Chapter 1

Introduction and overview

Background and motivation

Financial markets in many ways represent the pulse of an economy. They experience highs and lows, albeit in a more fast-paced manner than the real economy. The ability to therefore deduce market participants’ current sentiment and expectations about the future from financial market variables is key to the fields of international macroeconomics and finance. In addition, since economic policymaking, in particular of central banks, works through financial markets, using asset prices allows policymakers to answer questions about the current state of the macroeconomy.

This thesis incorporates three empirical projects, each with a separate methodology, research question and unique link to financial markets.

One of the most prominent traded assets are government bonds. In my first project, Chapter 2, I explore the interplay between two institutional constraints to fiscal policy manipulation before elections that could play a role in bond valuations. Incorporating a link to the field of political science, the project aims to understand the influence of institutions in securing soundness of fiscal policy during election campaigns. The likelihood of debt repayment is a key factor driving the valuation of government bonds. This applies with regard to the interest rates on long-term sovereign bonds as well as on spreads between different euro area economies in the case of the European Union, even more so during the sovereign debt crisis in Europe. Haugh et al. (2009), for example, show that movements in sovereign spreads in the euro area were...
affected not only by general risk aversion during the crisis, but also that risk aversion magnified the relevance of fiscal performance, for example, in the form of debt service-to-tax receipts ratios and expected budget deficits. Beirne and Fratzscher (2013) come to the same conclusion with regard to credit default swap spreads as an indicator of sovereign risk – that both deteriorating fundamentals and heightened sensitivity to these fundamentals matter, while von Hagen et al. (2011) also support the notion of markets penalising the same fundamentals more strongly, suggesting a need for continued efforts in complying with the Stability and Growth Pact’s deficit and debt limits and and building up fiscal buffers in good times. Therefore, understanding how elections and institutions affect fiscal budgets is of interest to policymakers as well as lawmakers, all the more in times of potentially heightened market attention to fundamental fiscal variables.

In Chapter 3, I look at another key asset, currencies, to analyse how information contained in the distribution of interest rates across maturities can be used to come up with predictions for exchange rate returns. As a result, we can not only determine investment strategies, but also study whether information already contained in the market is incorporated into prices. We focus on a popular trading strategy for exchange rates, the carry trade, which relies on investing in high interest rate currencies for their interest and exchange rate returns, and build an alternative strategy that uses information included in interest rates across a range of maturities. We argue that the signal used to predict the exchange rate, the curvature of the yield curve, can be associated with the monetary policy stance of the central bank.

Chapter 4 examines financial markets’ response to unconventional monetary policy. Specifically, the project aims at uncovering not only how the multitude of signals from unconventional monetary policy are incorporated in asset prices, but also how these effects spill over into other countries due to the integration of financial markets.

These projects are clearly very different from one another in the specific research question and methodology, but nonetheless share the common theme of how financial markets incorporate information into asset prices. In addition, the projects not only answer current policy questions as well as providing
fundamental monetary policy and financial market insights, but also link to related fields of political economy and finance.

**Political Budget Cycles**

The valuation of a government’s bond depends critically on the sustainability of its debt, in other words, the ability of a government to repay its debt when it matures. Crucially, the sustainability of government debt depends on the stock of debt as well as potential future deficits, with high deficits casting doubt on a government’s commitment towards repayment. As Figure 1.1 shows, debt levels in the European Union, have risen substantially in a few years time.

**Figure 1.1: General government gross debt in the EU**

![Graph showing general government gross debt in the EU from 2006 to 2017.](image)

*Note: Figure 1.1 shows the general government gross debt of EU member states on the primary vertical axis (in trillions of euros) and of the EU in total on the secondary vertical axis (as a percentage of GDP). Source: Eurostat*
Figure 1.2: Fiscal balances around elections, low income countries (1990–2010)

Note: Figure 1.2 shows regression estimates from Ebeke and Ölcer (2013) with fiscal values represented as % of GDP. Only statistically significant regression estimates are shown. Source: Ebeke and Ölcer (2013)

Around the time of elections, the appropriateness of budget deficits is often challenged. This can arise both before and after elections. An example of potential manipulation before an election was brought forward by the Polish political opposition in relation to the parliamentary election of 2015. Specifically, the accusation was that the incumbent government was influencing fiscal policy strategically, with re-election being the motivation for such behaviour. The manipulation of fiscal policy by the incumbent to enhance chances to get re-elected is generally known as a political budget cycle (Nordhaus, 1975). By manipulating fiscal policy, the incumbent government attempts to signal competence in policymaking through greater provision of public goods (or a stronger economy), at greater cost to the taxpayer. In recent years, the field of political economy has studied political budget cycles (PBCs) from multiple contextual perspectives and with a host of different samples,
budget variables, levels of temporal or regional aggregation to often confirm the existence of such political budget cycles. However, as a meta-analysis by Philips (2016) shows, these contextual conditions and the setup of the study and its sample can matter substantially for the findings, although there is overall evidence for such cycles. Contrasting this is the meta-analysis by Mandon, Pierre and Cazals, Antoine (2019) which concludes that there is little to no evidence of cycles, while publication selection bias, an issue also found to matter in Philips (2016), is found far more strongly in the data, as well as the strong conditionality on institutions. Given the ongoing debate, any results thus need to be treated with caution and assessed with regard to several other conditioning factors to ensure robustness of the result. An example of a study with significant estimates is by Ebeke and Ölcer (2013) who study low-income countries between 1990 and 2010 (Figure 1.2). Typically, public consumption rises in election years; in the following years, tax revenues rise and public investment falls. While the debate initially centered around this being a new democracy phenomenon, PBCs have since also been shown in both new and established democracies. The focus has thus shifted to the institutional environment in which these cycles occur (de Haan and Klomp, 2013). A prominently examined sample is that of the European Union, for which some member states display evidence of PBCs (Mink and de Haan, 2006; Shi and Svensson, 2006; de Haan and Klomp, 2013).

We add to the literature in this field by zooming in on two factors argued to matter for the prevention of PBCs, namely press freedom and national fiscal rules, and the contingency that exists between them. Within the European Union there is substantial heterogeneity in both factors, while the strengthening of fiscal rules has received particular attention within the EU in recent years. Using a range of panel data methods with data for 25 member states, we assess fiscal balances between 1996 and 2012 for the EU and ask how institutions have hindered electoral cycles in fiscal policy in both established and new EU members. We employ three different econometric approaches to our panel, fixed effects, two stage least squares, and the generalised method of moments, to robustly quantify our hypothesized contingency on institutional factors, and split our sample to provide insights for different samples of countries and institutional strength. We find that governments throughout
the enlarged EU fiscally stimulate the economy prior to elections. Based on these results, we echo the findings of Shi and Svensson (2006) and Vergne (2009) that a larger share of informed voters reduces PBCs. We find that this is also the case in EU countries with a high level of freedom of the press. By employing a more detailed indicator of press freedom, however, we also find that there is a certain threshold of press strength that – once passed – eradicates PBCs. We additionally hypothesize and find evidence for a peculiar interaction effect of different institutional constraints: fiscal institutions limit the extent of opportunistic fiscal behaviour in EU Member States that lack a strong press to control unsustainable government spending, while they are seemingly irrelevant in countries with a strong press. We suggest that this may be due to higher degrees of political pressure to break rules in environments with strong media and the possibility for governments to engage in ‘creative accounting’ in countries with weaker media environments.

Our findings highlight the strong nature of conditionality of PBC evidence discussed extensively also in the survey by Dubois (2016). Therein lies the relevance for lawmakers and researchers alike. For lawmakers, aiming towards stronger institutions is key to eradicating PBCs. In the European Union in particular, where fiscal institutions and the strength of the press have each individually received much attention in recent years, our results provide more guidance on how to improve fiscal discipline and where existing institutions may still need further support. Some empirical support for our creative accounting hypothesis comes from Alt et al. (2014), who show how the electoral cycle and limited budget transparency at the national level lead to the undermining of the EU’s Stability and Growth Pact through creative accounting and fiscal ‘gimmicks’. One of the many avenues for future research mentioned in Dubois (2016) would be of great interest in this context as well, namely how PBCs develop (with regard to these institutional factors) over the electoral cycle, i.e. immediately after elections, and with regard to more detailed components of the government budget. The main limitation of our study relates to the collinearity of the interaction effect of fiscal institutions with press freedom, resulting in us using sample splits for press freedom. While a regression that jointly models these two institutional factors and their
contingency would be desirable, this correlation of explanatory variables is a general difficulty within the literature (de Haan and Klomp, 2013).

**Carry trades**

As a consequence of the financial crisis that began a decade ago, central banks around the world reacted by providing major stimulus to their economies through monetary easing. This included interest rates effectively reaching a lower bound. Among the many implications for the macroeconomy and monetary policy, one heavily discussed effect of low interest rates is capital flows out of low-interest rate economies. This issue was, and still is, debated also in central banks (Cœuré, 2018).

Given low interest rates, financial market participants will, all else being equal, seek investment opportunities in economies with higher interest rates. This has implications for a prominent trading strategy, the carry trade. Following this strategy, an investor borrows in a low-interest rate economy and invests in a high-interest rate economy. The uncovered interest rate parity (UIP) theory points to an exchange rate depreciation of the investment currency equivalent to the interest rate differential over the investment horizon. The empirical failure of UIP, however, with appreciation of high-interest rate currencies first shown by Bilson (1981) and Fama (1984), motivates the carry trade as a trading strategy that generates excess returns but is also susceptible to crashes.

Traditional carry trade strategies are based on differences in short-term interest rates. This strategy generates high returns, on average, which have been explained in the literature with the help of risk factors such as crash risk, in other words the risk of a rare but sharp jump in the price of a currency impacting the strategy’s returns. This trade, however, neglects any other information embedded in yield curves. As shown in Figure 1.3, the economic and monetary policy conditions in the euro area have changed completely in the last years. This reflects the major policy measures of the ECB and is seen at the short end, long end and in the overall shape of the curve. The short end of the yield curve is generally seen as reflecting current monetary policy conditions, while the long end of the curve incorporates market participants’
Figure 1.3: Euro area yield curves over time

![Yield curves over time](image)

*Note:* Figure 1.3 shows yield curves for AAA rated central government bonds in the euro area. The curves are based on data for the first day of the respective month. Source: ECB inflation expectations. The shape of the curve can reflect differences between short-term conditions and anticipated long-term monetary policy conditions, and is sometimes used as a recession indicator (when the curve inverts). While the carry trade by construction only draws on the short end of the yield curve and makes investments on the foreseen interest rate return component of the trade, there is a growing literature pointing to the signalling ability of the yield curve for the macro-economy, future interest rates and the exchange rate. We therefore study whether the shape of the yield curve has more to say about potential exchange rate investments and why this may be the case.

Chapter 3 therefore derives return distributions of carry trade portfolios among G10 currencies, where the signals to buy and sell currencies are based on summary measures of the yield curve, the so-called Nelson-Siegel factors. We extract these Nelson-Siegel factors, approximating the shape of the yield
curve using zero-coupon bond yields. Our analysis shows that the differential of curvature factors has predictive power for exchange rate returns in a panel of major currencies. We therefore develop a strategy that invests in currencies likely to appreciate, rather than currencies that yield a high interest rate. We find that a strategy based on the relative curvature factor, a trade we label the ‘curvy trade’, yields higher Sharpe ratios and a smaller return skewness than traditional carry trade strategies when forming portfolios of currencies according to the signal. Curvy trades build less upon the typical carry currencies, like the Japanese yen and the Swiss franc, and are hence less susceptible to crash risk. In line with that, standard pricing factors of traditional carry trade returns, such as exchange rate volatility, fail to explain curvy trade returns in a standard linear asset pricing framework using both Fama-MacBeth regressions and GMM estimations for the Stochastic Discount Factor representation. The findings are in line with recent interpretations of the curvature factor (Moench, 2012; Dewachter and Lyrio, 2006). A relatively high curvature signals a relatively higher path of future short-term rates over the medium term, in other words a more hawkish monetary policy stance, placing appreciation pressure on the currency.

The implications for policymakers and market participants stem primarily from this link. Our findings improve the understanding of currency-bond linkages, which are particularly relevant for investors, not just due to the strong performance of the strategy, but also because yield curves in many countries are likely to change shape as monetary policy normalises. An aspect limiting our analysis is the historical availability of bond yields at a high frequency and the resulting small number of currencies. A larger number of currencies would allow for a more robust assessment of performance in portfolios sorted according to the relative curvature factor. This is relevant in particular for the asset pricing exercise. Future research needs to be conducted to confirm our conclusion that the returns are not explained by compensation for risk. In addition, empirical evidence of our explanation for the link between curvature and trading strategies, that draws on the literature, could strengthen this hypothesis.
Monetary policy spillovers

A further consequence of the low interest rate environment from late 2008 onwards was the implementation of unconventional monetary policy (UMP) measures. While low interest rates can matter for foreign exchange rates, as highlighted in Chapter 3, they have additional implications for domestic and foreign asset markets (see Blinder et al., 2017). Spillovers in financial markets, in particular when originating from monetary policy, are of interest in conventional policy times too. However, reaching the effective lower bound of interest rates introduced a completely new variety of monetary policy measures, including most notably forward guidance and asset purchases. These measures can work through different channels than conventional policy, and in many cases were targeted at restoring monetary policy transmission in specific markets. Therefore, the direction, magnitude and significance of spillovers between markets may have changed. Given the need for an exit from these unconventional policies and the differing paces with which this is taking place amongst major central banks, this is a relevant policy issue today (Cœuré, 2018), especially with regard to potential benefits from coordination among different policymakers.

This research is particularly interesting given the highly integrated nature of financial markets and economies. This can be seen also in the GDP growth data for the four economies used in Chapter 4 (Figure 1.4). The effects of the financial crisis and following economic crisis were remarkably global, with all four economic areas strongly hit at the same time. Research into spillovers becomes even more interesting after the crisis, given that since then the paths of these economies, in particular those of the euro area and the US, diverge. Understanding spillovers hence becomes even more relevant when central banks are conducting policy at very different stages of the business cycle.

The implementation of unconventional monetary policy measures by all G4 central banks (the Federal Reserve, the European Central Bank, the Bank of England, and the Bank of Japan) has triggered a large literature examining the announcement effects on financial markets. Within this literature, authors have focused primarily on the effects of UMP on domestic government bond yields, stock prices, and exchange rates. In addition to findings of lowered longer-term yields, depreciated currencies, and strengthened equity markets,
Figure 1.4: Annual real GDP growth in the Euro area, US, Japan and UK

![GDP growth chart]

Note: Figure 1.4 shows the annual real GDP growth rate at market prices based on constant local currency. Source: World Bank

the spill-over effects into other currency areas have gained attention, motivated in part by effects felt in emerging markets.

Our contribution is to combine the analysis of domestic and international announcement effects in a joint framework, building on the methodology by Ehrmann et al. (2011) that uses heteroskedasticity for identification, in a structured approach to finding an appropriate model. To my knowledge, this is the first study of unconventional monetary policies in a joint empirical setting. Using a Vector Autoregressive (VAR) model with daily data and extending the model setup to more than two economies, the primary question we ask is whether spillover effects in times of conventional policies are comparable to those in times of unconventional policies. We re-evaluate the results of previous studies using heteroskedasticity in a data driven approach for the identification of shocks, a method requiring weaker assumptions than those
used in most other contributions to the literature. Our findings broadly confirm global spillovers, both in times of conventional and unconventional policies. In particular, US monetary policy had significant effects on global markets throughout times of conventional and unconventional policies. In addition, we show that unconventional policy spillovers within short-term interest rates and longer-term government bond yields rise in magnitude vis-à-vis conventional policy spillovers. Overall, the share of variance in markets explained by foreign markets changes, at times substantially, when performing a variance decomposition for the model.

Whilst being able to make statements on spillovers and changes observed between samples, the limited sample size prevents me from assessing the potential effects of tapering and how the rise of interest rates moving away from the zero lower bound, as well as the reduction in asset purchasing programmes, affects global linkages. In this regard, it shall be interesting to see whether a discrete change in spillover patterns can be found when monetary policy normalises in multiple countries, in other words whether changes “remain” in a potentially new monetary policy environment. This is an interesting avenue for future research and from a policy perspective a very relevant topic. Such work would focus on the impact of returning to conventional policymaking, both in its transitional period and when the range of unconventional measures are either ended or part of the regular toolkit. Further research could also use the methodological framework in smaller geographic regions with multiple economies of a broadly similar size. As suggested by Ehrmann et al. (2011), the use of high frequency data could also provide an additional and clearer insight into the transmission channels. Furthermore, adding effective exchange rates and other assets such as corporate bonds could shed light on further links between markets.

While limitations to my work and numerous avenues for future research exist, the findings are highly relevant, in particular for policymakers. An understanding of linkages across markets and countries aids the design of policies that safeguard against a spillover of a (foreign) shock to domestic markets, especially given debates about a new normal in policymaking closer to the lower bound than in previous decades. One way of achieving stability in markets and economies may be through greater international cooperation. The
results are also relevant in the context of portfolio diversification, both across markets and internationally. Shedding light on how the increased complexity in monetary policy can affect the transmission across markets and borders, allows both policymakers and investors to react to the changing environment arising from major central banks that are at different stages of a transitional process.