Indicators for Setting the Countercyclical Capital Buffer

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Abstract

Since January 1 2016, the Countercyclical Capital Buffer (CCB), a new macro-prudential policy instrument, has been operational in Ireland. The CCB, which is a time-varying countercyclical capital requirement, aims to limit the potential systemic risks associated with excessive credit growth. This Letter provides an overview of the CCB and summarises European Systemic Risk Board (ESRB) recommendations on appropriate economic and financial indicator variables to guide the setting of the CCB. A number of indicators are applied to historical Irish data for illustrative purposes. The analysis also highlights challenges that arise in the estimation and interpretation of indicators and, therefore, the importance that policymaker judgement will play in setting the CCB rate.

1 Introduction

The Countercyclical Capital Buffer (CCB) is a macro-prudential instrument designed to make the financial system more resilient and less pro-cyclical. It is a time varying, countercyclical, capital requirement which will apply to banks and investment firms.[2] Within the broader macro-prudential policy framework, the CCB is an instrument which should help authorities meet one of the intermediate objectives of macro-prudential policy, namely mitigating and preventing excessive credit growth and leverage (see CBI (2014)). As set out in the Capital Requirements Directive (CRD) IV, the CCB framework has been in effect across the EU since January 2016.

The Central Bank of Ireland, along with the European Central Bank (ECB), will be the designated authorities responsible for setting the CCB for Ireland.[3] Currently, the CCB rate on Irish exposures, as set by the Central Bank, is 0 per cent. The Central Bank will review the rate on a quarterly basis.[4]

This Economic Letter provides an overview of the CCB, describing its objectives and operation (Section 2). It will outline European Systemic Risk Board (ESRB) recommendations on appropriate indicator variables that designated author-

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[2]For simplicity, this Economic Letter refers to banks alone.

[3]Macroprudential powers povided under the Single Supervisory Mechanism give the ECB a role in the setting of the CCB.

[4]Further information on how the Central Bank applies the CCB framework in Ireland is availabe on the Central Bank of Ireland website.

ities should use to guide the setting of the CCB (Section 3). A key element, however, is that there will be no mechanical or automatic link between a particular indicator or indicators and the CCB rate. Designated authorities will set the CCB rate based on expertise and judgement, employing indicators as an input into the decision. Several of the recommended indicators are applied to historical Irish data for illustrative purposes (Section 4). Challenges that may arise when estimating and interpreting the indicators are also discussed. Key conclusions are then outlined (Section 5).

2 Overview of the CCB

According to the ESRB, the objective of the CCB is to *"protect the banking system against potential losses when excessive credit growth is associated with a build-up of system-wide risk, thereby supporting the sustainable provision of credit to the economy"* (ESRB, 2014b). The approach is that the CCB will increase the capital requirement faced by banks when credit growth is deemed excessive and systemic risk is increasing.[5] The CCB rate can then be decreased, partially or fully, either during periods of financial stress or when risks significantly recede. In this way the capital should be available to absorb potential losses. A secondary benefit of the CCB is that it may make the provision of bank credit less pro-cyclical as increased capital requirements may constrain lending growth in an economic upswing and the additional capital buffers may reduce the incentives of institutions to curtail lending during a downturn.

Ordinarily, the CCB rate will range from 0 to 2.5 per cent of total risk exposures, but can be set at a higher rate if deemed necessary. Once the CCB rate is set or increased above 0, banks will generally have one year to meet the increased capital requirement. When the CCB rate is reduced, the lower capital requirement will be immediately applicable. The CCB rate set by the designated authorities in each EU member state will apply to ex-

posures in that jurisdiction.[6] The CCB rate which will apply to individual institutions then will be the weighted average of the CCB rates in the countries where they operate.[7] Capital held by banks to meet their institution specific CCB rate will be in addition to capital held to meet other prudential capital requirements.

The CCB is only one of a range of possible macro-prudential tools at the disposal of designated authorities. Different tools, or combinations thereof, may be used depending on the nature and source of the specific risk(s) at a given point in time.

3 ESRB Recommendations

As provided for under CRD IV, the ESRB issued guidance to designated authorities on the setting of CCB rates in June 2014 (ESRB, 2014a). Among the recommendations are that, when setting the CCB rate, designated authorities should analyse a range of economic and financial indicator variables which provide information on credit growth, systemic risk and financial stress. This analysis should then be combined with other information (e.g. market intelligence, financial stability assessments) and policymaker judgement to determine the appropriate CCB rate.

Indicator variables are classified as either build-up phase or release phase indicators. Build-up phase indicators will be used during an economic upswing in order to assess potential excessive credit growth and systemic risk. Release phase indicators will come into play if the CCB rate is above 0 per cent, indicating the extent of stress in the financial system and/or that risks have significantly abated, signaling the possible need to reduce the CCB rate. This Economic Letter focuses on build-up phase indicators - release phase indicators will be the subject of future work.

The ESRB identified appropriate indicators for the build-up phase based on a detailed analysis of the performance of candidate indicators for bank-

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[5]Whether the imposition of a CCB rate actually impacts on the level of capital held by an institution is likely to depend on a number of factors including their initial capital position and internal capital strategy. Where an institution already has a capital ratio in excess of the regulatory minima they may be able to meet the increased capital requirement arising from the CCB rate from existing capital for example.

[6]CRD IV sets out a system of reciprocity whereby designated authorities recognise the CCB rates set in other jurisdictions. Reciprocity is automatic within the European Union where the CCB rate is set between 0 and 2.5 per cent. Above the 2.5 per cent limit reciprocity is optional.

[7]Under transitional arrangements, which phase-in the CCB requirements in Ireland, the institution specific capital buffer is capped at 0.625 per cent in 2016, 1.25 per cent in 2017 and 1.875 per cent in 2018.

ing crisis prediction for EU countries over the period 1970-2013. The best performing indicators for banking crisis prediction have been recommended for setting the CCB rate. The rationale for this approach is that, as banking crises mainly occur after periods of excessive credit growth and increasing systemic risk, indicators that could predict these crises are likely to be suitable for setting the CCB.

The ESRB recommends designated authorities use two broad classes of indicator to guide the setting of the CCB in the build-up phase; first, the credit gap, and secondly, other indicators.

The credit gap

The credit gap is defined as the deviation of the credit-to-GDP ratio from its long-run trend.[8] Research on the CCB, by the Basel Committee on Banking Supervision (BCBS, 2010), identified the credit gap as suitable for identifying periods of excessive credit growth. Building on this, the ESRB recommends that the credit gap, calculated in a standardised manner, act as a common reference point for designated authorities in setting the CCB rate. This standardised approach defines credit broadly to include credit[9], from any source, to resident households and non-financial corporations (NFCs). Credit to government and to financial institutions was deemed less suitable for setting the CCB and is excluded. To estimate the long-run trend in the credit-to-GDP ratio, the ESRB recommends the use of a statistical technique called the *Hodrick-Prescott (HP) Filter*.[10]

Member States will then be required to use the standardised credit gap to calculate a benchmark CCB rate which will act as a common guide to designated authorities across member states. The benchmark rate will be calculated as follows:

- When the credit gap is below 2 per cent the benchmark rate should be 0 per cent.

- When the credit gap is 10 per cent or above the benchmark rate should be at its maximum of 2.5 per cent.

- When the credit gap is between 2 per cent and 10 per cent the benchmark buffer rate

should rise linearly from 0 to 2.5 per cent.

It should be borne in mind that the standardised credit gap and associated benchmark buffer rate serves only as one of several inputs into CCB rate decisions. It is meant to inform policymakers and it is not envisaged that the CCB rate be set in an automatic manner based on any one indicator, or group of indicators.

Designated authorities should publish the standardised credit gap each quarter along with the announcement of the actual CCB rate. The ESRB recommendation acknowledges, however, that the standardised credit gap may not be the most appropriate indicator in all cases. Therefore national designated authorities can also utilise an additional, national specific, credit gap based on either an alternative measure of credit or methodology.

Other Indicators

In addition to the credit gap, the ESRB analysed the performance of a wide range of variables as indicators of the build-up of systemic risk. Arising from this, the ESRB recommends designated authorities monitor a variety of indicators incorporating:

(a) measures of the potential overvaluation of property prices (e.g. deviation of house prices or commercial property prices from long run average levels)

(b) measures of credit developments other than the credit gap (e.g. credit growth)

(c) measures of external imbalances (e.g. current account balance, external debt)

(d) measures of the strength of bank balance sheets (e.g. leverage ratio, loan-to-deposit ratio)

(e) measures of private sector debt burden (e.g. household debt service ratio)

(f) measures of the potential mis-pricing of risk (e.g. equity price appreciation)

(g) measures derived from models that combine the credit gap with a selection of indicators relating to (a) to (f) (e.g. multivariate indicators such a Logit regression model).

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[8]For example, if the credit-to-GDP ratio is 200 per cent, and the estimated trend 190 per cent, the credit gap is 10 percentage points.

[9]Credit incorporates loans and debt securities.

[10]The HP Filter separates a time series into a trend and cyclical component. The sensitivity of the trend to short-term changes in the time series can be varied by changing a smoothing parameter termed *lambda*. The ESRB recommends the use of a lambda value of 400,000.

Designated authorities can also identify additional indicators for their country.

4 Applying the Indicators to Ireland

In this section, a number of indicators are applied to historical Irish data. A long-run data series, going back to the 1970s, is used in the calculations, however, the analysis and charts presented here focus on the period since the early 1990s.

The credit gap in Ireland

The first indicator presented is the credit-to-GDP gap calculated in line with the ESRB recommended approach (the standardised credit gap). Although, only one element to be considered by designated authorities, the calculation and publication of this standardised credit gap is a requirement when setting the CCB rate. Chart 1.1 shows two periods where growth in the ratio was particularly strong; the first in the late 1990s and the second and more extensive period from the early-2000s up to 2010. Throughout these periods the credit-to-GDP ratio was above its trend level thereby resulting in a positive credit gap (Chart 1.2). In fact for much of the period from the late 1990's onwards the credit gap was in excess of the upper threshold of the CCB framework (10 per cent) putting the CCB benchmark buffer rate (Chart 1.3) at 2.5 per cent. Recently, the credit gap has fallen sharply and is currently negative indicating a benchmark rate of 0 per cent.

A notable feature of the broad measure of credit used in the standardised approach is that in the Irish case it did not begin to decline materially until well after the commencement of the financial crisis. This measure of credit is made up of both household and NFC credit. As noted in Cussen and O'Leary (2013) and Cussen (2015), foreign-owned multinational corporations (MNCs) play a substantial role in the Irish NFC sector. These MNCs tend to source funding from international markets or through corporate treasuries rather than domestic Irish sources. This results in a high proportion of NFC sector funding coming from non-resident sources.

As volatile trends in multinational NFC credit make interpretation of broad credit challenging, analysis of a national specific measure of credit, which is more reflective of domestic economic conditions, may be informative. In this case, credit from resident banks to resident NFCs is used as a proxy for domestic NFC credit in this case. In addition to excluding credit from foreign sources this series will also not include non-bank domestic sources of credit (e.g. from other financial institutions or Irish NFCs).[11] The measure of household credit is unchanged from that used in the standardised approach.

Chart 2.1 shows the breakdown of total credit, as a percentage of GDP, into its three components: household credit; credit from resident banks to resident NFCs and other NFC credit. It indicates that from 2008 to 2013 increases in other NFC credit offset declines in household and resident bank NFC credit, preventing a sharp decline in broad credit.

Using this national specific measure of credit, the credit-to-GDP ratio (Chart 2.2) increased more slowly than the standardised measure in the early/mid 1990s, but then also increased significantly from the late 1990s to 2009, driven by mortgage lending and lending to NFCs in the property development/construction sector. A positive credit gap emerged in this national specific measure in the late 1990s, increasing significantly in the years before the crisis. The corresponding benchmark buffer rate (Chart 2.3) is 0 per cent until 1999, increasing to the maximum of 2.5 per cent from 2003 to 2010. In contrast to total credit, this alternative measure of credit began to decline sharply following the onset of the crisis (from 2009 on), as households and NFCs began deleveraging. As of 2015Q3, the national specific credit gap was negative, with a corresponding buffer guide of 0 per cent.

Other Indicators

From the range of additional indicators suggested by the ESRB, two particular areas are looked at here in the Irish context - residential property and external imbalances.

Strong credit growth when coupled with strong growth in house prices can pose significant risks to financial stability (the Irish case provides re-

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[11] The series of resident bank credit to to resident NFCs is from Central Bank statistical data. In recent years the series has also been impacted by asset sales and transfers. Data from Quarterly Financial Accounts published by the Central Bank show that in the region of 20 per cent of NFC loans are sourced from domestic monetary financial institutions.

cent evidence of this). Credit and house price growth can occur in tandem with credit impacting on house prices as house purchases are often financed through mortgage lending. Increases in house prices then can lead to increased lending through its role as collateral. Chart 3.1 shows indicators based on three standard measures of developments in house prices: real house prices, house prices relative to rents and house prices relative to income. All are presented as indices based to 2007Q1=100. As with many macro-economic variables in Ireland, all three saw a significant increase from the mid-1990s until the financial crisis. All three indicators peaked in early 2007. The presence of clearly identifiable distinct periods in the behaviour of the indicators (i.e. pre-1995, "Celtic Tiger", Crisis) can make the identification of a stable trend difficult.

Nonetheless, similar to the credit gap indicators above, charts 3.2 and 3.3 present residential property indicators relative to non-structural benchmarks. Chart 3.2 shows the house price-to-income index relative to its long-run average with chart 3.3 showing the house price index and gap calculated using a HP filter. Both indicators were above these benchmarks from the late 1990s until 2007 when they began to decline.

The current account balance (CAB) is a measure of an economy's lending/borrowing to/from the rest of the world. When credit growth is significantly above growth in the domestic economy, it tends to be the case that domestic savings are insufficient to finance the credit expansion and an inflow of foreign money is required in order to meet demand. This borrowing from abroad is recorded as a deficit in the current account. It should be noted that there can be alternative reasons behind a current account deficit, for example the deficit in Ireland during the 1980s was primarily related to government debt. Nonetheless, research by Davis et al. (2014) among others has indicated that when strong credit growth is associated with an increased current account deficit, this may be a particular cause for concern.

In the Irish case, the CAB was in surplus throughout most of the late 1990s. Having being more or less in balance during the early 2000s, there was a rapid deterioration of the CAB in the years immediately preceding the crisis pointing towards an increased dependence on foreign capital. In more recent years, the CAB has returned to surplus.[12]

Assessment of the Indicators

One important question is whether the indicators would have provided a signal of potential excessive credit growth and rising systemic risk in Ireland before 2008. Analysis of the indicators shows that they did indeed suggest increasing risks. The standardised and national specific credit gaps and the residential property indicators all increased significantly during the 2000's. In addition, the decline in the CAB, in particular from 2004/05 on, indicated that the real economy was becoming increasingly unbalanced.

It is noticeable that for the two credit gap indicators, both remained positive indicating a positive benchmark CCB rate for a substantial period of time after the onset of the financial crisis in 2008. This shows the possible disconnect between indicators used for the build-up phase of the cycle and the release of the CCB in periods of financial stress. While a detailed analysis of release phase indicators is not undertaken here, the theory is that faster moving financial-market type information is more appropriate, rather than the somewhat slower moving credit gap for example. Market-based indicators which would point to stress in the financial system would be used to determine when a release of the CCB may be appropriate, despite the possibility that credit gap indicators may continue to signal a buffer.

The analysis undertaken here reveals a number of additional challenges when estimating and interpreting the build-up phase indicators. Aggregate Irish NFC credit data is strongly influenced by volatile trends in multinational NFC credit. Economic data, on which the indicators are based, are subject to revisions (for example, see Bermingham (2006) for analysis of the volatility of Irish GDP data). Analysis shows that the majority of indicators have been more volatile for Ireland than the EU average (Table 1). This may reflect fundamental factors (i.e. the business and financial cycles of a small and open economy such as Ireland may be

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[12]In recent years, redomiciled companies, who route their profits through Ireland but do not contribute to the real economy, are likely to have artificially increased the Irish current account. Additionally, a statistical change regarding the measuring of trade in aircraft resulted in the CAB being revised downwards. See CSO Macroeconomic Scoreboard 2014 and ESRI Research Note 2013 for further details.

inherently more volatile) or one-off factors (i.e. a process of catch-up growth followed by a boom-bust cycle). To the extent it is the former, this may persist in future and points to caution when interpreting the indicators for Ireland (in particular relative to threshold levels which have been estimated based on data for all EU countries). The appropriateness of the HP filter and its technical challenges, including sensitivity to the choice of the smoothing parameter and end-point bias are issues of debate. The impact of structural change in the economy and financial system, for instance, may complicate the estimation and interpretation of the indicators. Where an economy undergoes significant structural change, the trend estimated by the HP filter could be misleading; see Kelly et al. (2011) for further discussion of this issue. For all these reasons, indicators will only serve as an input into policy makers CCB rate setting discussions. Policymaker judgement will be crucial in choosing the appropriate rate at any given point in time.

5   Conclusions

This Economic Letter provides an overview of the CCB, a macro-prudential instrument that came into effect across Europe in January 2016. Apply-ing indicator variables recommended by the ESRB to historical Irish data suggests that these indicators would have pointed towards excessive credit growth and increasing systemic risk in Ireland prior to 2008. A hypothetical benchmark CCB rate for Ireland, mechanically based on the credit gap variables, would have been set at its standard maximum from 2004 on, at the latest. However, a range of issues make interpreting the indicators for Ireland challenging; the significant impact of multinational NFCs on Irish credit data, the impact of data revisions, the relatively high volatility of Irish economic and financial data, the impact of structural change in the economy and financial system, and technical issues related to the HP filter. These challenges highlight that, as recommended by the ESRB, designated authorities should analyse a wide set of indicators and other information, combined with expert judgement, when setting the CCB rate. No one indicator or group of indicators is sufficiently reliable in isolation. Finally, it should be borne in mind that the CCB is just one of a range of macro-prudential instruments available to the Central Bank of Ireland. In future, the CCB may be used in conjunction with these other instruments in order to mitigate excessive credit growth and systemic risk.

References

BCBS (2010): *Guidance for National Authorities Operating the Countercyclical Capital Buffer*, Basel Committee on Banking Supervision.

BERMINGHAM, C. (2006): "An Examination of Data Revisions in the Quarterly National Accounts," Research Technical Paper 10/RT/06, Central Bank and Financial Services Authority of Ireland.

CBI (2014): *A Macro-Prudential Policy Framework for Ireland*, Central Bank of Ireland.

CUSSEN, M. (2015): "New Insights from the Enhancements to Quarterly Financial Accounts," *Quarterly Bulletin April 2015*.

CUSSEN, M. AND B. O'LEARY (2013): "Why are Irish Non-Financial Corporations so Indebted?" *Central Bank of Ireland Quarterly Bulletin 1*, pg. 104–118.

DAVIS, J. S., W. PHOA, A. MACK, AND A. VANDENABEELE (2014): "Credit Booms, Banking Crises, and the Current Account," Working paper no. 178, Federal Reserve Bank of Dallas, Globalization and Monetary Policy Institute.

ESRB (2014a): *Recommendation of the European Systemic Risk Board on Guidance for Setting Countercyclical Capital Buffer Rates*, European Systemic Risk Board.

——— (2014b): *The ESRB Handbook on Operationalising Macro-prudential Policy in the Banking Sector*, European Systemic Risk Board.

KELLY, R., K. MCQUINN, AND R. STUART (2011): "Exploring the Steady-State Relationship between Credit and GDP for a Small Open Economy – The Case of Ireland," Research Technical Paper 01/RT/11, Central Bank of Ireland.

Table 1: Analysis of Indicator Volatility

| | Standard Deviation | | | | | |
| | Ireland | | | EU Average | | |
	Full Sample	Pre-1999	1999-present	Full Sample	Pre-1999	1999-present
Credit Gap Indicators						
Standardised Credit-to-GDP Ratio	2.8%	2.5%	3.1%	1.6%	1.7%	1.3%
Alternative Credit-to-GDP Ratio	2.5%	2.2%	3.0%	1.6%	1.7%	1.3%
Other Indicators						
House Price-to-Rent Ratio	4.5%	5.1%	3.1%	2.3%	2.5%	1.7%
House Price-to-Income Ratio	1.7%	1.4%	2.15%	2.3%	2.3%	1.8%
Current Account Balance	0.7%	0.8%	0.6%	0.5%	0.6%	0.4%

Source: Central Bank of Ireland.

Standardised Credit Gap

National Specific Credit Gap

1.1: Credit-to-GDP Ratio and Trend

2.1 Credit Breakdown

1.2: Credit Gap

2.2 Credit-to-GDP Ratio, Trend and Gap
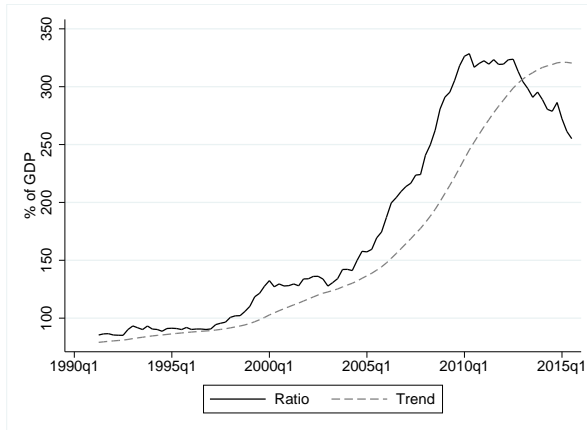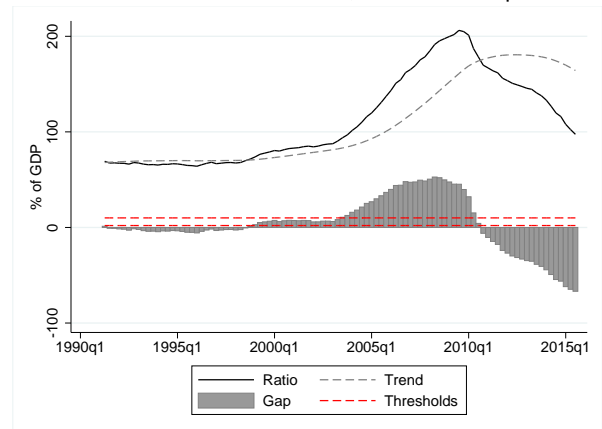

1.3: Benchmark Buffer Rate
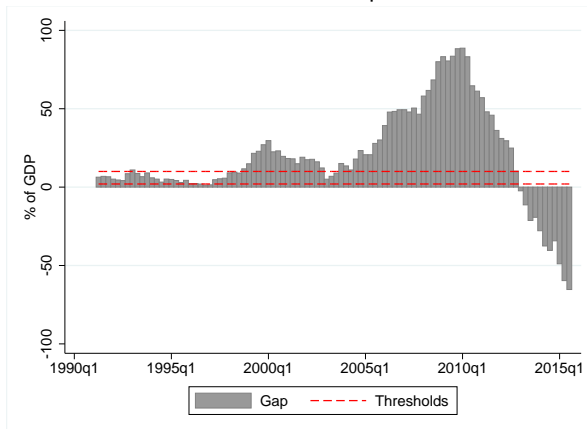
2.3 Benchmark Buffer Rate

Source: BIS, Central Bank of Ireland.
Notes: The standardised measure of credit is total credit to resident households and NFCs.
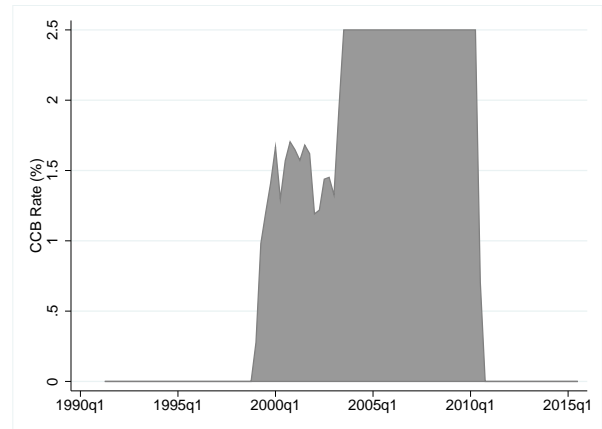
Source: Central Bank of Ireland.
Notes: The national specific measure of credit includes total credit to households plus credit from resident banks to resident NFCs.
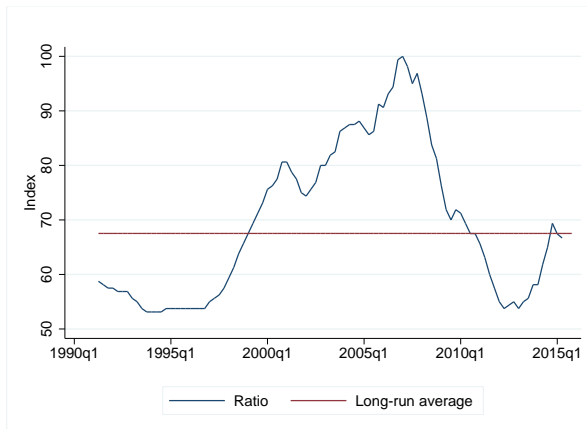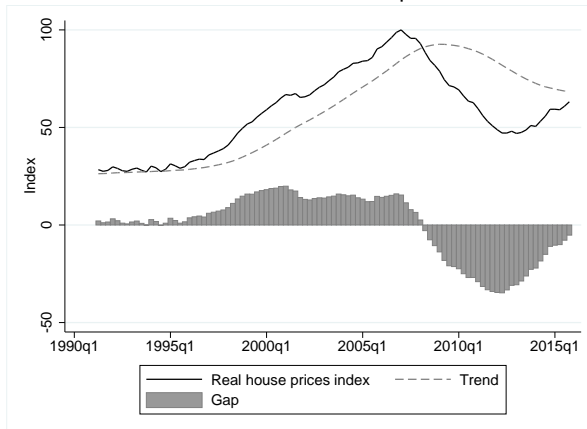
Residential Property Indicators

External Imbalances

3.1: Residential Property Indicators

4.1: Current Account Balance
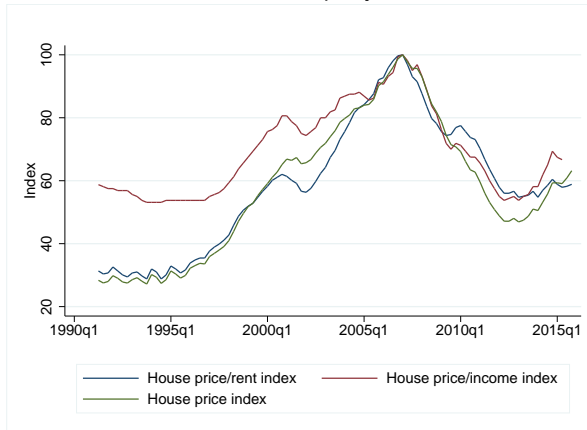
3.2: House Price-to-Income Index
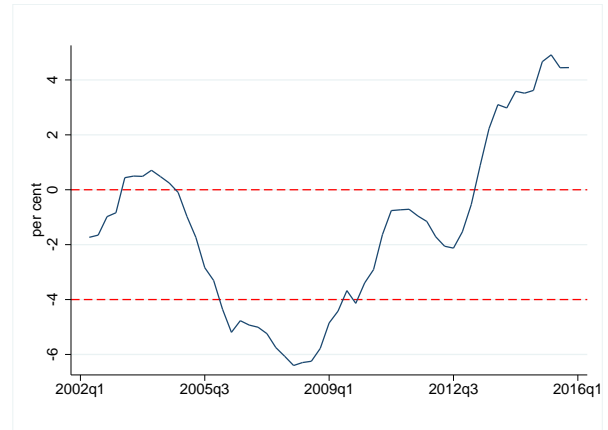

3.3: House Price Gap

Source: Central Bank of Ireland, CSO.
Notes: Indicators are presented as indices based to 2007Q1=100. The house price gap is measured as the difference between the the price index and its trend estimated using a one-sided HP filter.

Source: Central Bank of Ireland, CSO.
Notes: Current account balance is from the balance of payments and indicates total economy lending or borrowing to/from the rest of the world.