Banc Ceannais na hÉireann
Central Bank of Ireland

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Contents

Introduction

The Central Bank of Ireland has a statutory mandate to provide "analysis and comment to support national economic policy development." Following the mandate, the Central Bank provides high quality independent economic advice and financial statistics that can be used in evidence based policy making. The Central Bank aims to ensure that its economic advice is forward looking and independent and that statistics are robust and relevant. To achieve this, the Central Bank undertakes data collection, statistical analysis, economic analysis and research designed to inform economic policy making domestically and at the euro area level. The analytical and statistical outputs are disseminated through a suite of publications, seminars and through ongoing interactions with government departments, academia and commentators.

This is the 12th edition of the Research Bulletin of the Central Bank of Ireland and its aim is to highlight economic research and associated activities conducted by Central Bank staff during 2019. The themes explored reflect a continued movement away from financial crisis to current and potential issues germane to the domestic and international economies. Reflecting the upturn witnessed in the domestic economic activity, work has continued to focus on monitoring economic developments as well as potential risks to the economy including Brexit. From a policy perspective, research has continued to examine and evaluate instruments that policymakers, both domestically and internationally, have or can utilise to mitigate shocks that hit the economy, improve economic resilience and achieve their policy objectives.

Fifteen Research Technical Papers were released last year. The non-technical summaries for each of these papers are included in this bulletin while the full papers are available for download from the Central Bank website. Some of the recent topics explored include: examining the effects of quantitative easing on money market funds and ECB reserves respectively; factors that affect consumption in both Ireland and the euro area; government investment and how it is financed; access to finance by SME's both during and after the financial crisis; monetary policy expectations and risk-taking; state dependent in monetary policy regimes; determinants of capital flows in the US; estimates of Irish foreign assets and liabilities; international debt issuance through special purpose vehicles; and liquidity and tail risk dependencies among euro country government bond markets.

Fourteen Economic Letters were released in 2019 and a listing of these is included in this Bulletin while the actual Letters are available for download. Some of the topics covered in this series include: assessing the demand for housing based on future demographic change; what is the effect of temporary fiscal windfalls; quantifying the effects of (un)conventional monetary policy on the euro area yield curve; climate change and the financial system; predicting recessions in the euro area; long-term inflation expectations; the relationship between the exchange rate; inflation and the current account; what can online job search tell us about slack in the labour market and what are the risks to the public finances.

Seventeen notes were released through our Financial Stability Notes series which focuses on issues germane to improving our understanding of the risks and vulnerabilities facing the Irish and European financial system. Some of the topics examined include: mortgage lending; macroprudential regulation; bank capital; bank lending; market-based finance; macro-financial linkages; SME and corporate lending; stress testing and analysis of financial resilience of banks and borrowers. All of these notes are available for download here.

This year the Statistics Division introduced a new series entitled Behind the Data. The series seeks to provide the public with a better understanding of data released by the Central Bank and how the data aids our understanding of the economic and financial systems. The first two topics discussed Colateralised Debt Obligations and the evolution of domestic household wealth. A number of signed articles featuring economic and statistical analysis were published in the Quarterly Bulletin throughout the year. These can be accessed from our website here.

Also included in this edition are recent and forthcoming publications by Bank staff in peer reviewed academic journals as well as a listing of visiting speakers who presented over the past year at the Central Bank. Central Bank staff have also presented externally at a broad range of domestic and international conferences and institutions including: ASA statistical meeting; Bank of England; CEBRA; Dublin Economic Workshop; Dynare conference; EEA meetings; European Banking Authority; ECB; IEA annual conference; IZA labour conference; Money, Macro, Finance Meetings; NUI Maynooth and UCD amongst others.

The Central Bank hosted the annual research conference of the Household, Finance and Consumption Network on the 16th and 17th of December. A macroprudential workshop entitled Macroprudential Capital Regulation: Future Challenges in a SOE was also held in December. Congratulations to Raffaele Giuliana who won the Conniffe Prize for best paper by a young economist at the annual Irish Economics Association with a paper examining the impact of recently introduced bail in regime on bank bond yields. Peter Dunne won the prize for the best paper at the annual European Capital Markets Institute conference for a paper exploring the interpendencies and tail risk between euro government bonds.

Non Technical Summaries of Research Technical Papers 2019

01/RT/19: Quantitative Easing and the Hot Potato Effect: Evidence from Euro Area Banks

Ellen Ryan & Karl Whelan

Unconventional monetary policies enacted since the outbreak of the financial crisis, have led to an unprecedented expansion in the size of central bank balance sheets. When central banks carry out quantitative easing (QE) programmes, the purchase of financial assets (typically debt securities) drives the expansion of the asset side of the balance sheet. However, this is mirrored on the liability side by an expansion in reserve accounts, as it is through credits to these accounts that central banks pay for purchased assets.

Much of the empirical literature examining the effects and transmission channels of quantitative easing programmes has focused on the impact of purchases on the available supply of specific assets to the private sector (the portfolio rebalancing channel). The literature has also examined the role of announcements regarding future bond purchases and their affect on market participant expectations (the signalling channel). The role of reserve creation in the transmission of QE programmes has received little attention, with many studies either implicitly or explicitly assuming that banks passively allow reserve balances to build-up over time.

Our paper examines the behaviour of reserves held by euro area banks during the ECB's Asset Purchase Programme (APP), using a monthly bank-level data set. In particular, we assess whether the banking system has passively absorbed these reserves (as the collapse in the money multiplier during the APP might suggest) or whether there is evidence of banks trying to push reserves off of their balance sheets. The latter is referred to as the "hot potato" effect: As Eurosystem reserves can only be held by euro area banks, if one bank successfully reduces its reserve balance then these reserves will simply land on the balance sheet of another, who in turn will push them onto the balance sheet of yet another bank. The euro area is a particularly interesting case for examining such an issue as, due to the Eurosystem's negative deposit facility rate, banks have been paying to hold reserves throughout the relevant period.

We find substantial evidence that banks are in fact actively managing their reserve holdings and are seeking to reduce them at the individual bank-level on a month-to-month basis, thus creating a high level of "churn" in reserves across the euro area banking system. We then ask how they are doing so, as this will determine transmission to the real economy. For example, if banks use reserves to make loans to households or firms, then the "hot potato" effect will have a direct impact on the real economy. If banks are purchasing debt securities, the impact on the real economy will be more indirect but could occur via lower bond yields. By examining the balance sheet adjustments made by banks that have successfully resisted the aggregate upward trend in reserve holdings, we find strong evidence that banks are managing reserves by adding to their debt security holdings and paying down a broad range of funding sources. As such, it is likely that the response of banks to reserves created through the APP has had an effect in driving down European bond yields and we believe this effect is conceptually different from the portfolio rebalancing effect which has dominated the literature on QE. Our analysis is also interesting to consider in the context of the traditional money multiplier model. While we find that banks are actively working to reduce their reserve balances, they do not seem to be doing so via loan creation as this model would suggest.

02/RT/19: America First? A US-Centric View of Global Capital Flows

Peter McQuade & Martin Schimtz

The US financial system is the most sophisticated in the world and international financial flows vis-á-vis the US tend to be larger than those of any other individual country. This paper examines the determinants of gross flows of international capital, and investigates the extent to which events and policies in the US explain the variation in US and global capital flows, shedding light on the role of the US in the global financial cycle. Our motivation extends from the fact that, in much of the academic research, the term global has frequently embodied an implicit assumption that US variables should be important universally. This paper simplifies and extends that logic by taking a US-centric view of global capital flows.

We begin by investigating the characteristics and determinants of US cross-border gross financial flows and then examine how these compare and contrast with those of the "rest of the world", i.e. excluding those directly involving the US. We do this in a novel way by combining country-level unilateral data with bilateral US data. This allows for investigating the importance of US variables such as the VIX, Federal Reserve standard and non-standard monetary policy and the US dollar exchange rate. We then assess the relative importance of US, country-specific and global variables by comparing the results of estimations of aggregate US financial flows with those using bilateral US financial flows, and "rest of the world" flows.

This paper adds a number of important insights that are directly relevant for the ongoing debate on the global financial cycle. In the descriptive section we highlight that, while the US maintains a preeminent role in global finance, in recent decades emerging market economies (EMEs) have accounted for a growing fraction of international capital flows. The econometric results indicate that variation in US variables – notably the VIX and US dollar exchange rate – has a quantitatively important influence on global financial flows, but mostly via US cross-border flows. Global and national risk indicators perform better in explaining "rest of the world" flows. Moreover, we find that the correlation between US and rest of the world flows peaks around periods of elevated uncertainty.

Overall, our findings provide evidence for the existence of a global financial cycle, only some of which is driven by policies and events in the US. Should the US share of global financial flows continue to decline in the future, the validity of using US variables as proxies for global conditions may become increasingly tenuous. Our results indicate that truly global drivers of international capital flows, as proxied by alternative uncertainty indices, are becoming ever more important as events and policies in other important regions, such as the euro area or China, have an increasingly global impact. Given the high degree of interconnectedness, larger cross-border policy spillovers could necessitate further efforts to coordinate policy at a regional or global level.

03/RT/19: Estimates of Foreign Assets and Liabilities for Ireland

Vahagn Galstyan

This paper calculates foreign assets and liabilities for Ireland that are more reflective of foreign activities of Irish-resident entities. This is accomplished by stripping from the Irish international investment position the intermediation component that arises from the activities of investment funds and special purpose entities and, to some extent, correcting distortions arising from redomiciled PLCs, intellectual property transfers and aircraft leasing. My estimations not only substantially reduce gross external positions, but also shrink the extent of Irish net foreign indebtedness from 280 to 80 per cent of modified gross national income.

03/RT/19: State-dependent Monetary Policy Regimes

Shayan Zakipour-Saber

This paper examines whether monetary policy regimes are state-dependent. How to model changes in monetary policy is an important and relevant question as within the last thirty years most advanced economies have experienced at least two major changes in the way their central bank conducts monetary policy. The first and the one this paper examines, is the adoption of inflation-targeting, which explicitly began in the early 1990s where beforehand, other nominal variables such as exchange rates or the monetary base were targeted. The second is the more recent move towards unconventional monetary policy instruments after the nominal interest rate hit its effective lower-bound, prompted in most economies by the global financial crisis of 2008.

Despite the mentioned shifts in monetary policy, estimated structural models that are used for policy analysis often assume the central bank targets and the policy response to deviations from these targets remains constant across the entire estimation sample. The primary example is New Keynesian general equilibrium models, that are widely used by central banks and typically estimated on at least two decades of quarterly data. In this framework, the monetary policy instrument is usually the nominal interest rate, and it is set following a systematic rule that depends on how far target variables such as price inflation and output are away from target levels. Recent advances in the literature propose empirical approaches to modeling changes in monetary policy within this class of models that allow for time-variation in parameters of the systematic rule. To keep additional complexities to a minimum, the time-varying parameters are assumed to follow an exogenous process. This paper relaxes the assumption of a completely exogenous source of time-variation by estimating New Keynesian general equilibrium models that allow for changes in the monetary authority's stance on inflation to depend on the performance of the economy and finds supportive evidence of this mechanism. Model dynamics are affected through the formation of agents expectations as the probability of future regime change can now depend on variables that gauge the performance of the economy relative to target levels such as inflation

and output gaps. To estimate the effects of allowing for state-dependent monetary policy regimes, I focus on the well-studied case of the adoption of inflation targeting by the U.S. Federal Reserve, spearheaded by the appointment of chairman Paul Volcker in 1979. During the regime prior to Volcker, the central bank is believed to have been more accommodative of inflation and instead pursued other nominal targets such as the monetary base and exchange rates, in addition to placing more emphasis on influencing unemployment. The increased focus of monetary policy on inflation is put forward as one of the leading causes of the remarkable stabilisation of the U.S. economy from the mid-1980s until the recent global financial crisis in 2008, often referred to as the great moderation period. However, as the existing literature does not allow for the type of state-dependence considered in this paper, this particular regime change is an ideal candidate for evaluating the mechanism.

The best fitting model identifies the period between 1973 and 1985 as being relatively accommodative towards inflation. In this model, the probability of remaining in this regime has an inverse relationship to the amount of inflation in the previous period is above the target level. This form of state-dependence reduces the expected duration of the accommodative regime from eight quarters in 1973 to four quarters in 1978, when inflation reached peak rates. The time-varying probabilities show some evidence of dampening responses to cost-push shocks relative to a model estimated with no state-dependence. Parameter estimates are also affected, most importantly, the estimated inflation target in the accommodative regime is lower when state-dependence is enabled. I find mixed evidence that state-dependence alters agents' expectations through impulse response analysis suggesting a dampening of inflation responses only to cost-push shocks relative when the mechanism is shutdown.

05/RT/19: Securitisation Special Purpose Entities, Bank Sponsors and Derivatives

Pawel Fiedor & Neill Killeen

Special purpose entities engaged in securitisation, also known as financial vehicle corporations, are a significant component of the market-based finance sector domiciled in Ireland, with over €400 billion in assets at the end of June 2018. To put their size into perspective, they hold assets of value comparable to those held by Irish-domiciled money market funds (approximately e500 billion as of mid-2018). Financial vehicle corporations are not prudentially regulated as independent entities by the Central Bank of Ireland. Further to this, these entities rely heavily on debt financing, and have, in most cases, only nominal amounts of equity capital. They are also strongly interconnected with the banking system through their sponsor linkages. In this paper, we document the use of derivatives by financial vehicle corporations domiciled in Ireland using transaction-level data established by the European Market Infrastructure Regulation (EMIR). Moreover, we examine the key characteristics of financial vehicle corporations and their bank sponsors in determining their derivative use.

While some of the derivative exposures of these entities may relate to hedging, their involvement in derivative markets raises a number of important issues from a financial stability perspective. For example, engagement in derivative markets can create complexity in risk exposures, including counterparty credit risk and liquidity risk. This is especially pertinent for financial vehicle corporations, as these entities do not use central clearing, which is one of the key post-crisis reforms of the financial system. While a small but growing literature has examined the use of derivatives by investment funds, there is a lack of empirical evidence on the use of derivatives by off-balance sheet vehicles such as financial vehicle corporations. This paper aims to address this gap in the literature.

Our results show that these entities primarily engaged in interest rate derivatives over the period of 2015–2017. We show empirical evidence that key characteristics of financial vehicle corporations and their bank sponsors affect the likelihood of engagement in derivative markets. In particular, we find that economies of scale are important. For example, larger financial vehicle corporations, measured by their total assets, are significantly more likely to engage in derivative markets. The same can be said for vehicles which have listed their debt on a stock exchange. Vehicles with a financial institution as a sponsor (be it a bank or non-bank financial institution) are significantly more likely to engage in derivative markets than their counterparts sponsored by nonfinancial corporations. In terms of bank sponsors, we find evidence that larger banks and those with lower capitalisation and profitability are more likely to engage in derivative contracts.

06/RT/19: Monetary Policy Expectations and Risk-Taking among U.S. Banks

David Byrne & Robert Kelly

Central banks conduct monetary policy with the aim of achieving price stability in the economy. Central banks also monitor risks to financial stability, often arising in the banking sector, because these can have material negative effects on economic growth. Since the financial crisis, many central banks have also engaged in forms of macroprudential policy to mitigate these financial stability risks. Recent experience has also shown that monetary policy and financial stability do not operate in vacuums. Linkages exist between monetary policy and financial stability and these represent important areas of research for central banks in considering their policies. Central banks must consider which mixture of their tools they should use to achieve their monetary policy and financial stability aims. Monetary policy affects the economy through a number of channels.

Since the financial crisis, the risk-taking channel has become increasingly prominent. This refers to how monetary policy, and expectations of future monetary policy, can change how financial agents perceive the riskiness of their activities or change their appetites for taking on risk. In this paper, we use data on the lending of US banks to examine how they change the riskiness of their lending based on changes in expectations of monetary policy. Previous research has shown that the level of the monetary policy rate can affect risk-taking by financial agents. Our contribution is to show that expectations for the path of future monetary policy rates also affect risk-taking, independent of the level of the monetary policy rate.

We use the term spread, the difference between interest rates at long and short maturities, as a representation of the expected path of monetary policy. The term spread is important for banks for a number of reasons. An increase in the term spread (i) makes bank lending more profitable, (ii) causes banks to consider their lending less likely to make losses, and (iii) raises the value of the bank's equity, meaning they can bear more risk according to standard risk measures. The importance of these factors also leads banks to anticipate changes in the term spread when setting their lending policies. For this reason, in this paper,we focus on changes in the term spread not previously anticipated by banks to identify the causal link from the term spread to their risktaking.

We find that an increase in the term spread causes US banks to increase the riskiness of their lending. They reduce their share of lending to less risky borrowers and increase their lending to riskier borrowers. They also increase the total volume of their risky lending and accept less collateral from borrowers. This paper highlights how monetary policy can induce changes in the riskiness of behaviour in the banking sector. It underscores the importance for monetary policymakers to consider the entire term structure of interest rates when setting short-term rates. For financial stability policy, it highlights the need to carefully consider the mix of lending done by banks and not just the aggregate amount of lending. It also emphasises the importance of the use of macroprudential policy to address the build-up of financial imbalances and mitigate financial stability risks.

07/RT/19: Money Market Funds and Unconventional Monetary Policy

Giovanna Bua, Peter Dunne & Jacopo Sorbo

Money market funds (MMFs) are key actors in money markets and play an important role in the transmission of monetary policy. They perform liquidity transformation by issuing redeemable shares while investing in high quality short-term assets such as treasury bills, repurchase agreements and certificates of deposit. Compared with MMFs in the US, MMFs in Europe tend to invest more heavily in bank-issued short term liabilities so their behavioural response to monetary policy has more relevance for banks' short term funding. During the Global Financial Crisis some MMFs struggled to maintain a constant net asset value and some sponsor banks provided support. Fund-sponsor linkages as a source of systemic risk has been greatly reduced due to regulatory changes in both the US and Europe. However, run risks may still have relevance for the smooth functioning of money markets depending on how MMFs respond to the challenging conditions brought about by extreme and unconventional monetary policies. It is the response to these challenging conditions that is the main focus of the present analysis.

We assess how the large population of Irish-domiciled MMFs have responded to quantitative easing and low interest rates. We categorise funds by reporting currency and investment mandate. The behavioural response is considered in two different ways. Firstly, we examine changes in the types of assets that MMFs choose to hold. Secondly, we examine MMF investment performance. In the case of the latter, we apply panel regression methods to reveal how policy rate changes and other risk factors transmit to annualised return performance.

Our descriptive analysis reveals that most MMFs domiciled in Ireland do not report in euros (about one quarter of the sample by invested amount is in the EUR-reporting category). Since MMFs, by regulation, may only invest in assets denominated in the currency in which they report, we are able to assess the effects of different monetary policies without the confounding effects of differential regulation. Unsurprisingly, MMF investment returns are strongly related to the policy interest rate of the currency of their investments. There is, however, evidence of heterogeneity in this relation depending on the direction of policy and the policy mix. We find a difference in the speed of performance response to policy consistent with a shortening of investment term when rates are declining and vice versa. This has supply-of-funding implications for the very short-end of the term structure of interest rates and could have implications for the funding risks of banks.

The other principal explanation for heterogeneity in responses to policy concerns the policy mix. Euro area unconventional monetary policy has been unusual in terms of its intensity and the timing of its implementation. Short term interest rates, unlike in the US or UK, were pushed into negative territory before unconventional measures were introduced. Being much closer to the true lower bound of conventional policy, asset purchases pushed short term bond yields below the negative policy rate. We find that EUR-reporting MMFs increased their investments in short term bank liabilities in these circumstances. They substantially increased the volume of their cash and near-cash transactions. Further examination of EUR-reporting MMF assets indicates a significant increase in holdings of euro-denominated Tradable Certificates of Deposit issued by UK banks (particularly by Constant Net Asset Value funds). These developments coincide with a reassertion of the link between performance and the conventional policy rate. Reducing these linkages should be a consideration when the mix of monetary policies is being renormalised.

08/RT/19: Phillips Curves in the Euro Area

Laura Moretti, Luca Onorante & Shayan Zakipour-Saber

In this paper, we evaluate the importance of the Phillips curve, the standard theoretical and empirical benchmark stating a relationship between real activity and inflation, after the recent financial crisis. The paper provides four main contributions. First, we confirm the existence of a Phillips curve in the euro area, using simple models and testing different cycle indicators. Second, we proceed to its robust estimation, extending the existing literature. To account for model specification uncertainty, we estimate, using Dynamic Model Averaging, a battery of 630 models. Using inclusion probabilities, we identify the main determinants of core inflation over the sample and we confirm that the main drivers of core inflation change between the first and the second dip of the recession. The first dip is characterized by a stronger role of external variables, while the second by domestic factors. Another robust finding is that expectations are the single most important determinant of core inflation in the sample. Third, we estimate the slope of the Phillips curve and we expand the battery to 1260 models to test for nonlinearities. We provide evidence in favour of using unemployment based measures of the cycle and we conclude that the slope of the Phillips curve is sizeable and statistically significant. However, we do not find any evidence of non-linearities. Finally, using the battery of 630 models, we forecast the probability distribution of HICP inflation excluding energy and unprocessed food three-year ahead for different samples ending in 2016Q1, 2017Q1, and 2018Q1. At each point in time, the distribution accounts for shocks, parameter and model uncertainty. We find an increasing, although still moderate, probability of core inflation to converge towards its long-term average, compatible with headline inflation reaching the objective. We conclude that the Phillips curve is still a valid policy instrument once it is robustly estimated.

09/RT/19: Government Investment, Its Financing and the Public Capital Stock: A Small Open Economy Perspective

Ronán Hickey, Matija Lozej & Diarmaid Smyth

During the recent crisis, many European countries, especially those that were more severely affected by the sovereign debt crisis, resorted to reductions in government investment. Such a measure is relatively easier to implement during downturns compared to other types of government spending. However, if such measures last for a long period of time, they result in depleted public capital stock, with tangible implications such as deteriorated or outdated infrastructure. This can increase costs for the industry and reduce competitiveness of the economy. Governments can replenish public capital by either borrowing, or in a budget-neutral way, by either restructuring government expenditure or by increasing various types of taxes. This paper examines which of these options is preferable.

The paper first describes the developments in government investment spending in Ireland, putting recent developments in the context of what happened prior to, and during the, financial crisis. We show the impact that these long-lasting government investment spending reductions have had on the public capital stock. The paper then takes a forward-looking approach, using the concrete example of Irish government investment projections. While this requires assumptions on depreciation, it appears that the level of public capital will increase by a sizeable margin in the years ahead. We then use the Global Dynamic General Equilibrium model of Ireland in a monetary union, and examine how different ways of financing government investment affect the key macroeconomic variables, in particular, how do different options affect the economy's fiscal and external balance.

We find that no matter how government investment is financed, the increase of productive public capital stimulates output in the medium and longer term. However, we find that where the increase in government investment is financed by redirecting other government spending toward investment seems to be the most beneficial in terms of achieving output growth, fiscal balance, and an improvement in the trade balance. Interestingly, over the medium run this has similar effects as a fiscal devaluation, just that it is achieved using fiscal policy variables on the expenditure side rather than on the revenue side. Pure debt financing increases public debt, and financing with labour taxes increases marginal costs and reduces the external competitiveness of the economy, leading to a worsening of the trade balance. While the financing of government investment with VAT depresses private consumption, it also leads to a lesser deterioration and faster improvement of the trade balance compared to the case when government investment is financed by labour taxes. Importantly, in all cases, an increase in even moderately productive public capital has sufficiently strong effects on output that offsets the negative effects of higher taxes in the short run. This implies that timing of government investment is important, as there may be some short-run costs, while the benefits will accrue over the medium and longer run. Our findings are robust to a number of assumptions, such as time-to-build, permanent shocks, different fiscal rules, and the non-wastefulness of government consumption.

10/RT/19: SME Access to Finance in Europe: Structural Change and the Legacy of the Crisis

John McQuinn

In the euro area, SMEs heavy reliance on banks for financing leaves these firms vulnerable to banking shocks. In the context of the financial crisis and a fragmented capital market across Europe, the European Commission introduced a plan for a Capital Markets Union to address these challenges by both deepening and widening capital markets, with specific reference to SMEs.

In this paper, I investigate key financial and macroeconomic channels associated with the credit constraints of SMEs across Europe to inform policy making. I model a number of channels constraining SME access to finance over the period of the crisis and subsequent recovery (2010 H2 to 2017 H2). Following the methodologies applied in previous literature, I model these channels after taking into account the fundamental performance and characteristics of firms applying for credit as well as the cost of bank funding. Credit constrained firms which did not apply for credit because of potential rejection are distinguished from other types of credit constraints to better understand this specific type of constraint.

The findings from the modelling show that firms with better performance in terms of profitability, credit history and capital are less credit constrained and smaller firms with lower employment and turnover are more credit constrained. These factors have a larger impact on firms discouraged from applying for credit. Lower bank funding costs, following more accommodative monetary policy, are shown to ease credit constraints for SMEs after taking into account firm performance and characteristics. Among the channels found to be linked to increased credit constraints of SMEs are structural changes, such as bank branch closures (a soft information channel) and a less competitive lending market. The legacy of the financial crisis is also found to have constrained credit for firms through a deterioration of firm and bank balance sheets. Structural changes, in particular, are found to increase SME credit constraints further through discouragement of SMEs from applying for credit in the first instance, even after accounting for firm performance and characteristics. The most economically important of these channels is found to be the soft information channel and firm indebtedness. The evidence presented in this paper provides a basis for which to prioritise the legislative agenda. Specific channels through which policy can alleviate credit constraints is through the strengthening of local financing networks and greater competition. The evidence also points towards the importance of policies to help resolve impaired bank and firm balance sheets following the crisis and to improve future resilience.

11/RT/19: Liquidity and Tail-Risk Interdependencies in the Euro Area Sovereign Bond Market

Daragh Clancy, Peter Dunne & Pasquale Filiani

The designers of the Maastricht Treaty envisaged that a combination of fiscal rules and market discipline would ensure the safety of euro area national government bonds. The European sovereign debt crisis revealed serious flaws in this approach, as the abrupt repricing of sovereign bonds forced some countries to seek financial assistance from the official sector and raised fears over the survival of the euro. A prominent literature (e.g., DeGrauwe and Ji, 2012) questions whether the repricing that occurred during the crisis was larger than implied by developments in economic fundamentals, implying that non-fundamental factors amplified sovereign bond market tensions. Despite the widely recognised importance of this vulnerability, there is little direct empirical evidence of the transmission channels through which non-fundamental factors can affect euro area sovereign bond markets.

We fill this gap in the literature by documenting economically significant ownand cross-market interdependencies between liquidity and tail risks in the German, Italian and Spanish sovereign bond markets. More specifically, we demonstrate that contractions in liquidity negatively affect perceptions of tail risk, which then feedback onto further reductions in liquidity. We uncover this mechanism using intra-day data from the MTS trading platform and sophisticated risk modelling techniques, such as the VAR-for-VaR methodology of White et al., (2015) complemented with the Marginal Expected Shortfall approach of Brownlees and Engle (2017).

Our analysis delivers a compelling set of results. First, we document the severity of liquidity contractions in the Italian and Spanish bond markets in response to heightened risks from different sets of economic circumstances. We demonstrate that these effects are amplified by the "safe-haven" status of the German Bund. Second, we provide evidence of a post-crisis dampening of cross-market effects following crisis-era announcements of changes to euro area policies and institutional architecture, proxied by the famous 'whatever it takes' speech by ECB President Draghi in 2012. Third, we identify a structural break in Italy's cross-market conditional correlation during rising political tensions in 2018, which produced a lasting reduction in liquidity. Our analysis suggests that the negative effects could have been much more disruptive had background economic circumstances been less accommodative.

Taken together, these results suggest that establishing at what point liquidity contraction is endogenous rather than fundamentally driven is crucial to the design of a stabilising policy response. In spite of substantial improvements in the euro area policy and institutional architecture, the 2018 disruptions show that national sovereign bond markets remain susceptible to risks unrelated to economic fundamentals.

12/RT/19: Firms' or banks' weakness? Access to Finance Since the European Sovereign Debt Crisis

Giuseppe Corbisiero & Donata Faccia

Since the European sovereign debt crisis, we can observe divergent credit developments across the euro area. While bank lending to non-financial corporations located in periphery countries has strongly decreased, bank loans to enterprises based in core countries have increased. Several factors may account for such divergence. On the one hand, credit demand from firms located in the periphery may have been constrained by the lack of new business opportunities or stronger deleveraging needs. On the other hand, these firms may have faced stronger obstacles to accessing external financing. Very different policy implications could be drawn depending on which factors stand behind such divergent credit developments.

Results from the ECB Survey on the Access to Finance of Enterprises (SAFE) provide useful information in this respect. They show that firms located in the periphery demanding a bank loan were more likely to see their loan application rejected in the period that goes from 2010 to 2018. However, looking at SAFE results in isolation does not provide sufficient information to understand whether such more frequent credit rejections were due to a lower creditworthiness of firms, or there were also supply-side weaknesses at play.

Against this background, in this paper we build a unique dataset where information on loan applications from SAFE is matched with firms' and banks' balance sheet information. First, we augment SAFE with firms' balance sheet data from Bureau van Dijk's Orbis-Amadeus databases. This detailed information on firms' characteristics provides appropriate controls to proxy for the health of the firm, including whether it displays an unbalanced leveraged ratio. Second, we further enrich our dataset with information on banks' asset quality, capitalisation, and profitability obtained from Fitch Connect. All in all, this allows us to study whether the stronger financing obstacles faced by firms located in the periphery have been due to being less creditworthy than their peers in core countries, or rather due to confronting banks with a lower ability to grant credit.

We find that firm leverage is strongly associated with a higher probability of credit rejection. However, loan applications have been rejected more often in stressed countries than in core countries, and this gap is not explained fully by differences in firm characteristics. Interaction terms allowing for a different impact of firm characteristics across the two country groups do not show statistical significance.

When we include in our analysis measures of the health of banks, results suggest that periphery-specific bank weakness can explain the higher rejection rates experienced by firms operating in stressed countries. Additionally, we find that in crisis times banks with higher level of non-performing loans (NPLs) seem to lend less even to creditworthy firms, but the effect of the NPL ratio depends on its level. Specifically, at reasonably low levels, a higher NPL ratio might signal the bank use of a more aggressive business model and, as such, be associated with a lower rejection rate. Only at the high levels mostly observed in periphery countries, we find that a higher NPL ratio signals weakness in the bank balance sheet, and thus a limited ability to grant loans even to sound firms.

13/RT/19: International Debt and Special Purpose Entities: Evidence from Ireland

Vahagn Galstyan, Eduardo Maqui & Peter McQuade

Banking activity and cross-border bank flows in many advanced economies have only recovered gradually from the global financial crisis. In contrast, the non-bank financial sector has grown more rapidly. The rapid growth in non-bank financial activities includes an important cross-border element, particularly as they are concentrated in a small number of financial centres.

This paper examines international debt issuance in the context of market-based finance entities resident in one particular financial centre, namely Ireland. Using a unique new dataset covering Irish-resident special purpose entities (SPEs) over the period 2005-2017, we study the macroeconomic determinants of debt issued through SPEs. Ireland is an ideal country in which to examine the international dimension of market-based finance, since it acts as a major global channel for cross-border financial flows and international debt issuance through SPEs.

The diverse set of sponsor and investor countries in our dataset allows us to implement an empirical analysis with an international macroeconomic focus, building on a substantial literature looking at the institutional and geographic determinants of international financial flows and applying similar methods to market-based finance. Accordingly, we examine whether certain institutional features commonly identified in the international finance literature can help explain the geographic pattern of financial assets intermediated by Irish-resident SPEs. In particular we focus on four factors: (1) financial development; (2) investor protection; (3) taxation; and (4) information asymmetries.

From an academic perspective, this paper contributes by bridging the gap between existing micro-oriented papers on market-based finance, and the more macro-focused literature on international finance. Specifically, we identify cross-country debt financing links channelled through SPEs. The descriptive analysis highlights the differing pattern of debt issuance intermediated by Irish-resident SPEs compared to conventional cross-border portfolio debt examined in much of the existing literature. Moreover, our results also highlight the importance of distinguishing between different types of market-based finance activities. Our empirical analysis suggests that debt issuance by Irish-resident securitisation vehicles, referred to as financial vehicle corporations (FVCs), is at least partly motivated by tax optimisation. Institutional factors such as investor protection and financial development are important additional considerations for sponsors of non-securitisation issuance through special purpose vehicles (SPVs).

The relationship between the institutional quality variables and debt issuance intermediated by Irish-resident SPVs is found to be quite different to that for other types of cross-border investment. Rather than acting as a deterrent, weaker financial development and investor protection, ceteris paribus, are associated with increased debt issuance through Irish-resident SPVs. This suggests that Irish-resident SPVs may be more attractive for countries where weaker institutions raise the cost of traditional forms of international finance.

This paper is part of a concerted effort by the Central Bank of Ireland to shed light on market-based finance activities and increase our understanding of the factors driving them. Our analysis provides evidence regarding the motivations of participants in international market-based finance, as well as describing the sources and destinations of funding raised through SPE debt. The unique new dataset that we exploit demonstrates the value of collecting adequate information in order to gain a greater understanding of the activities of SPEs, and the global market-based finance sector more generally. The paper also highlights the sheer scale of the activities taking place in Ireland, as cross-border market-based finance is concentrated in a relatively small number of international financial centres. This implies that further international cooperation may be necessary to adequately monitor global non-bank financing activity, both to increase transparency, and to improve the quantification of risk.

14/RT/19: Indebtedness and Spending: What Happens when the Music Stops?

Julia Le Blanc & Reamonn Lydon

Like many other countries, the Great Recession in Ireland was preceded by a creditfuelled housing bubble which played an important role in driving consumer expenditure before the crash. This paper investigates how spending adjusts to negative changes in income and wealth when households hold a large amount of debt. It adds to a growing empirical literature which asks whether the depth and length of recessions is significantly affected by the household debt-burden at the onset of a downturn.

Using micro data for the period 1995-2015, we construct a synthetic pane to understand the multitude of factors that had an impact on the spending behaviour of Irish households during this era. We find evidence for both a housing wealth effect and income shocks depressing household consumption during the crisis in Ireland. The baseline estimated MPCs for income and wealth are similar to those found elsewhere in the literature. The large fall in consumer spending and subsequent long recovery is also related to high levels of indebtedness at the onset of the crisis. In particular, we find that households who entered the crisis with more debt are significantly more sensitive to changes in their income and wealth. The differences are largest for durable goods spending, where the income and wealth MPCs for highly indebted households are approximately double those of less indebted households. This key result highlights how balance sheets can be an important amplification mechanism for aggregate shocks. The final part of the paper discusses three aspects of our key result. First, we argue that these indebtedness effects are large enough to have significant aggregate effects.

We show this by illustrating the scale of the increase in indebtedness during the credit boom and bust in Ireland. Next we decompose the Fisher effects to understand which factors contributed to unsustainable debt dynamics for so many households. We show how, despite sharp falls in the policy rate, the nominal interest rate on mortgage debt for borrowers who bought at the peak was between 440 and 720 basis points higher than the growth rate for nominal income during the six years of the recession. This is one of the key reasons why debt for certain cohorts stagnated at very high levels relative to income, dragging on consumer spend during the recovery. Finally, we show that, after controlling for income shocks and levels, highly debted households are more likely to be credit constrained. This is consistent with the literature on the collateral constraints channel for wealth and debt.

015/RT/19: Disaggregate Income and Wealth Effects in the Largest Euro Area Countries

Gabe de Bondt, Arne Gieseck, Pablo Herrero & Zivile Zekaite

This paper presents a thick modelling application of private consumption for the euro area as well as the four largest euro area countries. Thick modelling considers a multiplicity of model specifications rather than a single "best" one. This is in particular advantageous when facing model uncertainties, which is the case because euro area data typically start only in 1999, resulting in a comparatively short sample and the measurement of income and wealth is surrounded with ambiguity. Using this method, a large number of model specifications are tested and the best ones are then combined by giving equal weights to the selected equations. In our case, we keep those specifications that explain and forecast private consumption well using standard determinants from the consumption literature.

Private consumption is largely determined by expected lifetime income, which is typically proxied by disposable income and wealth. Nevertheless, the empirical literature provides ample evidence that other determinants, such as interest rates, uncertainty and consumer debt, might also play important roles. In addition, many studies have looked into the differential effects of wealth components, i.e. financial and non-financial wealth, on household consumption. However, income components can also be expected to have different effects on consumption and the marginal propensities to consume out of labour, transfer and property income are not necessarily the same. This disaggregation of income has remained comparatively unnoticed in the empirical literature.

We use quarterly sector accounts data to decompose disposable income into labour, transfer and property income as well as to split total wealth into financial and non-financial (mainly housing) wealth when modelling private consumption. In addition to income and wealth components, we consider a wide set of other potential determinants in the short run: interest rates and spreads, measures of consumer indebtedness, government debt measures capturing Ricardian equivalence effects, several measures of uncertainty and demographics. We generate multiple (6.5 thousand) single-equation error correction models for private consumption growth estimated by General Method of Moments (GMM) over the period 1999Q1 to 2018Q2. We then select a set of best performing equations by applying pre-determined in-sample and out-of-sample criteria, focusing on a final set of 50 equations that meet all criteria and have shown the best out-of-sample performance. Finally, we perform several robustness checks to account for various approaches of model specification and for various possibilities to define income and wealth variables.

Three main findings emerge. Firstly, our estimates show that it is not only essential to distinguish between components of wealth, but also between components of income when analysing private consumption. The estimated long-run elasticity of labour income is in all cases substantially larger than that of property income and transfer income. In terms of marginal propensities to consume (MPC), the differences between income components are less pronounced. Nevertheless, the MPC out of property income is comparatively small in France, Italy and Spain. With respect to wealth, the average long-run elasticity of financial wealth is often found to be larger than of non-financial wealth. This finding is in line with the literature. The average marginal propensity to consume out of financial wealth is found to be up to 3 cents per euro (in Spain) while it is up to 0.2 cents for non-financial wealth (in Germany and Spain). The estimated short-run elasticities are also found to differ across income and wealth components.

Secondly, our thick model-based estimation results in wide ranges of elasticities of private consumption with respect to income and wealth components. In particular, we find that the elasticities of property income in France and Italy and the elasticity of transfer income in Spain can be significantly different from zero on both sides. The same finding holds for the estimated long-run elasticities of non-financial wealth in the euro area, Germany and France, and for financial wealth in Germany. A number of robustness checks also reveal that the sign of the estimated coefficients may depend on the model specification and the respective definition of wealth components.

Thirdly, our results show that aggregate euro area income and wealth effects mask striking cross-country differences. Property income is found to be essential for German consumption, whereas consumption in France, Italy and Spain is best explained by focusing on non-property income. Long-run MPCs out of financial wealth are on average estimated to be 1 to 3 cents on a euro in France and Spain, but less than 1 cent in Italy and close to zero in Germany. Long-run MPCs out of non-financial wealth are estimated to be on average close to zero in Germany, France and in Italy, whereas they are found to be significantly positive (on average 0.2 cents) in Spain.

Economic Letters

Financial Stability Notes

1. The Role of Country Factors in the 2018 EBA Stress Test
   Benedetta Bianchi
2. An Lonn Dubh: A Framework For Macroprudential Stress Testing of Investment Funds
   Pawel Fiedor & Petros Katsoulis
3. Securitisation Special Purpose Entities' Use of Derivatives: New Evidence from Ireland
   Pawel Fiedor & Neill Killeen
4. Real Estate Concentration in the Irish Banking System
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6. Who Invests in Irish Commercial Real Estate Market? An Overview of Non-Bank Institutional Ownership of Irish CRE.
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7. A Vunlerability Analysis of Irish SME Credit Exposures
   Niall McGeever
8. Lending Above Macroprudential Mortgage Limits: The Irish Experience Since 2015
   Christina Kingham & Fergal McCann
9. The Future of Global Financial Centres after Brexit: An EU Perspective
   Silvia Calò & Valerie Herzberg
10. A Profile of Non-Performing SME Loans
    Niall McGeever
11. Mortgage Borrowers at the Loan-to-Income Limits
    Edward Gaffney
12. A Measure of Bindingness in the Irish Mortgage Market
    Robert Kelly & Elena Mazza
13. Mortgage Servicing Burdens and LTI Caps
    Jane Kelly & Elena Mazza
14. Have First-Time Buyers Continued to Default Less?
    Raffaele Giuliana
15. Mortgage Repayment Affordability Across the Income Distribution
    Jane Kelly & Elena Mazza
16. An Overview of the Irish Housing Market
    Gerard Kennedy & Samantha Myers

17. Mapping Market-Based Finance in Ireland
Simone Cima, Neill Killeen & Vasileios Madouros

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Michael Nower	Durham	Intermediate Inputs and the Dynamic Response to the UK's Exit From the EU
Gert Peersman	Ghent	International Food Commodity Prices and Missing Disinflation in the Euro Area
Andrea Presbitero	IMF	Negative Monetary Policy Rates and Portfolio Rebalancing: Evidence from Credit Register Data
Katerina Petrova	St. Andrews	Monetary Policy Across Space and Time
Sam Langfield	ECB	Regulating the Doom Loop
Juan Antolin-Diaz	Fulcrum AM	Narrative Sign Restrictions for SVARs
Franziska Ohnsorge	World Bank	Global Economic Prospects Report
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Robert Kollmann	Université Libre de Bruxelles	Stationary Rational Bubbles in Non-Linear Business Cycle Models
Neale Mahoney	Chicago	The Geography of Financial Distress: Delinquency and Default in America
James Cross	UCD	Policy Agendas, Information Processing, and the Unusually Proportional Nature of ECB Communications Policy Responses

External Publications

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