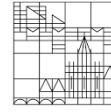




Utrecht University

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## Alternative agendas

*Central bankers on monetary policy  
before and after the euro crisis*

### Master thesis

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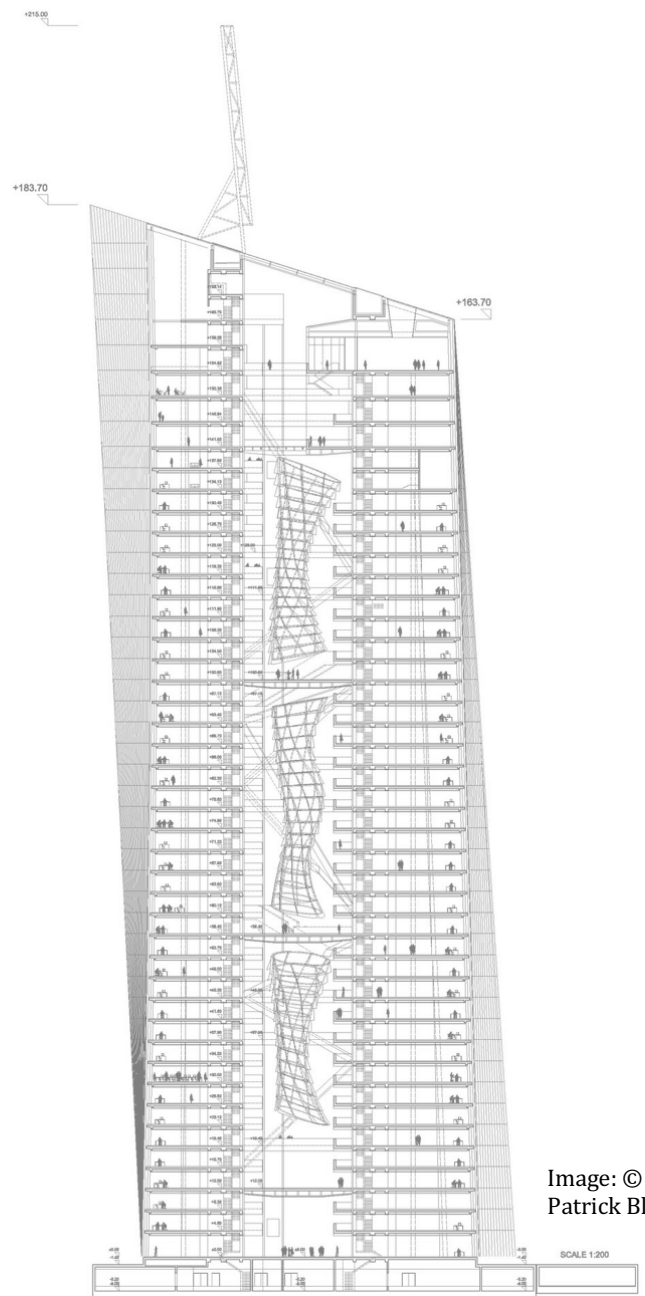


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## 1. Introduction

Financial Times, after the publication of the December 2017 Governing Council meeting minutes:

*“The minutes of the December meeting, published this month, signalled that the ECB president faces mounting threats to his go-slow approach to withdrawing the bank’s crisis-era support, which will be under scrutiny on Thursday. [...] Bundesbank president Jens Weidmann and Dutch central bank chief Klaas Knot both demand an end date [...], while Banque de France governor François Villeroy de Galhau and Philip Lane want the message tweaked.”* (Jones, 2018).

Central bankers who openly contradict each other are nowadays a familiar sight for newspapers and opinion makers, who enthusiastically report on the statements of different European Central Bank (ECB) governors (e.g. Ankersmit, 2018; Ballegeer, 2018). This open debate between central bankers poses a theoretical puzzle for the traditional theories on independent authorities. According to this literature, as one of the most independent central banks of the world, the ECB should be free from political influence, so monetary policy experts can select the best monetary policy decision at a certain moment (Hanretty & Koop, 2013, p. 197). This is also how the ECB profiles itself: as a technocratic expertise centre that is aiming to make the best possible decision in a consensual way (Jung, Mongelli & Moutot, 2010).

The firm stance of the traditional theory raises the question if central bankers really differ so much in their position on monetary policy, or that this is just a frame that the media likes to use. The existing *empirical* literature is however not able to give a convincing answer. Research from the first decade after the introduction of the euro sometimes finds differences between central bankers (Segers & Van Esch, 2007) and sometimes not (Jansen & De Haan, 2006). Since the euro crisis, a small amount of literature finds differences since the beginning of the euro area debt crisis (euro crisis), but it has serious empirical limitations: it is either only focused on France and Germany (Van Esch, 2014), only looks at differences after the euro crisis (Schulz, 2017) or does not have an empirical part at all (Walter & Frieden, 2017). Lastly, Bennani & Neuenkirch (2017) find that differences have actually decreased in the last 10 years. Thus, there is a gap in the literature on the precise development of differences between central bankers over time and what role the euro crisis might have played.

This thesis aims to fill this research gap and investigates differences between central bankers by looking at differences in the *agendas* of central bankers. An *agenda* is the collection of topics that a central banker considers at a certain moment in time (Princen, 2011, p. 927). It contains the problems, possibilities and instruments that a central banker thinks are important at a certain moment. One central banker, for example, may focus on interest rates and inflation, whereas another central banker focusses on the financial sector. By comparing central bankers' agendas, it is thus possible to get a broad overview of the differences between them. The central research question is: *What is the effect of the euro crisis on agenda dispersion between central bankers in the euro area?*

To answer this question, this thesis takes a multidisciplinary approach and uses theories from the field of economics, political science and public administration. Within these disciplines, there are two perspectives with contradicting expectations regarding agenda dispersion. To test which perspective has the best explanatory value, the theoretical framework formulates contradicting hypotheses on basis of the two perspectives (Blatter & Haverland, 2012, p. 27). On the one hand, from an independent authority perspective, it is expected that technocratic goals and approaches work as convergent factors, and central bankers have more or less the same agendas. A crisis only changes the content of the agendas, but in the same way for every central banker. On the other hand, from a political economy perspective, it is expected that there are also diverging factors to be considered; central bankers have different ideas and interests, which makes their agendas differ. As the euro crisis strengthened these factors, it is hypothesized that the crisis increased the agenda dispersion.

To measure agenda dispersion, this thesis uses a relatively novel approach. Agenda dispersion is measured with quantitative text analysis, a quantitative tool that is until now scarcely used in the field of economics and political science (Hansen & McMahon, 2016; Bholat et al., 2015). These algorithms detect which topics central bankers talk about based on word patterns in texts, in this case speeches of central bankers. Quantitative text analysis makes it possible to process large amounts of data in a relatively short amount of time. Moreover, the algorithms require little subjective input and are thus able to derive inductive results that are not biased by preceding expectations of the researcher (Bholat et al., 2015, p. 1).

The hypotheses are tested with two quantitative models. First, an interrupted time-series model to estimate the effect of the crisis. This type of model focusses on the development of the dependent

variable, agenda dispersion, before and after an ‘interruption’, in this case, the euro crisis. The euro crisis started in the end of 2009 when the Greek government admitted that it had been lying about its government fiscal status for years. The unexpected shock led to massive unrest on the financial markets, and spread to Portugal, Ireland and later Italy and Spain (Collignon, Esposito & Lierse, 2013, p. 1). The clear shock of the fraud by the Greek government makes it possible to identify the exact start of the euro crisis, which is necessary for this design (Penfold & Zhang, 2013, p. 39). Second, a panel model is used to test if and which national economic characteristics can predict agendas of central bankers.

The results show that central bankers in the euro area do have different agendas: they address different topics over time and compared to each other. Moreover, agendas are strongly linked with several national economic predictors, suggesting influence from national interests. Although there is not enough evidence to conclude that the *euro crisis* had a significant effect on dispersion, there has been a significant change in agenda dispersion in the last 15 years. All in all, the conclusions support the political economy perspective: central bankers are subject to diverging factors.

These results are not only relevant as they fill a theoretical gap in the literature on central banks, but also have broader implications. First, they show that it is time to take a broader set of factors into account when talking about monetary policy and the priorities of central bankers. Second, quantitative text analysis turns out to be a promising methodology with large potential. And lastly, the results indicate that it is necessary to take policy measures in order to preserve the legitimacy, effectiveness and survival of the Economic Monetary Union (EMU).

The rest of this thesis is structured as follows: The first chapter gives an introduction into monetary policy, the ECB and the euro crisis. The second chapter introduces the two theoretical perspectives and formulates the main hypotheses. The third chapter discusses the methodology that is used to test the hypotheses, including a specification of the used data and sources. The fourth chapter presents the results and the last chapter concludes with an answer on the research question, a discussion, and theoretical, methodological and policy implications.

## **2. The ECB, monetary policy and the euro crisis**

*This first chapter gives a short introduction into the most important institutions in the field of monetary policy. The first paragraph presents the ECB and its main decision-making body; the General Council. The second paragraph explains in very general terms the aim and instruments of monetary policy. The last paragraph gives an overview of the developments in the euro area during the financial and euro crisis.*

### **2.1 The European Central Bank**

The ECB is the central bank of the euro area and was established in 1993 by the Maastricht Treaty. Since the creation of the euro area in 1999 the ECB took over the main decision-making powers from the national central banks and the national central banks lost the control over monetary policy in their countries. However, the national central banks are still closely involved in the preparation and the implementation of monetary policy (De Grauwe, 2016, p. 171). The main goal of the ECB is to maintain price stability in the euro area (Article 282(3) TFEU). In the first years, the ECB adopted an official policy strategy, which consists of a quantitative definition of price stability: "Price stability is defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%" (ECB, 1998). In 2003 this statement was slightly adjusted: "in the pursuit of price stability it [The Governing Council] aims to maintain inflation rates below, but close to, 2% over the medium term" (ECB, 2018). What price stability exactly is and why it matters, is explained in paragraph 2.2.

The Governing Council is the main decision-making body of the ECB and consists of the presidents of the 19 national central banks in the euro area and six members of the Executive board, who are appointed by the European Council by a qualified majority (Jung, Mongelli & Moutot, 2010). The Governing Council has a rotating voting system. The five countries with the largest economy and financial sector (Germany, France, Italy, Spain and The Netherlands) share four votes. So, each of these countries does not vote once every five meetings. The other 14 countries are in the second group and share eleven votes. This means that these countries also vote approximately four out of every five meetings. However, the eleven votes are fixed, regardless of the size of the second group. If more countries will join the euro area, the voting frequency of the members in the second group will decrease (De Grauwe, 2016, p. 173).

## **2.2 Monetary policy**

### **2.2.1 Price stability**

As said above, the primary goal of the ECB is price stability. Most central banks have this type of goal, the main exception being the central bank of the United States, the Federal Reserve (FED), who also aims to keep unemployment low. Price stability means that prices do not rise or fall too quickly or too much, i.e. that there is neither too much inflation nor deflation. Price stability is defined by most central banks as an inflation rate near two per cent. The classic central bank literature states that price stability has the following desirable consequences. First, price stability maintains the purchasing power of consumers; if prices stay the same over time, consumers can get the same value for a certain amount of money, now and in the future. Second, price stability contributes to stable long-term interest rates. If lenders expect inflation, they want a higher interest rate to compensate for the loss of purchase power in the future when they get their money back. A third effect of stable prices is that wealth redistribution is prevented: by decreasing the value of nominal assets and liabilities decrease in value, inflation lowers the wealth of lenders. This devaluation, fourthly, also has an influence on banks assets and thus can threaten financial stability. Fifth, hyperinflation can lead to social instability. Sixth and lastly, deflation can cause economic standstill by a deflationary spiral of decreasing prices, economic output and employment. When prices are decreasing and consumers and producers expect that they will decrease even more, they will delay expenditures, thereby decreasing demand, which decreases employment, which decreases spending, and so on (De Haan et al., 2016, pp. 12-15).

The mainstream economic view on the source of inflation is that it occurs when money growth increases at a faster pace than economic growth. If more money is available in the economic system than real goods and services, aggregate demand raises, and producers are able to ask and get higher prices (Abel, Bernanke & Croushore, 2008, p. 276; Romer, 2006, p. 497). The instruments of the ECB are therefore targeted to influence inflation through the money supply (De Grauwe, 2016, p. 204). The three most important instruments are communication, the interest rate and QE and they are discussed in turn below.

### **2.2.2 Instruments**

The first policy instrument that central banks use to reach their inflation goal is communication (Blinder et al., 2008). The idea is that if central banks communicate clearly what their inflation goal is and what they are able to do to maintain price stability *and* market participants believe this,

participants' inflation expectations will resemble the inflation goal set by the central bank. In turn, inflation expectations have a significant influence on actual inflation. If employees, for example, do not expect that prices will go up, they will not demand higher wages, and producers do not need to increase their prices in order to pay for the higher wages. So, if the central bank can keep inflation *expectations* at the desired level, actual inflation will follow, at least in theory (De Haan et al, 2016, p. 40, see also Galati, Poelhekke & Zhou, 2011).

The second type of policy instrument aims at influencing the conditions on the money market via the interest rate of the ECB. This process is called the *monetary transmission mechanism*. The following explanation is very simple and stylistic, in reality the mechanism is more complex. The central bank first sets the interest rate that banks need to pay if they want to lend money to or borrow money from the central bank. This influences the available amount of money (liquidity) on the money market and this, in turn, influences the lending and deposit rates that banks ask from their customers. If the central bank raises its interest rate, it will be more expensive for banks to invest in the economy and more attractive for consumers to stall their money. The money supply in the economy will decrease, and economic activity will slow down, leading to less inflation. If the central bank decreases its interest rate, it will be more profitable for banks to lend their money and less attractive for consumers to save. The money supply increases, economic activity is boosted, and inflation goes up (De Haan et al., 2016, pp. 55-57).

The third type of instrument is often called *unconventional* monetary policy as it is relatively little used. The problem with traditional monetary policy, the use of the central bank interest rate, is that it has a lower bound: it cannot go (very much) lower than zero. At zero, the central bank has no possibilities to stimulate the money supply. As this was exactly what happened after the euro crisis, most central banks turned to quantitative easing (QE). With QE, the central bank buys public and private assets from banks. The banks can use their new cash to buy other assets, for example, make investments in the real economy (De Haan, 2016, pp. 63, 64).

The above sections have given a short overview of the institutional structure of the ECB, the logic behind its primary goal of price stability and the three main instruments to reach that goal. As a last remark, it is important to bear in mind that all three aspects are not uncontested. There is no consensus in the economic literature on the sources and consequences of inflation, the optimal design of a central



bank and the effectiveness of monetary policy instruments. A literature stream called Modern Monetary Theory, for example, puts more emphasis on full employment instead of price stability (For an introduction, see Hail, 2018) and in an Anglo-French model, central banks cooperate with the government (De Grauwe, 2016, p. 156). Paragraph 3.3.1 of the next chapter addresses these different visions more extensively.

## **2.3 Crisis and the policy response of the ECB**

### **2.3.1 The financial crisis**

The global financial crisis that started in the end of 2007 with the collapse of the housing market bubble in the United States caused a recession worldwide, including Europe. Economic output declined and unemployed increased all over the euro area (De Grauwe, 2016, p. 14). The fall of the Lehman Brothers bank in September 2008 had major implications for the financial sector in Europe. To begin with, several European banks had such high stakes in Lehman Brothers that they faced insolvency immediately. More generally the trust in the whole financial sector disappeared. Banks were reluctant to lend each other money and the interbank market crumbled, resulting in a liquidity crisis (De Grauwe, 2017, p. 173). The ECB reacted to the financial crisis by injecting millions of euros of liquidity into the banking sector. A lot of euro area governments reacted by bailing-out failing banks. Next to the expenses on bank bail-outs, government's fiscal status came under pressure because of decreasing tax incomes and increasing spending on welfare, such as unemployment benefits. As a result the government debt to GDP ratios soared (Copelovitch, Walter & Frieden, 2016, pp. 814-816).

### **2.3.2 The euro crisis**

The euro crisis started late 2009, when the Greek government admitted that it had been lying about its government fiscal status for years. The unexpected shock led to massive unrest on the financial markets (Collignon, Esposito & Lierse, 2013, p. 1). As Greece could not solve the problems on its own by austerity policies, the other euro area Member States and the International Monetary Fund (IMF) agreed on a 110 billion euro rescue package in May 2010. Several other rescue packages were discussed and agreed upon in the following months, as well as the setup of the European Financial Stability Facility (EFSF), that could lend up to 440 million euros to euro area countries with financial problems. Regardless of the several attempts, the crisis worsened and spread to Ireland, Portugal, Spain, Italy and Cyprus. The spreads of the government bonds of these countries against the German bond soared and their credit ratings devaluated rapidly. Euro area governments reacted by proposing

a banking union, where one set of rules, one supervisory authority and one resolution mechanism would apply to all euro area banks. Financial markets finally calmed down after Mario Draghi told them in July 2012 that the ECB would do “whatever it takes to preserve the euro” (Copelovitch, Walter & Frieden, 2016, pp. 814-816). Nevertheless, economic recovery in the euro area remained sluggish and the inflation rate declined rapidly. To prevent further deflation, the ECB decreased its interest rate, but as the rate approached the lower zero bound, it had no effect anymore. Therefore, the ECB adopted the QE programme begin 2015 (see 2.2.2) (De Grauwe, 2016, pp. 206, 208).

### 3. Theoretical framework

*This chapter starts with an introduction of the central concepts of this thesis: agendas and agenda dispersion. Thereafter, the question what determines agenda dispersion is answered from two different perspectives. First, from a perspective that sees central banks as independent authorities, it is expected that agendas are all based on the two-pillar approach of the ECB. Second, from a political economy perspective, central bankers may have different ideologies or different interests. Each of the perspectives results in different hypotheses on the effect of the euro crisis on agenda dispersion.*

#### 3.1 Central bankers' agendas

##### 3.1.1 Agendas and their relevance

This thesis studies the dispersion in agendas between national central bankers in the euro area. An *agenda* is defined as the collection of topics that a central banker considers at a certain moment in time (Princen, 2011, p. 927).<sup>1</sup> *Agenda dispersion*, consequently, occurs if central bankers consider different topics. The literature on central bankers distinguishes so far three types of topics: Central bankers consider a) economic circumstances, b) policy goals and c) policy instruments (e.g. Jansen & De Haan, 2006, Hughes & Kesting, 2014, p. 336). For example, central bankers address economic concepts, such as inflation, GDP and employment. These can be discussed because presidents present their analysis of the current or future economic outlook, or as goals of monetary policy. Furthermore, central bankers talk about the different instruments of monetary policy. Before the euro crisis the most important instrument was the interest rate, after the crisis unconventional measures were available (see 2.2.2) (e.g. Coenen et al., 2017, p. 14; Jansen & De Haan, 2006; Picault & Renault, 2017).

Agendas are important as they reflect “which issues are to be dealt with and in what terms” (Princen, 2007, p. 22). For a topic to be decided on, it needs to be on the agenda in the first place. For example, in the case of QE, central bankers must first have a policy in goal in mind, such as inflation around 2%. Second, they need to consider the economic circumstances and notice that inflation stays low. Lastly, the idea of using QE must be available to them and their attitude towards the use of this instrument must be favourable. If all these conditions are satisfied, QE makes a chance (see also Kingdon, 1984).

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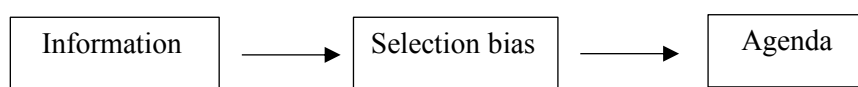
<sup>1</sup> Some authors define agendas more specific as a collection of *issues*; conflicts over certain matters (Princen, 2007, p.927). This thesis intentionally chooses the more neutral *topic*, as issues would imply almost automatically dispersion and thus no variation in the dependent variable.

### 3.1.2 Hawks and doves

The definition of agendas used in this thesis is relatively broad and open as compared with the previous research on central bankers. So far, most of the literature has used the unidimensional scale of ‘hawks’ and ‘doves’ to describe variation between central bankers (Hughes & Kesting, 2014, p. 336). In general, ‘hawkish’ central bankers want to tighten monetary policy and ‘dovish’ members want to loosen monetary policy (e.g. Blix & Grimaldi, 2014, p. 8; Favaretto & Masciandaro, 2016, p. 52; Tobback, Nardelli & Martens, 2017, p. 2). However, there seems to be no consensus on the exact use of the metaphors. Some authors specifically refer to the instrument of interest rates (e.g. Eiffinger, Mahieu & Reas, 2018, p. 109; Hayo & Meon, 2014, p. 145). Istrefi refers to the goal of monetary policy: “Hawks are believed to put the inflation fight high above other goals. Conversely, doves are seen as pro-growth and more tolerant to price pressures, or at least the threat of them” (2017, p. 2). Schulz connects the two terms to ideology: hawks are orthodox and doves are revisionist central bankers (2017, p. 101). Furthermore, some authors do not even define the concepts of hawks and doves (e.g. Jung & Latsos, 2015; Blinder et al., 2008, p. 926; Picault & Renault, 2017, p. 139). Because of the confusing and sometimes ambiguous employment of the categories in the literature, this thesis does not make use of the terms.

### 3.1.3 Disproportionate information processing

The agenda-setting literature poses that not all topics that are relevant at a certain moment are on the agenda of central bankers. Central bankers, just as all policy makers, face time-constraints and are subject to bounded rationality. Because of these limits, central bankers cannot pay attention to all the signals that come in about the state of the economy. In other words, they process information on the state of the economy in a disproportionate way; some signals get attention and others do not. Heuristics, such as earlier experience, scientific models and media attention are used to choose what is important and what not. Thus, central bankers have a selection bias that serves as a gate watcher for their agenda (see Figure 3.1) (Jones & Baumgartner, 2004, p. 334).



**Figure 3.1: Disproportionate information processing and agendas**

What this selection bias looks like and if it is the same for all central bankers, depends on the disciplinary perspective. From an independent authority perspective, technocratic goals and approaches work as convergent factors and central bankers have more or less the same agendas. However, from a political economy perspective there are also diverging factors to be considered, such as different ideas and interests. Both perspectives are reviewed in turn below.

## **3.2 Explaining agendas: the independent authority perspective**

### **3.2.1 The optimal central banker**

The first perspective stresses that central banks should be designed like *independent authorities*. Independent authorities are public bodies characterized by formal independence from elected politicians and specialization in one particular domain, such as monetary policy (Gilardi, 2007, p. 304, Majone, 1997, pp. 152–155; Thatcher, 2002, p. 954). These characteristics have two clear benefits, according to the proponents of this perspective. First, the central bank is able to make *credible commitments*; central bankers are, in contrast to elected politicians, not tempted to change their policy plans because they do not face pressure from the electorate or interest groups. Politicians, for example, may want to change monetary policy in light of upcoming elections in order to increase employment. This leads to fluctuations in monetary policy and thus uncertainty for economic actors, which may result in higher inflation (see 2.2.1). Central bankers do not have these incentives, so economic actors can trust their commitments. The result is, in theory, that policy announcements of central bankers have the desired effect and lead to stable inflation (Gilardi, 2007, p. 307; Hanretty & Koop, 2013, p. 197).

Second, central banks independence and specialization enables central bankers to assemble expertise in order to make the best possible decision. Freed from political interests and daily issues, monetary policy experts can academically assess the economic situation, discuss these with each other in a consensual way and decide on the best monetary policy decision at a certain moment (Eberlein & Newman, 2008, p. 27, see also Joerges & Neyer, 1997). There may be different viewpoints at first on how to interpret certain information, but those are resolved through deliberation. In this way, a central bank designed as an independent authority leads to better monetary policy (Hanretty & Koop, 2013, p. 197).

### 3.2.2 Judicial reality

The ECB is indeed designed like an independent authority (Gilardi, 2007, p. 302). Judicially, members of the Governing Council are formally independent from any influence from Member States and the European institutions and all have the same constitutional mandate with one specific goal: to maintain price stability in the euro area (Article 282(3) TFEU). The ECB defined price stability as the aim “to maintain inflation rates below, but close to, 2% over the medium term” (ECB, 2018). To reach these inflation rates, the monetary policy is based on an approach that has not changed since 1998. The Governing Council assesses the economy on basis of two pillars and decides if adjustment of the monetary policy strategy is necessary. The first pillar consists of a “prominent role for money, as signalled by the announcement of a reference value for the growth of a broad monetary aggregate” and the second pillar “broadly based assessment of the outlook for future price developments and the risks to price stability in the euro area as a whole” (ECB cited in Gerlach, 2004, p. 392).

### 3.2.3 Empirical evidence

There is a vast body of literature that tries to answer the question if this judicial reality ascribed in the last paragraph is also the empirical reality. There are two types of research. First, a very large collection of econometric papers that uses a *Taylor rule*, named after American economist Taylor. Taylor (1993) was the first economist to propose a simple policy rule for the interest rate set by the central bank. The rule states that the central bank determines its interest rate on basis of economic indicators, such as inflation and the output gap (the difference between GDP and target GDP)<sup>2</sup> (p. 202). Taylor found that this rule describes the actual behaviour of FED policy makers in practice, i.e. that American central bankers indeed change monetary policy in reaction to these indicators (p. 202). Several studies have estimated a Taylor rule of the ECB, with mixed results. On the one hand, there are studies who show that the ECB reacts to inflation and the output gap (e.g. Belke & Klose, 2011, p. 168; Caputo & Diaz, 2017; Hayo & Hofmann, 2006; Gerlach & Lewis, 2014), on the other hand there are studies who show that it does not (e.g. Caputo & Diaz, 201; Gerlach, 2011; Rühl, 2015). As for the influence of money growth, the results are mixed as well. In an overview of the literature in 2004, Gerlach finds that almost no study can find a significant relation between money growth and decisions of the ECB (2004, p. 392). However, after the euro crisis, Belke & Klose find that including money growth increases the fit with the actual monetary policy decisions of the ECB (2014, p. 521).

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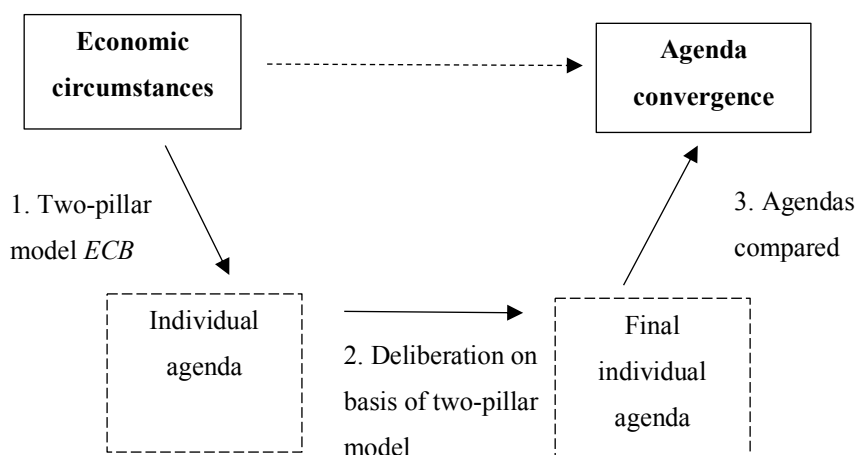
<sup>2</sup> The original rule has the following form, where  $r$  is the rate set by the central bank,  $p$  is the inflation over the previous year,  $y$  is the difference between GDP and target-GDP and  $r^*$  is the equilibrium interest rate:  $r = p + 0.5y + 0.5(p - 2) + r^*$  (Taylor, 1992, p. 202).

Next to the econometric evidence, there are two qualitative studies that (try to) show that practice is close to the judicial reality: First, Ehrmann & Fratzcher (2005) analyse the communication of central bankers of the Federal Reserve, the Bank of England and the ECB. Their conclusion is that ECB central bankers do not often contradict each other in their communication compared to the Federal Reserve (p. 526). Second, Jung, Mongelli & Moutot (2010) (all working for the ECB) describe how monetary policy decisions are made within the ECB. The following two statements are insightful for their conclusions. First, about the preparations of monetary policy decisions: “We find that an important aspect of the Eurosystems monetary policy preparations is the involvement of committees in all functional areas to process information by fully exploiting the expertise from ECB and NCB experts.” (p. 343). And second, about the decision-making practices: “In practice, however, the Governing Council practices consensus voting” (p. 332), which means that if Governing Council members “reach consensus about the best policy reaction, they consider all available information” (p. 331). The statements confirm the theoretical expectations of the independent authority perspective: the high level of expertise and the consensual decision making aimed at finding the ‘best’ policy.

#### **3.2.4 Model I: Central bankers as technocrats**

The literature above can be summarized in a model that is visualized in figure 3.2. Central bankers form a technocratic group, who try to manage monetary policy as good as possible. When information about the economy comes in, a central banker assesses what is important on basis of the two-pillar model of the ECB and what needs to be done in terms of monetary policy (arrow 1). This collection of considered topics together forms the individual agenda of a central banker. Next, central bankers discuss their views in the Governing Council in a deliberative way focused on consensus, resulting in central bankers’ individual final agenda (arrow 2). Because the assessments and discussion are based on the same model and the discussion has the goal to reach consensus, the final agendas are expected to be quite similar and result, when compared to each other, in agenda convergence (arrow 3). What would the model predict for the effect of the euro crisis? The economic circumstances in the euro area changed drastically. However, the mandate of the ECB and the connected two-pillar approach did not change, and central bankers still talked about it in the same deliberative way during their meetings; two converging factors that make the agendas more alike. So, although all together the addressed topics may have changed somewhat, there is still no dispersion between central bankers. Together, these considerations lead to the null hypothesis:

*Hypothesis 0: Agenda dispersion does not vary over time*



**Figure 3.2: Information processing of central bankers I**

### 3.3 Explaining agendas: ideas and interests

The model sketched above is problematic from a Political Economy perspective because it relies heavily on the assumption that all central bankers use the two-pillar approach. There is no room for individual differences and conflict. According to the Political Economy literature, there are three main sources of individual differences: ideas, interests and political bargaining. These concepts are discussed in turn.

#### 3.3.1 Multiple ideas

The first source of differences between central bankers are their ideas on how the world works (Blyth, 2002, p. 37). Ideas constitute the concepts that are important in the economy (such as ‘interest rate’) and the relations between those concepts (such as ‘increasing the interest rate increases the credit supply’) (Blyth, 2002, p. 37). Ideas enable actors to make sense of the world and select the ‘right’ policy in response to a certain problem (‘if the credit supply is too low, the interest rate needs to be increased’) (Schulz, 2017, p. 97). Ideas are very hard to measure (Gerring, 1997, p. 966). The most recent and impressive study, by Schulz (2017) measures ideas by surveying central bank economists and presidents. Schulz shows that in 2016, when he conducted the survey, central bank economists and presidents differed highly in beliefs, especially in the euro area (p. 98, 118). Overall there is a great variety of schools within the euro area, but the two dominant schools are Monetarism and Keynesianism (p. 113). The schools have highly differing views on the objectives of a central bank.



For monetarists, price stability is the one and only goal of the central bank. Furthermore, they pose that inflation in the end has one cause: money growth increasing at a faster pace than economic growth. If more money is available in the economic system than real goods and services, aggregate demand raises, and prices go up. According to the monetarist view, central bankers can influence the money supply in the economy with their interest rate (see also paragraph 2.2.1). So, central bankers should focus on combatting inflation via the interest rate (Schulz, 2017, p. 69, see also Friedman, 1970). Closely related to monetarism, is the viewpoint that in order for central bankers to pursue their goal, it is important that the government does not interfere in the policies of the central bank. The government should keep to a tight fiscal policy and should not, for example, support the economy in times of recession with extra spending (Van Esch, 2014, p. 290).

Keynesianists, on the other hand, state that inflation has its origins in the real economy, not the money supply. If economic demand increases or costs rise and prices rise accordingly, this can cause a ‘wage-price spiral’; employees demand higher wages to pay the higher prices, which increases costs and demand, and so on. As demand and costs can rise as a result of multiple factors, such as climate change or demographic developments, inflation has various causes (Schulz, 2017, p. 69). More importantly, for Keynesianists price stability is not the only goal of central bankers (Van Esch, 2014, p. 290). As important are high employment levels, a stable business-cycle and financial stability (De Grauwe, 2017, p. 157). From the Keynesian point of view, central bank and government should work together to reach these goals and the government is encouraged to use its fiscal policy to steer the economy (Van Esch, 2014, p. 290). The ideas of Keynes were largely ignored in the last decades, but after the financial crisis the field economics has witnessed the “return of the master” and the ideas of Keynes are widely used again (Skidelsky, 2010, p. 1).

Very closely related to the Keynes-Monetarist divide is the French-German divide that existed before the introduction of the euro. Before the transfer of decision-making powers to the European level, the French central bank came close to the ideal typical Keynesian central bank, whereas the German central bank was an ideal typical monetarist central bank. This French-German ‘axis’ is still often used to explain different ideas and policy debate on central banking in the euro area (De Grauwe, 2017, p. 157; Van Esch, 2014, p. 288, see also Segers & Van Esch, 2007).

Central bankers can get their ideas from various sources. Education, could be a possibility (Adolph, 2013, p. 22; Farvaque et al., 2014, p. 23), but in their study of FED central bankers, Smales and Apergis do not see any effect (2015). Second, experiences of members with inflation developments in the past may be relevant (Malmendier et al., 2017; Smales & Apergis, 2015). Occupational experience is important (Farvaque et al., 2014, p. 23; Göhlmann and Vaubel, 2007) and lastly, national cultures could play a role, as Northern central banks are more orthodox than their Southern central banks (Schulz, 2017, p. 118).

### **3.3.2 Multiple interests**

The second diverging factor are different interests (Princen, 2011, p. 929). In case of the Governing Council, members wear two hats. On the one hand they are appointed to serve the euro area interest (Article 282(3) TFEU). On the other hand, they are national central bank presidents. Although they are formally independent, Adolph (2013) argues that central bankers have “shadow principals”: “patrons who set implicit contracts with bureaucratic agents to implement policies that the shadow principal desires” (p. 17). Implicit contracts include for example dependency on re-appointment or further jobs. Furthermore, the existence of a national central bank depends on the legitimacy it enjoys in the eyes of national citizens (Scott, 2016, p. 71). These ties could lead central bankers to prefer national interests above euro area-interests (Jung & Latsos (2015). For the euro area there is no literature that studies this question, as the voting records of the Governing Council are not available. However, Benanni & Neuenkirch show that the sentiment of national presidents’ speeches correlates with the developments in national GDP, which could be seen as prove that central bankers attach value to national information. Moreover, several authors find that the interest decisions by the ECB are best predicted with a model where members follow national objectives (Hayo & Méon 2013, p. 138; Lee and Crowley, 2009, p. 3).

Although ideas and interests are often separated, they are highly connected. On the one hand, what is in an actor’s interest depends on the idea of the actor of its interest and the instruments that are suitable to serve that interest (Blyth, 2002, p. 29). At the same time, interests can influence ideas. For example, the central bankers from the euro area countries that are highly dependent on exports for their economic growth may bias their interpretive framework towards exchange rates (Baccaro & Pontusson, 2016).

### **3.3.3 Bargaining and strategic positioning**

Next to the differences in interest and ideology, there is a third factor that can intensify diverging interests. As explained above, the independent authority perspective assumes that within authorities, technocrats discuss economic circumstances and necessary policy measures in a deliberative way aimed at consensus. There is however, also literature that suggests that even in technocratic groups the decision-making process can be characterized by power struggles, debate and bargaining (e.g. Van de Kerkhof, 2006, p. 282, see for an overview Siderius & Brandsma, 2017, p. 1268). Hayo & Meon find evidence for this strategy in their analysis of the interest rate decisions of the ECB: output of models that are based on bargaining have a better fit with the real interest rate decisions than models based on consensus (2013, p. 152). If central bankers indeed bargain more than deliberate, they are less likely to change their position after a meeting with other central bankers, which implies that their agendas do not converge.

### **3.3.4 Interests, ideas and the euro crisis**

To sum up, next to the converging forces of the two-pillar approach, the political economy perspective shows that there are also diverging factors. Different ideas, (national) interests lead to dispersing agendas and bargaining between central bankers sustains this dispersion. There are indications that the euro crisis intensified the first two factors; ideas and interest. First, national interests diverged highly in the aftermath of the euro crisis, as a result of emerging financial market imbalances within the euro area. After the euro crisis, the spreads on government bonds dispersed directly and the imbalances in the European interbank markets increased rapidly (DNB, 2016; Pusch, 2017, p. 526). In some countries, the credit ratings moved into the direction of junk status quickly, whereas in other countries, the ratings remained stable (Mullard, 2012). Countries who faced high interest rates on their government debt and countries with banks with high interbank deficits and non-performing loans had an interest in expansive and unconventional monetary policy, whereas the other countries did not (Frieden & Walter, 2017, p. 18; Schulz, 2017, pp. 37, 148, 153).

At the same time, a debate took place on a more ideological level. As Smets (2014) concludes after a literature review: “[The crisis] led to a rethinking of monetary policy frameworks focused primarily on maintaining price stability, as price stability has proven not to be a sufficient condition for financial stability and lack of financial stability can have large negative feedback effects on price stability.” (p. 263). For example, stress on financial markets can block the monetary transmission mechanism so that interest rate adjustments do not affect price stability anymore (p. 265). However, not all central

bankers made this paradigmatic change, some stayed with the old believe that financial stability and price stability should be kept strictly separated (p. 268). Next to the debate on financial stability, the aftermath of the euro crisis involved a debate on QE: did QE fit within the mandate of the ECB? The northern countries said no: a central bank focusses on price stability and has the interest's rate as its instrument only. The southern countries were in favour of QE, as they saw it as the only option to turn around the deflation and the sluggish recovery of the euro area (Schulz, 2017, p. 149-151).

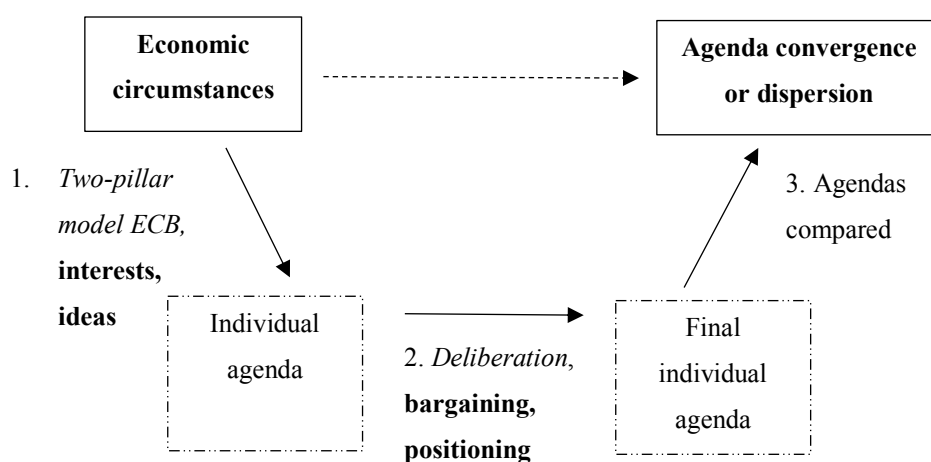
### 3.3.5 Model II: Central bankers with interests and ideas

With these new insights from the political literature, the model from Figure 3.2 can be *supplemented* (see Figure 3.3). Next to the two-pillar approach of the ECB, central bankers have their own ideas and national interests. These three factors determine the individual agenda (arrow 1). Next, during discussions in the Governing Council, discussions do not necessarily have the goal to reach consensus and may even strengthen contradictions (arrow 2). When agendas are compared, in the end, it is thus possible that agendas are highly dispersed, depending on the alignment of ideas and interests at a certain moment (arrow 3). As the euro crisis increased interest and ideology conflicts, it strengthened dispersion. This leads to the following hypotheses:

*Hypothesis 1: Agenda dispersion varies over time.*

*Hypothesis 2: Central bankers take national economic indicators into account in their agendas*

*Hypothesis 3: The euro crisis had a positive effect on agenda dispersion*



**Figure 3.3: Information processing of central bankers II**  
 Converging factors in *italic*, diverging factors in **bold**

## 4. Design and methodology

*This chapter is concerned with the design and methods that are used to test the hypotheses formulated in the previous chapter. The first two paragraphs address the choices for the quantitative design and the case selection, respectively. The third paragraph explains the text analysis methods that are used to measure the dependent variable; agenda dispersion. The ITS model that is used to test for the effect of the euro crisis on agenda dispersion is introduced in paragraph 5.4. The last paragraph discusses the panel model with economic predictors for agendas.*

### 4.1 General research design

#### 4.1.1 Quantitative approach

This thesis takes a quantitative approach in three ways. First, an interrupted time-series (ITS) design is used. ITS is one of the most powerful quasi-experimental research designs and can estimate the effect of an ‘interruption’ on a dependent variable (Morgan & Winship, 2015 p. 355; Penfold & Zhang, 2013, p. 38). This choice follows from the research question: this thesis aims to estimate the effect of the euro crisis on agenda dispersion in the euro area. Second, a quantitative panel model is used to test hypothesis 2 about the relationship between national economic indicators and agendas. A panel model controls for unobserved country-specific time-invariant effects. This is of great value for testing hypothesis 2, as exactly those country-fixed effects may influence both the economic characteristics of a country as well as the agenda of the central banker.

Third, the dependent variable is measured with quantitative text analysis. This follows automatically from the choice for the ITS and panel model. These models require multiple, *comparable* observations over time (Mahoney & Goertz, 2006, p. 229). Quantitative text analysis can deliver this. Moreover, quantitative text analysis has the considerable advantage that it is possible to analyse all possible text sources available, which increases the reliability and validity of the dependent variable (Tobback, Nardelli & Martens, 2017, p. 5). Compared to a qualitative analysis, however, there are also drawbacks. Qualitative analysis allows for a more holistic, context-sensitive analysis. Subtle changes in word use or complex multi-dimensional cause- and effect structures, for example, can be noticed more easily (Mahoney & Goertz, 2006, p. 229). This is a price that must be paid to obtain comparable observations.

#### **4.1.2 Scope and case selection**

As mentioned before, the *scope* of this thesis entails the national central bank presidents that are seated in the monetary policy committee of the euro area: the ECB Governing Council. The introduction already touched upon the fact that differences within the ECB Governing Council have been heavily understudied (Bennani & Neuenkirch, 2017, p. 1115). This can partly be explained by the fact that the ECB did not publish any (voting) records until 2015, and from 2015 only marginally addresses differences of opinion in its records (Coenen et al., 2017, p. 9). Thus, analysis depends on individual statements of central bankers, which is time-consuming. The benefit of choosing one central bank and not multiple is that the institutional context is the same for all central bank presidents and stays the same over the years and thus can be ruled out as a potential explanation for differences in dispersion. A drawback is that the results cannot be generalized one-on-one to other central banks, such as the FED or the Bank of England, because the contexts differ a lot.

Regarding *case selection*, this thesis takes countries as the main unit of analysis and not individual central bankers. This choice follows from the theoretical framework: of interest is the difference between euro area countries and the influence of *national* economic indicators, not personal differences. So, any effects of personal differences between consecutive central bankers of the same country are omitted from the analysis. Since the introduction of the euro in 1999, several countries have joined the euro area, bringing the total number of euro area countries to 19. To keep the number of central bankers in the selection relatively stable and have at least two observations for each country before and after the euro crisis, only the euro area countries that joined the euro before 2009 are selected. This leads to the following selection of 14 countries: Austria, Belgium, Cyprus, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, The Netherlands, Portugal and Spain.

The choice for the *time frame* is determined by the chosen research design and data availability. To estimate the effect parameters in an ITS design, at least 8 observations before and after the interruption are needed (Penfold & Zhang, 2013, p. 44). More observations after the euro crisis are not feasible because this thesis is written in 2018. More observations before the euro crisis are not possible because the number of available speeches is too low. Therefore, the time frame is 2002-2017.

## **4.2 Measuring the dependent variable: agendas**

### **4.2.1 Data and data preparation**

The primary source for the dependent variable are speeches by central bank presidents. The agenda of a country in a certain year is operationalized as the topics addressed by the central banker of that country in his/her speeches in that year. The alternative to using speeches is to analyse media articles about all spoken contributions by central bank presidents (as done in Jansen & De Haan, 2006). The advantage of this alternative approach is that next to speeches also television performances, interviews and quotes in newspaper articles are included. A major disadvantage is however that communication of central bankers is not measured directly, but indirectly and selectively. The media could give a false interpretation of the communication or only present information of central bankers that they find relevant (Blinder, 2008, p. 926). Therefore, speeches are the preferred option.

The Bank of International Settlements (BIS) collects almost all speeches of central banks worldwide and translates them to English if necessary. For some countries (Austria, Cyprus, Finland and Portugal), the BIS has little or no speeches in certain years and for these countries an extra effort was made to retrieve speeches (in English) from the websites of the central bank in question. A full overview of the used speeches per country and year is available in Annex I. The total number of retrieved speeches is 1155.

To prepare the data for analysis, the speeches are read into data analysis software R. Punctuation, numbers and symbols are removed, capital letters are replaced with lower letters. Often occurring stop words (“and” “or”, etc.), very rare words and country names are removed. The documents are grouped for country and year, so all speeches for a country in a year as taken as one document, which results in 194 documents that represent the agenda of one country in one year.

### **4.2.2 Quantitative text analysis**

The next step is to measure the addressed topics. There are roughly three options (Blinder et al., 2008; Rotemberg, 2016, p. 88). First, coding by hand, whereby every sentence or paragraph is categorized by a coder using a coding scheme (e.g. Jansen & De Haan, 2006). Besides the fact that this method is very time-consuming, the output also heavily depends on the coding scheme and can involve coding bias by the researcher. Consequently, the studies have a low reliability (Slapin & Proksch, 2008, p. 707). Second, ‘dictionary analysis’, in which every topic is represented by a selection of words (the

dictionary) and the score for each topic is determined by the number of occurrences of these words in the dictionary (e.g. Benanni & Neuenkirch, 2017). Although less demanding, this method also profoundly relies on the input by the researcher. The third option is using an algorithm that selects the important topics or topic dimensions itself based on word frequencies in the texts (e.g. Hansen & McMahon, 2015). The major advantage of this approach, which will be used in this thesis, is that little subjective input is required. However, two remarks need to be taken into account. First, the algorithms themselves make certain assumptions that can influence the output. And second, the output itself needs to be interpreted, which is not always straightforward, as will be shown below. The next paragraphs introduce the two algorithms that are used in this thesis.

#### **4.2.3 LDA algorithm**

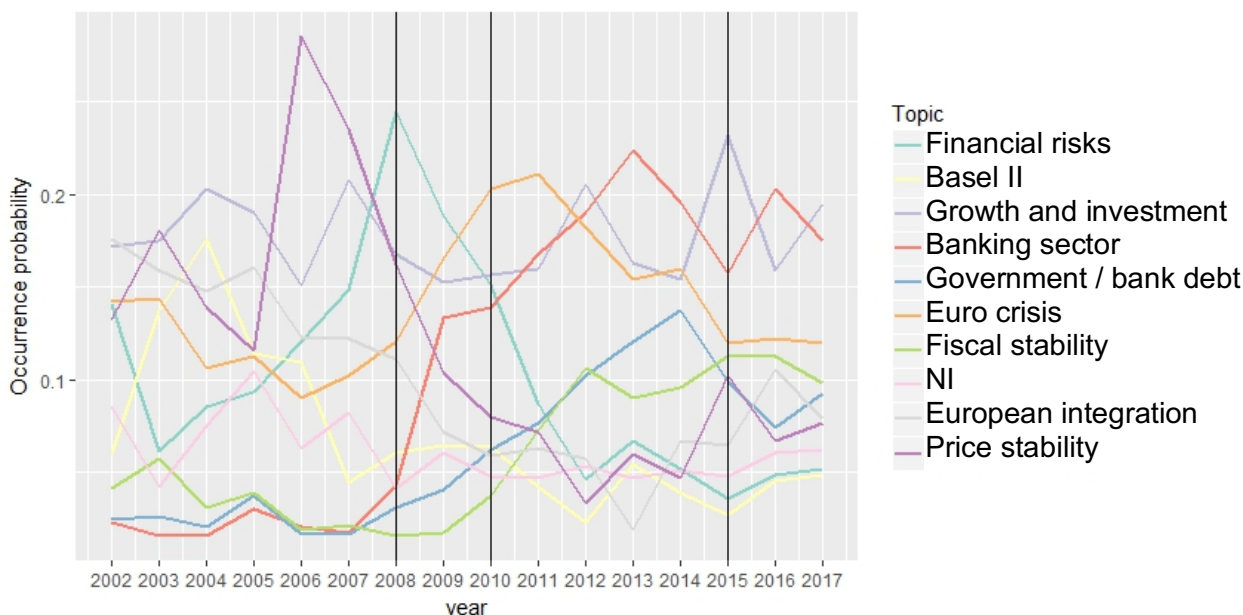
The first algorithm is called Latent Dirichlet Allocation (LDA). The LDA algorithm identifies different topics in documents on the basis of word patterns (for a good introduction see Jacobi, van Atteveldt & Welbers, 2015). Topics consist of groups of words that are highly likely to appear together. Topics do not automatically get a meaning or a name, this is subject to interpretation. Next to topics, the algorithm reports per document and topic pair the probability that the topic is present in the document. These occurrence probabilities can be compared to see if documents (are likely to) contain the same topics.

The number of topics has to be specified beforehand. There is no a-priori optimal number of topics and the selection is subject to multiple considerations. The goal is to reduce the number of information dimensions as much as possible, while at the same time keeping as much relevant data as possible. Second, the interpretability of and oversight over the topics is important. In light of the goal of the LDA-analysis – insight in the agendas of central bankers – the second criterion is more important (Jacobi, van Atteveldt & Welbers, 2015, p. 7,8). After analysing the interpretability of 5, 10, 25, 40 and 60 topics, a choice is made for a simple model of ten topics. After ten, no meaningful different or interpretable topics are added to the already identified topics, nor do the already identified topics change considerably.



Table 4.1 shows the ten word groups that were identified by the LDA algorithm<sup>3</sup>. The labels of the topics in *italic* are *not given* and chosen by the researcher on basis of interpretation of the words. For some topics, the interpretation is quite straightforward, for example for Topic 10. Central bankers that use the words monetary, policy, price, stability, inflation and interest are most likely talking about monetary policy in the sense of the ECB’s official monetary policy goal (see paragraph 3.2.2). This topic is called ‘Price stability’, after the goal. The same goes for Topic 1 (Financial risks), Topic 2 (Basel II), Topic 3 (Growth and investment), Topic 6 (Euro crisis) and Topic 9 (European integration). For the other topics the interpretation is more ambiguous. Topic 4, for example, consists of a lot of words connected to the banking sector, and a more specific description than this is not feasible. The only not interpretable is Topic 8 and is therefore labelled “Not interpretable”.

As mentioned above, next to topics, the algorithm also produces occurrence probabilities: the probability that a topic occurs in a document. Figure 4.1 shows the results by plotting the average occurrence probabilities per year for each topic. The peaks of the two crisis topics confirm that the labels of the topics are intuitive: ‘Financial risks’ peaks right in 2008 and ‘Euro crisis’ in 2011.



**Figure 4.1: Occurrence probability per topic**  
The vertical lines indicate consecutively 1) the start of the financial euro crisis, 2) the start of the euro crisis and 3) the start of the QE programme.

<sup>3</sup> The word groups do not consist of a fixed number of words. The LDA algorithm reports per topic word pair the probability that it belongs to that topic. The 15 words with the highest probability are shown in the table.

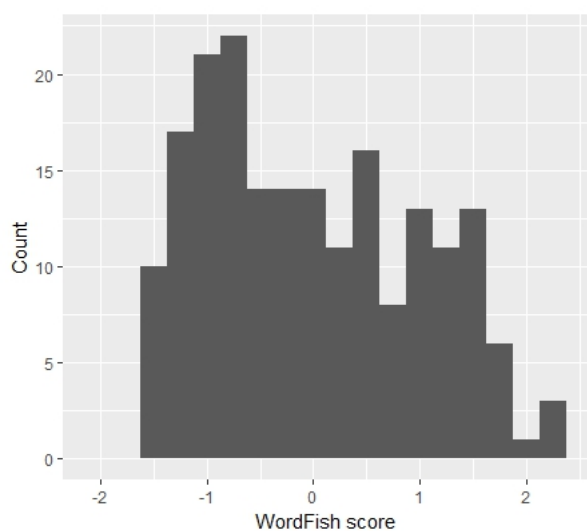
	<b>Topic 1</b>	<b>Topic 2</b>	<b>Topic 3</b>	<b>Topic 4</b>	<b>Topic 5</b>	<b>Topic 6</b>	<b>Topic 7</b>	<b>Topic 8</b>	<b>Topic 9</b>	<b>Topic 10</b>
	<i>Financial risks</i>	<i>Basel II</i>	<i>Growth and investment</i>	<i>Banking Sector</i>	<i>Government bank debt</i>	<i>Euro crisis</i>	<i>Fiscal stability</i>	<i>Not interpretable</i>	<i>European integration</i>	<i>Price stability</i>
1	financial	basel	growth	banks	banks	euro crisis	monetary	per	european	policy
2	banks	risk	economy	financial	bank	countries	union	cent	euro	monetary
3	market	capital	economic	euro crisis	central	euro	policy	must	countries	inflation
4	risk	banks	area	banking	government	policy	central	bank	eu	central
5	markets	new	euro	central	debt	area	financial	firms	economic	price
6	review	committee	public	bank	banking	us	fiscal	banks	europe	stability
7	system	ii	european	european	programme	central	banks	public	integration	bank
8	credit	supervisors	year	bankers	capital	first	stability	capital	bank	rate
9	liquidity	framework	labour	speeches	bankers	now	can	countries	currency	interest
10	stability	management	investment	sector	much	new	economic	economic	growth	euro
11	institutions	banking	sector	capital	losses	financial	european	billion	financial	rates
12	global	supervisory	fiscal	policy	speeches	economy	debt	year	exchange	economic
13	international	bank	gdp	stability	banco	rates	however	gdp	union	expectations
14	risks	requirements	years	measures	restructuring	need	bankers	growth	states	eurosystem
15	current	accord	system	resolution	can	economic	speeches	years	national	area

**Table 4.1: Ten word groups with topic label (interpretation researcher)**

#### 4.2.4 WordFish algorithm

One of the main advantages of the LDA algorithm is that it produces output that is easy interpretable and multidimensional; together, the topics give a nuanced and comprehensive overview of what central bankers talk about. However, to determine the *average* dispersion in one year, a unidimensional measure is necessary that indicates the agenda of a central banker in a certain year with *one score*. The algorithm *WordFish*, developed by Slapin and Proksch (2008), produces such a unidimensional measure (Slapin & Proksch, 2008, p. 708-709). The full model with details is available in Annex II. WordFish estimates positions of documents on a one-dimensional scale based on word frequencies in documents. Simply said, countries with similar positions on the dimension use the same words in the same amount.

Figure 4.2 is a histogram of the WordFish position scores and shows that the dimension runs from approximately -2 to +2.5. From now on, this dimension is called the *agenda index*. Next to the agenda index scores, the algorithm returns another informative indicator. For every word, the algorithm estimates a word weight giving information on the importance of the word for distinguishing between positions on the scale. If the word weight is negative, this indicates that the specific word is more used by documents on the negative end of the scale and vice versa (Slapin & Proksch, 2008, p. 708, 709, 715).



**Figure 4.2: Histogram WordFish scores**

#### 4.2.5 Interpretation of the agenda index

The main drawback of the WordFish algorithm is that it does not provide an interpretation of the agenda index it scales the documents on. However, with the help of the word groups of the LDA topics (see Table 4.1), it is possible to interpret the two sides of the index. Table 4.2 presents an overview of the average word weights of the words in the LDA topics. From the word weights, the conclusion can be drawn that agendas that are at the negative end of the index use more words from topic ‘Price stability’ and slightly more words from the topics ‘Fiscal stability’ and ‘European integration’ than agendas at the positive end of the index. Agendas at the positive end of the index, in contrast, use more words from topics ‘Basel II’, ‘Growth and investment’ and ‘Government / bank debt’ and slightly more words from the topics ‘Financial risks’ and ‘Banking sector’.

<i>Topic</i>	<i>Average weight</i>
Financial risks	0.09
Basel II	0.22
Growth and investment	0.16
Banking Sector	0.09
Government / bank debt	0.29
Euro crisis	-0.02
Fiscal stability	-0.08
Not interpretable	0.55 <sup>4</sup>
European integration	-0.09
Price stability	-0.23

**Table 4.2: Average word weights of the LDA topics**

A positive average word weight indicates that the topic is mostly used by central bankers who score on the positive side and vice versa for negative word weights.

The word weights show that central bankers with agendas at the negative side of the index have a *narrow focus*: these central bankers address the main goal of the ECB, price stability, a lot. This may indicate that these central bankers have a monetarist agenda and want to stick to the mandate of the ECB (see 3.3.1). The central bankers on the other side of the index have a *broader agenda*; they also consider other topics, which may indicate that they have a more Keynesian agenda. As Keynes is not taboo anymore since the financial crisis (see 3.3.1), this would be not unlikely. However, as the algorithm only reports on the occurrence of the topics and not the position of central bankers towards

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<sup>4</sup> Although this topic is not interpretable, it has a very high positive average word weight and is thus important for distinguishing between countries according to the WordFish algorithm. When looking at the occurrence probability of this topic per country (see Annex IV.C), it becomes clear that it is mainly Italy that uses this topic a lot. And Italy is indeed on the positive side of the WordFish scale (see Figure 5.3). One possible explanation could be that Italian central bankers have an entirely own way of talking about their job.

these topics, it is not possible to conclude that the two ends stand for ‘Monetarism’ and ‘Keynesianism’. Instead, the negative end of the agenda index will be called ‘Narrow agenda’ and the positive end of the index ‘Broad agenda’.

#### 4.2.6 Reliability of the agenda index

The reliability of the WordFish estimators depends on the number of unique words in the entire sample. Every unique word is an independent observation, so as the number of words increase, the algorithm has more data to base the agenda positions on and the estimation uncertainty decreases. Slapin & Proksch (2008) proved this with a parametric bootstrap. With 10000 unique words, the average confidence interval is 0.1 (p. 721)<sup>5</sup>. The number of unique words in the estimation in this thesis is approximately 35000, which means that the average confidence interval around the scores is probably even smaller than 0.1.

#### 4.2.7 Dispersion indicators

The WordFish and LDA algorithm return eleven indicators of agendas of central bankers: the occurrence probabilities of ten interpretable topics and the agenda index score. There is no established dispersion measure in the central bank literature. Therefore, this thesis uses two general statistical dispersion functions: First, the standard deviation of the country scores, i.e. the average deviation from the mean, and second the interquartile range, i.e. the difference between the upper and lower quartiles. The last chapter will reflect on the choice for these measures more extensively. Table 4.3 shows a summary of the process of reduction of the data.

<i>Step</i>	<i>Description</i>	<i>n</i>
1	Assemble all speeches of central bank presidents for all countries and years	1155 (speeches)
2	Measure topics and agenda index score per country per year	194 (documents)
3	Measure dispersion in topics and agenda index score between countries per year	16 (years)

**Table 4.3: Reduction of data in the process of measuring agenda dispersion**

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<sup>5</sup> Slapin & Proksch use a standardized scale (mean = 0, SD = 1), just like this thesis (2008, p. 721), so the results are more or less transferable.

### 4.3 Measuring the effect of euro crisis

#### 4.3.1 Interrupted time-series design

As said above, ITS is used to test if there is a statistically significant change in agenda dispersion between the period before the euro crisis and the period after the euro crisis. The following equation shows the most basic ITS model:

Specification I 
$$y_t = \beta_0 + \beta_1 D_t + e_t$$

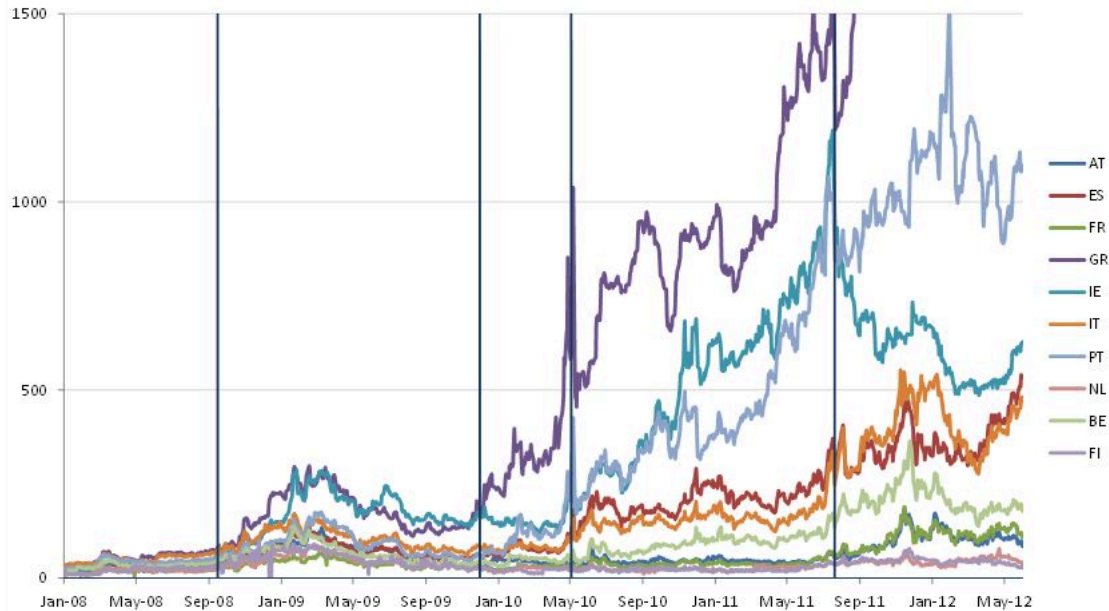
Where  $y_t$  is the agenda dispersion at time  $t$  ( $t = 1, \dots, 16$ ), determined by the presence of the euro crisis ( $D = 1$ ) or absence ( $D = 0$ ) and an error term. The  $\beta_1$  can be interpreted as the difference between the mean before the euro crisis and the mean after the euro crisis. This model is simple and straightforward but does not control for a time trend. Furthermore, no distinction is made between the direct effect and the structural effect. The following equation shows a more extensive model that does take these factors into account:

Specification II 
$$y_t = \beta_0 + \beta_1 T_t + \beta_2 D_t + \beta_3 DT_t + e_t$$

Where  $y_t$  is the agenda dispersion at time  $t$ , determined by time ( $T$ ), the presence of the euro crisis ( $D = 1$ ) or absence ( $D = 0$ ), the time after the interruption of the euro crisis ( $DT$ ) and an error term. The  $\beta_1$  can be interpreted as the time trend, the  $\beta_2$  as the direct effect of the euro crisis and  $\beta_3$  as the structural effect of the euro crisis (Penfold & Zhang, 2013, p. 41). Under the assumption that the euro crisis was an exogenous shock, the causal (direct and structural) effect of the euro crisis can be identified by estimating  $\beta_2$  and  $\beta_3$ . The drawback of this specification compared to the first is that it has more variables, which combined with the low number of observations could lead to overfitting. Therefore, this thesis will use both models. The estimation is executed with the linear regression function of the R package *stats*.

#### 4.3.2 Reflection on the exogeneity of the euro crisis

How justified is the assumption that the euro crisis was an exogenous shock? On the one hand, the start of the euro crisis came as a shock for policy makers in the euro area (Copelovitch et al., 2016, p. 835). Before the publication of the Greek debt fraud, notwithstanding the financial crisis, the spreads in the euro area were very small. After the publication, they skyrocketed (see Figure 4.3).



**Figure 4.3: 10-year government bond spread against the German bond.**

Source: European Central Bank (ECB, 2012).

However, the start of the euro crisis is not a fully *exogenous* event. That is, it is possible that there are confounders that influenced the start of the euro crisis as well as the agenda dispersion between central bankers. One confounder, for example, could be the trust in the markets in the Greek economy after the financial crisis. As visible in Figure 4.4, the spreads already started to disperse after the fall of the Lehman Brothers bank in September 2008. The distrust fuelled the beginning of the euro crisis and could also have an influence on the position of central bankers. Also note that the *effect* of the euro crisis on one particular country is not exogenous and depends – among others - on the economic characteristics of a country.

Ideally, randomization inference would have been used to put the effect of the euro crisis in perspective. Randomization inference compares the estimated effect of the interruption with the estimated effects from a model where the interruption happens at a randomly selected year (see for more explanation e.g. Ho & Imai, 2006). However, as there are only 16 years available, there are no other years that have the necessary eight observations before and after the interruption (see 4.1.2). Therefore, instead of randomization inference, other possible shocks, such as the start of the financial crisis in 2008 and the start of QE in 2014, are taken into account in the descriptive part of the results. Moreover, the output of the ITR is interpreted very carefully.

## 4.4 Economic predictors of agendas

Next to estimating the effect of the euro crisis, the last chapter also formulated a hypothesis (hypothesis 2) about the relationship between national economic characteristics and agendas. The next paragraphs explain how this relationship is tested with a panel model with country-fixed effects and elaborates on the choice for the economic predictors.

### 4.4.1 Panel with country-fixed effects

In order to stay within the scope of this thesis, only the relationship between economic predictors and one agenda-indicator can be examined: the agenda index. The agenda index scores are panel data: cross-sectional and time-series. Panel data makes it possible to control for unobserved country-specific time-invariant effects (hereafter called: country-fixed effects), such as ideas, culture and the variety of capitalism in a country (Croissant & Milo, 2008, p. 3; Hall & Soskice, 2001). This is of great value for testing hypothesis 2, as exactly those country-fixed effects may influence both the economic characteristics of a country as well as the agenda of the central banker. The following linear model is used to estimate the effects of economic predictors on the agenda index score and is integrally taken over from Croissant & Milo (2008):

$$\text{Panel model} \quad y_{it} = \alpha + \beta^T X_{it} + \mu_i + e_{it}$$

Where  $y_{it}$  is the agenda index score for country  $i$  ( $i = 1, \dots, 14$ ) at time  $t$  ( $t = 1, \dots, 16$ ),  $\beta^T$  a vector with effect parameters of selected economic predictors ( $X_{it}$ ) and  $\mu_i$  the fixed effect of country  $i$ .<sup>6</sup> Croissant & Milo's accompanying *plm* package is used to execute the regression in R. It is important to note that the effect parameters estimated with this model indicate correlation between economic predictors and agendas and *not* causation. No conclusions can be drawn about causal effects on basis of this model.

### 4.4.2 Economic predictors and data sources

The second chapter provides suggestions for possible economic predictors from different theoretical perspectives (e.g. paragraph 3.2.3 and 3.3.4). From a practical perspective it is also important that the predictors are available for most of the countries for most of the years. This has led to the inclusion of the following predictors: First, the usual suspects from the Taylor rule: inflation and GDP growth.

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<sup>6</sup> The model thus assumes parameter homogeneity:  $\alpha_{it} = \alpha$  for all  $i, t$  and  $\beta_{it} = \beta$  for all  $i, t$ .



These indicators too form an important part of the economic pillar of the ECB approach, from which additionally GDP per capita, government surplus, sovereign debt and unemployment can be taken (Jung et al., p. 341). The second pillar of the ECB approach includes money and credit flows. Money growth is unfortunately only available on the euro area level, but a credit flow indicator is available. Moreover, from a financial stability perspective, the capital level of banks and their ownership of non-performing loans are important. Lastly, the spreads of government bond vis-à-vis the German bonds as well as the net payment inflows of a country (target 2 balance) are an indicator for the trust of the markets in a country. Table 4.4 gives an overview of the different predictors, their time frame and the source of the data.

	<i>Predictor</i>	<i>Time frame</i>	<i>Source</i>
1	Inflation (%)	2002-2017	Eurostat
2	GDP per capita (EUR)	2002-2017	Eurostat
3	GDP growth (%)	2002-2017	Eurostat
4	Government surplus (% of GDP)	2002-2017	Eurostat
5	Sovereign debt (% of GDP)	2002-2017	Eurostat
6	Unemployment (% of total workforce)	2002-2017	Eurostat
7	Domestic credit to private sector by financial institutions (% of GDP)	2002-2016	WorldBank
8	Spread vis-a-vis German bonds	2002-2017	ECB
9	Target 2 balance (EUR)	2002-2017	IMF
10	Average capital level of banks (%)	2005-2016	WorldBank
11	Non-performing loans (% of average gross loans)	2005-2016	WorldBank

**Table 4.4: Overview of economic predictors and data sources**

#### **4.4.3 Specifications**

With 11 economic predictors, 14 country-fixed effects and a relatively low number of observations (n = 194), there is a risk of overfitting. Moreover, there is a high level of multicollinearity among the selected economic characteristics (see Annex III). Therefore, two specifications with less economic predictors are selected with low levels of multicollinearity (see Table 4.5). First, a very simple specification with four economic variables that are commonly used to describe the economic status of a country: inflation, GDP, government deficit and unemployment. And second, an extended specification that in addition takes the financial sector into account by including the credit supply to the private sector by financial institutions and the amount of non-performing loans.

<i>Specification 1</i>	<i>Specification 2</i>
<ul style="list-style-type: none"> <li>- Inflation</li> <li>- GDP growth</li> <li>- Government deficit</li> <li>- Unemployment</li> </ul>	<ul style="list-style-type: none"> <li>- Inflation</li> <li>- GDP growth</li> <li>- Government deficit</li> <li>- Unemployment</li> <li>- Domestic credit to private sector by financial institutions</li> <li>- Non performing loans</li> </ul>

**Table 4.5: The economic predictors that are used in the two panel model specifications**

## 5. Results

*This chapter presents the results of the analysis of agenda dispersion between central bankers in the period 2002-2017 and is divided into three parts. The first part focusses on the dependent variable and its development over time according to the topic probabilities and agenda index scores. Part two contains the results from the ITS analysis and addresses the effect of the euro crisis. The last part explores national economic predictors of the agenda index scores.*

### 5.1 Agenda dispersion in the euro area

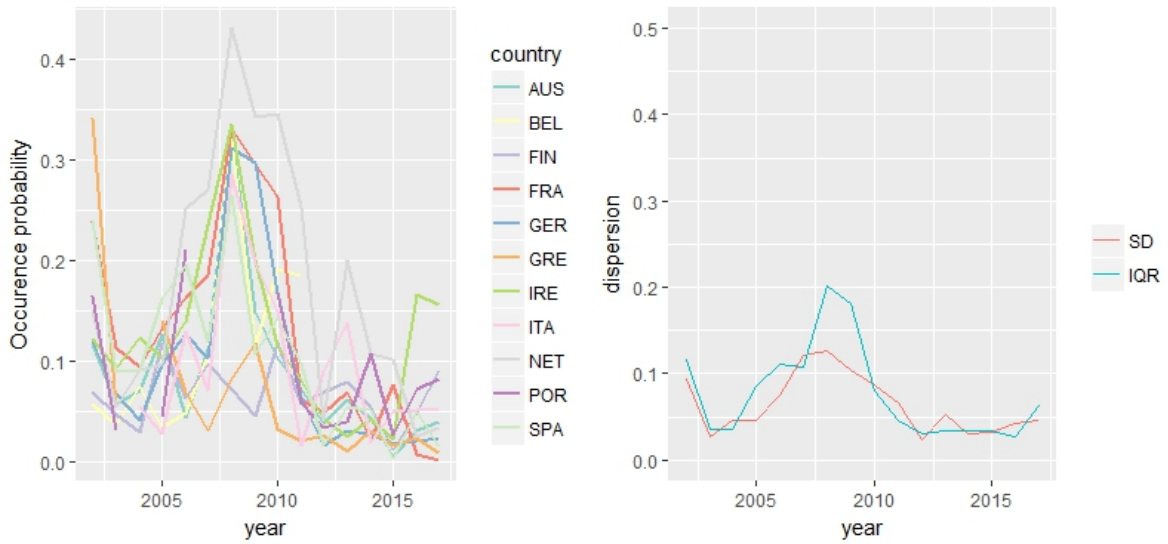
#### 5.1.1 Topic probabilities

To get a first overview of the content of central bankers' agendas and how agenda dispersion develops over time, this section highlights four out of the ten topics from the topic analysis. For each of the topics, a figure with two panels is included (Figure 5.1-5.4). The left panel plots the occurrence probability of the topic over time for selected countries<sup>7</sup>. This panel thus shows how often central bankers talk about the topic and how this has changed over time. The right panel of each figure plots the development of the two dispersion indicators over time: the standard deviation (SD) and the interquartile range (IQR) of the occurrence probabilities in a year. The same figures for the other topics and descriptive statistics of all topics are available in Annex IV.

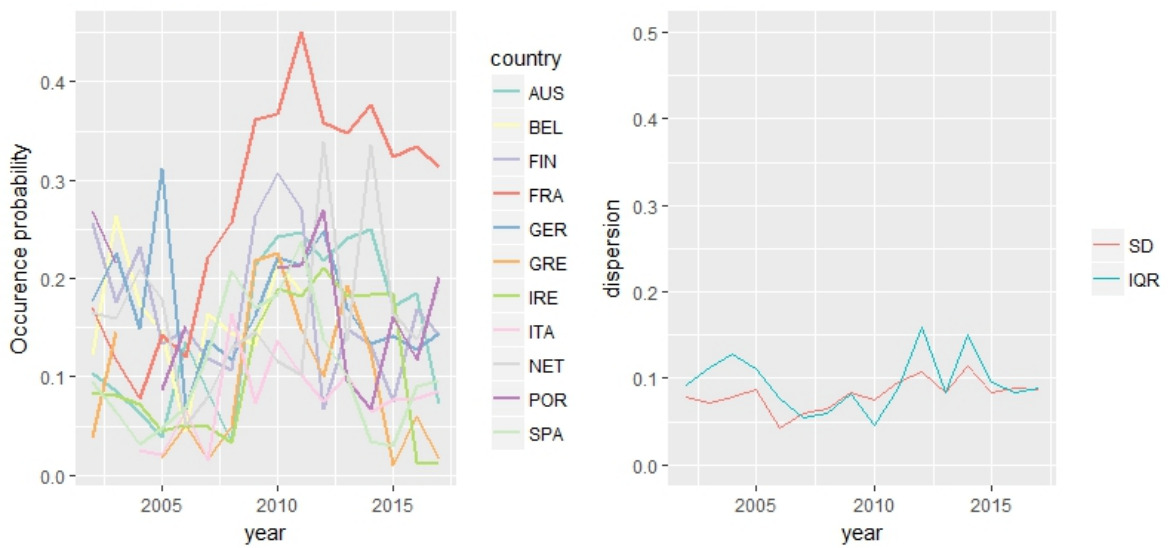
Figure 5.1 concerns the topic 'Financial risk'. Most of the countries do not talk about this topic before the financial euro crisis (left panel). After 2006, the appearance of the topic quickly increases, reaching its peak at the height of the euro crisis, 2008. Especially the central banker from The Netherlands addresses this topic, whereas Greece and Finland do not increase attention to the topic. This explains the small peak in the dispersion scores around this period (right panel). After 2011, the attention for the topic fades away and consequently also the dispersion is low again. The same trend is visible in the development of the topic 'Euro crisis', although starting a few years later (Figure 5.2). After 2010, the occurrence probabilities (left panel) for almost all countries have increased, except for Italy. After 2013, the interest for the topics decreases, with the exception of France and occasionally The Netherlands and Portugal.

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<sup>7</sup> To make the figures more readable, the figures in this chapter only display results for the eleven largest countries. Luxembourg, Malta and Cyprus are excluded. Descriptive statistics for all countries are available in Annex IV.

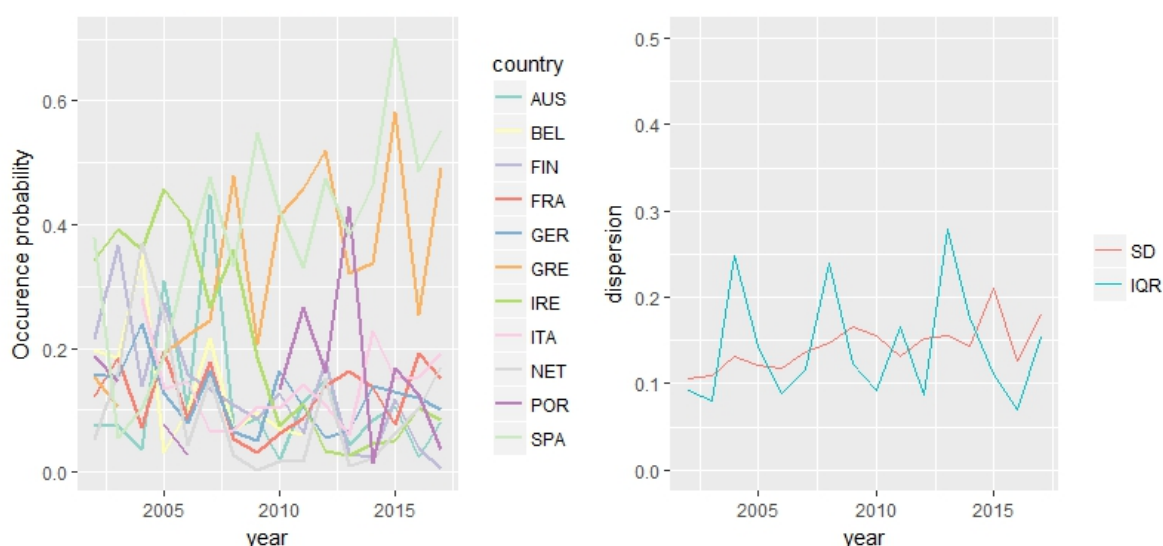


**Figure 5.1: Occurrence probability and dispersion topic 'Financial risk'.**  
Dispersion measured by the standard deviation (SD) and the inter quartile range (IQR) of the occurrence probabilities.



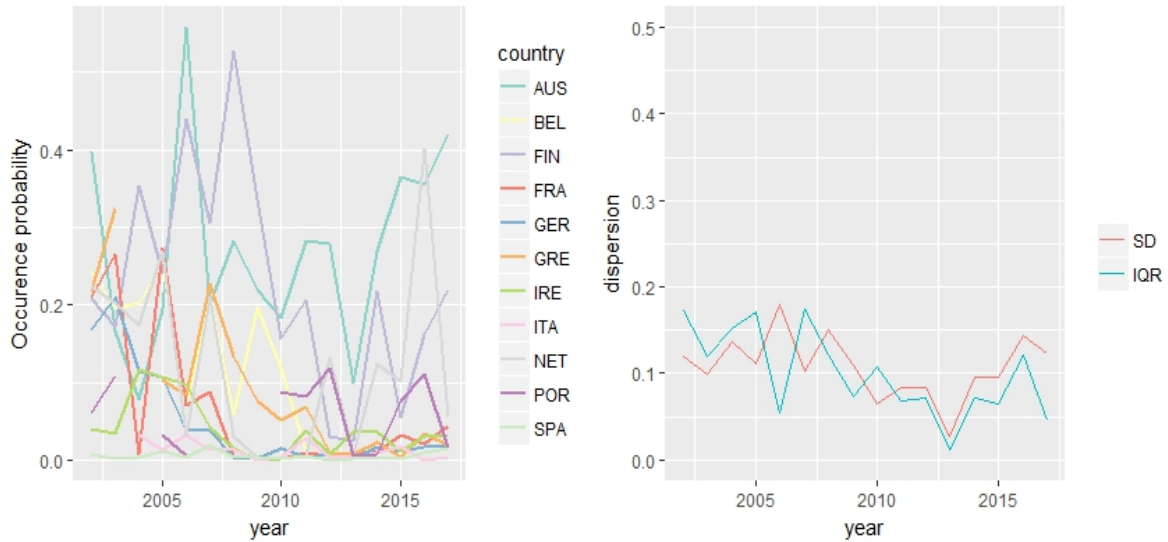
**Figure 5.2: Occurrence probability and dispersion topic 'Euro crisis'.**  
Dispersion measured by the standard deviation (SD) and the inter quartile range (IQR) of the occurrence probabilities.

The next topic, ‘Growth and investment’, shows a different trend (Figure 5.3). Before 2006, the occurrence probabilities (left panel) of all countries are spread somewhere between 0 and 0.4, with the exception of Ireland. After 2006, a dichotomy appears between Greece and Spain on the one hand and the other countries on the other hand: Greece and Spain mention the topic quite often, whereas the other countries do not have higher scores than 0.2. The dispersion indicators (right panel) behave different. On the one hand, the IQR indicator is quite volatile, that is, the upper and lower quantiles come closer and further apart once every five years. On the other hand, the standard deviation from the mean (SD) slightly increases and peaks in 2015. The bifurcation observed in the left panel is thus only moderately picked up by the dispersion in the right panel.



**Figure 5.3: Occurrence probability and dispersion topic ‘Growth and investment’.** Dispersion measured by the standard deviation (SD) and the inter quartile range (IQR) of the occurrence probabilities.

Figure 5.4 shows that a select group of countries talks about the topic ‘European integration’ (left panel). Austria and Finland almost always address the topic. Greece, France and Belgium have high occurrence probabilities especially before the euro crisis and The Netherlands after the crisis. The other countries do not talk about European integration at all. This development is reflected in the dispersion scores (right panel): after 2008 both indicators decrease, when Greece, France and Belgium stop talking about the topic and increases again in 2014.

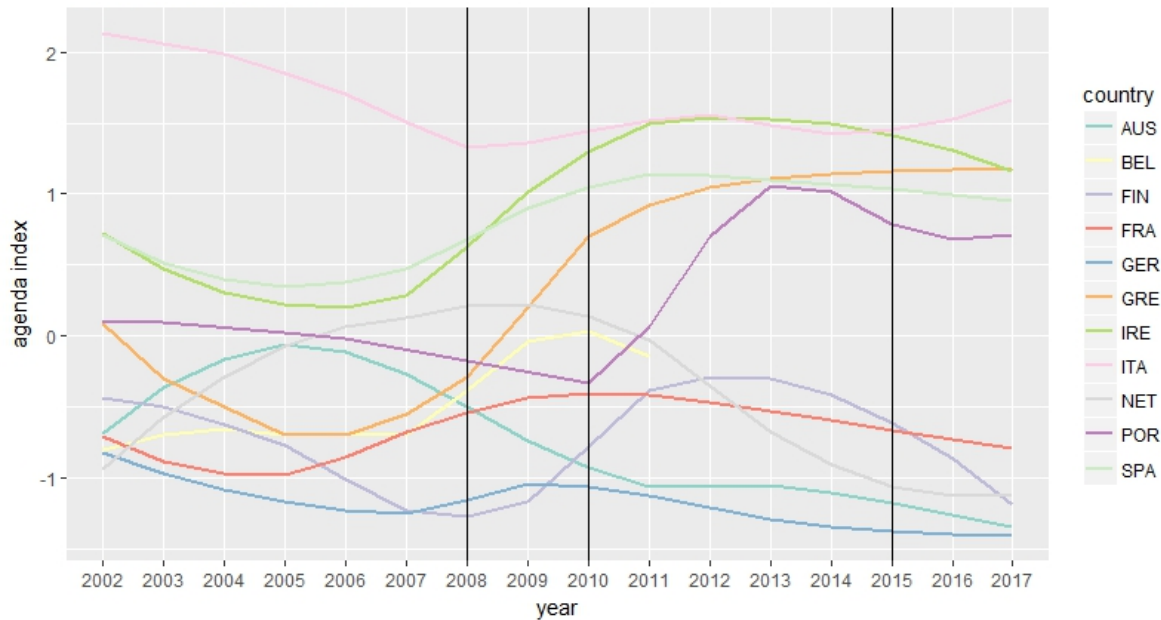


**Figure 5.4: Occurrence probability and dispersion topic ‘European integration’.** Dispersion measured by the standard deviation (SD) and the inter quartile range (IQR) of the occurrence probabilities.

### 5.1.2 Agenda index indicator

Turning now to the agenda index indicator, Figure 5.5 plots the development of the agenda index score per country. To ease the interpretation, the lines are smoothed, the original graph is available in Annex IV. On the basis of the scores it is possible to compare countries’ agendas and the development over time. As discussed in the previous chapter, scores at the negative end of the agenda index indicate a narrow agenda, and scores at the positive end of the index a broad agenda. From 2002 to approximately 2008, the start of the euro crisis, there is relative stability. Two aspects stand out. First, the difference between Italy and the others; Italy has a significant higher agenda index score over the period compared to the other countries. Second, there is no major change in countries’ score, except for the Netherlands, that moves more to the broad end of the scale and Greece, which moves down and then up again.

In the second period, after 2008, countries start to move. Greece, Spain, Belgium, Ireland and Finland move to the ‘broad’ end of the scale, whereas Austria’s score decreases. Germany and Italy stay stable. After 2010, the start of the euro crisis, Greece, Spain and Ireland continue with relatively high scores, whereas the Netherlands, Belgium and Finland and Austria move back to the ‘narrow’ end of the scale. The result is a bifurcation between the Southern and the Northern countries.



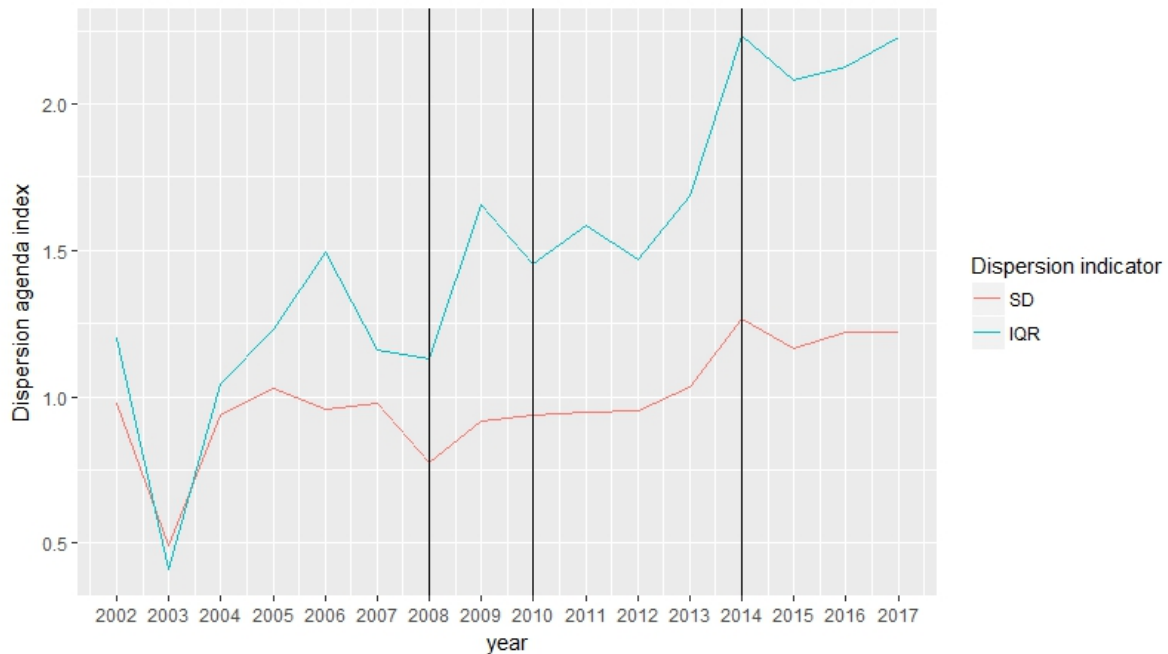
**Figure 5.5: Agenda index scores per country and year**

The vertical lines indicate consecutively 1) the start of the financial euro crisis, 2) the start of the euro crisis and 3) the start of the QE programme.

Time trend smoothened with Local Polynomial Regression Fitting, method = loess.

The above observations are partly visible in the development of the two dispersion indicators (see Figure 5.6). Before the start of the financial euro crisis, the IQR dispersion indicator moves between 1.0 and 1.5, with the exception of 2003, a year with an extreme low score<sup>8</sup>. After 2008, IQR dispersion moves up to values around 1.5 until 2014, when dispersion peaks. The SD dispersion indicator shows the same trend, although in a subtler way.

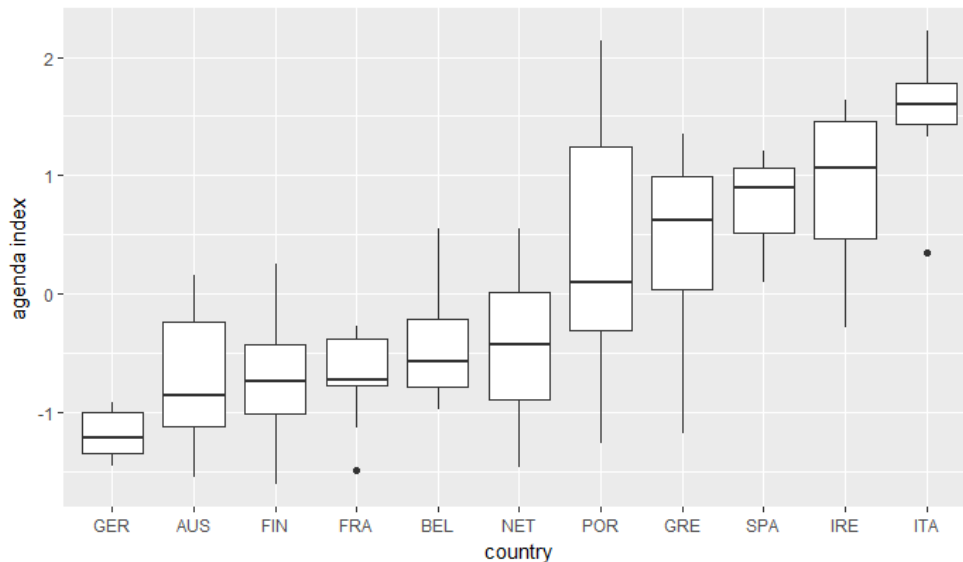
<sup>8</sup> To look for an explanation of this low score, the speeches and country scores underlying these scores have been checked extensively. There is no sign of coding error. One possible explanation is measurement error: 2003 is the year with the lowest amount of speeches (34), which reduces the number of observations and thus increases the measurement uncertainty.



**Figure 5.6: Dispersion between central bankers on the agenda index, measured by the standard deviation (SD) and the inter quartile range (IQR)**  
 The vertical lines indicate consecutively 1) the start of the financial euro crisis, 2) the start of the euro crisis and 3) the start of the QE programme.

Another way to get an idea of the IQR indicator scores, is to look at the box plot of the agenda index scores per country (Figure 5.7). Italy and Germany represent the extremes: the scores from Germany are grouped at the negative end of the scale, whereas all scores from Italy are at the positive end. Italy is accompanied by Spain and Ireland, Germany by Austria, Finland, France and Belgium. The Netherlands, Portugal and Greece are more in the middle. From the boxplots it becomes clear that some countries are quite consistent in their position, whereas others are more dispersed: The scores of Portugal, for example, are quite wide spread.





**Figure 5.7 Boxplot agenda index scores per country**  
Countries sorted by mean agenda index score

## 5.2 The effect of the euro crisis

To see if the dispersion increased significantly over time, the results of the ITS regressions are shown in Table 5.1 and 5.2. Table 5.1 presents the results for specification I and Table 5.2 the results for specification II (see 4.3.1). To prevent unnecessary repetition, the following description focusses on the IQR dispersion indicator and only reports the SD indicator if there is a noteworthy difference in the results. Tables 5.1 and 5.2 therefore only include the results for the IQR dispersion indicator, the same results for the SD indicator are in Annex IV.

### 5.2.1 Specification I: Comparing means

Column 1 of Table 5.1 shows the results for the regression on the dispersion in the agenda index. As described in the previous chapter, the parameter of the dummy of the euro crisis in specification I can be interpreted as the difference in average dispersion scores before and after the start of the euro crisis (see 4.3.1). The effect of the dummy on dispersion is significantly positive at the one percent level. That is, regarding the agenda index, the average dispersion after the euro crisis was higher than before the euro crisis.

Turning to the dispersion in topics (columns 2-11), the effect of the euro crisis dummy is also highly significant ( $p < 0.01$  or lower) and positive for three topics: Dispersion on the topic ‘Banking sector’ increased, just as dispersion on ‘Government / bank debt’ and ‘Fiscal stability’. The dispersion

declined for topic ‘Basel II’, ‘European integration’ and ‘Price stability’ ( $p < 0.05$ ). The dispersion on the topic ‘Financial risks’ also declined significantly ( $p < 0.05$ ), but this effect is not noticeable for the SD dispersion measure. Taking the results for specification I together, it can be concluded that the differences between the agendas of central bankers in the euro area change significantly over time.

### **5.2.2 Specification II: the direct and structural effect**

The results of specification II are less convincing. In specification II the dummy parameter can be interpreted as the direct effect of the euro crisis and the ‘Time after’ parameter as the structural effect of the euro crisis. For the agenda index score (column 1) there is no significant direct effect, nor a significant structural effect. With regard to the topic indicators (column 2-11), also here, almost no effect is significant. There are two noteworthy exceptions. First, the structural effect of the euro crisis is significant for the topics ‘Financial risks’ and ‘Fiscal stability’, signalling that dispersion on ‘Financial risks’ declined and dispersion on ‘Fiscal stability’ increased. Second, although the direct effect of the crisis on dispersion in topic ‘Government / bank debt’ is not significant when measured with the IQR dispersion indicator, the effect is highly significant as measured by the SD dispersion ( $p < 0.001$ ); indicating that immediately after the debt crisis, in 2010, dispersion on ‘Government / bank debt’ soared.

The results of this section lead to the following interim conclusion: The dispersion between central bankers in the agenda index and most of the topics changes significantly over time. So, the extent to which central bankers focus on the same issues can vary. However, there is only little evidence that *the euro crisis is the significant driver of this change*, as there is no significant direct or structural effect of the euro crisis on the agenda index or most of the topics. Paragraph 6.2 discusses these results further.

<i>Dependent variable:</i>											
	Dispersion (IQR)										
	<i>Agenda index</i>	<i>Financial risks</i>	<i>Basel II</i>	<i>Growth and investment</i>	<i>Banking Sector</i>	<i>Government / bank debt</i>	<i>Euro crisis</i>	<i>Fiscal stability</i>	<i>Not interpretable</i>	<i>European integration</i>	<i>Price stability</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Dummy debt crisis (year > 2009 = 1)	0.69** (0.18)	-0.07* (0.02)	-0.02* (0.01)	0.001 (0.03)	0.10*** (0.01)	0.08*** (0.02)	0.01 (0.02)	0.04** (0.01)	-0.01 (0.01)	-0.06* (0.02)	-0.11* (0.04)
Constant	1.17*** (0.13)	0.11*** (0.02)	0.05*** (0.01)	0.14*** (0.02)	0.03** (0.01)	0.02 (0.01)	0.09*** (0.01)	0.03** (0.01)	0.04*** (0.01)	0.13*** (0.01)	0.17*** (0.03)
Observations	16	16	16	16	16	16	16	16	16	16	16
R <sup>2</sup>	0.52	0.39	0.30	0.0000	0.76	0.61	0.03	0.44	0.13	0.38	0.36
Adjusted R <sup>2</sup>	0.49	0.34	0.25	-0.07	0.74	0.59	-0.04	0.40	0.06	0.33	0.32
Residual Std. Error (df = 14)	0.35	0.04	0.02	0.07	0.03	0.04	0.03	0.03	0.02	0.04	0.08
F Statistic (df = 1; 14)	15.20**	8.80*	5.97*	0.0004	44.07***	22.29***	0.37	11.05**	2.01	8.56*	7.91*

*Note:*

\*p<0.05; \*\* p<0.01; \*\*\*p<0.001

**Table 5.1 Interrupted time-series regression on dispersion (IQR) specification I**

<i>Dependent variable:</i>											
Dispersion (IQR)											
	<i>Agenda index</i>	<i>Financial risks</i>	<i>Basel II</i>	<i>Growth and investment</i>	<i>Banking Sector</i>	<i>Government / bank debt</i>	<i>Euro crisis</i>	<i>Fiscal stability</i>	<i>Not interpretable</i>	<i>European integration</i>	<i>Price stability</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Dummy debt crisis (year > 2009 = 1)	-0.18 (0.26)	-0.12** (0.03)	-0.03 (0.02)	-0.02 (0.07)	0.04 (0.03)	0.06 (0.04)	0.03 (0.03)	0.02 (0.02)	-0.001 (0.02)	-0.02 (0.04)	-0.12 (0.09)
Time after (DT)	0.04 (0.06)	-0.02* (0.01)	0.003 (0.004)	-0.01 (0.02)	-0.004 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01* (0.005)	0.002 (0.004)	0.01 (0.01)	-0.01 (0.02)
Time (T)	0.09* (0.04)	0.02** (0.01)	0.0001 (0.003)	0.01 (0.01)	0.01* (0.004)	-0.001 (0.01)	-0.01 (0.005)	-0.01 (0.003)	-0.002 (0.003)	-0.01 (0.01)	0.004 (0.01)
Constant	0.77** (0.20)	0.03 (0.03)	0.05** (0.01)	0.11 (0.06)	-0.01 (0.02)	0.03 (0.03)	0.12*** (0.02)	0.05** (0.02)	0.05** (0.01)	0.17*** (0.03)	0.16* (0.07)
Observations	16	16	16	16	16	16	16	16	16	16	16
R <sup>2</sup>	0.79	0.70	0.35	0.03	0.85	0.64	0.18	0.69	0.17	0.47	0.37
Adjusted R <sup>2</sup>	0.74	0.62	0.19	-0.21	0.81	0.55	-0.03	0.61	-0.03	0.34	0.21
Residual Std. Error (df = 12)	0.25	0.03	0.02	0.07	0.03	0.04	0.03	0.02	0.02	0.04	0.09
F Statistic (df = 3; 12)	14.91***	9.28**	2.17	0.12	23.02***	7.04**	0.85	8.91**	0.84	3.56*	2.32

Note:

\*p<0.05; \*\* p<0.01; \*\*\* p<0.001

**Table 5.2 Interrupted time-series regression on dispersion (IQR) specification II**

## 5.3 National predictors of agendas

### 5.3.1 Economic predictors and dispersion

Table 5.3 shows the results of the panel regression of economic predictors on the agenda index. Column 1 shows the estimated parameters of the first specification with inflation, GDP growth, budget surplus and unemployment as predictors. Only the parameter of unemployment is significant: if unemployment increases by one percent, the agenda index score increases, i.e. central bankers consider a broader range of topics. However, this effect disappears when financial sector predictors are added to the regression in the second specification (column 2). Now the budget deficit and the amount of Non-Performing Loans are significantly correlated with the agenda index score. In other words, the status of government finances is a predictor for how central bankers score on the agenda index: if the budget surplus increases with one percent, the agenda index score decreases, i.e. central bankers move to the narrow end of the index. Furthermore, the status of the financial sector is important: if the percentage of NPL's of total loans goes up with one per cent point, the agenda index score increases, i.e. the central banker is more at the broad end of the agenda index.

The fact that unemployment is only significant in the first specification could be explained by missing values: there is almost no data on non-performing loans before 2006, which causes the drastic decrease in observations in columns 2 to 5. However, when the specification in column 1 is run again with only data from 2006 to 2017, the results stay the same (see Annex IV). More likely, therefore, the results may indicate that unemployment acts as a sponge that soaks up all kinds of economic developments, also in the financial sector. If credit supply to the private sector goes down, for example, more businesses will fail, and unemployment goes up. When controlling for these financial sector predictors, unemployment in itself has no significant effect on the agenda index anymore. This conclusion is supported by further robustness checks. The effects found in the extended specification are robust for dropping unemployment from the model (column 4) and adding the full range of predictors (column 5).

Although these effects are correlations and not causal effects, the results indicate at least that there is a possibility that central bankers look at the fiscal status of their own national government and the status of their national banking sector when choosing their topics.

	<i>Dependent variable:</i>			
	Agenda index			
	(1)	(2)	(3)	(4)
Inflation (%)	-0.06 (0.04)	0.004 (0.04)	0.01 (0.04)	-0.01 (0.04)
GDP per capita (EUR)				-0.0000 (0.0000)
GDP growth (%)	-0.004 (0.01)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)
Budget deficit (% GDP)	-0.01 (0.01)	-0.04** (0.01)	-0.04** (0.01)	-0.04** (0.01)
Sovereign debt (% GDP)				-0.01 (0.01)
Unemployment (%)	0.07*** (0.01)	-0.02 (0.02)		0.01 (0.03)
Private credit supply (EUR)		-0.004 (0.003)	-0.004 (0.003)	-0.01* (0.005)
Spread vs German bonds				0.05 (0.03)
Target-2 imbalances (EUR)				0.00 (0.00)
Average capital level banks (%)				0.02 (0.07)
Non Performing Loans (%)		0.05*** (0.01)	0.05*** (0.01)	0.06*** (0.01)
Observations	193	117	117	110
R <sup>2</sup>	0.27	0.42	0.42	0.49
Adjusted R <sup>2</sup>	0.19	0.32	0.32	0.35
F Statistic	15.81*** (df = 4; 175)	11.97*** (df = 6; 98)	14.29*** (df = 5; 99)	7.46*** (df = 11; 86)

*Note:*

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001

**Table 5.3: Panel regression results of economic predictors on the agenda index score**

Data sources: see Table 4.3

Differences in the number of observations are due to missing values

Two other results are worth highlighting. First, inflation and GDP growth are insignificant in all specifications. This is striking, as almost all models on monetary policy use these two indicators to explain monetary policy choices (see paragraph 3.2.3). Second, it is interesting that the budget surplus parameter is significant, and the government debt parameter is not, although excessive debt is a larger threat for the stability of a country in the long term than an occasional high budget deficit (De Kam, Koopmans & Wellink, 2011, p. 49). This may indicate that central bankers rather take a short-term perspective instead of a long-term perspective.

### 5.3.2 Country-fixed effects

To see what remains from the differences between countries when economic variables are taken into account, table 5.4 presents the country-fixed effects from the specification in column 2. The effects are significant for Austria, Germany, Italy and Spain. Austria and Germany on average have a lower agenda index scores, whereas Italy and Spain have a significantly higher agenda index score. These results indicate that these countries, regardless of the national economic conditions, always lean a bit more to the narrow or broad end of the scale. It is however, not possible to say if these effects represent different time-invariant ideas, economic characteristics, institutions or a combination (see also paragraph 3.3.2).

	Estimate	Std. Error	t-value	p-value
Austria	-0.718	0.324	-2.216	0.029*
Belgium	-0.144	0.299	-0.481	0.632
Cyprus	-0.124	0.766	-0.162	0.872
France	-0.437	0.352	-1.241	0.218
Germany	-0.982	0.322	-3.055	0.003**
Greece	-0.013	0.416	-0.032	0.974
Ireland	0.767	0.437	1.754	0.083
Italy	1.237	0.313	3.955	0.0001***
Luxembourg	0.427	0.393	1.088	0.279
Malta	0.748	0.413	1.809	0.074
Netherlands	-0.218	0.386	-0.565	0.573
Portugal	0.333	0.478	0.698	0.487
Spain	1.198	0.544	2.201	0.030*

Note: \*p<0.05; \*\*p<0.01; \*\*\*p<0.001

**Table 5.4: Country-fixed effects of the extended panel model regression (see column 2 Table 5.3)**

## 6. Conclusion and discussion

*This last chapter answers the central question of this thesis: What is the effect of the euro crisis on agenda dispersion between central bankers in the euro area? First, the results of the previous chapter are compared to the hypotheses formulated in the theory framework chapter. The section thereafter reflects upon these results and evaluates the research design and measurement of agenda dispersion. The last sections discuss the broader meaning of the results for the study of politics and economics and the future of the European Monetary Union (EMU), respectively.*

### 6.1 Agendas and the crisis: answering the research question

This thesis chose to study the central question in light of two perspectives. First, from an *independent authority* perspective, it was expected that technocratic goals and approaches work as convergent factors and central bankers have more or less the same agendas, before as well as after the euro crisis. The null hypothesis was that agenda dispersion does not vary over time. Second, the *political economy* perspective posed that there are also diverging factors to be considered; different ideas and interests. So, it was hypothesized that agenda dispersion does vary over time (hypothesis 1) and that national economic indicators are correlated with agendas (hypothesis 2). Lastly, as the crisis strengthened the dispersion in ideas and interests, it was expected that the crisis increased the agenda dispersion (hypothesis 3).

The results presented in the previous chapter tend to support the second perspective. To begin with, central bankers have different agendas in two ways. Firstly, the topic analyses showed that the topics that central bankers address change over time. ‘European integration’ is such a topic: after the crisis years, central bankers use less words that are related to further integration of the European union and the euro. Secondly, and more important, central bankers from different countries have different agendas at the same time. After the financial crisis, for example, Spain and Greece have the topic ‘Growth and investment’ high on the agenda, whereas the other countries do not. Regarding the overall agenda index, which takes all topics together, there are substantial differences over time. Before 2008, Italy was isolated at the broad end of the index, with all the other countries close to or on the narrow end of the index. Countries started to move in 2008 and since 2010 there is a bifurcation between the Northern and the Southern countries on the agenda index. The increase in dispersion over time on the agenda index is statistically



significant. Altogether, this does not support the null hypothesis: ‘Agenda dispersion does not vary over time’ and does support hypothesis 1: ‘Agenda dispersion varies over time’.

Moreover, the results of the panel analysis are also in support of the second perspective. National economic predictors are significantly correlated to central bankers’ position on the agenda index. These results cannot prove that central bankers take national economic indicators into account when constructing their agendas, but do point in the direction of this conclusion. Surprisingly, these factors are not the standard factors inflation and GDP growth, but government budget surplus and non-performing loans. These results support hypothesis 2: Central bankers take national economic indicators into account in their agendas.

Turning now to the effect of the euro crisis: the evidence that the euro crisis had a significant effect on agenda dispersion is very weak; the direct and structural effect is not significant for most of the indicators. There is not enough support for hypothesis 3. The answer on the research question is: there is not enough evidence to conclude that the euro crisis had a significant effect on dispersion, i.e., that the euro crisis was a significant driver of the change in dispersion. The next paragraph reflects on this answer.

## **6.2 Discussion**

There are two aspects of the design of this thesis that could explain the insignificant result of the euro crisis described above. First, as already pointed out in chapter 4, the euro crisis was preceded by a financial crisis in 2008. It is unfortunately not possible to measure the effect of the financial crisis, as there are not enough observations before 2008. However, a possible premise could be that the effect of the financial crisis interacted with the effect of the euro crisis. This is best to illustrate with the results on the agenda index (see figure 5.4). After 2008, when financial problems hit the euro area, the southern countries and Ireland started to move to the broad end of the agenda index. After 2010, when interests of countries in the north and south begin to disperse, most of the northern countries move further to the narrow end of the index, while the southern countries stayed where they are. It looks like the dispersion increase has taken place in two steps, which is not measurable with the chosen ITS specification. Further research could study this interaction into more detail with Causal Process Tracing (Blatter & Haverland, 2012, p. 27).

The second aspect to consider is the operationalization of *dispersion*. Next to the SD and IQR indicator there are other ways to measure dispersion that might have been more straightforward to interpret. Further research, for example, could look at clustering of countries over time. Methods that are used in network analysis offer clustering measures that can indicate the level of clustering, the different clusters and the distance between different clusters (see e.g. Hennig, 2012, p. 134).

More general it is necessary to reflect upon the used algorithms. The great benefit of the WordFish algorithm is that it produces results that are comparable over time and across country. A drawback of the WordFish algorithm is that the dimension has no a priori meaning and relies on interpretation. This thesis has based this interpretation on word scores, but the question still remains what a score of 0.1 on the agenda index or a difference of 0.2 between countries actually *means*. The same goes for the interpretation of the LDA scores, the occurrence probabilities. What does it exactly mean that a central banker has a 0.4 probability to talk about ‘Growth and investment’? These questions indicate the need for more fundamental research in the area of quantitative text analysis.

### **6.3 Theoretical and methodological implications**

With these critical reflections in mind, the theoretical and methodological implications of the results of this thesis can be considered. To begin with the theoretical implications; all in all, the above summarized results offer support for the view on central bankers that was derived from the political economy perspective: central bankers are not just technocrats who academically reflect on the one best solution for the euro area. They are individuals with different (national) interests and ideas. This does *not* mean that they do not consider the two-pillar approach or do not want the best for the eurozone. It means that next to the converging forces, central bankers are also subject to diverging forces.

As a consequence, for the field of econometrics, it is time to take a broader set of factors into account when talking about monetary policy and the priorities of central bankers. It is time for economics to take *political ideas and interests seriously*. As long as there are different ideas about the aim and means of monetary policy and different national interests, central bankers will not have the same agendas and not the same priorities. Furthermore, the results of this thesis suggest that it is time to revise the macro-economic predictors of monetary policy. This thesis

showed, for example, that the amount of bad loans in the financial sector is an important predictor for central bankers' agendas, whereas the classic Taylor predictors inflation and GDP growth are not. This points at the necessity for cross-fertilization between the field of financial and monetary economics. Further research should take these factors into account.

Thirdly, the field of political science should take note of the finding of this thesis that the central bankers of Germany and France did not and do not differ so much in their agendas on monetary policy. This result questions the relevance of the French-German divide for explaining differences within the euro area (see 3.3.1). The developments on the agenda index imply that the Italy-German or South-North axis may be more important. The French-German axis is also often used in political science to explain non-economic dynamics in the European Union (e.g. Baun, 2018; Krotz & Schild, 2018; Otero-Iglesias & Steinberg, 2017). It would be interesting to explore if the alternative axes found in this thesis are important in other domains too.

Fourth and last, quantitative text analysis – although not fully matured (see above) – is a promising methodology. There are thousands of documents that turn into valuable data from a quantitative text analysis perspective. Moreover, quantitative text analysis provides a way to take less tangible factors, such as ideas, into account. Researchers who study lobbying in the European Union, for example, it is until now very difficult to trace down influence from interest groups (Joosen, Haverland & De Bruijn, 2018). With quantitative text analysis, similarities between interest group position papers and documents throughout the whole decision-making process can be tracked and analysed.

#### **6.4 Policy implications**

The findings of this thesis also have a number of important implications for future policy regarding the EMU. (Increasing) diverging agendas could have three problematic consequences. First, it could put the legitimacy of the ECB as an independent authority under pressure. Independent authorities owe their exceptional status outside the political arena to their expertise and independence (see paragraph 3.2.1). Dispersing agendas, however, indicate that central bankers are not always technocrats that discuss what is best for the euro area in a consensual way, independently from economic circumstances of individual countries. Indeed, this thesis suggests that decision making is more of a political nature. This endangers the expertise and independence and raises the question if central bankers still have a legitimate position. An often-heard

possibility to enhance legitimacy of independent authorities is to increase transparency and ex-ante accountability (e.g. Kovacic & Hyman, 2012, p. 11; Ottow, 2016, p. 25, Scholten, 2017). But is this really enough if interests and priorities are highly dispersed in the first place?

The second problematic consequence concerns the decision-making capacity of the Governing Council. The bifurcation in the agendas of central bankers, with two groups of countries that oppose each other, may put appropriate and fast decision making in jeopardy (Van Esch, 2014, p. 288). This would be a problem if a next crisis hits the euro area. Third and related, different agendas and national interests endanger the EMU in a more existential way. How long can the euro live with such (structural) economic imbalances (Frieden & Walter, 2017)?

To encounter these challenges, this last section proposes two possible strategies. First, the ECB could foster alignment of *ideas* in the euro area with tools stemming from the EU public administration literature. By providing fora for exchange and mutual learning between central bankers in the euro area, the ECB could increase professional homogeneity among central bankers (Eberlein & Newman, 2008, p. 36). Second, the EU institutions could increase efforts to align economic *interests* by supporting measures that enhance economic convergence, also in times of crisis. For example, the European Commission recently proposed to establish a European Investment Stabilization Function that would help sustaining investments in countries faced with an economic shock (European Commission, 2018). Policies like this would make an economic shock in one country an issue for all euro area countries and thus increase shared interests. If pursued successfully, the two strategies will decrease the number alternative agendas that were found in this thesis.

All in all, the practical policy implications discussed here show that understanding of central bankers' agendas in the euro area is not only relevant and necessary from a theoretical perspective, but also matters in practice. This thesis has set a first step in the direction of increasing this understanding. May other researchers put the topic on their agenda soon too.

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## Annex I: Overview of used speeches

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
AUS	5	6	9	8	1	4	2	6	2	4	2	3	5	5	2	1	65
BEL	2	1	3	1	2	6	2	1	3	2	0	0	0	0	0	0	23
CYP	0	0	0	0	0	3	8	6	7	4	6	2	6	1	1	3	47
FIN	1	1	3	2	9	9	6	2	4	5	5	7	6	5	6	7	78
FRA	5	1	1	3	5	12	16	9	10	11	11	8	9	8	17	27	153
GER	3	3	8	4	8	5	12	12	14	11	9	18	19	15	13	16	170
GRE	1	3	0	2	2	1	7	3	2	3	1	4	9	2	12	11	63
IRE	1	3	4	4	6	5	7	7	13	5	11	11	8	9	9	12	115
ITA	14	0	6	5	6	3	8	14	8	14	8	12	5	13	11	8	135
LUX	1	2	1	1	3	2	6	4	7	8	0	0	0	2	0	0	37
MAL	0	0	0	0	0	0	4	3	4	3	3	2	0	2	0	5	26
NET	8	3	3	4	3	6	13	8	8	6	4	3	2	2	1	8	82
POR	3	1	0	1	3	0	0	0	7	3	1	4	3	1	1	5	33
SPA	2	10	11	9	4	5	3	10	7	8	10	14	11	8	6	10	128
Total	46	34	49	44	52	61	94	85	96	87	71	88	83	73	79	113	1155

## Annex II: WordFish model

The WordFish model, R code and explanation are integrally taken over from Slapin & Proksch (2008) and adjusted for the context of this thesis.

The model looks as follows;

$$y_{ijt} \sim \text{Poisson}(\lambda_{ijt})$$
$$\lambda_{ijt} = \exp(\alpha_{it} + \psi_j + \beta_j * \omega_{it})$$

Where  $y_{ijt}$  is the count of word  $j$  in country  $i$ 's speeches in year  $t$ ,  $\alpha_{it}$  is a set of country-year fixed effects,  $\psi_j$  a set of word fixed effects,  $\beta_j$  is an estimate of a word specific weight capturing the importance of word  $j$  in discriminating between country positions and  $\omega_{it}$  is the estimate of country  $i$ 's position in year  $t$  (therefore  $it$  is indexing one set of speeches given by the central bank president of country  $i$  in year  $t$ ).

The only input required from the researcher is to point at two reference documents that are most likely to be very different from each other. The algorithm starts the estimation with these two reference documents. The results, however, are not significantly influenced by this choice, as long as the number of documents is fairly large. Based on theoretical considerations (see 3.3.1 and 3.3.2), the chosen documents in this thesis are the document with all the speeches from Germany in 2002 and the document with all the speeches from Greece in 2017.

### Annex III: Multicollinearity checks

	<i>VIF</i>		
	<i>Full</i>	<i>Specification 1*</i>	<i>Specification 2*</i>
Inflation (%)	2.010094	1.168490	1.382868
GDP per capita (EUR)	2.383977		
GDP growth (%)	2.160604	1.219918	1.230353
Government surplus (% of GDP)	1.606627	1.450441	1.440278
Sovereign debt (% of GDP)	7.186054		
Unemployment (% of total workforce)	2.934945	1.487381	1.966013
Domestic credit to private sector by financial institutions (% of GDP)	4.153470		1.309260
Spread vis-a-vis German bonds	2.404520		
Target 2 balance (EUR)	2.186092		
Average capital level of banks (%)	5.444223		
Non-performing loans (% of average gross loans)	1.282561		2.041863

**Table II.1: Results of the Variance Inflation Factors (VIF) tests for the three panel specifications (model = pooling)**

\* See paragraph 4.4.3

## Annex IV: Additional results

### A. Descriptive statistics

	country	mean	SD	min	max	N
1	AUS	-0.738	0.557	-1.546	0.164	16
2	BEL	-0.454	0.458	-0.978	0.552	10
3	CYP	0.252	1.229	-1.172	1.642	11
4	FIN	-0.724	0.501	-1.609	0.255	16
5	FRA	-0.682	0.321	-1.490	-0.270	16
6	GER	-1.182	0.198	-1.445	-0.912	16
7	GRE	0.408	0.833	-1.174	1.351	15
8	IRE	0.950	0.568	-0.280	1.635	16
9	ITA	1.603	0.450	0.344	2.223	15
10	LUX	-0.515	0.636	-1.380	0.555	11
11	MAL	0.600	0.329	-0.063	1.019	8
12	NET	-0.408	0.583	-1.469	0.558	16
13	POR	0.350	0.999	-1.256	2.143	12
14	SPA	0.802	0.349	0.096	1.208	16

### Agenda index

	country	mean	SD	min	max	N
1	AUS	0.087	0.075	0.006	0.326	16
2	BEL	0.116	0.092	0.033	0.321	10
3	CYP	0.053	0.032	0.011	0.094	11
4	FIN	0.067	0.029	0.011	0.118	16
5	FRA	0.131	0.105	0.001	0.332	16
6	GER	0.095	0.094	0.016	0.312	16
7	GRE	0.067	0.086	0.008	0.342	15
8	IRE	0.125	0.083	0.021	0.335	16
9	ITA	0.090	0.077	0.016	0.286	15
10	LUX	0.164	0.149	0.013	0.447	11
11	MAL	0.075	0.041	0.032	0.133	8
12	NET	0.174	0.128	0.024	0.431	16
13	POR	0.086	0.063	0.026	0.210	12
14	SPA	0.106	0.078	0.003	0.265	16

### Financial risks



	country	mean	SD	min	max	N
1	AUS	0.122	0.202	0.002	0.708	16
2	BEL	0.070	0.044	0.022	0.142	10
3	CYP	0.055	0.021	0.019	0.084	11
4	FIN	0.035	0.021	0.012	0.095	16
5	FRA	0.042	0.025	0.013	0.115	16
6	GER	0.025	0.017	0.006	0.074	16
7	GRE	0.032	0.057	0.003	0.230	15
8	IRE	0.040	0.027	0.007	0.096	16
9	ITA	0.036	0.026	0.008	0.085	15
10	LUX	0.050	0.038	0.006	0.147	11
11	MAL	0.028	0.009	0.017	0.042	8
12	NET	0.138	0.150	0.009	0.575	16
13	POR	0.057	0.040	0.012	0.135	12
14	SPA	0.183	0.252	0.011	0.754	16

**Basel II**

	country	mean	SD	min	max	N
1	AUS	0.114	0.112	0.019	0.448	16
2	BEL	0.137	0.099	0.032	0.353	10
3	CYP	0.126	0.058	0.048	0.215	11
4	FIN	0.129	0.096	0.005	0.365	16
5	FRA	0.121	0.054	0.031	0.195	16
6	GER	0.120	0.050	0.050	0.239	16
7	GRE	0.332	0.149	0.105	0.582	15
8	IRE	0.206	0.157	0.026	0.458	16
9	ITA	0.139	0.060	0.061	0.279	15
10	LUX	0.087	0.052	0.021	0.201	11
11	MAL	0.375	0.073	0.303	0.464	8
12	NET	0.101	0.103	0.003	0.368	16
13	POR	0.147	0.115	0.014	0.428	12
14	SPA	0.390	0.168	0.055	0.701	16

**Growth and investment**

	country	mean	SD	min	max	N
1	AUS	0.082	0.067	0.004	0.237	16
2	BEL	0.094	0.107	0.016	0.355	10
3	CYP	0.195	0.112	0.010	0.380	11
4	FIN	0.173	0.185	0.009	0.524	16
5	FRA	0.110	0.087	0.005	0.237	16
6	GER	0.036	0.035	0.003	0.118	16
7	GRE	0.129	0.119	0.006	0.397	15
8	IRE	0.068	0.115	0.003	0.375	16
9	ITA	0.125	0.095	0.004	0.259	15
10	LUX	0.131	0.120	0.011	0.301	11
11	MAL	0.167	0.108	0.045	0.355	8
12	NET	0.101	0.104	0.003	0.295	16
13	POR	0.148	0.091	0.025	0.308	12
14	SPA	0.062	0.071	0.003	0.217	16

**Banking sector**

	country	mean	SD	min	max	N
1	AUS	0.012	0.009	0.002	0.030	16
2	BEL	0.021	0.017	0.006	0.064	10
3	CYP	0.182	0.147	0.015	0.365	11
4	FIN	0.018	0.010	0.004	0.040	16
5	FRA	0.006	0.007	0.002	0.032	16
6	GER	0.007	0.004	0.002	0.016	16
7	GRE	0.062	0.053	0.005	0.169	15
8	IRE	0.264	0.213	0.041	0.582	16
9	ITA	0.016	0.014	0.003	0.051	15
10	LUX	0.017	0.011	0.007	0.042	11
11	MAL	0.072	0.025	0.034	0.112	8
12	NET	0.018	0.010	0.007	0.040	16
13	POR	0.109	0.123	0.004	0.412	12
14	SPA	0.080	0.062	0.003	0.193	16

**Government / bank debt**

	country	mean	SD	min	max	N
1	AUS	0.149	0.080	0.035	0.250	16
2	BEL	0.159	0.058	0.045	0.263	10
3	CYP	0.100	0.088	0.028	0.323	11
4	FIN	0.172	0.073	0.068	0.308	16
5	FRA	0.271	0.114	0.078	0.450	16
6	GER	0.172	0.060	0.068	0.312	16
7	GRE	0.094	0.076	0.011	0.225	15
8	IRE	0.108	0.072	0.011	0.211	16
9	ITA	0.074	0.042	0.014	0.164	15
10	LUX	0.122	0.060	0.027	0.205	11
11	MAL	0.093	0.024	0.060	0.126	8
12	NET	0.165	0.078	0.050	0.339	16
13	POR	0.172	0.069	0.068	0.270	12
14	SPA	0.108	0.064	0.031	0.237	16

**Euro crisis**

	country	mean	SD	min	max	N
1	AUS	0.064	0.053	0.012	0.177	16
2	BEL	0.058	0.051	0.014	0.159	10
3	CYP	0.035	0.048	0.003	0.168	11
4	FIN	0.041	0.019	0.007	0.079	16
5	FRA	0.042	0.043	0.003	0.132	16
6	GER	0.279	0.224	0.023	0.564	16
7	GRE	0.028	0.010	0.009	0.043	15
8	IRE	0.016	0.018	0.002	0.066	16
9	ITA	0.021	0.019	0.004	0.069	15
10	LUX	0.042	0.036	0.004	0.102	11
11	MAL	0.040	0.019	0.014	0.070	8
12	NET	0.081	0.070	0.005	0.195	16
13	POR	0.052	0.052	0.004	0.171	12
14	SPA	0.010	0.008	0.003	0.030	16

**Fiscal stability**

	country	mean	SD	min	max	N
1	AUS	0.016	0.015	0.003	0.061	16
2	BEL	0.040	0.032	0.005	0.104	10
3	CYP	0.020	0.017	0.003	0.061	11
4	FIN	0.030	0.026	0.003	0.102	16
5	FRA	0.014	0.007	0.002	0.026	16
6	GER	0.013	0.010	0.002	0.041	16
7	GRE	0.053	0.023	0.012	0.093	15
8	IRE	0.038	0.021	0.007	0.077	16
9	ITA	0.445	0.166	0.145	0.733	15
10	LUX	0.030	0.022	0.010	0.084	11
11	MAL	0.045	0.036	0.012	0.097	8
12	NET	0.028	0.032	0.002	0.091	16
13	POR	0.043	0.029	0.010	0.094	12
14	SPA	0.012	0.010	0.003	0.036	16

**Not interpretable**

	country	mean	SD	min	max	N
1	AUS	0.273	0.125	0.079	0.558	16
2	BEL	0.157	0.084	0.012	0.253	10
3	CYP	0.032	0.028	0.004	0.082	11
4	FIN	0.229	0.139	0.024	0.527	16
5	FRA	0.066	0.095	0.003	0.273	16
6	GER	0.049	0.065	0.002	0.211	16
7	GRE	0.093	0.096	0.004	0.325	15
8	IRE	0.041	0.036	0.001	0.117	16
9	ITA	0.014	0.012	0.001	0.034	15
10	LUX	0.151	0.133	0.012	0.394	11
11	MAL	0.053	0.036	0.015	0.121	8
12	NET	0.124	0.116	0.003	0.401	16
13	POR	0.060	0.044	0.007	0.119	12
14	SPA	0.006	0.005	0.001	0.019	16

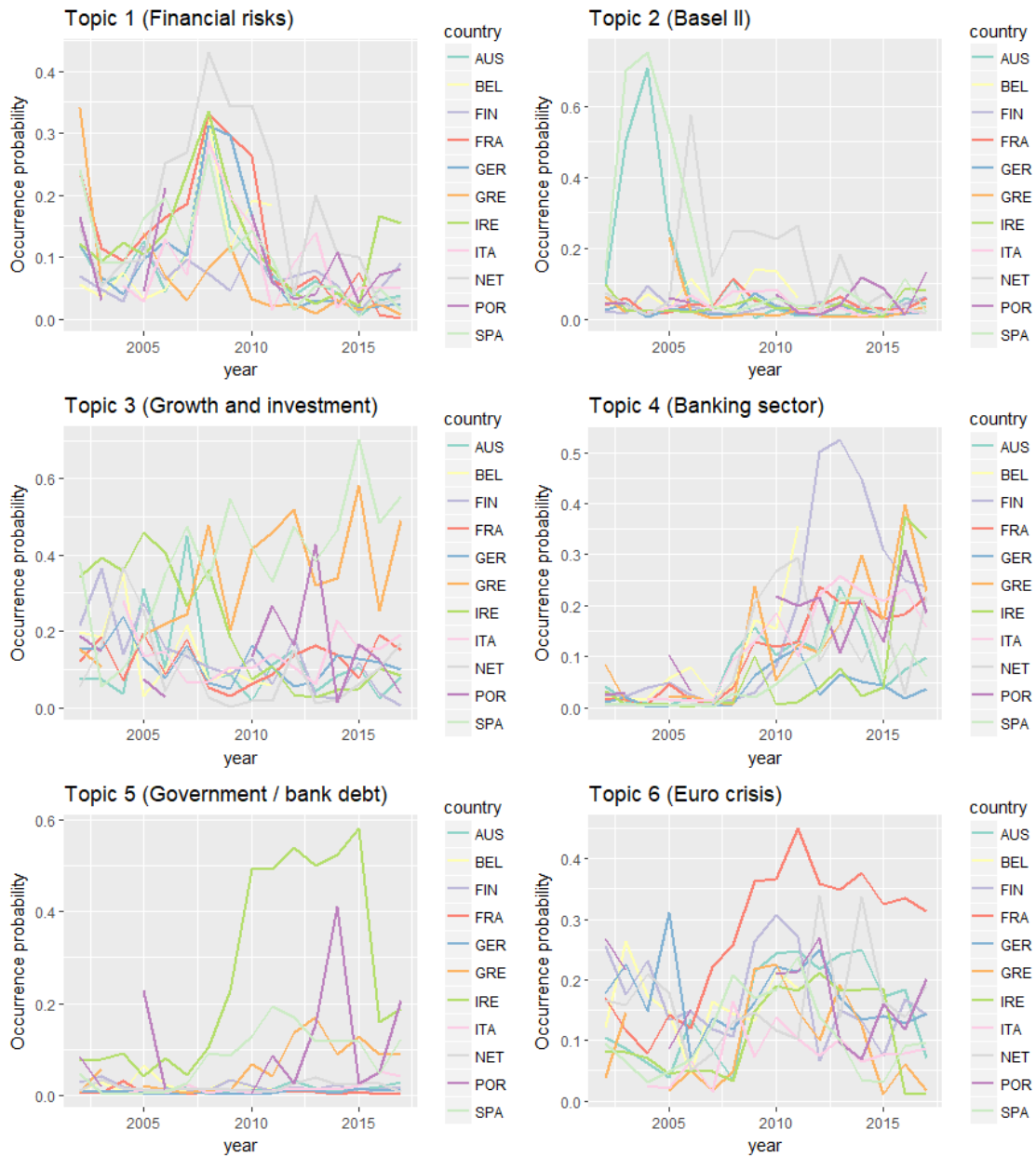
**European integration**

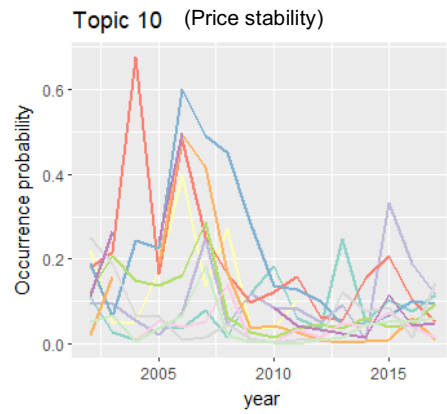
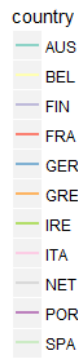
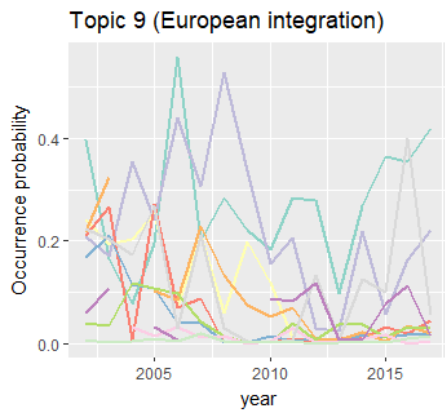
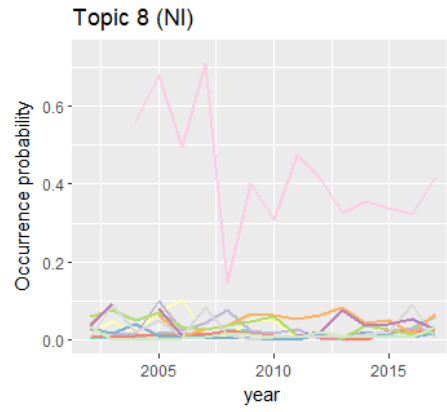
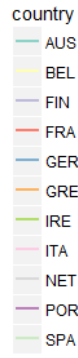
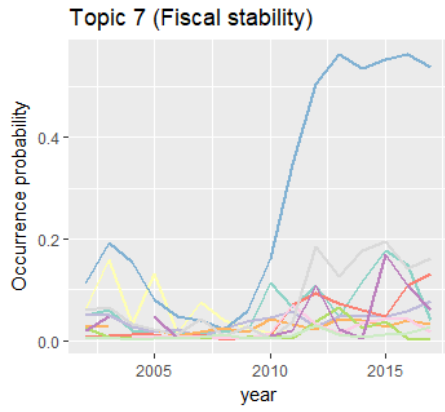
	country	mean	SD	min	max	N
1	AUS	0.081	0.064	0.009	0.245	16
2	BEL	0.147	0.120	0.036	0.397	10
3	CYP	0.200	0.237	0.006	0.572	11
4	FIN	0.106	0.085	0.009	0.332	16
5	FRA	0.197	0.164	0.052	0.676	16
6	GER	0.204	0.172	0.046	0.600	16
7	GRE	0.110	0.155	0.004	0.493	15
8	IRE	0.095	0.076	0.016	0.285	16
9	ITA	0.038	0.036	0.002	0.141	15
10	LUX	0.207	0.210	0.037	0.657	11
11	MAL	0.052	0.044	0.019	0.152	8
12	NET	0.070	0.073	0.003	0.250	16
13	POR	0.126	0.143	0.013	0.497	12
14	SPA	0.042	0.045	0.001	0.183	16

**Price stability**

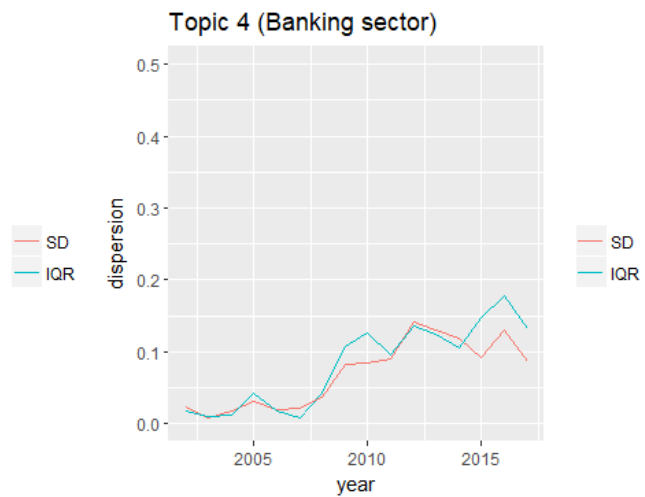
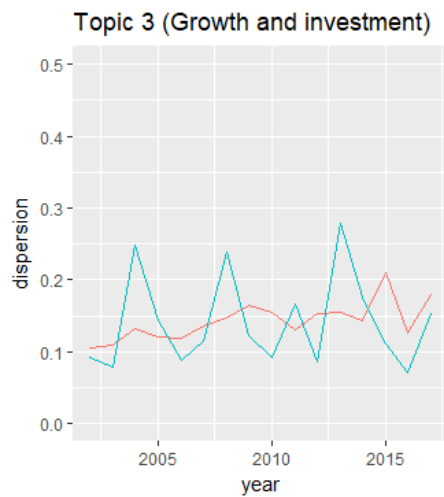
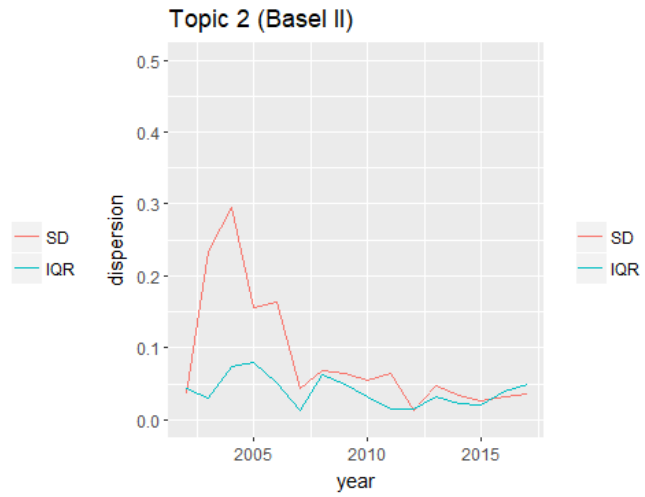
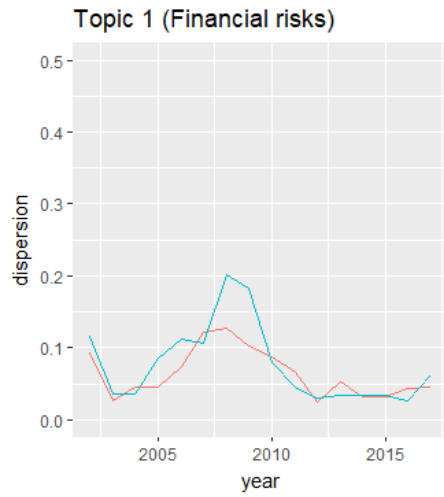
## B. Additional topic and agenda index results

### Topic occurrence

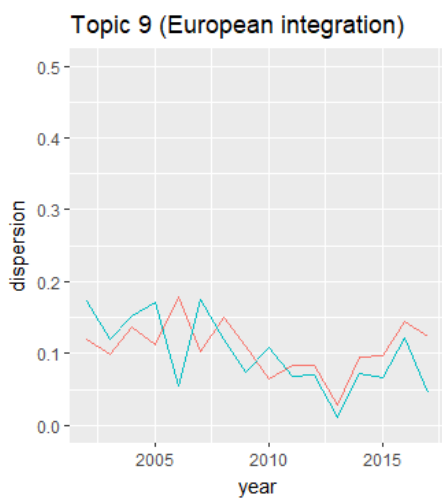
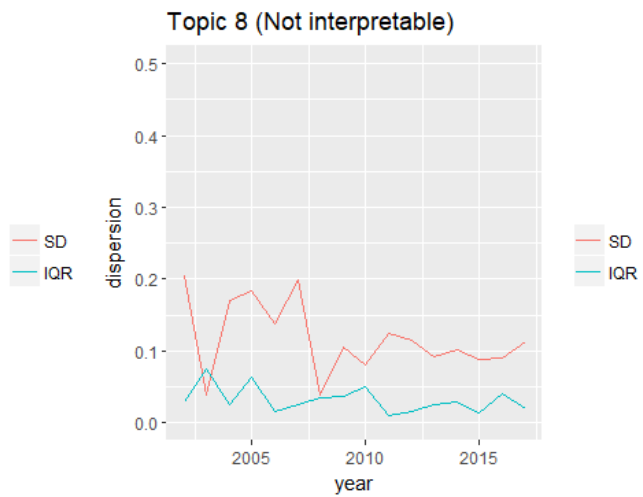
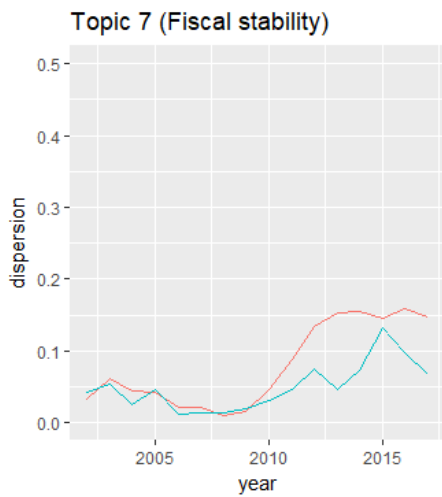
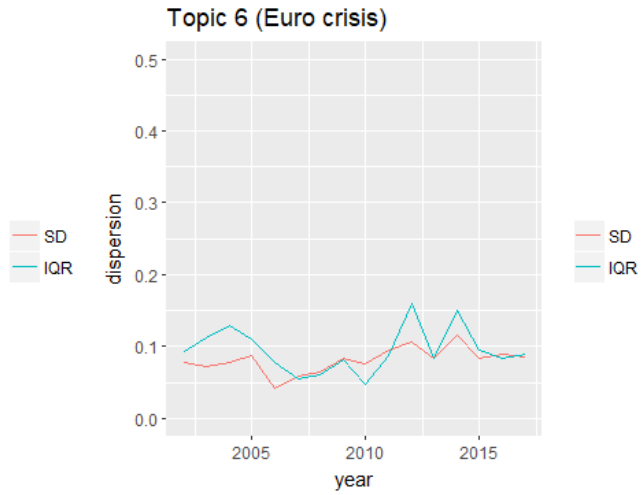
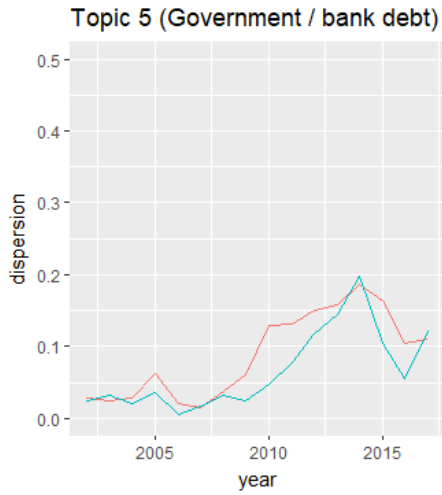




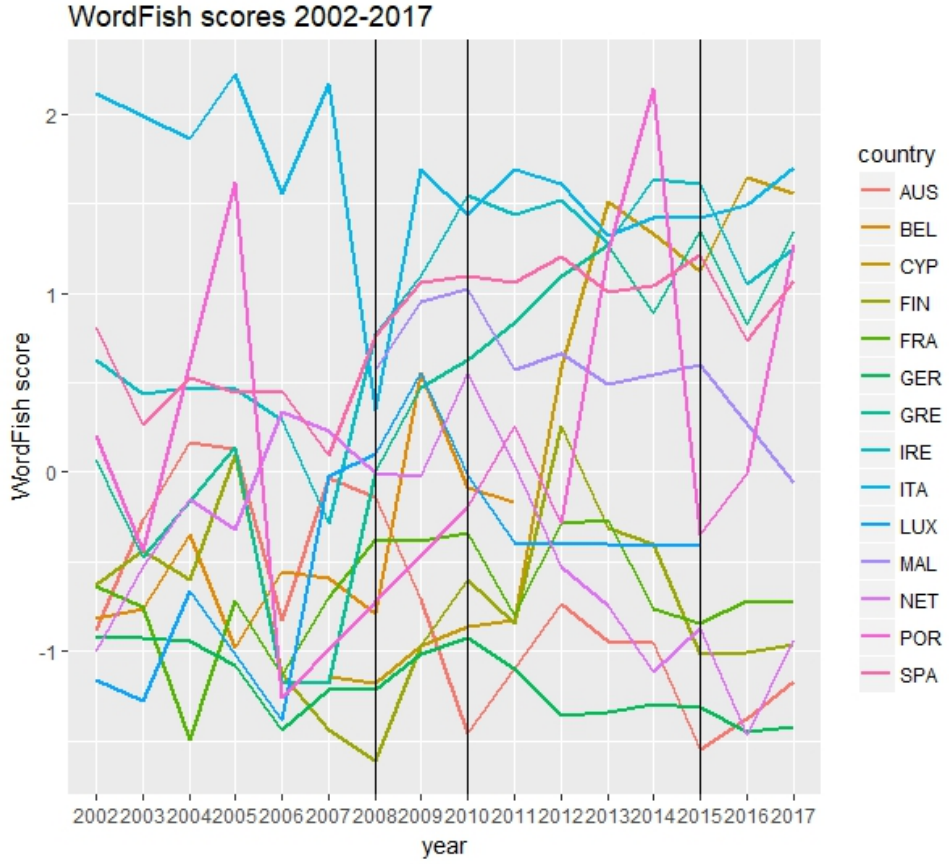
*Topic dispersion*







WordFish scores all countries



### C. ITS results SD dispersion indicator

	<i>Dependent variable:</i>										
	Dispersion (SD)										
	<i>Agenda index</i>	<i>Financial risks</i>	<i>Basel II</i>	<i>Growth and investment</i>	<i>Banking Sector</i>	<i>Government / bank debt</i>	<i>Euro crisis</i>	<i>Fiscal stability</i>	<i>Not interpretable</i>	<i>European integration</i>	<i>Price stability</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Dummy debt crisis (year > 2009 = 1)	0.21*	-0.03	-0.09*	0.03*	0.08***	0.11***	0.02**	0.10***	-0.03	-0.04*	-0.10***
	(0.08)	(0.02)	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Constant	0.88***	0.08***	0.13***	0.13***	0.03**	0.03***	0.07***	0.03*	0.13***	0.13***	0.16***
	(0.06)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.005)	(0.01)	(0.02)	(0.01)	(0.02)
Observations	16	16	16	16	16	16	16	16	16	16	16
R <sup>2</sup>	0.34	0.24	0.35	0.27	0.77	0.85	0.39	0.74	0.12	0.27	0.60
Adjusted R <sup>2</sup>	0.29	0.18	0.30	0.22	0.75	0.84	0.35	0.72	0.06	0.22	0.57
Residual Std. Error (df = 14)	0.16	0.03	0.07	0.02	0.02	0.02	0.01	0.03	0.05	0.03	0.04
F Statistic (df = 1; 14)	7.08*	4.40	7.43*	5.20*	46.96***	82.17***	8.96**	39.30***	1.97	5.29*	21.25***

*Note:*

\*p<0.05; \*\*p<0.01; \*\*\*p<0.001

**Table IV.1 Interrupted time-series regression on dispersion (SD) specification I**

<i>Dependent variable:</i>											
	Dispersion (SD)										
	<i>Agenda index</i>	<i>Financial risks</i>	<i>Basel II</i>	<i>Growth and investment</i>	<i>Banking Sector</i>	<i>Government / bank debt</i>	<i>Euro crisis</i>	<i>Fiscal stability</i>	<i>Not interpretable</i>	<i>European integration</i>	<i>Price stability</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Dummy debt crisis (year > 2009 = 1)	-0.06 (0.14)	-0.04 (0.03)	-0.02 (0.07)	-0.01 (0.02)	0.05* (0.02)	0.11*** (0.02)	0.02 (0.02)	0.06* (0.02)	-0.01 (0.05)	-0.09* (0.03)	-0.10* (0.05)
Time after (DT)	0.04 (0.03)	-0.01* (0.01)	0.01 (0.01)	-0.004 (0.005)	-0.01 (0.005)	-0.005 (0.01)	0.001 (0.003)	0.02** (0.004)	0.01 (0.01)	0.01 (0.01)	-0.01 (0.01)
Time (T)	0.01 (0.02)	0.01* (0.004)	-0.02 (0.01)	0.01* (0.003)	0.01 (0.003)	0.003 (0.004)	-0.001 (0.002)	-0.01 (0.003)	-0.01 (0.01)	0.002 (0.004)	0.005 (0.01)
Constant	0.83*** (0.11)	0.04 (0.02)	0.21** (0.05)	0.10*** (0.02)	-0.001 (0.02)	0.02 (0.02)	0.08*** (0.01)	0.06** (0.02)	0.17** (0.04)	0.12*** (0.02)	0.14** (0.03)
Observations	16	16	16	16	16	16	16	16	16	16	16
R <sup>2</sup>	0.55	0.54	0.46	0.53	0.83	0.86	0.40	0.90	0.19	0.48	0.62
Adjusted R <sup>2</sup>	0.44	0.42	0.33	0.41	0.79	0.83	0.25	0.88	-0.01	0.36	0.53
Residual Std. Error (df = 12)	0.14	0.03	0.07	0.02	0.02	0.02	0.02	0.02	0.05	0.03	0.04
F Statistic (df = 3; 12)	4.87*	4.63*	3.44	4.51*	19.78***	25.39***	2.67	37.05***	0.94	3.76*	6.58**

Note:

\*p<0.05; \*\* p<0.01; \*\*\* p<0.001

**Table III.2 Interrupted time-series regression on dispersion (SD) specification II**

#### D. Additional specification panel model

	<i>Dependent variable:</i>
	Agenda index
Inflation (%)	-0.06 (0.04)
GDP per capita (EUR)	-0.01 (0.02)
GDP growth (%)	-0.01 (0.01)
Budget deficit (% of GDP)	0.08*** (0.02)
Observations	148
R <sup>2</sup>	0.29
Adjusted R <sup>2</sup>	0.19
F Statistic	13.01*** (df = 4; 130)
<i>Note:</i>	*p<0.05; **p<0.01; ***p<0.001

**Table IV.3: Panel model specification 1, time window 2006-2017**