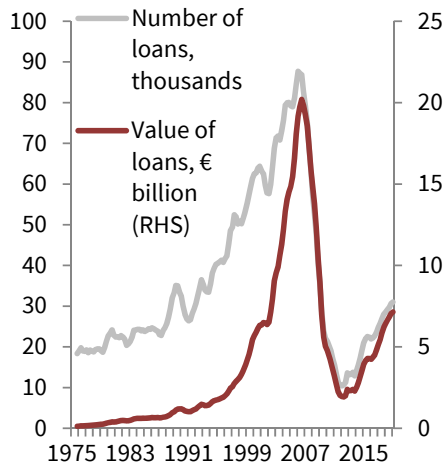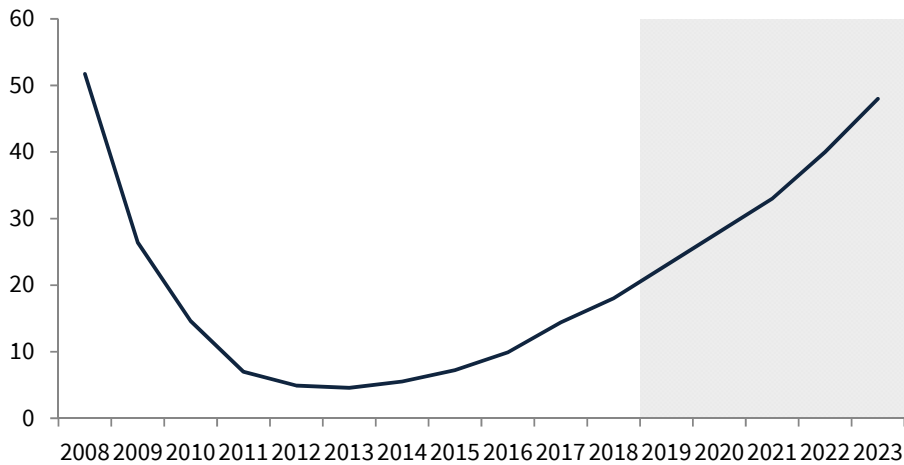

I. Loans to Irish households for house purchase

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

Loans: House Purchase
Loans: PDH House Purchase
Household Debt (RHS)
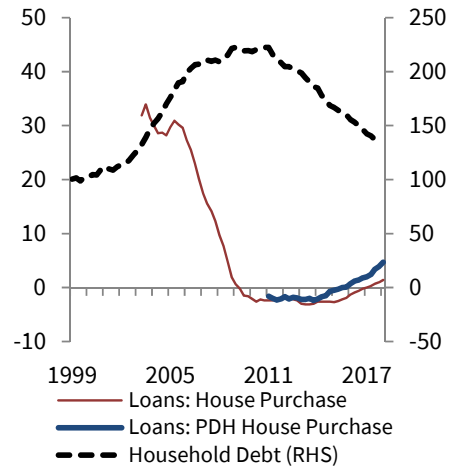
J. Housing completions

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.
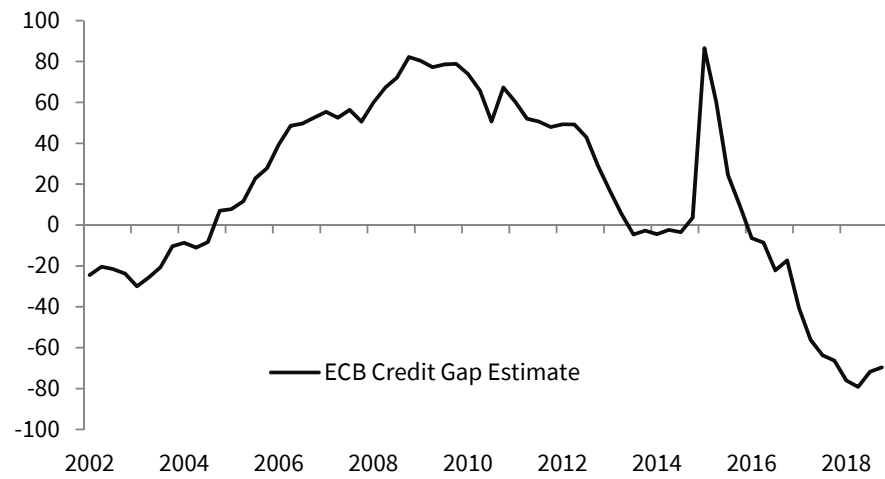
Appendix Figure D.4: Credit Indicators

A. Private sector credit-to-GDP ratios
Per cent of GDP
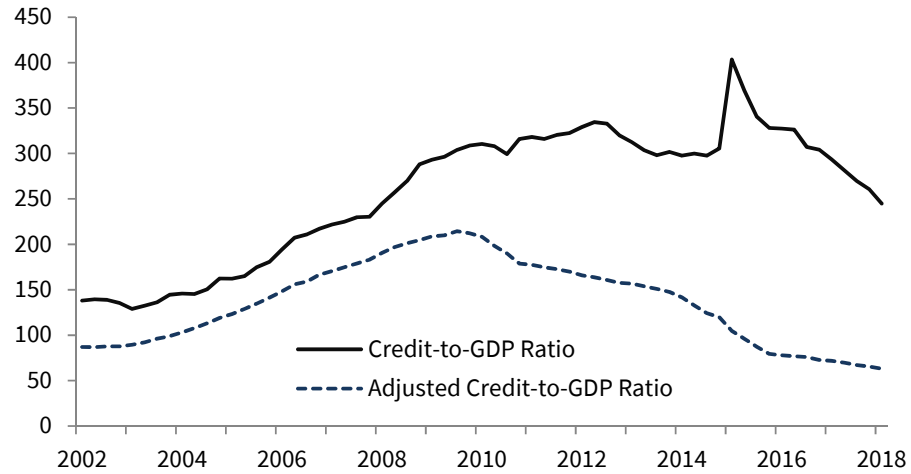
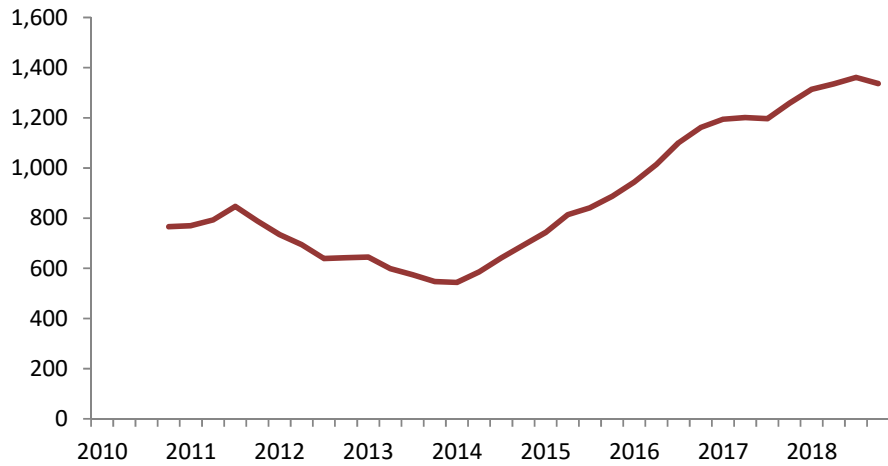### B. Private sector credit-to-GDP gap
Per cent of GDP

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

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*