Master thesis

Belief-dynamics during the Euro-crisis:

the role of belief-strength and openness to information

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Preface

Na zes maanden intensieve bestudering van *belief-change* zou het opmerkelijk zijn als mijn ideeën over dit onderwerp zelf niet veranderd zouden zijn. Mijn verwachtingen zijn gelukkig gevalideerd, het blijft een erg interessant onderwerp. Wat ik niet verwacht had, was dat ik ook iets over mijzelf zou leren, of eigenlijk over de menselijke conditie in het algemeen; we zijn lang niet zo rationeel als we graag zouden geloven. Dat deze observatie van belang is voor de studie van leiderschap spreekt voor zich, maar dat deze ook voor mezelf en ieder ander lijkt te gelden, die conclusie lijkt mij bovengemiddeld *zen* voor een afstudeerscriptie.

Ik ben erg blij deze scriptie, en daarmee een vrij lange studieperiode (…), af te kunnen ronden. Dat dit zowaar lijkt te gaan lukken, is mede dankzij iedereen die mij hierin al lange tijd steunt; bedankt! Speciale dank aan mijn begeleidster, Femke. Niet alleen heb je me laten zien hoe leuk onderzoek kan zijn, je hebt me ook geholpen positief te blijven wanneer dat nodig was, en iets minder positivistisch als dat de me maar in de weg zat.

Aan u, de lezer, wens ik veel leesplezier; mocht u denken dat *belief-change* maar een saai onderwerp is, ik hoop dat deze scriptie u op andere gedachten brengt.

Summary

In this thesis the effects of the Euro-crisis on the belief-systems of four European heads of state and government are compared to determine whether their reaction is conditional on character traits or belief strength. In order to do this, a new model of belief-change is proposed that allows for the occurrence of different patterns of belief-change. The occurrence of these patterns, incremental and paradigmatic belief-change, is proposed to be conditional. Determination of the co-variance of openness to information and belief-strength with these patterns demonstrates that belief-strength, and not openness to information, is a decisive factor for their occurrence. This means that leaders with strong beliefs are likely to experience either no belief-change at all, or large scale, paradigmatic belief-change as a result of crises. Leaders with weak beliefs on the other hand, are most likely to experience small scale, incremental belief change. These results imply that belief-change is indeed conditional, and that the existing models of belief-change are incomplete.

1.Introduction

The Euro-crisis has laid bare a number of uncomfortable issues for leaders in Europe. Besides the obvious economic and financial problems, it has shown the European leadership to be divided on its reaction to the crisis (MacNamara 2010). It has also revealed differences in leadership styles and political culture between European countries, especially between France and Germany, causing uncertainty over a common European response (Bohn and de Jong 2011). Such dissonance among leaders may be problematic since crisis management literature stresses the importance of shared sense- and meaning-making in the first stages of a crisis (Boin, et al. 2005). Sense making is the phase of diagnosing confusing, contested and often fast-moving situations, while the subsequent phase of meaning-making requires politicians to provide persuasive public accounts of what is happening and why, and what can be done about it (Boin, et al. 2005). In other words if European leaders wish to efficiently solve the crisis, they will have to come to a shared diagnosis of the Euro-crisis and a coherent approach to its solution, meaning at least some of them will have to change their beliefs on economic and fiscal policy.

A puzzling contradiction

Leaders respond to the challenges of crises in very different ways. This has led to the formulation of two diametrically opposed theories on the cognitive effects of crises on leaders (Stern and Sundelius 1997). According to the crisis-learning thesis, the experience of crises may contribute to a posture of cognitive openness conducive to individual and collective learning (Stern 1997). The *threat-rigidity thesis* takes the opposite view, suggesting crises lead to cognitive rigidity because increased uncertainty and the threat that accompanies crises lead to a restriction of information processing, resulting in a narrower field of attention and a reduced number of used information channels (Staw, Sandelands and Dutton 1981) The threat-rigidity thesis and the crisis-learning thesis describe two possible states of belief-systems under the specific conditions of a crisis. These are on opposite ends of a spectrum that ranges from stability to change of beliefs. Both theses have their merits, and both are based on empirical observation. Belief-systems have been shown to experience major changes, yet, the same results also suggest the durability of many beliefs over time. If neither thesis can be rejected, and both are considered as equally valid observations of the dynamics of belief-change, the notion arises that belief-change may be conditional, and as a result the following puzzle presents itself: what are the factors that determine the state of a leader's belief system during crises?

Several potential causes for belief-change have been suggested, including role change, traumatic events, and learning in office. (Renshon 2008). It is likely that this list is not exhaustive and that many other factors play a role in the stability of a leader's beliefs. This study focuses on the role of cognition. This is of particular importance since structural and institutional theory have long been the dominant perspectives on decision-making. However, more recently the study of less tangible factors like beliefs, ideas and culture has contributed to political and policy sciences (Goldstein en Keohane 1993) (Young and Schafer 1998). Studies into international crises and decision-making have shown that beliefs, emotions, information-processing abilities, personal characteristics and leadership styles can explain to a considerable extent the outcome of a crisis (Brecher 1993). This makes it plausible that these factors are indicative for a leader's reaction to crises. Therefore, the main focus of this study is on the influence of belief-strength and leaders' openness to information on the state of their belief-systems.

Main question

Of all the potential causes for belief-change during crisis, this study focuses on the influence of belief-strength and openness to information. To ascertain this influence, the predictive value of both for the state of a leader's belief-system over time will be determined. The main question of this study can therefore be formulated as follows:

Is the state of a leader's belief-system during a crisis affected by his/her openness to information and by the strength of his/her beliefs?

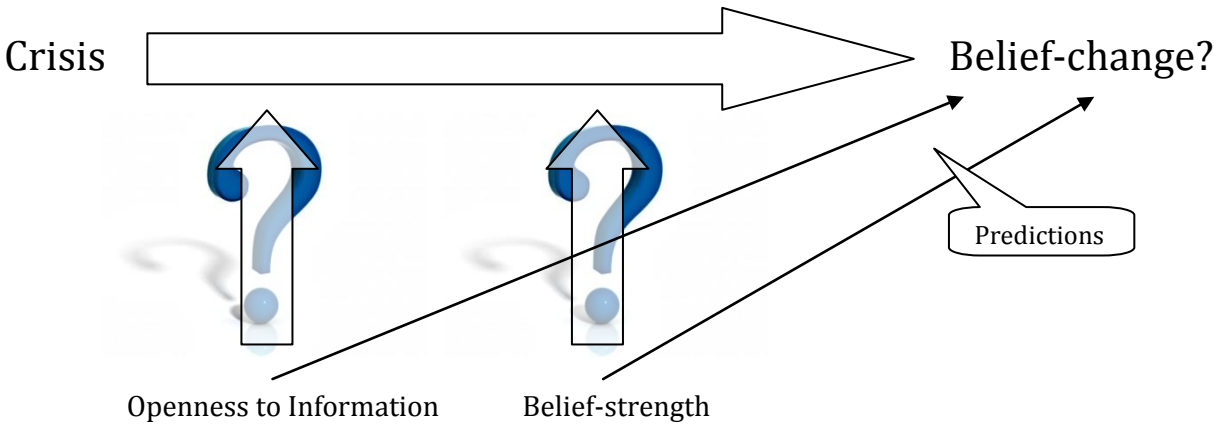
Relevance

The social relevance of this subject can be found in its implication for crisis management; if a leader's response to crises can be shown to correlate with either his personality or the strength of his beliefs, and if these can be determined by the methods used in this study, this knowledge can contribute to the selection of the right leaders for the right job. Wider society may also benefit from a better understanding of how, why and when leaders change their mind; insight into the different processes of belief-change could benefit those trying to promote policy-change and those trying to facilitate consensus among leaders.

The main relevance of this study however is scientific. By determining the predictive value of the strength of a leader's beliefs and of a leader's personality traits for the state of said leader's belief system during a crisis this study can contribute to the scientific debate on the effects of crises on the state of a leader's belief-system. The aim of this study is to, at least, provide a proof of concept for the study of conditional belief-change using a more inclusive model than has been applied to date. If such a model is accepted it may provide a more coherent and comprehensive approach to the cognitive aspects of decision-making during crises. This in turn would, hopefully, enable a more integrated effort to solve the remaining puzzles of crisis-decision-making.

Research design

To answer the main question of this thesis, the following research design is employed. First of all, a model is proposed that incorporates the possibility for belief-change to be conditional. Two hypotheses regarding the effects of openness to information and belief-strength on belief-change during crisis will be derived from this model, resulting in a research design that is best described visually as follows:



Crisis are, through a some process, assumed to influence the occurrence of belief change. The two independent variables in turn, are hypothesized to somehow decisively influence this process. To assess the validity of these hypotheses, both variables will be determined and corresponding predictions on the occurrence of belief change will be made. If these predictions turn out to be correct, as established by comparison of the predictions to the observed occurrence of belief-change, the hypotheses will be accepted.

Reading guide

The structure of this thesis is as follows:

Chapter 2; *Literature: What we know of crises and beliefs*, will assess the literature that is relevant to the central question of this thesis. It will subsequently introduce a new model of belief-change from which hypotheses about the conditionality of belief-change can be derived.

Chapter 3; *Methods*, will give an overview of the methods used to test these hypotheses. The choice of the specific case of decision makers during the Euro-crisis will be justified, as will the use of the source material. The different variables that are central to answering the questions posed in this thesis will be operationalized. This chapter will end with a discussion on the validity and reliability of the aforementioned methods for answering the posed questions.

Chapter 4; *Independent variables: predictions of change to come,* will determine the independent variables; openness to information and belief-strength. From these predictions will be derived for each leader about the occurrence of belief-change.

In chapter 5; *Dependent variables: a chance at change?,* the independent variables relating to belief-change will be determined, and the occurrence of the different forms of belief-change will be established.

In Chapter 6; *Conclusion and discussion,* the predictions of chapter 4 will be compared to the forms of belief-change determined in chapter 5, and corresponding conclusions will be drawn about the validity of these predictions. This enables the main question of this study to be answered. This chapter further consists of a reflection on the validity and reliability of the conclusions drawn and the implications of these conclusions will be discussed.

2 Literature: What we know of crises and beliefs

Belief-change defined

Before focussing on belief-change during crises, the concept of belief-change itself needs to be introduced. As it is used in this study, belief-change is closely related to learning, as learning is often considered to be the main process of change in personal preferences. Steinbruner (1974) describes a cognitive paradigm with regard to learning which is distinguished from an analytic and a cybernetic paradigm by its approach to uncertainty, or the "imperfect correspondence between information and the environment". According to this cognitive paradigm "the mind acts so as to establish strong beliefs and act on them, categorically resolving uncertainty under a single governing set of beliefs". Learning is therefore constrained; the mind operates to keep internal belief relationships consistent with one another, and in processing information favourable outcomes will be inferred for preferred alternatives and unfavourable outcomes for alternatives which the decision maker intends to reject. The principle mechanisms through which learning and belief-change do take place according to Steinbruner, are reinforcement, inconsistency management and small-group interactions (Steinbruner 1974). The cognitive paradigm closely matches the need for a definition of belief-change that focuses on the individual leader. The cognitive psychological approach similarly defines learning as 'a change of beliefs (or the degree of confidence in one's beliefs) or the development of new beliefs, skills, or procedures as a result of the observation and interpretation of experience' (Levy 1994). These definitions differ from alternative conceptions in the literature in the sense that they do not require that learning involves actual policy change, an improved understanding of the world, or an increasingly complex cognitive structure.

Crisis defined

In order to accurately study the phenomenon of belief-change, it needs to be clear under which circumstances it is studied. The focus is not on belief dynamics under any circumstances, but under the specific circumstance of a crisis. Specifically, this study focuses on the belief dynamics of European Heads of State and Government (HSG) during the Euro-crisis. The reason for the focus on belief dynamics during crises is the assumption that opposing theories on learning during crises (as described by Stern and Sundelius, 1997) might actually describe different patterns of belief-change occurring under different circumstances. In order to be able to focus on belief dynamics during crises, we must first define the concept of crisis itself.

Crises are usually considered to be both unexpected and undesirable. Things that used to function without problems (e.g.; economic systems, governments or societies) stop working as they used to. It is a transitional phase during which the normal ways of operating no longer work (Boin, et al. 2005). A sense of urgency usually accompanies such a transition, because those involved feel that some form of order needs to be restored as soon as possible. A crisis can have a subjective nature; it can be the result of a threat that is merely construed by those experiencing it, rather than an objective reality. Leaders, as policymakers, need to address both the unexpected, undesirable and urgent character of crises, and its possibly subjective nature. Therefore the definition of crisis used in this study is as follows: a crisis is when policy makers experience a threat to the basic structures or the fundamental values and norms of a system (Boin, et al. 2005).

Three key components of crises are generally agreed upon: threat, urgency and uncertainty (Boin, et al. 2005). Crises occur when core values or essential systems of a community come

under threat. These include widely shared values like safety, security, welfare, health, integrity and fairness. The threat to these values can come in any shape or form , including violence, destruction or any form of adversity caused by man or nature, perceived or real. The severity of a crisis is related to the extent to which lives are governed by the values under threat; the large scale destruction of property and lives that accompany natural disasters evoke a deep sense of crisis because it threatens important values of safety and security on a massive scale (Boin, et al. 2005). Similar equations can be made for other phenomena threatening core values, including financial turmoil such as the crisis central to this study, the Euro-crisis, which is perceived to threaten the economic and financial welfare of millions ('t Hart and Tindall 2009).

Urgency is another key component in inducing a widespread sense of crisis. Serious threats that do not pose immediate danger are not usually considered a crisis. Time compression is one of its defining elements, because (of the perception that) a problem must be dealt with as soon as possible. This perception of threat is usually accompanied by a high degree of uncertainty of both the nature and the potential consequences of the threat. During a crisis both are often unknown, adding to a sense of urgency in acting upon possibly imminent and indefinite threats (Boin, et al. 2005). This combination of threat, urgency and uncertainty can also be seen in the Euro-crisis, where a strong need for action and a high degree of uncertainty about the causes and possible consequences of the financial troubles is felt.

It should be noted that this definition of crisis demands an explicit referent if the concept is to have meaning. A crisis situation, and with it threat, urgency and uncertainty, is experienced by someone or something: an individual , a group, an organization, a society, or a state. Although the Euro-crisis itself surpasses even the level of the state, this study focuses on the level of the individual leaders involved in making decisions in response to this crisis. This means that there is an important caveat to be made: the perception of the crisis may vary among the leaders under study.

Such dissonance among leaders may be problematic since crisis management literature stresses the importance of shared sense- and meaning-making in the first stages of a crisis. Sense making is the phase of diagnosing confusing, contested and often fast-moving situations, while the subsequent phase of meaning-making requires politicians to provide persuasive public accounts of what is happening and why, and what can be done about it (Boin, et al. 2005). In other words if European leaders wish to efficiently solve the crisis, they will have to come to a shared diagnosis of the Euro-crisis and a coherent approach to its solution. In case of pre-existing dissonance, at least some of them will have to change their beliefs on economic and fiscal policy.

Belief-change through crisis

Belief-change might seem like the most obvious response to crisis, but leaders have been hypothesized to respond to the challenges of crises in very different ways. This has led to the formulation of two diametrically opposed theories on the cognitive effects of crises on leaders (Stern and Sundelius 1997). The *crisis-learning thesis* states that conditions associated with policy crises may facilitate learning and change, and contribute to overcoming the governmental inertia and political dynamics which would have inhibited learning under normal conditions. Crisis experiences are seen to re-order the political agenda, stimulate an appetite for change and reform on the part of the electorate and the mass media and, thus, create moments of political possibility or 'policy windows' (Kingdon 1984), which create opportunities for agile reformers. According to the *crisis-learning thesis*, experiencing a crisis tends to substantially change the way

people think. Crisis experience often entails the challenging of tacit or explicit beliefs about adversary actors, the character of the environment (social and physical) and the adequacy of existing organizational and political arrangements designed to cope with that environment. The crisis-learning thesis posits that this experience may contribute to a posture of cognitive openness conducive to individual and collective learning (Stern 1997).

The *threat-rigidity thesis* takes the opposite view, suggesting crises lead to cognitive rigidity because increased uncertainty and the threat that accompanies crises lead to a restriction of information processing, resulting in a narrower field of attention and a reduced number of used information channels. Staw, Sandelands and Dutton (1981) posited this hypothesis after reviewing a wide body of literature and identifying a number of parallel, and mutually reinforcing, effects operating at the individual-, group- and organizational-levels. They argue that theoretical and empirical work done at each of these levels suggests that social actors tend to respond in a rigid and inflexible manner to adversity and threat. This is characterized by reliance upon what they describe as 'well-learned' or 'dominant' modes of thought or action.

The crisis-learning thesis and the threat-rigidity thesis represent opposing views of the effects of crises on the state of belief-systems. The threat-rigidity thesis is in accordance with the description of belief-change as described by Steinbruner's (1974) cognitive paradigm, suggesting constraints to learning that become even stronger when the correspondence between information and the environment becomes more imperfect and uncertainty increases. The crisis-learning thesis, however, contradicts this description of belief-change, as it implies that greater uncertainty actually facilitates belief-change.

If belief-change is defined as a single, uniform concept, only one of these theses can be correct. However, the similar debate on the nature of policy change has shown that the redefinition of a concept can result in the conclusion that two opposing views on the nature of a concept are actually two complementary descriptions of its constituting parts (Howlett and Migone 2011). Later in this chapter, a new model of belief-change incorporating both threat-rigidity and crisis-learning will be introduced. First, the punctuated equilibrium model of policy dynamics on which this new model is based and the opposing views that it conjoins will be described.

Models of policy change

Change in the policy beliefs of leaders plays an obvious role in change of public policy, and an instinctive similarity between the two could even be said to exist; a person or a group of people 'changing their mind'. In this paper, I would in fact like to suggest that belief-change taking place within a belief-system is analogous to the occurrence of policy change within a group of decision-makers, and that these are actually similar processes occurring at different levels. Theories explaining the occurrence of different forms of policy change could therefore also be helpful in explaining different forms of belief-change.

Two of the theories that are fundamental to the contemporary study of policy dynamics are Charles Lindblom's (1959) work on incrementalism and Peter Hall's (1989) study of shifts in policy paradigms. Both authors propose that general patterns of policy development can not only be identified, but also predicted (Howlett and Migone 2011). The patterns they describe are, however, very different; incrementalism pertaining to slow and marginal adaptation over longer periods of time, and paradigm shift to swift and revolutionary change. A third 'punctuated equilibrium' theory, attempts to reconcile these two patterns and their inter-relationships

(Baumgartner and Jones 1991). The following paragraph will introduce and explain each of these theories

Incrementalism, paradigm shifts and punctuated equilibria

Lindblom's incrementalism is the oldest of the theories of policy change discussed in this chapter. It rejects the possibility of rational, maximizing policy choices and outlines the actual 'strategies of decision' most often followed by decision-makers. In these strategies decision-makers are bounded by the costs of calculation and by their own cognitive and informational limits in predicting future events and their consequences. The essence of incrementalism is 'successive limited comparison'; a systematization of the decision-making process based on the recognition of the need for political agreement and learning by trial and error, rather than making decisions based on an unrealistic 'comprehensive rational' analysis and planning. Such 'successive limited comparisons' make no distinction between selection of goals and empirical analysis of the means to achieve them; these are considered to be closely intertwined rather than distinct (Lindblom 1959).

Incrementalism assumes a strong correlation between the complex and unpredictable nature of policy-making and the adoption of incremental strategies to tackle this complex environment. According to Lindblom, there are two reasons why decisions typically do not stray far from the status quo; these can be described as uncertainty aversion and inflexibility. First of all, since the benefits and costs of present arrangements are known to all actors, unlike the uncertainties surrounding new arrangements, agreement on major changes is more difficult. The result is typically the aversion of uncertainty, either by continuation of the status quo or by agreement to make only small changes to it. Second, the standard operating procedures of bureaucracies also tend to promote the continuation of existing practices. The methods by which bureaucrats identify options and the procedures and criteria for choice are often inflexible, inhibiting innovation and perpetuating existing arrangements (Howlett and Migone 2011).

While common, incrementalism is not the only form of decision-making, as Peter Hall's (1989) study of shifts in policy paradigms clearly demonstrated. In his comparative work on macro-economic policy in Europe, he identified a second pattern of change; the broad paradigm shift, in which major, non-marginal, change occurs. This pattern seems to contradict Lindblom's observation that policy change is the result of successive limited comparisons. In an attempt to reconcile these two patterns and their inter-relationships, the 'punctuated equilibrium' theory was introduced. It is inspired by a theory explaining the variation in the pace of evolutionary adaptation developed in the field of paleo-biology (Eldridge and Gould 1972), and was first put forward in the context of policy dynamics by Baumgartner and Jones (1991). Hall's (1993) effort is, however, the clearest single statement of this unifying theory on policy dynamics, and has become the model and classification of policy change most often cited in the literature and applied in empirical studies (Howlett and Migone 2011). It states that periods of marginal adaptation (incrementalism) and revolutionary transformation (paradigm shift) are linked together in a complex 'punctuated equilibrium' pattern which combines both periods of 'normal' marginal adaptation and more infrequent and atypical periods of 'non-linear' change.

Hall's (1993) work not only challenges the view that all policy change is incremental in nature, he also rejects the lumping together of all the different forms of policy change into a single concept, instead of distinguishing between the means and ends of policies, and abstract and concrete policy decisions. He argues that this distinction is necessary to gain new insights into

processes of policy stability and development. His approach reveals policy change to consist of three different forms, each with different consequences for overall policy dynamics. 'First order' changes are mere calibrations to the current policy; changes to the settings of existing policy instruments, without changing the instruments themselves. In 'second order' changes, the instruments of policy as well as their settings are altered in response to past experience even though the overall goals of the policy remain the same. 'Third order' changes entail simultaneous changes in all three components of policy: the instrument settings, the instruments themselves, and the hierarchy of the goals behind policy, breaking the confines of the existing policy regime as a result.

Hall links each order to a different cause and to a specific pattern of policy change; either incrementally and at a small scale, or at a much larger-scale through a paradigm shift. The pattern of first and second-order changes is typically that of incremental change and these changes are usually caused by activities that are endogenous to a policy subsystem. The pattern of third-order changes involves a 'paradigmatic shift' and these changes are caused by the occurrence of anomalies between expected and actual results of policy implementation. The events triggering such anomalies are typically linked to exogenous events causing widespread disruptions in existing policy subsystem ideas, beliefs, actors, institutions and practices (Sabatier and Jenkins-Smith 1993; Smith 2000). Without such events, existing policy elements arrange themselves in a homeostatic system; a self-perpetuating or equilibrating order, allowing for incremental changes in settings and instruments to occur, but without altering policy goals[1] (Hall 1993).

A new model of belief-change

The punctuated equilibrium model of policy change conjoins two opposing theories of policy change as two complementary patterns in a new model of policy dynamics. In this section an attempt will be made to construct a similarly unified model of belief-change, conjoining the opposing theses of belief-change during crisis; threat-rigidity and crisis learning. The reason for redefining belief-change in this way is to show that the two theses are not necessarily mutually exclusive, adapting the theory to the fact that the patterns of both theses have been observed empirically. When belief-change is defined as a single, uniform concept, only one of these theses can be correct. A new model of belief-change should be pluriform, allowing for the two different patterns of belief-change as complementary descriptions of parts of the overall belief dynamic, and eliminating the need for the rejection of either thesis. Since belief-change is analogous to the occurrence of policy change, a homeostatic system like the punctuated equilibrium model could also be helpful in explaining the occurrence of different forms of belief-change.

The punctuated equilibrium model is not the only homeostatic model. In fact, homeostasis is a widespread phenomenon. Baumgartner and Jones (1991) were inspired by Eldridge and Gould's (1972) work on evolutionary processes to suggest such a model, regulating its internal environment through feedback mechanisms, for policy dynamics. This is not as unlikely a source of inspiration as it may seem; the study of policy dynamics involves the comprehension of highly complex systems, and biology is by definition the study of the highest complexity that naturally

[1] It is noteworthy that this model of change is similar to the homeostatic model developed by cybernetic theorists in which a system regulates its internal environment and tends to maintain a stable, relatively constant condition through positive and negative feedback mechanisms, allowing for a new equilibrium to be reached after stable system parameters have been altered by outside forces (Steinbruner 1974).

occurs; life. To a biologist homeostasis is the default regulatory system. Not only in evolutionary biology, but from genetic regulation within a single cell to animal behaviour and the stability of an ecosystem, life's complexity is governed by homeostasis. This omnipresence in biology suggests that homeostasis may be involved in the regulation of more than just policy dynamics in the field of policy sciences too. The aim of this study is to investigate whether the patterns of belief-change are analogous to those of policy change. To do so, a model encompassing different types of belief-change and an accompanying theory of belief-system homeostasis will be proposed in the following paragraph.

Belief-change redefined; from uniform to pluriform

A single and uniform definition of belief-change lumps together all the different forms of belief-change into a single concept. Distinction between different orders and patterns of belief-change is necessary to gain insight into processes of belief stability and development. Borrowing the punctuated equilibrium model from the study of policy dynamics enables the incorporation of two opposing hypotheses on belief-change during crisis as two different patterns of belief-change into a single homeostatic model. It also allows for the disaggregation of the concept of belief-change from a single, uniform concept into three different orders of belief-change. A careful delimitation of the different orders and their corresponding patterns should be followed, and these should be carefully operationalized and measured. This study aims to do just that. For that reason the following clarification will precede the statement of hypotheses about their occurrence during crises.

Three different orders of belief-change can be distinguished, each linked to one of two patterns of belief-change. 'First order' changes occur within existing confines of the belief-system when beliefs about the calibrations of policy instruments change. 'Second order' changes concern beliefs about the instruments themselves as well as their settings; these are altered in response to experiences, even though the overall goals in the belief-system remain the same. 'Third order' changes entail simultaneous changes in all three components of a belief-system: beliefs about the instrument settings, about the instruments themselves, and about the hierarchy of the underlying goals change, breaking the confines of the existing belief-system as a result (cf. Hall 1993).

Each of the orders of belief-change can be linked to a specific pattern of belief-change, analogous to Hall's classification (1993) of policy change. These patterns are *incremental* and *paradigmatic* belief-change. The pattern of incremental belief-change is linked to the occurrence of first and second order belief-change. This pattern entails common, step by step and small-scale change aimed at maintaining the consistency of the existing internal belief relationships, with existing beliefs arranging themselves in a self-perpetuating or equilibrating order, allowing for incremental changes in beliefs about settings and instruments but without altering overall goals. It occurs as a result of the mechanisms that enable constrained learning as described by the cognitive paradigm (Steinbruner 1974); reinforcement, inconsistency management, or small-group interactions.

The pattern of *paradigmatic* belief-change is linked to the occurrence of third order belief-change (which includes 1st and 2nd order change), entailing much rarer and much larger-scale change through a shift in the preferred paradigm. It occurs as a result of too high a level of uncertainty for learning to take place within the existing equilibrium of belief-change, caused by the observation of anomalies that create too great an imperfection of the correspondence

between information and the environment to be interpreted according to the current paradigm. The events triggering such anomalies and the response to them on the part of policy-makers are typically linked to disruptive, exogenous events that dramatically alter the *status quo* and necessitate a re-evaluation of policy goals. The normal mechanisms constraining learning break down and a new equilibrium is established based on new ultimate values and goals that allow for better correspondence with the environment.

Belief-change through crisis revisited

The reason for redefining belief-change is to show that the threat-rigidity thesis and the crisis-learning thesis of belief-change during crisis are not necessarily mutually exclusive. When belief-change is defined as a single, uniform concept, only one of these theses can be correct. Since a pluriform definition of belief-change allows for two different patterns of belief-change as complementary descriptions of parts of the overall belief dynamic, it eliminates the needs for the rejection of either thesis. Instead, this definition can help to understand why the views on the effects of crises on belief-change have been so divergent (Stern and Sundelius 1997); threat-rigidity being the negative feedback mechanism keeping belief-systems internally coherent in periods of equilibrium or incremental change, and crisis-learning being the manifestation of the establishment of a new equilibrium after an exogenous event has caused too high a level of uncertainty for the previous equilibrium to be maintained.

As mentioned before, Staw, Sandelands and Dutton (1981) suggest that the introduction of a heightened threat perception into decision-making processes is likely to produce restriction of information processing and a pronounced tendency towards rigidity in response, characterized by reliance upon what they describe as 'well-learned' or 'dominant' modes of thought or action. This threat-rigidity response can be explained as an increased activity of the negative feedback mechanism in the equilibrium state of incremental change, with the dependence on the dominant modes of thought and action being an effort to maintain the internal coherence of the belief-system in the face of increased uncertainty.

In this sense, this type of crisis response does not differ from the normal incremental first and second-order changes. The mechanisms that enable constrained learning, reinforcement, inconsistency management, and small-group interactions, are still present, but the higher than normal uncertainty of the crisis situation causes greater constraint on change. This results in a greater rigidity than would occur under normal circumstances, and a decrease in incremental change. However, the uncertainty is still manageable and not so great that the current paradigm cannot be maintained; the homeostatic system of belief dynamics remains in equilibrium. Belief-change is further constrained as compared to a non-crisis situation, and the changes that do occur are still only of a first or second order; calibrations of policy instruments and dominant beliefs change within the existing confines of the belief-system.

However, if a crisis is of such a magnitude that a threshold value of uncertainty is crossed, and this uncertainty can no longer be dealt with using the normal negative feedback mechanisms, the equilibrium is lost; the constraints on learning are broken and third order changes of belief take place. This explanation for paradigmatic change derived from the revised model of belief-change as a system of punctuated equilibria, is in full accordance with the crisis-learning thesis. The resetting of the equilibrium of belief-change constitutes paradigmatic change brought on by exogenous events that overstretch the constraints on learning and necessitate a re-evaluation of

policy goals.; in other words large scale crisis-learning or belief-change, brought on by a major crisis.

The conditionality of incremental and paradigmatic belief-change

In this chapter, a new theoretical model of belief dynamics has been presented and the mechanisms through which belief-change can take place have been explained. In this model threat-rigidity and crisis-learning are classified as two different patterns of belief-change occurring at different levels of uncertainty or imperfection of correspondence of information with the environment. This level of uncertainty therefore determines whether the system of belief-dynamics remains in equilibrium (1st and 2nd order, incremental change; threat-rigidity) or whether this equilibrium is punctuated (3rd order, paradigmatic belief-change; crisis-learning). However, uncertainty is not an absolute value; not all leaders experience crises in a similar manner, and each crisis affects each leader differently. The empirical finding that crises may induce belief-change as well as rigidity or reinforcement suggests that the effects of crises on leaders' beliefs is conditional. In this study the assumption is that this effect depends on the level of uncertainty that a leader experiences; threat-rigidity being typical of heightened uncertainty that can still be dealt with within the existing configuration of the belief-system through a pattern of incremental belief-change, and crisis-learning being typical of too high a level of uncertainty to be dealt with without a change in goal orientation and paradigmatic orthodoxy, resulting in a pattern of paradigmatic belief-change.

Since uncertainty is a subjective variable and differs form leader to leader and crisis to crisis it may in itself be dependent on other variables. In the literature, several possible intermediary variables are identified, like the pressure leaders are under, their personality traits, and the strength of their beliefs. While the pressure that leaders are under is an interesting variable, it only relates to belief-systems indirectly; it is an environmental factor, rather than an attribute of the leader or the belief-system itself. Therefore, this study will focus on the latter two categories of variables and study the intermediate effects of a leader's openness to information and of the strength of his or her pre-crisis beliefs on belief-change. These two categories affect the degree to which a belief-system is resilient to the pressures of uncertainty; a belief-system containing strong beliefs might be more likely to resist change, while openness to information might ease the introduction of new concepts and allow for the adaptation of existing beliefs.

Openness to information is a function of a leader's cognitive complexity and self-confidence (Young and Schafer 1998; Hermann 2005). In the literature, these traits have been associated with belief-change. Cognitive complexity refers to the complexity of the cognitive structure of a leader's belief-system. Individuals with a high cognitive complexity distinguish a wider variety of beliefs and relations amongst beliefs. Moreover, the categorisations they use to make sense of the world are more diversified, integrative and ambiguous. In contrast, individuals with a lower cognitive complexity distinguish both fewer beliefs and fewer connections amongst beliefs. Moreover, they are more absolutist in their thinking. The classifications and frames they use are more univocal and they are more likely to make judgements based on consideration of few alternatives (Hermann 2003; Thies 2009).

These characteristics suggest that cognitive complexity may be linked particularly to the question of a leader's propensity for both incremental and paradigmatic belief-change. For, based on the characteristics outlined above, one may expect individuals with a high cognitive complexity to be better capable of integrating new information, contextual developments and

ideas into their pre-existing belief-system than less cognitive complex individuals (Welch Larson 1994). As a result, one may expect that the greater a leader's cognitive complexity, the greater his or her propensity for a pattern of incremental belief-change.

Since leaders with a higher cognitive complexity have a greater ability to accommodate contradictory information, they have a greater capacity to deal with uncertainty within the constraints of the existing configuration of their belief-system. Changes in the environment are less likely to cause a punctuation of the equilibrium as a result of too high an imperfection of the correspondence between the environment and information. The uncertainty resulting from a changed situation can more easily be dealt with within the constraints of the existing belief-system. Incremental change of diagnostic and instrumental beliefs can take place without the need for a punctuation of the equilibrium and a change in ultimate values and goals. *This leads to the expectation that the higher a leader's cognitive complexity, the less likely (s)he will display a a pattern of paradigmatic belief-change.*

The second leadership trait, self-confidence, focuses on leaders' level of self-importance and confidence in their ability to exercise control over their environment. Leaders that score low on this trait are less aware of their self-identity, and engage with the environment without a clear sense of what they stand for. They are therefore more in search of outside input for clues to guide their thoughts and behaviour. A lack of self-confidence increases the likelihood of a leader experiencing uncertainty and therefore the likelihood that (s)he will experience 1st or 2nd order change through small-group interactions, reinforcement of ideas also held by others and inconsistency management by adaption of previously held beliefs to the environment. In contrast, leaders with high scores on self-confidence have a more solid self-image and are confident of their own take on the world. Such leaders are less attuned to their environment and less likely to take clues or adopt ideas from others (Hermann, 1980; 2003). This constrains 1st and 2nd order change through small-group interactions, instead making reinforcement of existing ideas, and inconsistency management to maintain these ideas, more likely. These characteristics suggest that self-confidence may influence the likeliness that leaders will experience belief-change; It may be expected that *the less self-confident a leader, the more likely (s)he will display a pattern of incremental belief-change.*

Since leaders with a lower self-confidence have a higher likelihood of incrementally accommodating contradictory information, they have a greater capacity to deal with uncertainty within the constraints of the existing configuration of their belief-system. Leaders with a high level of self-confidence do not adapt their belief-system incrementally and are therefore more likely to eventually experience uncertainty that cannot be dealt with within the constraints of their existing belief-system. Therefore, it may be expected that *the less self-confident a leader, the less likely (s)he will display a paradigmatic shift.* In contrast, more self-confident leaders, while less likely to show a pattern of incremental belief-change, are more likely to eventually show a pattern of paradigmatic belief-change because the imperfect correspondence of their beliefs with the environment cannot be dealt with within the constraints of their existing belief-system.

Since the relative score of a leader's cognitive complexity and self-confidence determine his openness to information, and since a high score on each dimension has an opposite effect on the likelihood of a leader displaying either incremental or paradigmatic change, openness to information should be a very strong indicator for the most likely form of belief-change that a leader will experience. A high openness to information (higher cognitive complexity than self-

confidence) should therefore result in a pattern of incremental belief-change as a result of a crisis, while a low openness to information (higher self confidence than cognitive complexity) should prevent a pattern of incremental belief-change, and possibly lead to an eventual paradigmatic shift, if the environment changes too much. This assumption leads to the first hypothesis of this study (H1) that *a greater openness to information predicts the occurrence of a pattern of incremental belief-change, while a lower openness to information predicts that either no belief-change, or a pattern of paradigmatic belief-change will occur.*

The strength of pre-crisis beliefs may influence the likelihood of the occurrence of incremental and paradigmatic belief-change in a similar manner. Belief-strength is directly related to the degree to which leaders experience uncertainty caused by the imperfect correspondence of the environment with information, and to the way they deal with this uncertainty; stronger beliefs constraining learning more than weaker beliefs. Like openness to information, belief-strength should therefore be a very strong indicator of the most likely form of belief-change that a leader will experience; a low belief-strength leading to a pattern of incremental belief-change as a result of a crisis, and a high belief-strength eventually leading to a paradigmatic shift if the environment changes too much. This assumption is the basis for the second hypothesis of this study (H2) that *a low belief-strength predicts the occurrence of a pattern of incremental belief-change, while a high belief-strength predicts that either no belief-change, or a pattern of paradigmatic belief-change will occur.*

3. Research Methods

In this chapter, the case selection and the methodological choices that are made in this study are explained and justified. First of all the chosen case study design is explained and justified. The choice of the specific case of decision makers during the Euro-crisis will be justified, as will the use of the source material, interviews for the leadership trait analysis and speeches for cognitive mapping. Next the methods for assessing the different variables relating to openness to information, belief-strength and belief-change are presented, and the variables are operationalized. This chapter will end with a discussion on the validity and reliability of the aforementioned methods for answering the posed questions.

3.1 Case study design

The European Heads of State and Government (HSG) whose personality traits, belief-strength and cognitive responses are studied are; the German Chancellor Angela Merkel, the French President Nicolas Sarkozy, the Spanish Prime Minister José Zapatero and the Irish Taoiseach Brian Cowen. These leaders were chosen because they were faced with different levels of pressure due to their countries' specific economic fundamentals and because of the differences in the political systems in which they operate. The variation in these variables is purposeful; since such variation cannot be avoided, the choice is made to include the extremes. By including leaders under higher and lower levels of pressure (Cowen and Zapatero versus Merkel and Sarkozy) and with more or less political power (Sarkozy versus the rest) this sample is guaranteed to be representative for western European and democratic leaders.

The empirical focus of this study lies on the first year of the crisis because the influence of leadership is deemed especially important in the sense-making part of the decision-making process. Centralisation of political decision-making as a result of the crisis means that, as members of the European Council, the studied HSG have been at the centre-stage of the crisis response.

This study is aimed at determining whether the cognitive response to the Euro-crisis by the Eurozone HSG's could be predicted by either one of two different variables; one regarding the character trait openness to information, and one regarding the strength of their pre-crisis beliefs. For this purpose a case study design is used with a single case, the Euro-crisis, and multiple embedded units of analysis, the four Eurozone leaders. The rationale for the use of a single case study is that the Euro-crisis provides a critical case in testing the relevance of the tested variables and that it meets all the conditions for testing them. Under these circumstances, a single case can be used to determine whether a theory's propositions are correct or whether some alternative set of explanations might be more relevant (Yin 2009).

The Euro-crisis provides a critical case because it enables the study of the effects on the beliefs of the HSG of (common) sense making in the context of a crisis. It provides a case of a crisis of such a severity that decision-making has become the almost exclusive responsibility of the highest political leaders. Given its severity and centralisation of decision-making, it provides a most-likely case for belief-change to take place, and for the degree to which this happens to be dependent on personal characteristics like traits and the strength of existing beliefs. Furthermore, it provides for a sufficiently complex yet dichotomic subject for the use of Comparative Cognitive Mapping; adherence to either the Keynesian or the Ordoliberal economic

paradigm is a belief-dimension that is central to an actor's preferences on European economic and monetary policy (Van Esch 2013).

The choice to use a case study design with four embedded units of analysis was made because it allows for analysis of co-variance of the different variables within a single case. Analysis of co-variance enables testing of whether different values of the independent variables (openness to information and belief-strength) lead to different outcomes in the form of the dependent variables (the various forms of belief-change). Its focus is on the independent variables as factors of influence and it requires strong differences in respect to these variables (Blatter and Haverland 2012).

A potential problem with using this approach when studying the belief-system of different leaders is the requirement to provide for high similarity in respect to the control variables (Blatter and Haverland 2012) This is hard to do, because no two leaders have exactly the same background, nor do they operate within exactly the same environment. However, if this problem is considered as insurmountable, no comparison between leaders would ever be possible. Precisely to assure the highest possible degree of similarity in respect to the control variables, this study is aimed at studying the HSG as embedded units of analysis within the context of economic monetary policy making in the European monetary union, and the specific case of the Eurozone crisis.

3.2 Determining the variables

To determine the variables for the analysis of co-variance, two different methods are used. For the determination of the independent variable 'openness to information', Leadership Trait Analysis (LTA) is used. For the independent variables relating to 'belief-strength' and the dependent variables relating to 'belief-change', Comparative Cognitive Mapping (CCM) is used.

Determination of openness to information using Leadership trait analysis

In the previous chapter it was hypothesized (H1) that *a greater openness to information predicts the occurrence of a pattern of incremental belief-change, while a lower openness to information predicts that either no belief-change, or a pattern of paradigmatic belief-change will occur.* To test this hypothesis it will be operationalized by formulating the falsifiable prediction (P1) that leaders with a greater openness to information experience a pattern of incremental belief-change, while leaders with a lower openness to information experience no belief change, or a pattern of paradigmatic belief-change.

According to Hermann (2005) Leadership Trait Analysis (LTA) allows for a leader's openness to information to be determined through the analysis of his or her speech acts. In this method, the degree to which a leader is predicted to be open to information depends on two measurable variables; the degree of displayed self-confidence and conceptual complexity. The ratio of these variables predicts whether or not a leader is open to input from his surroundings; a higher conceptual complexity, as relative to self-confidence, resulting in a greater openness to information. This ratio will be used as the measure to determine the HSG's degree of openness to information and to test the prediction that this relates to the occurrence of belief-change.

Both the degree of a leader's self-confidence and conceptual complexity are determined using the method of leadership trait analysis developed by Hermann (2005). The technique used for this analysis has been automated through the use of a software programme called Profiler+, developed by Social Science Automation. Using such a standardized test increases the validity

and reliability of the method as compared to manual coding (Thies 2009). Profiler+, automatically analyses documents using pre-set coding schemes. Words coding for self-confidence and conceptual complexity are counted resulting in a score for these traits.

For self-confidence the program counts the use self-oriented pro-nouns like; myself, I, me, mine or my. When speakers use these pronouns in their speech, it is first necessary to analyse how they see themselves relating to what is happening. If the use of the pronoun reflects that the speaker is instigating an activity (e.g., "I am going to . . ." or "That is my plan of action"), that he or she should be viewed as an authority figure on the issue (e.g., "If it were up to me . . ." or "Let me explain what we mean"), or that the speaker is the recipient of a positive response from another person or group (e.g., "You flatter me with your praise" or "My position was accepted"), this is counted as a show of self-confidence. The final score on this trait is then calculated as the percentage of times these personal pronouns are used in an interview response. The overall score for any leader is his or her average percentage across the total number of interview responses collected for that particular person (Hermann 2005).

A similar procedure is used to determine the score for conceptual complexity. The words counted in this procedure are those that indicate that the speaker is able to see different dimensions in the environment, as opposed to words that indicate the speaker sees only a few categories along which to classify objects and ideas. Words that are suggestive of high conceptual complexity are *approximately, possibility, trend,* and *for example;* words indicative of low conceptual complexity include *absolutely, without a doubt, certainly,* and *irreversible.* As with self-confidence, the score for conceptual complexity is the percentage of high and low complexity words used in interview responses. The final score that is used for further calculations is the average score across all interview responses (Hermann 2005).

For this analysis interview responses of at least 100 words are used.[2] A list of the interviews used for each leader can be found in the appendix. For each leader approximately fifty responses are used, except for Cowen, for whom only thirty such responses could be found. The scores calculated from these responses by Profiler+ are compared to scores from previous studies (Derksen 2012), to determine how the scores of the leaders in this study relate to other previously studied western European leaders. In this way, the scores could be qualified as relatively low, average, or high (table 1). Most importantly, the ratio of these scores can be used as a measure of a leader's openness to information, with a higher relative cognitive complexity (ratio > 1) indicating openness to information, and a higher self confidence (ratio < 1) indicating the opposite (Hermann 2005).

	Low	Average	High
Cognitive complexity	< 0,51	0,53 - 0,65	0,63 >
Self-confidence	< 0,19	0,19 - 0,45	0,45 >

Table 1. Classification of low, average, and high scores on cognitive complexity and self-confidence as determined by Derksen (2012)

Determination of strength of beliefs and belief-change using Cognitive Mapping[3]

Since belief has been determined to be a pluriform concept, several forms of belief-strength and belief-change are distinguished in this study. Therefore, besides openness to information,

[2] To give credit where it's due, the vast majority of these responses were collected by Marij Swinkels for her master thesis, 'Sense making in the Euro-crisis' (2012).
[3] The methods for performing CCM described in this section were developed by Van Esch (2013).

several variables relating to belief-strength and belief-change will be determined in this study. The independent variable relating to belief-strength determined in this study is *paradigmatic orthodoxy*. It will be used to test a second hypothesis (H2): that *a low belief-strength predicts the occurrence of a pattern of incremental belief-change, while a high belief-strength predicts that either no belief-change, or a pattern of paradigmatic belief-change will occur.* To test this hypothesis it will be operationalized by formulating the falsifiable prediction (P2) that leaders with a low belief-strength experience a pattern of incremental belief-change, while leaders with a high belief-strength experience no belief change, or a pattern of paradigmatic belief-change.

The dependent variables relating to the occurrence of belief-change differ for incremental and paradigmatic belief-change. To determine the occurrence of a pattern of incremental belief-change, the change in absolute and relative aggregated saliency, a measure for 1st and 2nd order belief-change, is determined. The dependent variables relating to the occurrence of a pattern of paradigmatic belief-change are both a change in relative and absolute aggregated saliency, and a change in goal orientation and/or paradigmatic orthodoxy. The simultaneous occurrence of all three forms of change indicates 3rd order belief change. The dependent variables will be used to determine which pattern of belief-change has occurred. This will enable the predictions derived from both hypotheses to be verified or falsified. The dependent and independent variables relating to belief-strength and belief-change will be determined using Comparative Cognitive Mapping (CCM), a technique that has been developed in the related disciplines of political and social psychology and organizational studies (Axelrod 1976; Young and Schafer 1998; Van Esch 2012). Using this method a systematic and in-depth analysis of a leader's policy beliefs can be made.

CCM differs from content analysis, like LTA, in that the analysis of a cognitive mapping is based on the causal relationships between concepts, not on simply counting the concepts themselves (Axelrod 1976). It focuses on causal beliefs because causal inference is considered to be at the centre of problem solving and decision-making; it assumes that, when looking for a solution to a problem, people tend to automatically focus on its cause. And that when they consider different options, they focus on their possible consequences. Cognitive mapping is designed to make these causal relationships between different concepts explicit by mapping the networks they form (Young and Schafer 1998).

Like Leadership Trait Analysis, Cognitive mapping is based on public assertions, in this case in the form of speeches. To determine causal relations, text-analysis of these speeches is performed based on subject-verb-object constructs. These indicate a causal or quasi-causal relationship (Young 1996). Any such relationship that corresponds to the English expressions "is usefully or desirably associated with" and "is adversely or undesirably associated with"' is recorded (Axelrod 1976). These relations are then graphically reproduced in a cognitive map showing the concepts used by the actor as points and the causal relations between these concepts as arrows (Axelrod 1976); (Van Esch 2007); (Young 1996); (Young and Schafer 1998).

The relationships in the map are attributed a sign to indicate whether the identified cause-belief is perceived to contribute positively (+) or negatively (-) to the effect-concept, or whether the decision maker (explicitly) has stated the cause-belief not to be related to the effect-concept (0)[4].

[4] The coding rules used for this study are adapted from Margaret Tucker Wrigthson (1976), the adaptation being the exclusion of two additional coding categories; "affects indeterminately" and "effects in some non-zero way"

To avoid too large an overlap of concepts, and to facilitate the comparison of different maps, concepts must be standardized to a degree. The degree of standardisation must balance the importance of doing justice to the exact meaning of a leader's statements with the empirical and theoretical focus of the study at hand. (Van Esch 2013).

After standardisation CM-graphs can be drawn by hand or using software specifically designed for the graphical representation of CM or graphs. For this study Gephi, an open-source graph visualization and manipulation programme was used.[5] In general, the cause-concepts are located at the left-hand side of the map, while the effect-concepts are located at the right-hand side. A simplified version of such a map is shown in illustration 1. The subsequent analysis of the substance of these cognitive maps relies on the elicitation of the consequent and antecedent paths between the belief-concepts, the determination of the positive or negative utility-value of these beliefs, and their saliency within the map. (Van Esch 2013).

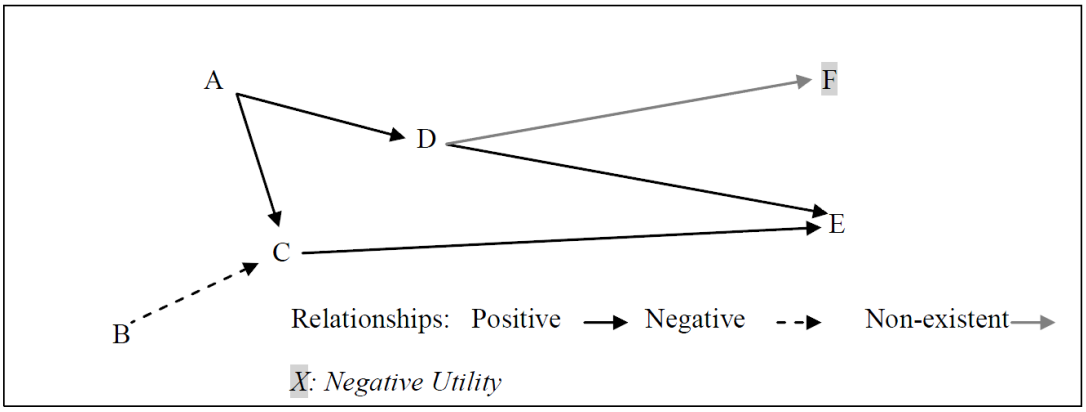


Illustration 1. Example of a (simplified) Cognitive Map (courtesy of F.A.W.J. van Esch)

First of all, determination of the *consequent paths,* emerging out of concepts, and the *antecedent paths,* feeding into concepts, must take place to establish whether and how individual beliefs are interrelated. A leader's evaluation of each concept's positivity or negativity can then be determined by how it is related to utility-concepts. These are concepts that refer to a general and abstract sense of well-being without specification of the exact nature of the benefits, like the 'success of Europe' or 'benefit of all'. Finally, CM-analyses are based on the saliency values (s) of concepts. The saliency of a concept is the frequency with which it is mentioned as being part of a causal relation by the leader in the original text. It can be seen as an indicator of the relative importance of a concept within a belief-system. (Van Esch 2013).

After the maps are analysed in this way, a measure of belief-strength, paradigmatic orthodoxy, can be derived from the resulting data. This measure, derived from the pre-crisis maps of the studied HSG, will serve to apply predictions to each leader. These predictions follow from the hypothesis (H2) formulated in the previous chapter, and enable it to be tested.

Paradigmatic Orthodoxy

Each leader's belief-strength will be measured by interpretation of their cognitive map. The reasoning in these maps will be compared to orthodox Keynesian and Ordoliberal thinking. The degree to which the reasoning in these maps is similar to the orthodoxy of the paradigms is used as a measure of the strength of the leader's Keynesian and Ordoliberal beliefs. With the

[5] This programme can be downloaded from: https://gephi.org

assumption that orthodoxy relates to belief-strength, the second hypothesis of this study (H2) can be tested through verification or falsification of the prediction (P2) that leaders with a low belief-strength experience a pattern of incremental belief-change, while leaders with a high belief-strength experience no belief change, or a pattern of paradigmatic belief-change. In order to apply this prediction to each HSG, the degree of pre-crisis compatibility of their cognitive map with either one of the two monetary-economic paradigms will be established; Keynesianism or Ordoliberalism. The degree to which the most prominent paradigm complies with its orthodoxy will result in a qualification of belief-strength, and a resulting prediction on the occurrence of belief-change. This degree can be determined through interpretive comparison of the relations in the map to the reasoning that is typical for each paradigm, as described below.

The degree to which the reasoning represented by a map is compatible with Ordoliberal orthodoxy will be determined by its similarity in reasoning. To qualify as Ordoliberal, a map has to contain the following elements (after (Van Esch 2013)):

- Price stability is considered as guiding principle.
- No trade-off is considered to exist between growth and employment on the one hand, and price stability on the other.
- Strict budgetary rules and fiscal policies are considered to be beneficial.
- The use monetary financing is rejected.
- ECB independence is considered crucial.
- Economic policies are considered a primary goal, not secondary to other goals.

The Keynesian perspective differs strongly from the Ordoliberal perspective both in its goals and its reasoning. The degree to which the reasoning represented by a map is compatible with Keynesian orthodoxy will be determined by its similarity in reasoning. To qualify as Keynesian, a map has to contain the following elements (after (Van Esch 2013)):

- A trade-off is considered to exist between growth and employment on the one hand, and price stability on the other.
- The benefits of economic stimulation are considered to outweigh its negative effects on budgetary discipline and price-stability.

A paradigm will be designated strong if most of the orthodox reasoning can be found in the map, and weak if this is not the case. The paradigm designated the highest degree of orthodoxy will be considered to be dominant. If both paradigms are designated weak or strong, dominance will be established by the highest similarity to orthodoxy.

The independent variable 'change in paradigmatic orthodoxy' will be determined in a similar manner; the post-crisis maps will be compared to Ordoliberal and Keynesian orthodoxy, and the resulting degree of orthodoxy will be compared to the pre-crisis degree. Belief-change will be concluded to have taken place if a change takes place in paradigmatic dominance, defined as highest relative similarity to paradigmatic orthodoxy.

Aggregated saliency

Another way of establishing a leader's position on the dimension ranging from Keynesian to Ordoliberal, is the aggregate saliency of all concepts in a CM denoting either a Keynesian or Ordoliberal preference and a positive utility-value. This score can then be used to calculate the percentage of the aggregated saliency of the entire map taken by either paradigm so as to enable

comparison over time and between leaders (Van Esch 2013). The aggregated saliency of a paradigm gives an indication of the importance of that paradigm as a whole in a leader's belief-system. Comparison of the aggregated saliency of Ordoliberal and Keynesian concepts pre- and post-crisis will be used to determine the occurrence of a pattern of incremental belief-change. This change can be determined both absolutely (aggregated saliency per paradigm) and relatively (ratio of the aggregated saliencies per paradigm). Comparison of these measures between the pre- and post-crisis maps provides two dependent variables indicative of a pattern of incremental belief-change: change in absolute aggregated saliency and change in relative aggregated saliency. These will be used to test the hypotheses concerning openness to information and belief-strength by falsification or verification of their resultant predictions (P1 and P2)

To be able to compare pre- and post-crisis aggregated saliencies, these will be qualified as indicating absolutely or relatively high or low belief-strength.[6] The two dependent variables indicating a pattern of incremental belief-change are determined in a similar manner. They are defined as the difference between the aggregated saliency per paradigm pre- and post-crisis (change in absolute aggregated saliency) and the difference between the ratios of the aggregated saliencies pre- and post crisis (change in relative aggregated saliency). In order to be able to qualify these differences either as the actual occurrence of belief-change and not just irrelevant variation, a benchmark for both variables has to be determined. The benchmark for establishing the occurrence of belief-change through a difference between the relative aggregated saliencies is taken to be the occurrence of a shift in paradigm that skips at least a category, e.g.; from low Ordoliberal to high Keynesian, or high Ordoliberal to low Keynesian. The benchmark for absolute aggregated saliency is a difference that results in a change of category (i.e.; high to low, or low to high absolute aggregated saliency), and that is at least a third of the entire range.[7]

Goal-orientation

Change in the goal-orientation is another variable used to determine the occurrence of a pattern of paradigmatic belief-change (Van Esch 2013). It is established using the go-value. The go-value of a concept is determined by subtracting the number of consequent paths emerging out of it from the number of antecedent paths feeding into it, and dividing this number by the total of paths in and out of the concept. It is a measure of a concept's goal-orientation; a positive value indicating that it is mostly a goal or an effect and a negative value indicating that it is mostly a cause or a means. Comparison of the average go-value of the concepts of each paradigm pre- and post-crisis will be used to determine the occurrence of a pattern of paradigmatic belief-change.

[6] To classify aggregated saliency as either high or low, the ranges of this indicator have to be determined. At the low end is zero, as it is conceivable that a leader mentions both paradigms exactly as often, or that a leader does not mention a paradigm at all. The high ends of these ranges are qualified as the highest scores measured using these methods; those of former *Deutsche Bundesbank* president and member of the ECB governing council, Axel Weber (De Jong and Van Esch 2013). The highest known scores are used to define these ranges so as to be as strict as possible; if aggregated saliency changes according to this definition, it can be said to have taken place by any less strict definition. The ratio of Weber's scores for both paradigms, 5,66, will be used as the high end of the range of relative aggregated saliency. This range is divided in two parts, high (< 2,83), and low (>2,83), so that an indication can be given of the degree of relative belief-strength. Weber's score for the percentage of the aggregated saliency of the map taken up by Ordoliberalism, 34,27%, will be used as the magnitude at the high end of the range of absolute aggregated saliency. This range will also be divided in two parts; high (<17,14) and low (>17,14).

[7] This means the difference has to be at least 11,42 percentage points.

This enables the predictions about the occurrence of a pattern of paradigmatic belief-change derived from hypothesis 1 and 2 to be tested, and the hypotheses to be accepted or rejected.

3.3 Validity and reliability

After describing the methods for establishing the variables used in this study, a few words on their reliability and validity are in order. A study's reliability depends on the precision and consistency with which the research is conducted; these should minimize the influence of accidental and non-systematic mistakes on the observations made (Boeije 2008). The adherence to two established procedures for the collection and analyses of the studied data, the leadership trait analysis as described by Hermann (2005) and Comparative Cognitive Mapping as described by Wrightson (1976), assures minimal error in reliability through lack of precision and consistency. The reliability of these methods has been further improved upon by the discussed use of software for automation of the LTA (Profiler+), and the procedures and software developed by van Esch (2013).

A study's validity depends on the prevention of systemic errors. These can effect a study's validity in two ways; through a lack of construct validity and a lack of external validity (Boeije 2008). A study's construct validity is the degree to which a study actually measures what it purports to measure. Its external validity is the degree to which it can be generalized to other cases and therefore affects its relevance outside of the specific case that was studied.

In every study these two forms of validity have to be balanced to a degree. In this study, to ensure construct validity, the hypotheses and predictions have been formulated in a way that allows for a conclusion to be drawn from the data that is available from, especially, Cognitive mapping. For this reason, the various forms of belief-strength and change that are discussed, are derived from the data about the structure of the maps, instead of the other way around. This is meant to ensure that all conclusions are valid in the sense that they measure what they purport to measure. This results in a lesser degree of external validity; since these data have not been applied to more cases in a similar manner, no universal validity can be claimed. This has been a deliberate choice, however, as the goal of this study is, partly, to establish new ways of studying belief-change. For these results to be generalized even more, more leader will have to be studied in a similar manner, and a more comprehensive analysis of covariance will have to be performed, resulting in a greater quantitative (external) validity. However, the studied leaders do represent larger groups of which they are a part, e.g.; western European, and democratic leaders. The results of this study can therefore be assumed to be representative of such similar leaders as well, even if they are not universally representative. For now, this study establishes the co-variance of the studied variables for this limited set of leaders and those that it represent, and aims to provide a proof of concept through its analytical (external) validity for all leaders (Yin 2009).

4 Independent variables: predictions of change to come

4.1 Openness to information: open to change?

In this study, the hypothesis (H1) is that *a greater openness to information predicts the occurrence of a pattern of incremental belief-change, while a lower openness to information predicts that either no belief-change, or a pattern of paradigmatic belief-change will occur*.

Analysis of a the leaders' leadership traits on the basis of interview fragments gives an indication of his or her openness to information. This allows for the application to each studied leader of the prediction (P1) that leaders with a greater openness to information experience a pattern of incremental belief-change, while leaders with a lower openness to information experience no belief change, or a pattern of paradigmatic belief-change. The LTA scores for each leader and the resulting predictions are summarized in table 2.

	Cognitive Complexity	Self-confidence	Openness to information	Open to information?	Prediction of belief-change (P1)?
Zapatero	0,53	0,55	0,96	No →	None, or paradigmatic
Cowen	0,48	0,36	1,33	Yes →	Incremental
Sarkozy	0,61	0,44	1,38	Yes →	Incremental
Merkel	0,61	0,48	1,26	Yes →	Incremental

Table 2. Table summarizing the scores on cognitive complexity, self-confidence and openness to information, and the resulting prediction on the occurrence of belief-change.

As can be seen in table 2, Zapatero scores higher on self-confidence than on conceptual complexity, suggesting a lack of openness to information. His score on openness to information is the lowest score of all the leaders in this study. In accordance with the aforementioned hypothesis, Zapatero is therefore predicted not to experience a pattern of incremental belief-change and to possibly experience a pattern of paradigmatic belief-change. Cowen's scores suggest that he is open to information, since his cognitive complexity is higher than his self-confidence. He is therefore predicted to experience a pattern of incremental belief-change but no pattern of paradigmatic belief-change. Sarkozy similarly scores higher for cognitive complexity than for self confidence. He must therefore also be considered to be open to information, and predicted to experience a pattern of incremental belief-change but no pattern of paradigmatic belief-change. Merkel's score for cognitive complexity is the same as Sarkozy's. Her score for self confidence is comparatively high, but still lower than her score for cognitive complexity. Therefore, she must also be considered to be open to new information, and she is accordingly predicted to experience a pattern of incremental belief-change but no pattern of paradigmatic belief-change.

4.2 Paradigmatic Orthodoxy: determination determined?

In this section each leader's belief-strength will be measured by interpretation of their cognitive map. The reasoning in these maps will be compared to orthodox Keynesian and Ordoliberal thinking. The degree to which the reasoning in these maps is similar to the orthodoxy of the paradigms is used as a measure of the strength of the leader's Keynesian and Ordoliberal beliefs. With the assumption that orthodoxy relates to belief-strength the second hypothesis of this study leads to the prediction (P2) that leaders with a low belief-strength experience a pattern of incremental belief-change, while leaders with a high belief-strength experience no belief change, or a pattern of paradigmatic belief-change.

Zapatero

Looking at Zapatero's pre-crisis map (figure 1), it is immediately obvious that economic well-being is his main goal; 'economic growth' and 'economic recovery', both of which score high on saliency (s=13 and s=12), are either directly or indirectly downstream in causation of most of the concepts in the map. These two concepts are similar in meaning, but don't necessarily belong to the same paradigm; growth is considered Keynesian, while recovery does not automatically belong to either paradigm, because it is sometimes used in a Keynesian and sometimes in a Ordoliberal sense. While this is the general rule, in this case Zapatero seems to use it in a way that is typically Keynesian; it is described as the positive effect of several forms of government expenditure and economic stimulation. Among these are the Keynesian concepts 'government expenditure' (s=4) and the 'fiscal support package' (s=4), both of which are a form of economic stimulation, positively affecting economic growth and recovery. However, both concepts also cause 'budgetary deficits'. But this concept is not highly salient (s=3), while the benefits of the different forms of economic stimulation are. It can therefore be concluded that the positive effects of economic stimulation are seen to outweighs this negative effect, which is in accordance with the typical Keynesian point of view.

It is more difficult to determine the degree to which Zapatero is Keynesian in his view on price stability. The concept of 'price stability' does not have a high saliency (s=4), and is not connected to concepts concerning economic stimulation. Therefore its importance cannot be said to outweigh the benefits of economic stimulation, which confirms the maps Keynesian character. However, it is not, negatively or otherwise, connected to concepts relating to growth and employment either, which implies that Zapatero does not necessarily believe in the Keynesian notion of a trade-off between growth and employment on the one hand, and price stability on the other. Overall, Zapatero's map can be said to contain Keynesian reasoning, even if some parts of the paradigm are not mentioned.

The role of his Ordoliberal beliefs can now be determined in a similar manner. As mentioned before, 'price stability' is not central to Zapatero's belief-system. This is not in accordance with the Ordoliberal view that it should be a guiding principle. It was also mentioned before that he does not mention price stability in relation to growth and employment, which could mean that he has the unspoken belief that no trade-off exists between price stability on the one hand and economic growth and employment on the other. However, this is not a belief he explicitly holds and therefore does not contribute to the Ordoliberal character of the map.

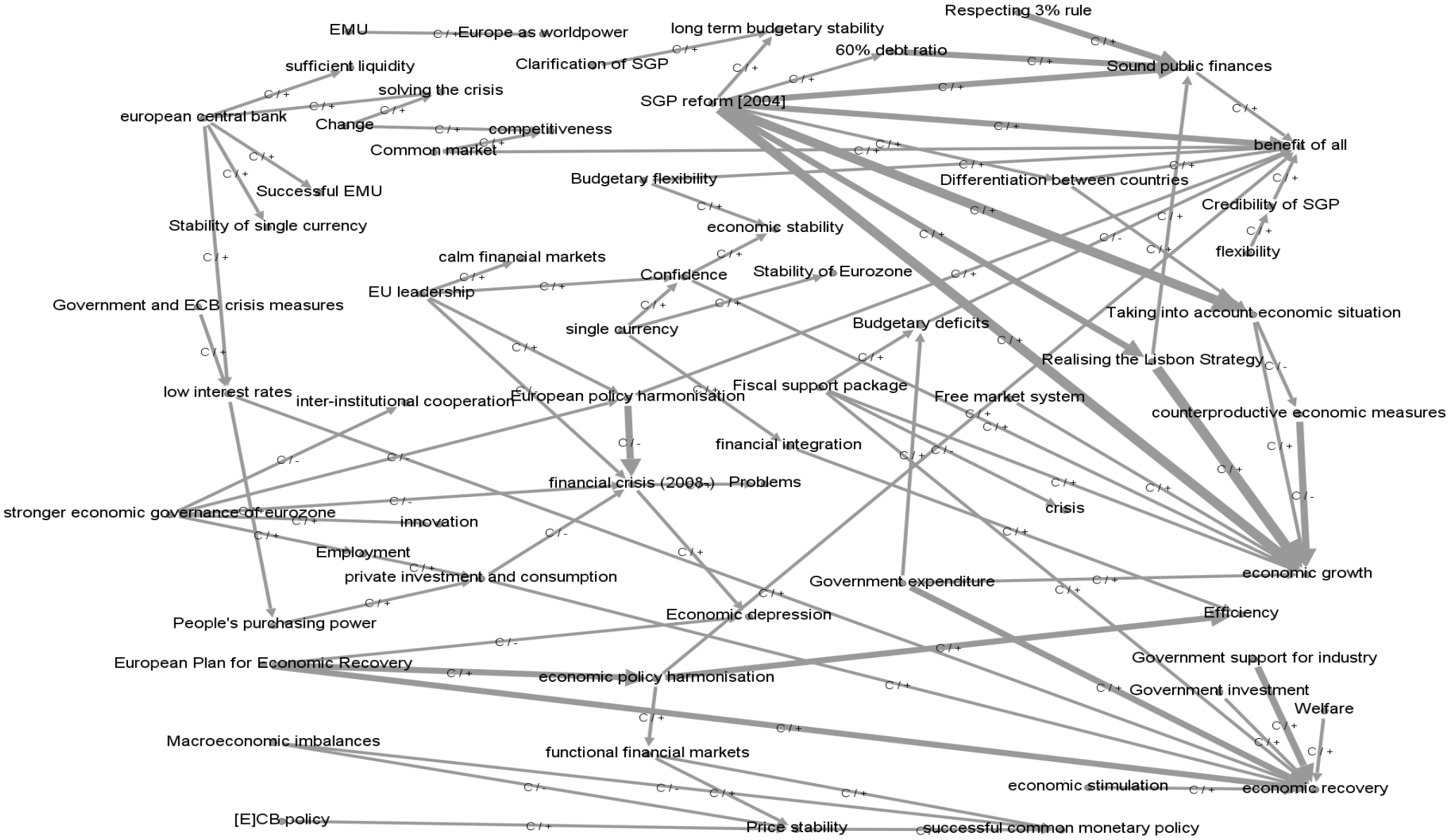


Figure 1. Zapatero's pre-crisis cognitive map.

Budgetary rules and fiscal policies are mentioned, mostly in relation to reform of the Stability and Growth Pact (SGP). As a matter of fact 'SGP reform' is the most salient concept of the map (s=15). It should be noted that this concept may be overrepresented in this map because all of its incidences occur in a single speech. It is nonetheless central to Zapatero's belief-system and is typical of the way in which he regarded the Stability and Growth Pact itself; good, but in need of adaptation. This is further indicated by other occurrences of the SGP in the map, which link it to a need for either flexibility, credibility or clarification. Even though credibility and clarification don't necessarily indicate that he wishes the SGP to be relaxed, this seems to be the main purpose of his remarks, besides stimulating economic growth' and enabling 'taking account of the economic situation'. All in all, this can't be qualified as a Ordoliberal plea for strict budgetary rules and fiscal policies.

ECB independence, rejection of monetary financing, and the primacy of economic policy are not mentioned at all. These central tenets of Ordoliberalism apparently do not play an important role in Zapatero's belief-system. In combination with the minor role for both price stability and strict budgetary and fiscal rules, it can be concluded that this is a decidedly un-Ordoliberal map. On the basis of this interpretation, Ordoliberal reasoning, seems to be almost completely absent from Zapatero's map and his Ordoliberal beliefs must for that reason be qualified as very weak. His dominant belief can be said to be Keynesian, although not very strongly. It is therefore predicted (P2) that he will experience a pattern of incremental belief-change.

Cowen

Examining Cowen's map (figure 2), it is immediately clear that neither paradigm plays a very central role. Instead Cowen considers European economic and monetary cooperation to be a means of increasing Irish prosperity, without a need for a reciprocal surrender of any national autonomy in policymaking. Three relations are apparent; the relationship between 'tax harmonization' (s=22) and 'competitiveness' (s=11) is rather straightforward; Cowen apparently considers tax harmonization to negatively affect competitiveness, both directly, and indirectly through flexibility. This relationship does not matter because competitiveness is itself an ultimate objective, but because it leads to 'attractiveness to business' and 'investment'. These two concepts are also directly and negatively influenced by 'tax harmonization', and these causal pathways signify Cowen's preoccupation with the competition for foreign direct investment on the basis of tax tariffs. Similarly, the causal relationship between 'membership of the Euro' (s=13) and 'common market' (s=13) concerns purely Irish interests. The 'common market' directly contributes to the 'benefit of Ireland' and the people, and to economic growth and related concepts, among which 'attractiveness to business'.

The third key relationship in the map drives the point of the centrality of Irish interests home. The causation pathways running from 'membership of the Euro' (s=13) and 'benefit of Ireland' are ambiguous in the sense that membership negatively affects Irish interests by incapacitating the power of the Irish government to manipulate its interest and exchange rates, while it positively affects Irish interests by lowering interest rates and the volatility of exchange rates. This last relationships does not only show Cowen to be focused on Irish interests, but also further disqualifies his belief-system as Ordoliberal. The fact that he sees 'relinquishing monetary autonomy' (s=6) as the downside to membership of the Eurozone is incompatible with Ordoliberalism. The view that ECB liquidity measures would positively influence economic recovery and stability further reinforces this disqualification. Cowen does mention a concept

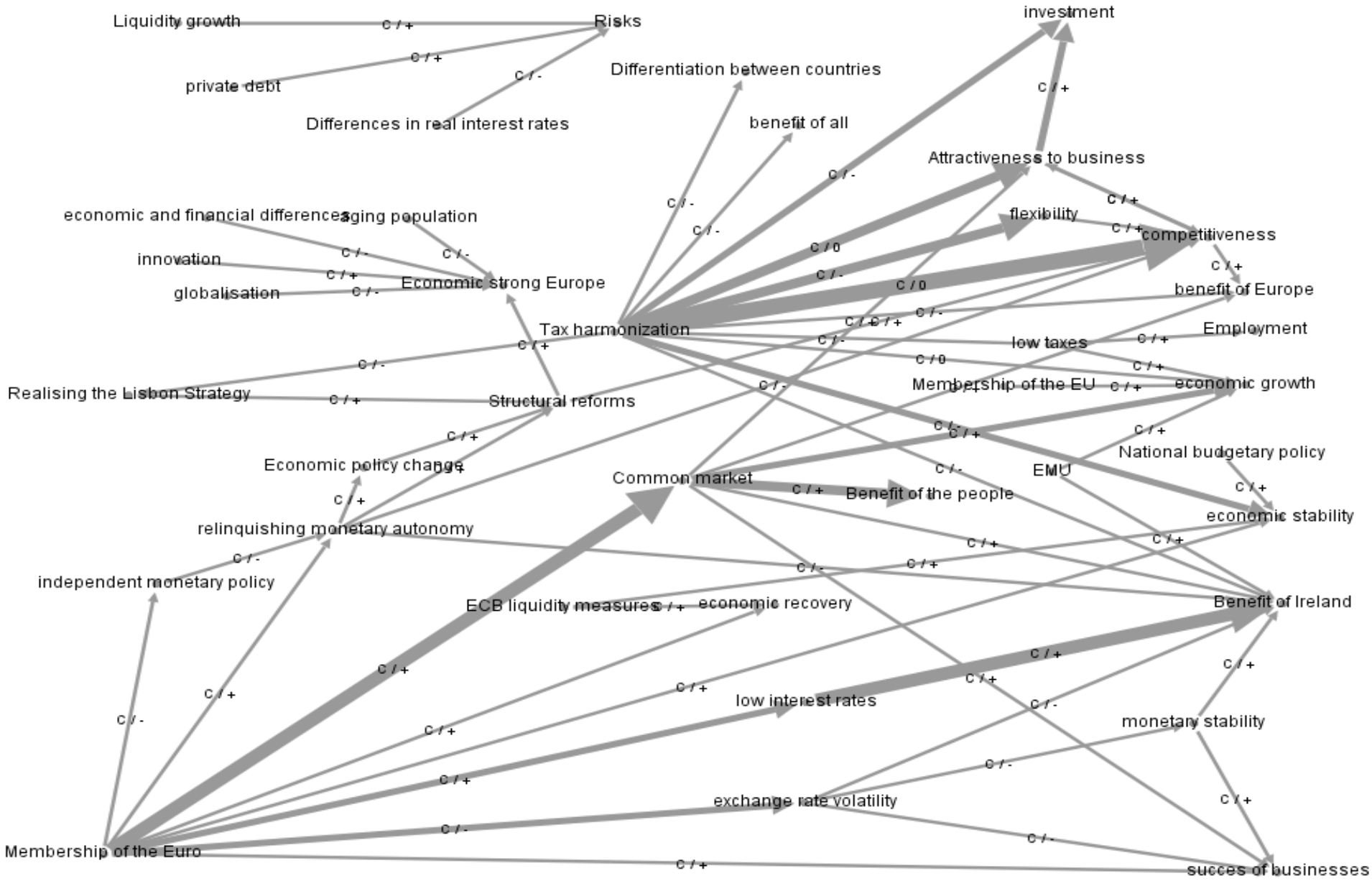


Figure 2. Cowen's pre-crisis cognitive map.

related to price stability, 'monetary stability' in a positive way, but at a saliency of s=3, it can hardly be called his guiding principle. Nor is it mentioned in relation to economic growth or employment, which means he does not explicitly deny a trade-off between these concepts and price stability. Strict budgetary rules are not mentioned at all, but the idea seems at odds with his insistence on the benefits of national autonomy in other policy areas like tax harmonization and monetary policy. The belief in positive effects of 'ECB liquidity measures' also does not comply with the Ordoliberal rejection of monetary financing. No mention is made of either ECB independence or the primacy of economic policy. All in all the lack of typically Ordoliberal reasoning seems to confirm the earlier conclusion that Cowen is no Ordoliberal.

The role of Cowen's Keynesian beliefs can now be determined in a similar manner. The lack of Ordoliberal reasoning does not automatically mean dominance of Keynesian reasoning. As a matter of fact, while the position of 'monetary stability' in Cowen's belief-system does not confirm Ordoliberal thinking on price stability, it definitely does not confirm the Keynesian idea of a trade-off between it and economic growth and employment either. Nor is there any mention of benefits of economic stimulation or whether these outweigh its negative effects on budgetary discipline and price stability. This makes Cowen's reasoning decidedly un-Keynesian.

On the basis of this interpretation, Cowen's map can be said to contain neither Keynesian nor truly Ordoliberal reasoning. While he has no truly dominant paradigm to qualify as either strongly or weakly complying with paradigmatic orthodoxy, the strength of his beliefs of either paradigm can be qualified as extremely weak. It is therefore predicted (P2) that he will experience a pattern of incremental belief-change.

Sarkozy[8]

Looking at the cognitive map of President Sarkozy derived from his public assertions prior to the outbreak of the Euro-crisis (figure 3), two causational networks stand out among the multitude of relationships. First of all the triangular relationship between 'Political debate on monetary policy' (s=18), 'ECB independence' (s=8) and 'benefit of all'. The first two could be seen to be to be mutually exclusive, but Sarkozy considers both to be highly beneficial. He makes a point of asserting that political debate on monetary policy does not affect ECB independence, while ECB independence actually has a positive effect on this debate. This is a very un-Ordoliberal idea, especially since he does not clarify what he considers to be beneficial about ECB independence. It appears as though he mentions ECB independence to put at ease those that would look unfavourably on any debate on monetary policy, let alone the conclusions that would be drawn from such a debate by the French president. The dubious nature of this assertion fits well with the overall un- Ordoliberal character of the map, especially since the goal of the political debate appears to actually be government interference in monetary policy so as to positively affect economic growth, a solution to the crisis, and national interests. The second foremost causational network proposes just such a policy; in which 'political-economic use of one's currency' (s=19) and the 'single currency' (s=13) cause 'economic growth' (s=7) and 'employment' (s=6). This view becomes even clearer through the assertion that 'single currency' leads, or should lead, to the unique concept of a 'European economic government' (s=12), which in turn would cause the 'political-economic use of one's currency'.

[8] The data used for the analysis described in this section was collected by Van Esch (2013).

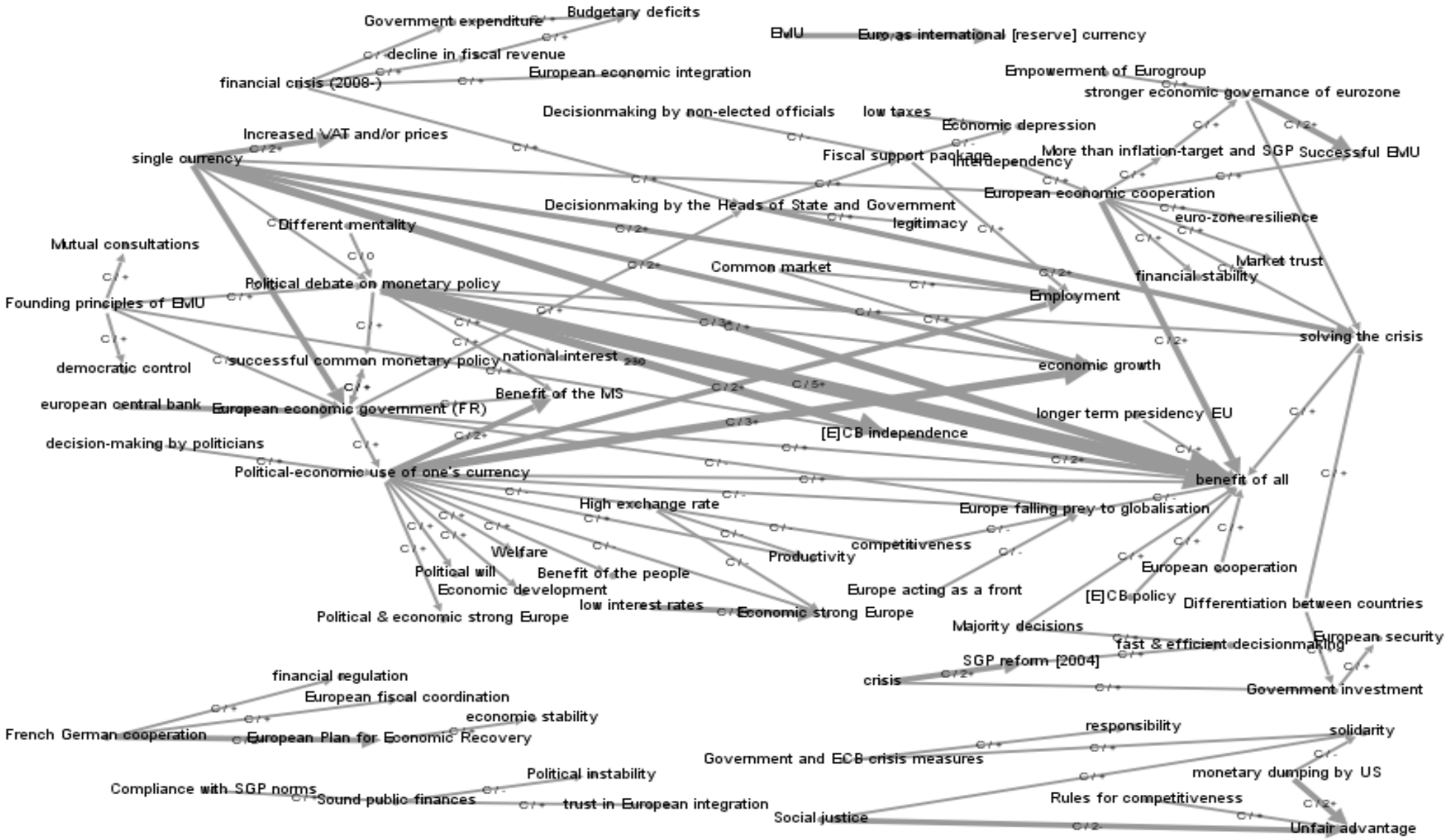


Figure 3. Sarkozy's pre-crisis cognitive map.

The prominence of these networks confirms the un-Ordoliberal nature of Sarkozy's thinking, since it makes clear that price stability is not his guiding principle by any definition, and that it should be compromised if this benefits economic growth and employment. In this scenario, ECB independence might be a benefit, but one that can probably be replaced by an economic government. Monetary financing is not mentioned, but 'the political-economic use of one's currency' does not preclude it. Strict budgetary rules and fiscal policies are only mentioned in relation to their relaxation through the 2004 SGP reforms. This means that none of the typically Ordoliberal ideas is part of Sarkozy's policy thinking, making the strength of his Ordoliberal beliefs very weak.

The role of Sarkozy's Keynesian beliefs can be determined in a similar manner. As mentioned, Sarkozy sees the political use of the currency as benefitting economic growth and employment. This suggests that he might be in favour of compromising its price stability in order to achieve these goals, which is a decidedly Keynesian way of thinking. He also mentions government expenditure and investment as results of the financial crisis, suggesting he might see them as positive in the sense that they mitigate its effects, but he does make this explicit. However, he does not unambiguously refer to the resulting budgetary deficit as bad thing, while considering European security as an additional benefit. These thought patterns are similar to Keynesianism, but not explicitly so. However, they are salient enough to qualify Sarkozy as a Keynesian and his Keynesian beliefs as moderately strong.

Since Sarkozy's Ordoliberal beliefs have been qualified as very weak and his Keynesian beliefs as moderately strong, Keynesianism is his dominant paradigm. Since it is moderately strong, it is predicted (P2) that he will either experience no belief-change, or a pattern of paradigmatic belief-change.

Merkel[9]

Looking at the cognitive map of Chancellor Merkel derived from her public assertions prior to the outbreak of the Euro-crisis (figure 4), it is immediately obvious that the 'single currency '(s=31) is at the root of her policy thinking on monetary and economic policy. Her perception of this concept is very favourable, in itself and as the cause of a variety of positive concepts. These include economic concepts like employment, welfare and competitiveness, but also political concepts like peace, transparency, and the stimulation European integration and identity. The single currency is, however, a non-paradigmatic concept, and these relations make the map neither Keynesian nor Ordoliberal.

A look at the other prominent concepts in the map does suggest such a paradigmatic preference. These are Ordoliberal concepts by themselves, or are related to such concepts in a way that is compatible with Ordoliberalism. The Ordoliberal concepts 'price stability'(s=7) , 'price stability as a ECB goal' (s=6) and 'ECB independence' (s=14) are notable as major causes of positive effects like the credibility, success, and public support of the monetary union. Monetary stability (s=7), though similar to price stability is not *per se* a Ordoliberal concept, but can be viewed as such within Merkel's belief-system, as according to her it is caused by sound fiscal, economic and financial policy, convergence criteria, the Deutsch Mark and a responsible view of constitutional debt breaks. Overall Merkel is highly Ordoliberal in placing price stability at the centre of her

[9] The data used for the analysis described in this section was collected by Van Esch (2013).

belief-system and considering ECB independence as an important goal in itself and as a means of achieving price stability. Furthermore, 'price stability' is seen to cause 'economic growth' (s=3), together with a responsible stance on constitutional debt breaks, and the single currency. This suggests that the Chancellor does not perceive a trade-off between price stability and economic growth. This is a typically Ordoliberal rather than a Keynesian interpretation. She also sees a central role for the SGP (s=7) in assuring sound public finances and all sorts of economic benefits, suggesting that she strongly favours strict budgetary and fiscal policies. Given the importance see ascribes to ECB independence and monetary stability , she is highly unlikely to favour monetary financing.

All in all, interpretation of Merkel's pre-crisis map is witness of her Ordoliberal credentials. This must lead us to conclude that her belief-system is in fact as disposed toward this paradigm. Furthermore, there is no evidence of Merkel believing in either a trade-off between price stability on the one hand and economic growth and employment on the other, or in the benefits of economic stimulation outweighing its budgetary disadvantages. Therefore, Keynesianism must be concluded to play an insignificant role in her thinking, while Ordoliberalism is at its heart; it is Merkel's dominant paradigm and it has a high degree of paradigmatic orthodoxy. It is consequently predicted (P2) that Merkel will either experience no belief-change, or a pattern of paradigmatic belief-change.

Summary

The prediction (P2) is that leaders with a *low belief-strength* experience a pattern of incremental belief-change, while leaders with a *high belief-strength* experience no belief change, or a pattern of paradigmatic belief-change . Table 3 summarizes the degrees of paradigmatic orthodoxy (as a measure of belief-strength) per leader and paradigm, the determination of the dominant paradigm, and the resulting predictions on belief-change, which are that Zapatero and Cowen will experience a pattern of incremental belief-change, and Sarkozy and Merkel will experience no belief-change, or a pattern of paradigmatic belief-change.

	Degree of Keynesian orthodoxy	Degree of Ordoliberal orthodoxy	Dominant paradigm	Prediction of belief-change? (P2)
Zapatero	Low	Low	Keynesianism	Incremental
Cowen	None	None	Neither	Incremental
Sarkozy	High	Low	Keynesianism	None, or paradigmatic
Merkel	Low	High	Ordoliberalism	None, or paradigmatic

Table 3. Degree of orthodoxy per leader and paradigm, the dominant paradigm, and the resulting prediction on belief-change.

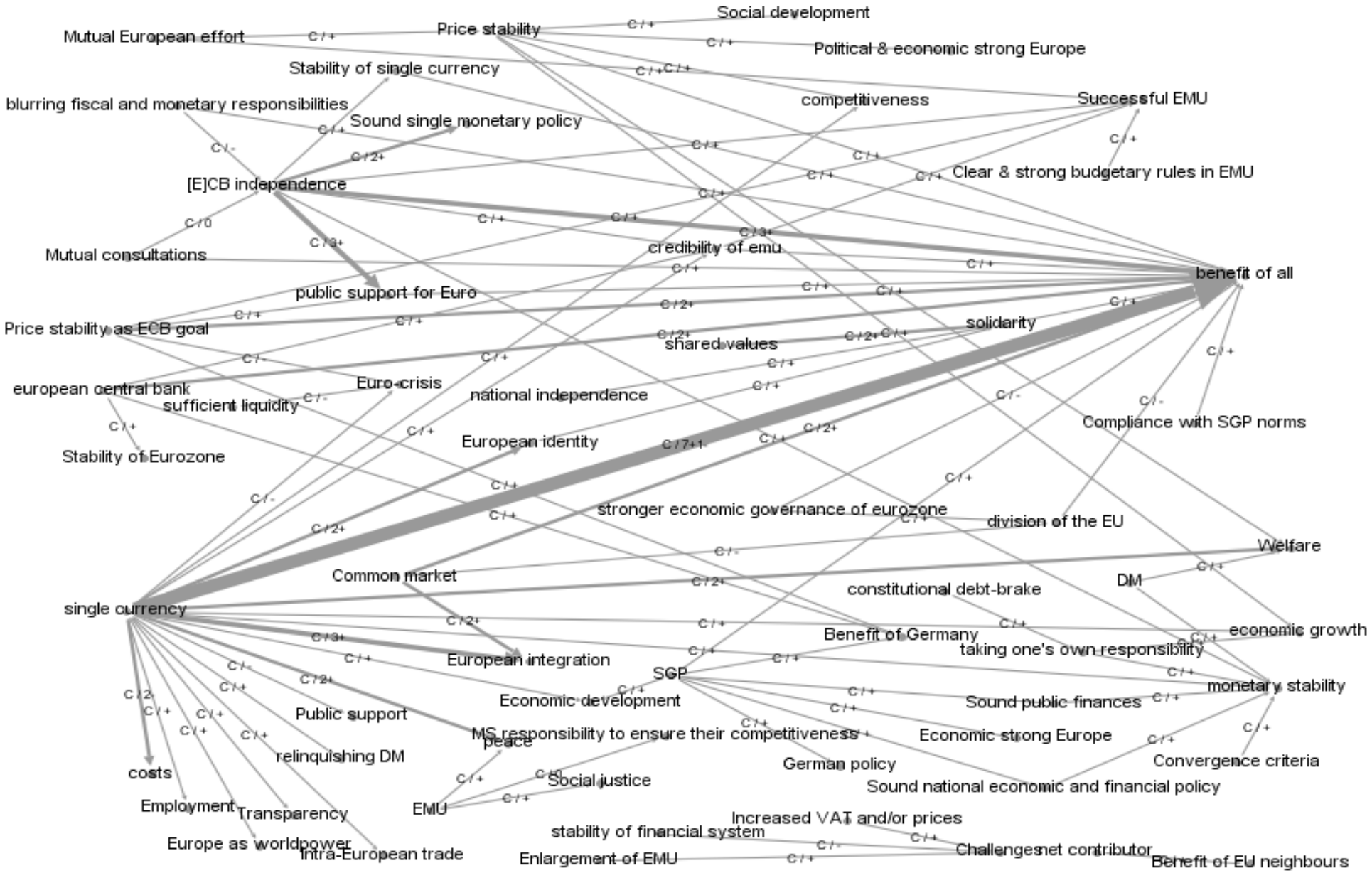


Figure 4. Merkel's pre-crisis cognitive map.

5 Dependent variables: a chance at change?

5.1 First and second order belief-change: aggregated saliency

Two measures of the occurrence of 1st and 2nd order belief-change can be derived from the comparison of the aggregated saliencies of pre- and post-crisis cognitive maps: the difference in relative aggregated saliency and in absolute aggregated saliency. These measures are used to test the predictions derived from hypothesis 1 and 2.

Zapatero

Comparison of the aggregated saliencies of Keynesian and Ordoliberal concepts as percentages of both maps (Figure 5), demonstrates that Zapatero's aggregated saliency changed from being more Keynesian to being more Ordoliberal. However, together these concepts now constitute only 35% of the aggregated saliency of the entire map, over eight percentage points less than previously. This reduction coincides with a major decrease in the aggregated saliency of Keynesian concepts. Together with an increase in the aggregated saliency of Ordoliberal concepts, this causes the slightly more Ordoliberal character of the second map; the map is now 1,29 times as Ordoliberal, as compared to 2,52 times as Keynesian before the crisis. The map's relative aggregated saliency has therefore gone from being weakly Keynesian to being even more weakly Ordoliberal. Although a change of most salient paradigm has taken place, the new ratio has only gone from weakly Keynesian to weakly Ordoliberal, therefore it cannot be concluded that Zapatero experienced 1st and 2nd order belief-change.

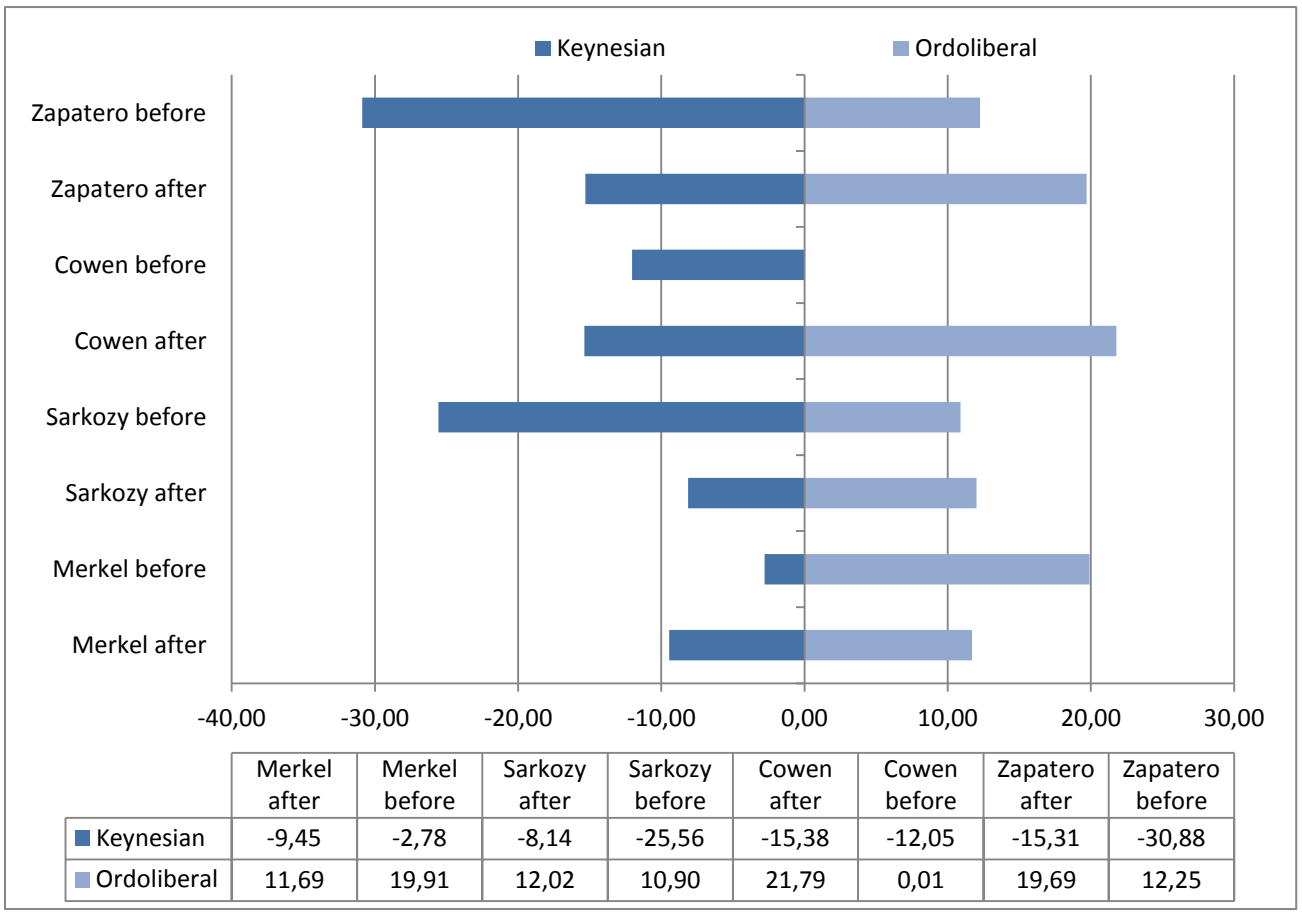
In terms of absolute aggregated saliency, Zapatero's Keynesianism has gone down from high to low, with the difference exceeding the benchmark for 1st and 2nd order belief-change. His Ordoliberalism has gone up from low to high absolute aggregated saliency, but the difference is smaller than the benchmark.

No change has occurred in Zapatero's relative aggregated saliency or his Ordoliberal absolute aggregated saliency. However, since the change in Keynesian aggregated saliency does qualify as 1st and 2nd order belief-change, it can be concluded that Zapatero experienced 1st and 2nd order belief-change as a result of the outbreak of the crisis.

Cowen

In Cowen's cognitive map, Ordoliberalism appears with the crisis. This is the immediate conclusion of even a glancing comparison of his pre- and post-crisis cognitive maps. In addition to the appearance of Ordoliberalism, an overall increase in concepts is immediately noticeable. The number of concepts in the map has gone up by 14, of which 12 are Ordoliberal, foretelling its increased importance. Comparison of the aggregated saliency of Keynesian and Ordoliberal concepts as a percentage of both maps (Figure 5), confirms this. Economic concepts constituted just over 12% of the aggregated saliency of the first map, while post-crisis they constitute over 37% of the map. This increase coincides with a major increase in the aggregated saliency of Ordoliberal concepts, resulting in Ordoliberal concepts taking up a larger share of the aggregated saliency in the newer map than Keynesian concepts. The map is now 1,42 times as Ordoliberal. It has gone from being strongly Keynesian, to being weakly Ordoliberal, therefore it can be concluded that Cowen experienced 1st and 2nd order belief-change.

The absolute aggregated saliency of Cowen's Keynesian concepts goes up slightly, but remains low. This small difference in aggregated saliency does not qualify as 1st and 2nd order belief-change. Ordoliberalism on the other hand goes up from 0% to 21,79%, crossing the benchmark for 1st and 2nd order belief-change. This means that it can be concluded on the basis of the difference in both absolute and relative aggregated saliencies that Cowen experienced 1st and 2nd order belief-change as a result of the crisis.



	Merkel after	Merkel before	Sarkozy after	Sarkozy before	Cowen after	Cowen before	Zapatero after	Zapatero before
Keynesian	-9,45	-2,78	-8,14	-25,56	-15,38	-12,05	-15,31	-30,88
Ordoliberal	11,69	19,91	12,02	10,90	21,79	0,01	19,69	12,25

Figure 5. Comparison of the percentages of the saliency of the leaders' cognitive maps, prior to and following the crisis, taken up by Keynesian and Ordoliberal concepts respectively. The percentage of the concepts that is Keynesian is indicated with a negative value, while Ordoliberal concepts are denoted with a positive value.

Sarkozy

The most directly noticeable difference between Sarkozy's pre- and post-crisis maps is the disappearance of the causational networks that dominated the earlier map. This is a likely indicator for more widespread belief-change. Indeed, a comparison of the aggregated saliency of Keynesian and Ordoliberal concepts as a percentage of both maps (Figure 5), affirms the observation that a decrease in the importance of Keynesian themes has taken place. As a matter of fact the entirety of economic concepts now constitutes only just over 20% of the aggregated saliency of the second map, as compared to 35% in the earlier map. It is remarkable that this reduction is entirely due to a decrease in the aggregated saliency of Keynesian concepts. Together with a slight increase in the aggregated saliency of Ordoliberal concepts, this means that Ordoliberal concepts now take up a larger share of the map's saliency than Keynesian concepts do; the map is now 1,48 times as Ordoliberal, compared to 2,34 times as Keynesian before the crisis. Although a change of dominant paradigm has taken place, the new ratio has

only gone from weakly Keynesian to weakly Ordoliberal, therefore it cannot be concluded on the that Sarkozy experienced 1st and 2nd order belief-change.

However, the absolute aggregated saliency of Sarkozy's Keynesian concepts was high and has gone down to a low absolute aggregated saliency. The difference is larger than the benchmark, thereby qualifying this as 1st and 2nd order belief-change. Ordoliberal aggregated saliency has gone up, but remains low. This means that no 1st and 2nd order Ordoliberal belief-change has taken place. Since the change in Keynesian aggregated saliency does qualify as 1st and 2nd order belief-change, it can be concluded on the basis of this difference that Sarkozy experienced 1st and 2nd order belief-change after the outbreak of the crisis.

Merkel

Comparing Merkel's pre- and post crisis maps, it is clear that the previously principal theme of the importance of central bank independence and price stability has taken a backseat to newly urgent, crisis related issues. Comparison of the aggregated saliency of Keynesian and Ordoliberal concepts as a percentage of both maps (Figure 5), confirms a decrease in the Ordoliberal character of Merkel's belief-system. Even so, economic concepts still constitute 21,15% of the aggregated saliency of the second map, similar to before. The decrease in the importance of Ordoliberalism has been partially matched by the magnitude of the increase in importance of Keynesianism. This means that Merkel's map is now only 1,24 times as Ordoliberal as it is Keynesian, while it was 7,16 times as Ordoliberal before the crisis. It is remarkable that Merkel is the only leader to become relatively more Keynesian, and the only leader not to experience a change in dominant paradigm. The difference is large, and Ordoliberalism's relative aggregated saliency has gone from high to low, but it remains the dominant paradigm. Therefore, it cannot be concluded on the basis of the difference in relative aggregated saliency that Merkel experienced 1st and 2nd order belief-change.

The absolute aggregated saliency of Merkel's Ordoliberal beliefs has gone from high to low. However, since the difference is smaller than the benchmark, this does not qualify as 1st and 2nd order belief-change. Keynesian aggregated saliency has gone up, but remains low, so no Keynesian 1st and 2nd order belief-change can be said to have taken place either. Since the changes in neither relative nor absolute aggregated saliency qualify as 1st and 2nd order belief-change, it cannot be concluded that Merkel experienced 1st and 2nd order belief-change as a result of the crisis.

Conclusion

None of the leaders, except Cowen, experienced such a change in relative aggregated saliency so as to qualify it as 1st and 2nd order belief-change. However, all the leaders, except Merkel, experienced a change in their absolute aggregated saliencies qualifying as 1st and 2nd order belief change. This means that Merkel is the only leader not to experience 1st and 2nd order belief change as a result of the crisis. The results for relative aggregated saliency are shown in table 4, those for the change in absolute Keynesian and Ordoliberal saliency in table 5 and the overall conclusions on the occurrence of 1st and 2nd order belief-change are summarized in table 6.

Relative Change

	Pre-crisis Relative aggregated saliency	Post-crisis Relative aggregated saliency	1st and 2nd order belief-change?
Zapatero	2,52 x more Keynesian: Weak	1,29 x more Ordoliberal: Weak	**No**
Cowen	∞ x more Keynesian: Strong	1,42 x more Ordoliberal: Weak	**Yes**
Sarkozy	2,34 x more Keynesian: Weak	1,48 x more Ordoliberal: Weak	**No**
Merkel	7,16 x more Ordoliberal: Strong	1,24 x more Ordoliberal: Weak	**No**

Table 4. Table summarizing each leader's scores on relative aggregated saliency of the dominant paradigm before and after the outbreak of the crisis, their categorization of paradigmatic dominance and the conclusion regarding the occurrence of 1st and 2nd order belief-change.

Absolute Change

	Pre-crisis Absolute aggregated saliency	Post -crisis Absolute aggregated saliency	1st and 2nd order belief-change?
Zapatero	High → Low > benchmark: **Yes**	Low → High, but < benchmark: **No**	**Yes**
Cowen	Low → Low: **No**	Low → High > benchmark: **Yes**	**Yes**
Sarkozy	High → Low > benchmark: **Yes**	Low → Low: **No**	**Yes**
Merkel	Low → Low: **No**	High→ Low, but < benchmark: **No**	**No**

Table 5. Table summarizing each leader's change in aggregated saliency based on absolute aggregated Keynesian and Ordoliberal saliency before and after the outbreak of the crisis, and the resulting conclusion regarding the occurrence of 1st and 2nd order belief-change.

Overall 1st and 2nd order belief change

	Relative change?	Absolute change?		1st and 2nd order belief-change?
Zapatero	No	Yes	→	**Yes**
Cowen	Yes	Yes	→	**Yes**
Sarkozy	No	Yes	→	**Yes**
Merkel	No	No	→	**No**

Table 6. Table summarizing the results regarding the occurrence of 1st and 2nd order belief change based on relative and absolute aggregated saliency, and the resulting overall conclusions regarding the occurrence of 1st and 2nd order belief-change.

5.2 Third order belief-change: change in Goal-orientation

In this section, the average go-value before and after the outbreak of the crisis are compared for each paradigm and each leader. The difference will serve to determine whether a pattern of paradigmatic belief-change has occurred. This enables testing of the predictions derived from hypothesis 1 and 2.

Zapatero

The go-values of Zapatero's pre-crisis paradigmatic concepts reveal that he considered seven Keynesian concepts to be means-oriented, five of these being stimulative measures. Only two Ordoliberal concepts scored comparably; the 'European Central Bank' and 'respecting the 3% rule'. On the other hand, 'long term budgetary stability', which is considered Keynesian because it is code for allowing temporary budget deficits, and the Keynesian concept 'economic growth' scored a fully positive go-value, while no Ordoliberal concept scores similarly. This means that Ordoliberal concepts cannot be considered to have purely been considered to be the goals of Keynesian means. Indeed, Zapatero's average pre-crisis go-value is negative for both Ordoliberal and Keynesian concepts (Figure 6). This means that he saw concepts of both paradigms as more means- than goal-oriented. Their goals being non-paradigmatic concepts, such as 'efficiency', 'competitiveness' and 'benefit of all'.

Before the crisis, Zapatero was the only leader in this study that did not see either paradigm as consisting mostly of goals, and the only one that did not see Keynesian concepts predominantly as goals. Since the average go-value for Keynesian concepts is of a greater magnitude than for Ordoliberal concepts, Zapatero on average considers Keynesian concepts more strongly means-oriented than Ordoliberal concepts, making Ordoliberalism his dominant goal-paradigm before the crisis. It was, however, still more means- than goal-oriented.

On the basis of the change in his average go-value, Zapatero can be concluded to consider both Keynesian and Ordoliberal concepts even more unilaterally as means-oriented after the outbreak of the crisis. A closer look at the data reveals that, in the new map, none of the paradigmatic concepts is exclusively a goal. This confirms that after the outbreak of the crisis, Keynesianism and Ordoliberalism are considered even less of a goal and more of a means. Instead, goals relating to European stability and economic success have become more prominent.

The crisis has also led Zapatero to now consider Ordoliberal concepts to be relatively more means-oriented than Keynesian concepts (figure 6), while it was the relatively more goal-oriented paradigm before the crisis. However, since neither paradigm was considered goal-oriented either before or after the crisis, this shift in goal-orientation is ambiguous at best; a change in dominant goal-paradigm has taken place, but this paradigm, Keynesianism, is not now considered to be a goal at all. Therefore it cannot be concluded on the basis of the change in goal-orientation that a pattern of paradigmatic belief-change has taken place.

Cowen

The individual go-values of the concepts in Cowen's pre-crisis map reveal that the importance of paradigmatic concepts paled in comparison to that of other monetary-economic concepts, such as: 'Tax harmonization', the 'Common market', 'Membership of the Euro' and 'competitiveness'.

This might mean that Cowen's pre-crisis belief-system cannot be so easily qualified in terms of a goal-paradigm, or that he follows a different paradigm altogether.

However, because Cowen's pre-crisis go-value is negative for his one Ordoliberal concept, 'relinquishing monetary autonomy', and positive for the average of the Keynesian concepts (Figure 6), it must nonetheless be concluded that before the outbreak of the crisis he saw Ordoliberalism as more means-oriented, and Keynesianism as both more goal-oriented and as the dominant goal-paradigm.

The emergence of new Ordoliberal concepts after the outbreak of the crisis is accompanied by a considerable shift in Cowen's Ordoliberal go-value; on average it has come to be much more means-oriented in his post-crisis map. Keynesian concepts remain predominantly goal-oriented, but the magnitude of the go-value does decrease considerably (figure 6). Upon further examination of the data, this is appears to be caused by a shift in the designation of the majority of Keynesian concepts as ultimate goals and effects, to a designation of the majority of these concepts to causes or intermediate goals and effects. The only paradigmatic goal with a high saliency is the Keynesian concept 'economic growth' (s=10 go=0,75). This indicates that while Ordoliberalism has newly occupied an important causative role in the post-crisis map, its ultimate goal is still of a Keynesian nature. Moreover, Keynesianism remains the relatively more goal-oriented paradigm. This means that no change in dominant goal-paradigm has taken place, and that it cannot be concluded on the basis of the change in goal-orientation that a pattern of paradigmatic belief-change has taken place.

Sarkozy

The individual go-values of the concepts in Sarkozy's pre-crisis map reveal that he considered most goals to be non- paradigmatic, including 'European economic integration', 'European fiscal coordination', 'financial regulation' and 'financial stability'. He did also consider some Keynesian concepts to be effects ('budgetary deficits', 'unfair advantages') but others as causes ('employment', 'economic growth'). This explains the positive, but small pre-crisis Keynesian go-value. The Ordoliberal concepts are on average strongly means-oriented before the outbreak of the crisis, which means that they were seen as the means to both Keynesian and non-paradigmatic goals. Because Sarkozy's go-value on average was negative for Ordoliberal concepts, and positive for Keynesian concepts (Figure 6), it must be concluded that he predominantly saw Ordoliberal concepts as means and Keynesian concepts as goals.

In Sarkozy's post-crisis map, the average go-value of Ordoliberal concepts has not changed much, implying that on average these are still considered to be mostly means-oriented. The most salient means-oriented concept in the map, however, is the newly occurring and non-paradigmatic 'French German Cooperation'(s=12), which must therefore be considered Sarkozy's prime solution to the crisis. The most salient goal in the new map is the similarly new and non-paradigmatic concept of 'successful EMU' (s=10). This suggests that the crisis has necessitated the formulation of both a new primary means and goal, neither of which belongs to either paradigm. Keynesian concepts, meanwhile, have gone from being predominantly seen as goals and effects (positive go-value) to being seen as means and causes (negative go-value) (figure 6). He is the only leader in this study to experience such a reversal of the go-value of a paradigm, resulting in a change from a goal- to a means-orientation of Keynesianism. This reversal is to a large degree due to the occurrence of negative Keynesian concepts relating to

expenditure, deficits and debt, suggesting that he believes the crisis to have had Keynesian concepts at its cause.

Although Keynesianism has gone from being mostly goal-oriented to mostly means-oriented, it remains the more goal-oriented paradigm as compared to Ordoliberalism. This means that no change in dominant goal-paradigm has taken place, and that it cannot be concluded on the basis of the change in goal-orientation that a pattern of paradigmatic belief-change has taken place.

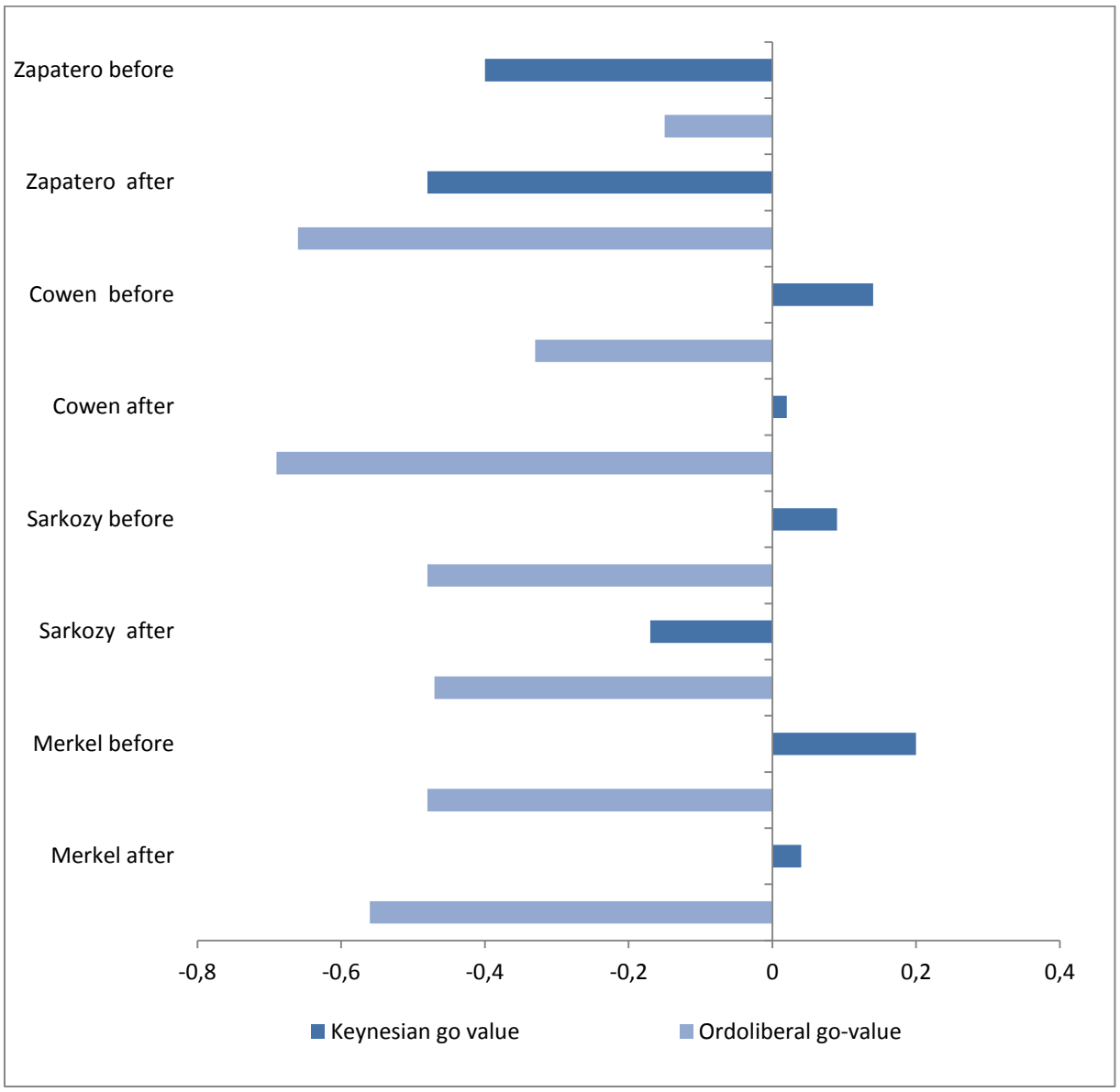


Figure 6. The average go-value of Keynesian and Ordoliberal concepts in each leader's cognitive map before and after the outbreak of the crisis.

Merkel

The go-values of Merkel's pre-crisis map reveal that, except for 'enlargement of EMU', all predominantly causative (paradigmatic) concepts were Ordoliberal, while the goal concepts were more evenly distributed over both paradigms. Indeed, the average go-value was strongly negative for Ordoliberal concepts (Figure 6), which implies that she believed these concepts to be means rather than goals. Merkel's dominant goal-paradigm, surprisingly, was Keynesianism, with the strongest positive goal-orientation found in this study.

In Merkel's post-crisis map Keynesianism on average becomes much less goal-oriented. Ordoliberalism becomes slightly more means-oriented, but this change is far less dramatic (Figure 6). A closer look at the data reveals that non-paradigmatic 'competitiveness' (s=18) and Ordoliberal 'sound public finances'(s=18) are newly prominent within Merkel's post-crisis belief-system. Both score negative go-values suggesting that they are perceived to be new instruments to solve the new macroeconomic and fiscal problems. The non-paradigmatic 'single currency'(s=23) remains the most salient concept, but becomes more goal-oriented than before the crisis, when it was seen purely as a means. The previously important Ordoliberal instruments 'ECB independence' (s=14 to s=1) and 'price stability'(s=7 to s=3) become more marginal, suggesting that these were means to solve now less relevant problems. Their positive average go-value suggests that Keynesian concepts are still mostly goal-oriented. The most salient Keynesian concept, however, is the 'fiscal support package' (s=12) which has a go-value of 0, meaning that it is as much a means as a goal. Moreover, the new map has almost as many Keynesian cause concepts as effect concepts. This results in a much weaker average goal-orientation for Keynesianism. All in all, this means that, according to Merkel, economic and monetary policy after the crisis more equally involves both Keynesian causes and effects, instead of mostly Keynesian goals. Ordoliberal concepts are seen to an even higher degree as instruments, although fiscal and macro-economic concepts replace monetary concepts as the most prominent among these. Still, Keynesianism remains mostly goal-oriented and Ordoliberalism overwhelmingly means-oriented. This means that no change in dominant goal-paradigm has taken place, and that it cannot be concluded on the basis of the change in goal-orientation that a pattern of paradigmatic belief-change has taken place.

Conclusion

None of the leaders in this study can unambiguously be said to have experienced 3rd order belief-change based on their change in goal-orientation. After the outbreak of the crisis, all the leaders, except Sarkozy, experienced a decrease in the goal-orientation of Ordoliberalism and a similar reduction in the Keynesian go-value, which means that they see both paradigms as less of a goal than before the crisis. However, of all the leaders, Sarkozy is the only one to experience a reversal from a goal- to a means-orientation, caused by the decreased average goal-orientation of his Keynesian concepts, even if Keynesianism still remains his dominant goal-paradigm. Zapatero is the only leader to experience a change in dominant goal-paradigm, however, since his new goal-paradigm remains more means- than goal-oriented, the occurrence of a pattern of paradigmatic belief-change is ambiguous. These results are summarized in table 7.

	Change in average Keynesian go-value	Change in average Ordoliberal go-value	Change in dominant goal- paradigm?	3rd order belief-change?
Zapatero	-0,08	-0,51	Ordoliberal →Keynesian	**Ambiguous**
Cowen	-0,12	-0,36	Remains Keynesian	**No**
Sarkozy	-0,26 (reversal)	+0,01	Remains Keynesian	**No**
Merkel	-0,16	-0,08	Remains Keynesian	**No**

Table 7. Change in go-values per leader and paradigm, with a negative change indicating a shift toward means-orientation and a positive change indicating a shift towards means-orientation. The resulting reversal in goal-orientation is also indicated and described, where it occurs.

5.3 Third order belief-change: change in Paradigmatic Orthodoxy

In this section, the paradigmatic orthodoxy before and after the outbreak of the crisis are compared for each paradigm and each leader. The difference will serve to determine whether a pattern of paradigmatic belief-change has occurred. This enables testing of the predictions derived from hypothesis 1 and 2.

Zapatero

Comparing the cognitive maps of Prime Minister Zapatero derived from his public assertions prior to (figure 1) and after (figure 7) the outbreak of the Euro-crisis, it is apparent that although economic well-being is still a prime objective, 'Stability of the Eurozone' has now become the most salient concept (s=25). 'Economic recovery' (s=12), is still either directly or indirectly downstream in causation of most of the concepts in the map. But the majority of these causation pathways now includes 'Stability of the Eurozone', indicating that this is the most important goal in the map, precisely because it positively affects economic recovery. As mentioned before, 'economic recovery' is a non-paradigmatic concept, that Zapatero seems to use interchangeably with 'economic growth', a Keynesian concept. This still seems to be true in the newer map, especially since 'economic stimulation' positively affects both concepts, without any mention of its potentially negative effects on price stability or budgetary discipline. This qualifies as a typically Keynesian line of reasoning.

The concept of 'price stability' itself is no longer mentioned in the new map, but instead the related concept of 'monetary stability' (s=3) has appeared. It is not connected in any way to growth and employment, making it unlikely that Zapatero perceives a trade-off between price stability on the one hand, and growth and employment on the other. This does not imply Keynesian reasoning, but since the non-existence of this trade-off isn't explicitly mentioned, it does not necessarily imply Ordoliberal reasoning either. Moreover, 'monetary stability' is thought to be positively affected by 'ECB asset purchases', 'fiscal crisis measures', and financial assistance', which is highly incompatible with Ordoliberal reasoning, since it compromises the Ordoliberal principals of ECB independence, rejection of monetary financing, and strict fiscal and budgetary rules. Furthermore, 'calm financial markets' (s=11) and 'stability of the Eurozone' (s=25) are also affected by these concepts, making it unlikely that 'monetary stability' (s=3), or price stability, is Zapatero's guiding principle. More Ordoliberal is the preference for strict budgetary rules and fiscal policies that becomes apparent in relation to the concept of 'economic strong Europe' (s=9), which is the goal-concept of a variety of regulatory concepts, including 'sanctions', 'clear and strong budgetary rules in the EMU', 'fiscal discipline', and 'compliance with SGP norms'.

All in all, Zapatero's post-crisis map can be said to be only weakly Ordoliberal, because only one of the Ordoliberal central tenets is professed. This has made his map more Ordoliberal than before the crisis, but since this still only results in a weakly Ordoliberal and moderately strong Keynesian map, no real change of dominant paradigmatic reasoning can be said to have occurred as compared to his moderately strong Keynesian and very weak Ordoliberal pre-crisis map. This means that it cannot be concluded on the basis of the change in paradigmatic orthodoxy that a pattern of paradigmatic belief-change has taken place.

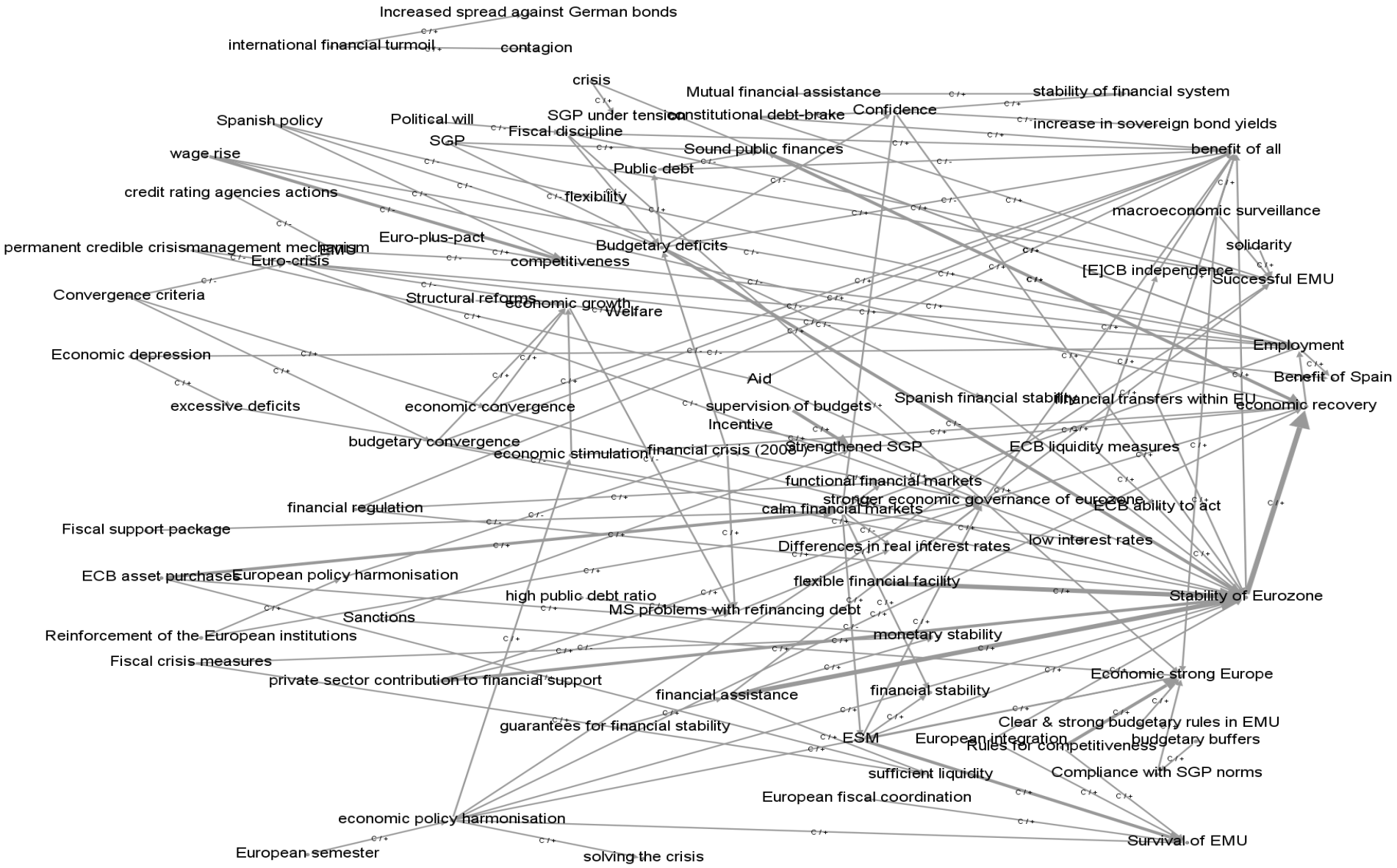


Figure 7. Zapatero's post-crisis cognitive map.

Cowen

Comparing Cowen's pre- and post-crisis maps (figures 2 & 8), it is clear that the themes that dominated his policy thinking before the crisis have greatly diminished in importance. The causal relation between 'tax harmonization' and 'competitiveness' isn't mentioned once. Neither is the concept of the 'common market' nor it's relation to 'membership of the Eurozone'. The last concept, 'membership of the Euro', is still mentioned as contributing to the 'benefit of Ireland', but no longer ambiguously, and no longer very saliently (s=13 down to s=3). These changes evidence a strong shift in focus, although not necessarily clearly along either paradigmatic line.

First of all, there is a new focus on the relation between the non-paradigmatic concepts of 'calm financial markets' (s=8) and 'financial stability' (s=8). The strong relation of this first concept with the utility concept 'benefit of all' further implies a strong preoccupation with maintaining financial order. Secondly, 'price stability' now appears in the map (s=3). It is positively affected by 'ECB independence' and positively affects 'export levels', implying both a more important role for price stability, and a preference for ECB independence. However, at s=3, price stability can't be designated his guiding principle. Perhaps more importantly he still sees 'relinquishing monetary autonomy' as a negative concept, now directly affecting price stability. All in all this is not a convincingly Ordoliberal line of reasoning. More convincingly, from the perspective of our paradigmatic dichotomy, is the focus on two other two relationships. These concern the concept of 'fiscal crisis measures' and its effect in reducing 'budgetary deficits' and contributing to 'sound public finances' (all s=6). Since in Cowen's case these fiscal crisis measures involve stricter appliance of budgetary rules and fiscal discipline, these relations do testify of Ordoliberal orthodoxy.

The next notable theme in Cowen's later map consists of concepts effecting 'economic growth' (s=10). These include 'competitiveness' (s=6), 'structural reforms (s=6)', 'export level' (s=5), 'sound public finances' (s=6) and 'financial stability' (s=8). Not mentioned in this context is a trade-off with price stability, but since its non-existence isn't explicitly mentioned either, this does not necessarily imply Ordoliberal reasoning. Neither is economic stimulation mentioned as positively contributing to growth or negatively, nor negatively to price stability and budgetary discipline. This means that since it is completely absent, Keynesian reasoning plays an even less prominent role in Cowen's thinking than Ordoliberalism.

All in all, Cowen must be considered to still not truly commit to either paradigm. He may be said to have become slightly more Ordoliberal in his thinking on public finances, and he must therefore be concluded to now be slightly more Ordoliberal than Keynesian. In this way he can be said to have experienced a change of paradigmatic reasoning, but since he did not have a dominant pre-crisis paradigm, and the paradigmatic orthodoxy of his post-crisis Ordoliberalism remains weak, any shift in paradigmatic reasoning is ambiguous . This means that, on the basis of the change in paradigmatic orthodoxy, it cannot be concluded that a pattern of paradigmatic belief-change has taken place.

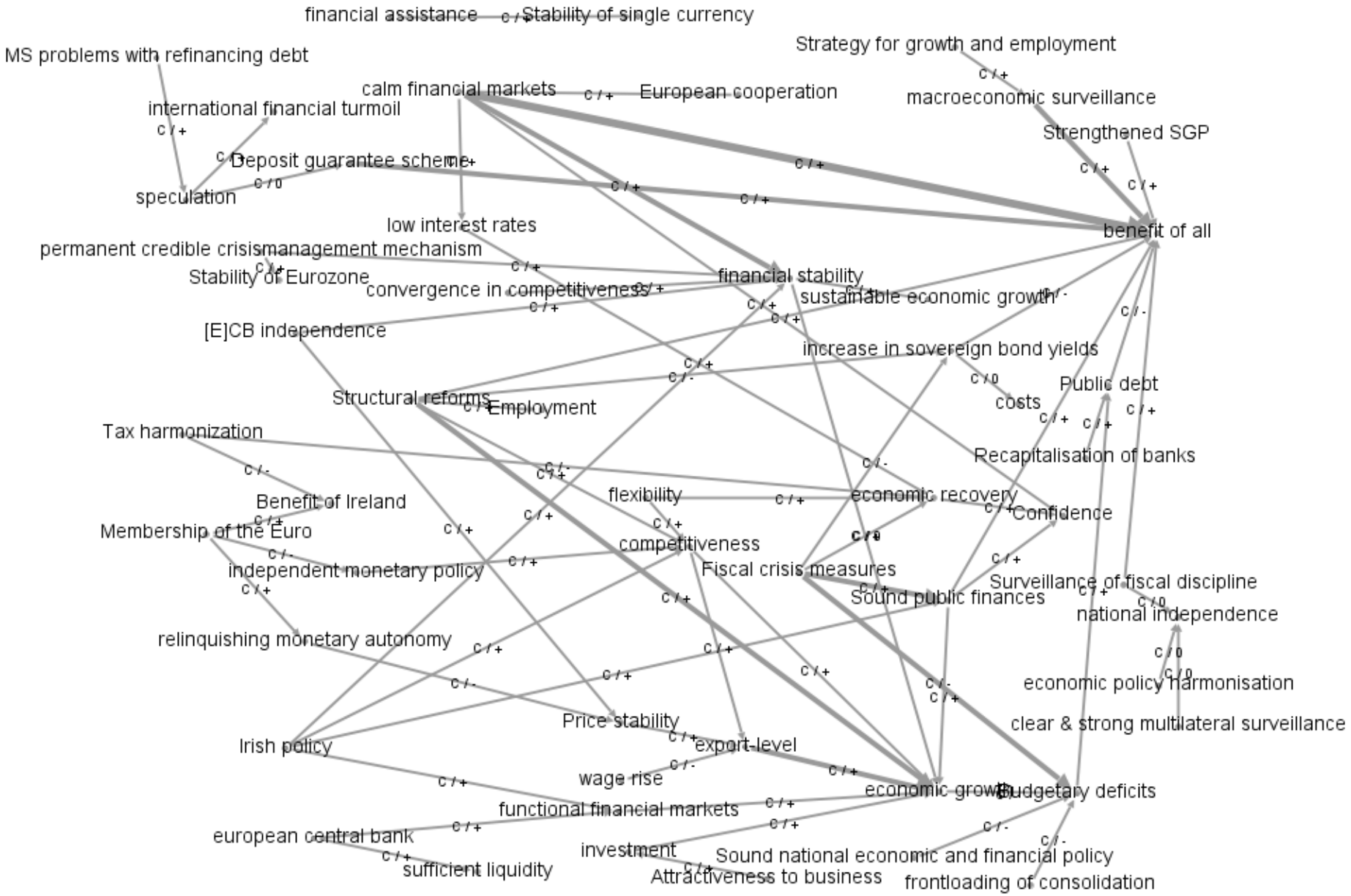


Figure 8. Cowen's post-crisis cognitive map.

Sarkozy

The most striking difference between President Sarkozy's cognitive maps derived from his public assertions prior to (figure 3) and following (figure 9) the outbreak of the Euro-crisis, is the disappearance of the relations that dominated the earlier map. It has already been demonstrated that this change coincides with a strong decrease in Keynesian aggregated saliency. What becomes clear from studying the difference between both maps, is that that the previously prominent un-Ordoliberal and Keynesian networks have been replaced by more typically Ordoliberal networks. Among these are several relations involving negative Keynesian concepts; 'public debt' and 'government expenditure' that negatively affect 'national independence', 'excessive debt' that has contributed to the 'Euro-crisis', and 'government expenditure' and 'budgetary deficits" that negatively affect the 'benefit of France'. All these relations somehow concern government expenditure and its effects on sovereign debt, and testify of Sarkozy's new-found belief that it is a problem, rather than a solution for effects of the financial crisis, as he previously seemed to imply. This line of reasoning is new to Sarkozy and is typically Ordoliberal in that it is compatible with the desire for stricter budgetary rules and fiscal policies.

Furthermore, it should be noted that many Ordoliberal concepts are seen as contributing to positive concepts such as a 'successful EMU' and the 'benefit of France'. However, price stability does not feature at all in Sarkozy's monetary and economic thinking, and the related concepts of 'monetary stability' and 'stability of the single currency' do not feature prominently either. ECB independence is not mentioned at all. Instead, ECB crisis measures are named as a possible means of realising economic growth. Monetary financing is not explicitly rejected, nor is the existence of a trade-off between price stability on the one hand and economic growth and employment on the other explicitly denied. Overall this, in combination with the relatively small increase in the saliency of Ordoliberal concepts, implies that Sarkozy might only be interested in certain parts of the Ordoliberal paradigm, specifically those relating to fiscal policies. The fact that the downside to government expenditure features so prominently in Sarkozy's post-crisis map, and a possible trade-off between price stability on the one hand and economic growth and employment on the other, also precludes a description of Sarkozy as truly Keynesian. Some Keynesian concepts might still be present, the role of Keynesian reasoning has diminished considerably. Such reasoning might have been replaced by an old solution to new problems; the striking new addition to the map of 'French German cooperation' as a means of achieving 'stronger economic governance' and a 'European economic government'. Although these are not explicitly mentioned as means of solving the crisis, Sarkozy, and other French leaders, might well consider this to be obvious.

Overall these changes produce a slightly more Ordoliberal and much less Keynesian map, resulting in a change of dominant paradigmatic reasoning to Ordoliberalism. This means that, on the basis of the change in paradigmatic orthodoxy, it can be concluded that a pattern of paradigmatic belief-change has taken place.

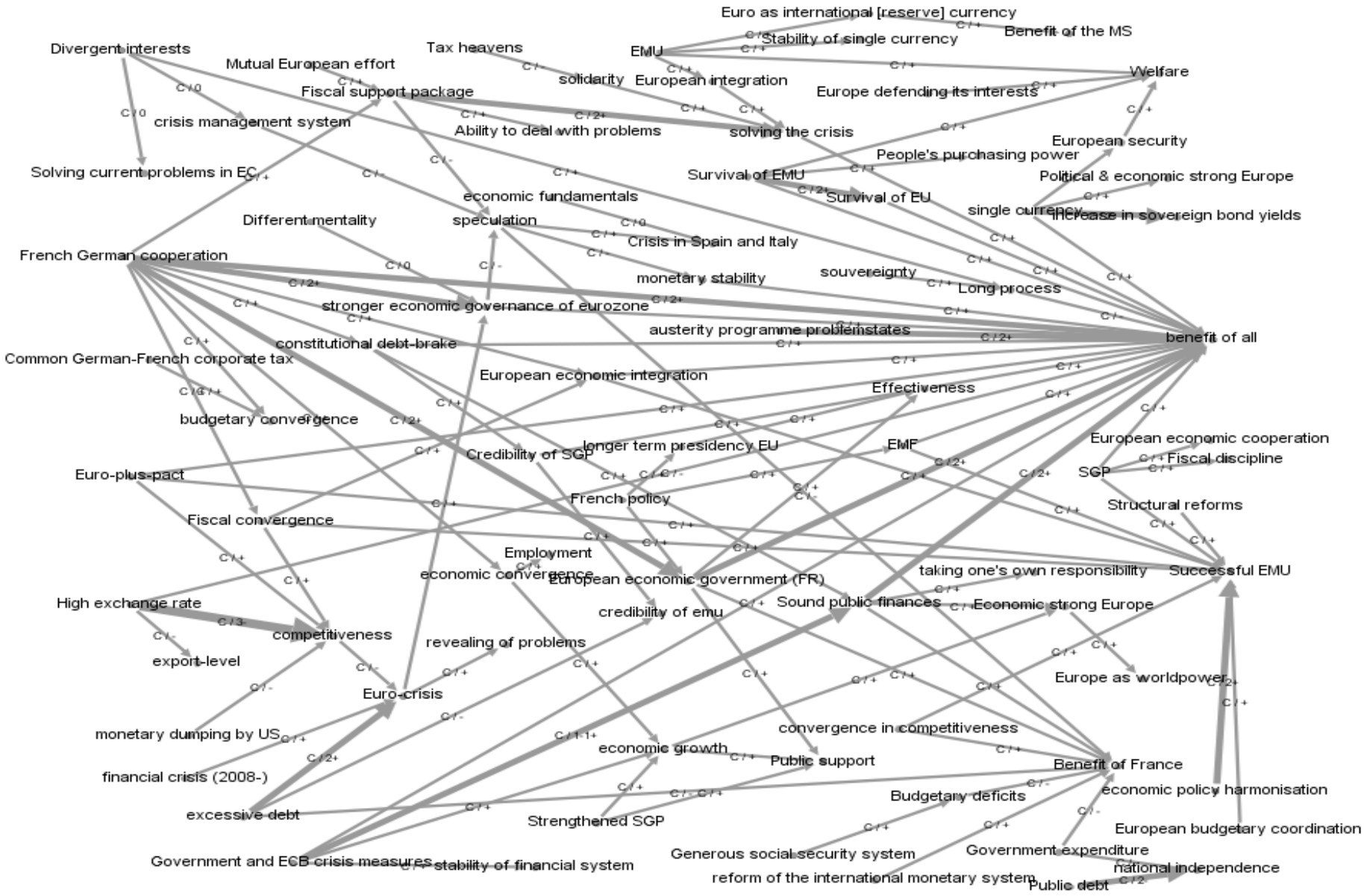


Figure 9. Sarkozy's post-crisis cognitive map

Merkel

Comparison of Chancellor Merkel's pre- and post-crisis cognitive maps (figures 4 & 10), shows that increased 'competitiveness' (s=18, up from s=2) is seen as the most likely, non-paradigmatic, solution to the crisis, partially trough restoring 'market trust' (s=10) and its beneficial effects. The 'single currency' (s=23), remains the most salient concept, positively affecting many Keynesian goals like 'economic growth' (s=3), 'export levels' (3), 'welfare' (s=3) and 'employment' (s=2) and a single Ordoliberal instrument; 'ECB independence'. The decrease in saliency of this last concept (from s=14 to s=1) is indicative of the loss of importance of monetary Ordoliberalism in relation to the EMU. The disappearance of 'price stability as a ECB goal' (previously s=6) and 'monetary stability'(previously s=7), and the decreased salience of 'price stability' (from s=6 to s=3) are further evidence that Ordoliberalism has not just decreased in saliency, but that its main monetary tenets are no longer considered central to the functioning of the monetary union.

The Chancellor's interpretation of the Euro-crisis is still Ordoliberal in that she identifies Keynesian concepts like 'economic stimulation' (s=2) and the long term saviour of the banking sector (s=2) as causes of the Euro-crisis, their benefits outweighing their negative effects. However, she also endorses the newly occurring 'fiscal support package' (s=12) and perceives it as contributing to the 'survival of the EMU' and to the restoration of 'market trust'(both s=10). This suggests that she considers the benefits of this form of economic stimulation to outweigh the negative effects it has on budgetary discipline and price-stability, which qualifies as a typically Keynesian line of reasoning. Even more strangely for pre-crisis Ordoliberal, she considers the concept of 'fiscal discipline'(s=8) to have contributed to the crisis, which seems to contradict the Ordoliberal insistence on strict budgetary and fiscal policy. On the other hand, both it and the concept of 'sound public finances' (s=18), have also become more important as solutions to combat the crisis and its effects. The decreased saliency of monetary Ordoliberal concepts seems to have been partially compensated by the increased saliency of these fiscal Ordoliberal concepts, suggesting a shift in focus within the paradigm.

Overall, the Chancellor's belief-system has become much less typically Ordoliberal, as some major changes have occurred, both within and to the detriment of this paradigmatic reasoning. These changes concern a shift from monetary to fiscal measures, including Keynesian measures like fiscal support and the Euro-plus pact, and even a reversal on previously held monetary beliefs, such as ambiguously supporting 'ECB asset purchases'. Still, it is fair to suggest that the map remains at least as Ordoliberal as it has become Keynesian. Therefore, no change of dominant paradigmatic reasoning can be concluded to have taken place. This means that it cannot either be concluded on the basis of the change in paradigmatic orthodoxy that a pattern of paradigmatic belief-change has taken place.

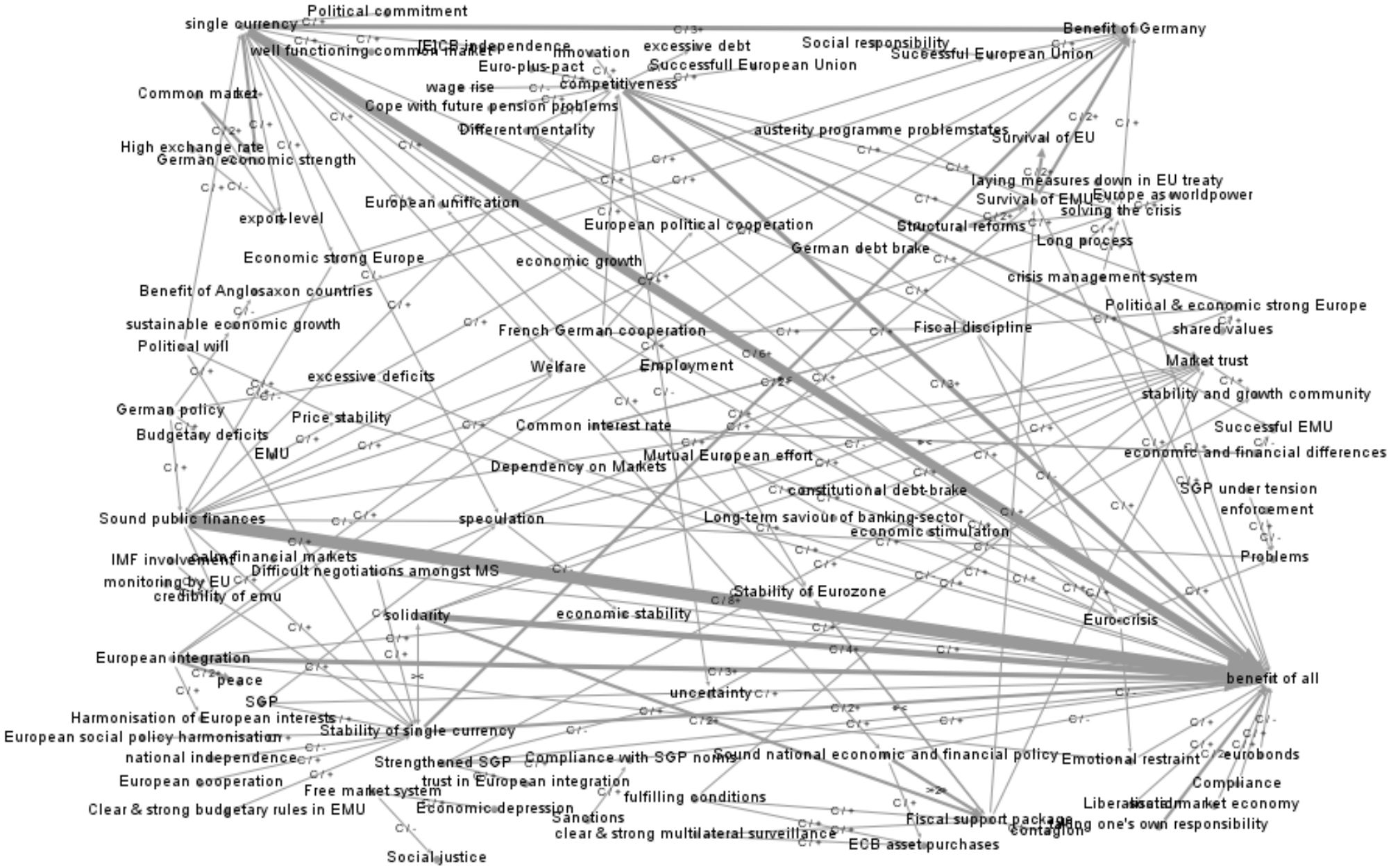


Figure 10. Merkel's post-crisis cognitive map

Summary

All in all, the crisis seems to have affected the leaders in this study mostly by decreasing the strength of their dominant paradigm and increasing the strength of their subordinate paradigm, bringing consensus on monetary economic policy making closer. This seems to be accompanied by an increased significance for fiscal Ordoliberalism in all the leaders' belief-systems. This increase causes Zapatero, Cowen and Sarkozy to become more Ordoliberal overall, while being the foremost reason that Merkel remains predominantly Ordoliberal after abandoning monetary Ordoliberalism. These results and their corresponding conclusions on the occurrence of 3rd order belief-change are summarized in table 8.

	Change in degree of Keynesian orthodoxy	Change in degree of Ordoliberal orthodoxy	Pre-crisis dominant paradigm	Post-crisis dominant paradigm	3rd order belief-change?
Zapatero	Remains strong	Increases, but remains weak	Keynesian	Keynesian	**No**
Cowen	Remains absent	Increases, but remains weak	Neither	~ Ordoliberal	**No**
Sarkozy	Decreases to weak	Increases, but remains weak	Keynesian	Ordoliberal	**Yes**
Merkel	Increases, but remains weak	Decreases to weak	Ordoliberal	Ordoliberal	**No**

Table 8. Degree of orthodoxy per leader and paradigm, the dominant pre- and post-crisis paradigm, and the resulting conclusion on the occurrence of belief-change.

5.4 Overall third order belief-change

The occurrence of two forms of 3rd order belief-change has been determined. In order to use the overall occurrence of 3rd order belief-change as a dependent variable table 9 summarizes the results for both the determination of the occurrence of a change in goal orientation and of a change in paradigmatic orthodoxy. If either of these forms of 3rd order change occurred, the conclusion is that overall 3rd order belief change occurred. This is ambiguous for Zapatero, because he may or may not have experienced a change in goal-orientation. Sarkozy is considered to have experienced third order belief-change, because of his change in paradigmatic orthodoxy. Merkel and Cowen did not experience either form of change and are therefore considered not to have experienced 3rd order belief- change.

Overall third order belief-change				
	Change in Goal-orientation	Change in Paradigmatic orthodoxy		3rd order belief-change?
Zapatero	Ambiguous	No	→	**Ambiguous**
Cowen	No	No	→	**No**
Sarkozy	No	Yes	→	**Yes**
Merkel	No	No	→	**No**

Table 9. Summary of the occurrence of changes in goal-orientation and paradigmatic orthodoxy and the overall conclusion on the occurrence of 3rd order belief-change.

6 Conclusion and discussion

Patterns of belief change

After determining the occurrence of 1st and 2nd order belief-change, as well as 3rd order belief-change for each leader, their pattern of belief-change as a result of the crisis can be established. Later in this chapter the observed patterns will be compared to the predictions from chapter four, to verify or falsify hypothesis 1 and 2. Each leader can have one of three patterns of belief-change, i.e.; no belief-change (no change at all), incremental belief-change (1st and 2nd order change only), or paradigmatic belief change (both 1st and 2nd order change and 3rd order change).

Cowen is considered to have experienced an incremental pattern of belief change because he did show 1st and 2nd order belief-change, but no (unambiguous) 3rd order change. Zapatero is similarly considered to have (at least) experienced an incremental pattern of change, but because he may have experienced 3rd order change as well, he must be considered to have possibly experienced a paradigmatic pattern of change. Sarkozy's pattern of belief change is paradigmatic since he displayed both 1st and 2nd order and 3rd order change. Since Merkel shows neither order of change, she is considered to have experienced no belief-change as a result of the crisis. All the results regarding belief change and the associated patterns of belief-change are shown in table 10.

Determination of patterns of belief change

	1st and 2nd order belief-change?	3rd order belief-change?	Pattern of belief change
Zapatero	Yes	Ambiguous	**At least Incremental, possibly Paradigmatic belief-change**
Cowen	Yes	No	**Incremental belief-change**
Sarkozy	Yes	Yes	**Paradigmatic belief-change**
Merkel	No	No	**No belief-change**

Table 10. Summary of the occurrence of 1st and 2nd order belief-change, and 3rd order belief-change, with the resulting conclusion on the corresponding pattern of belief-change.

Comparing predictions to observations

Determination of the observed pattern of belief change for each of the leaders in this study allows for the predictions on the occurrence of belief-change to be tested. In chapter four, two predictions were applied to each leader;

- the prediction (P1) that leaders with a greater openness to information experience a pattern of incremental belief-change, while leaders with a lower openness to information experience no belief change, or a pattern of paradigmatic belief-change.
- the prediction (P2) that leaders with a *low belief-strength* experience a pattern of incremental belief-change, while leaders with a *high belief-strength* experience no belief change, or a pattern of paradigmatic belief-change.

When applied to each leader by determination of their openness to information and their belief-strength, these allowed for specific predictions about their most likely pattern of belief-change as a result of the crisis; these predictions are shown in the first and second column of table 11.

Comparison of the predicted patterns of belief-change to those actually observed (third column of table 11) allows for the verification or falsification of each prediction.

Predictions and observations compared			
	Openness to information Predicted pattern (P1):	Belief-strength Predicted pattern (P2):	Observed pattern of belief-change
Zapatero	None, or Paradigmatic	Incremental	**At least Incremental, possibly Paradigmatic belief-change**
Cowen	Incremental	Incremental	**Incremental belief-change**
Sarkozy	*Incremental*	None, or Paradigmatic	**Paradigmatic belief-change**
Merkel	*Incremental*	None, or Paradigmatic	**No belief-change**

Table 11. The predicted patterns of belief change, as determined for the predictions, P1 and P2, applied to each of the studied leaders, compared to the observed pattern of belief change. Prediction matching the observed pattern are indicated in green and in underlined typeface, those that do not match the observed pattern are indicated in

The variable 'openness to information' correctly predicts Cowen's and Zapatero's pattern of belief-change, although the observed pattern is ambiguous for Zapatero. However, the observed pattern of belief change differs from the prediction for two of the studied leaders; Sarkozy and Merkel do not experience an incremental pattern of belief change. This makes it implausible that a leader's pattern of belief change as result of a crisis can be correctly predicted by determination of his or her openness to information. Therefore, hypothesis (H1) that *a greater openness to information predicts the occurrence of a pattern of incremental belief-change, while a lower openness to information predicts that either no belief-change, or a pattern of paradigmatic belief-change will occur*, has to be rejected.

The same cannot be said about hypothesis 2 and the predictive value of pre-crisis belief-strength. The predictions derived from this hypothesis match the observed pattern of belief change for each of the studied leaders (as indicated in table 11 by underlined, correct, predictions). This makes it plausible that a leader's pattern of belief-change as a result of a crisis can be correctly predicted by determination of his or her pre-crisis belief-strength. Therefore the hypothesis (H2) that *a low belief-strength predicts the occurrence of a pattern of incremental belief-change, while a high belief-strength predicts that either no belief-change, or a pattern of paradigmatic belief-change will occur*, is accepted.

The conditionality of belief-change revisited

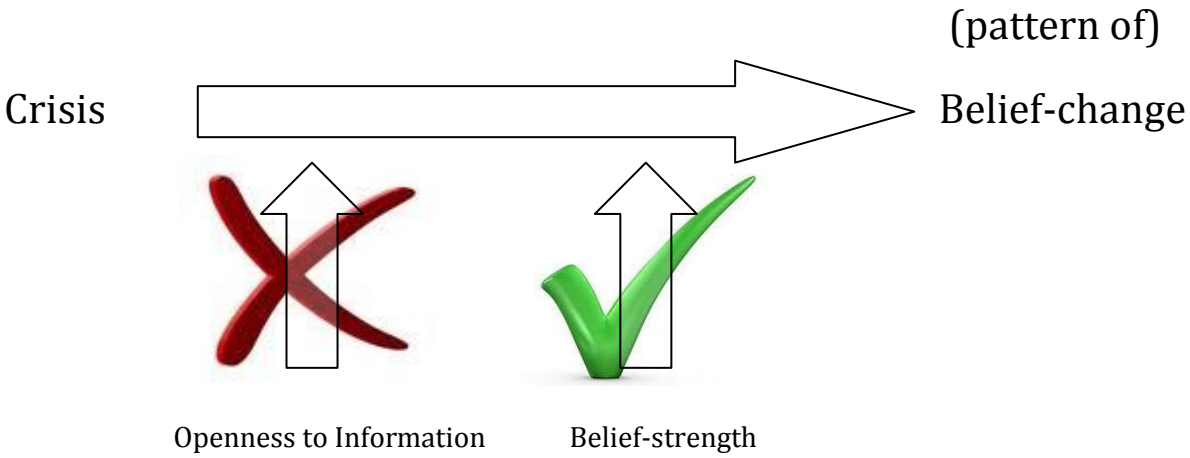
Rejection of hypothesis 1 means that it is unlikely that a leader's openness to information has a (critical) influence on patterns of belief-change during crises. No further explanation can, or needs to be, given for this lack of influence; it is simply observed not to be a decisive factor in determining the pattern of belief-change among the studied leaders.

The fact that belief-strength is shown to be predictive for the experienced pattern of belief-change in the studied leaders implies that hypothesis 2 is correct. The co-variance of belief-strength and patterns of belief-change as a result of the crisis fits the model of conditionality of belief-change proposed in chapter 2, and shows that differences in belief-strength are a plausible influence on patterns of belief change. This means that, under the assumption of the presented model, this study validates the possibility of conditionality of belief-change as a resultant of

belief-strength; the occurrence of a pattern of incremental belief-change or either a pattern of paradigmatic belief-change or no belief-change, as a result of crises, depends on a leader's pre-crisis belief-strength. In other words, the main question of this study can be answered as follows:

The state of a leader's belief-system during a crisis is not affected by his/her openness to information, but is affected by the strength of his/her beliefs.

Or visually;



Theoretical reflection

In this thesis, a new theoretical model of belief dynamics has been presented and a mechanism through which belief-change can take place has been proposed. In this model threat-rigidity and crisis-learning are classified as two different patterns of belief-change occurring at different levels of uncertainty or imperfection of correspondence of information with the environment. This level of uncertainty therefore determines whether the system of belief-dynamics remains in equilibrium (1st and 2nd order, incremental change; threat-rigidity) or whether this equilibrium is punctuated (3rd order, paradigmatic belief-change; crisis-learning). This uncertainty should not be considered to be an absolute value; the empirical findings presented in this study suggest that it is dependent on the leader's pre-crisis belief-strength. They also show that it is probably not (decisively) dependent on a leader's openness to information. This contradicts the usual association of this trait with belief-change (Hermann 2003; Thies 2009).

The demonstrated conditionality of patterns of belief-change on pre-crisis belief-strength is in accordance with earlier empirical finding that crises may induce belief-change as well as rigidity or reinforcement. However, it also further demonstrates that neither the threat-rigidity thesis, nor the crisis learning thesis, can satisfactorily explain belief-dynamics during crises. Neither thesis could predict the occurrence of belief-change as well or better than hypothesis 2 of this study. In addition, by not discriminating between different forms of belief-change, they would be in disagreement about whether belief-change actually occurred. The proposal of a new model of belief-dynamics, and the subsequent proof of principle given in this study, should therefore be considered its main innovation.

By introducing a model that allows for the occurrence of different forms of belief-change, the ability to accurately study belief-change during crisis is improved. Application of this model to previous observations may show that different conclusions on the occurrence of belief change

are in fact the result of the use of different definitions, rather than evidence pointing in different directions. Without such a model, the observations in this study would likewise support either the threat-rigidity thesis or the crisis-learning thesis, depending on which leader you look at, and which definition of belief-change you use. Similarly, the fact that belief-change is shown to be conditional, not only on the occurrence of a crisis, but also on a leader's pre-crisis belief-strength, helps to provide a more complex and complete understanding of belief-change and crises. By providing proof of concept for a cognitive model of crisis, this study also demonstrates the advantages of a cognitive approach to the study of crises; both the fact that different forms of belief-change may occur and the fact that this is conditional on the pre-crisis strength of beliefs, demonstrate that decision making during crisis is even more highly complex than most models assume. A cognitive approach to decision making, incorporating the model proposed in this study, may help elucidate this complexity.

Proof of the plausibility of a *punctuated equilibria* model of belief-dynamics implies that such homeostatic systems are even more ubiquitous than previously assumed. This should serve as an example for other areas of research in which seemingly irreconcilable theses dominate academic discourse. More importantly, incorporation of the model used in this study into the model that inspired it, may enrich the punctuated equilibria model of policy-change. Since it functions along the same lines as the model proposed by Hall (1993), its repercussions should be easily translated to the discussion about policy change, especially during crises.

Application of the changes to the discourse on belief change proposed in this study, may be beneficial to more than just academic society. Wider society may benefit from a better understanding of how, why and when leaders change their mind, both on monetary-economic policy and policy in general. In this way, insight into the different processes of belief-change could benefit those trying to promote policy-change and those trying to facilitate consensus among leaders. The findings in this study suggest that a *one-size-fits-all* approach to nurturing belief-change is unproductive; it may be helpful to ascertain the strength of the relevant leaders' beliefs before deciding on a strategy to change them.

Methodological reflection

The most important observation on the methods of this study relates to the difference between the employed approach and the causal process tracing approach; proof of causality of the demonstrated conditionality would benefit its persuasiveness. Evidence of (complex) interactions between belief-strength as a causal factor and patterns of belief-change as a dependent factor cannot be easily deduced to further corroborate hypothesis 2. However, the limitations of the methodology used and the subject studied are not best suited for causal process tracing to corroborate the presented findings, simply because cognitive processes are not easily traced. Therefore it is hard to provide a "temporal unfolding of situations, actions and events, traces of motivations ..., evidence of (complex) interactions between causal factors, and/or information about restricting/catalyzing contexts/conditions, and detailed features of a specific outcome" (Blatter and Blume 2008). An attempt at tracing the causality of the observed co-variance, would be based on too many assumptions, and would not differ much from the model of belief-dynamics proposed in chapter 2. Nonetheless, an attempt at tracing the causality of the conditionality of belief change, based on the results of this study could be attempted and might result in relevant observations. For now, however, it is beyond the scope of this thesis.

As for the reliability of the methods used for establishing the different variables in this study, the adherence to the two procedures for the collection and analyses of the studied data, LTA and CCM, did, as expected, assure minimal error in reliability through lack of precision and consistency. It should be noted that inter-coder reliability for CCM should be determined to assure reliability of any comparison between researchers. However, the method employed appears to be robust, and therefore any mistakes made have hopefully been minor. Experience suggests that such minor differences are unlikely to affect the overall conclusions derived from the method.

The validity of the conclusions drawn about the conditionality of belief-change depends on the degree to which systemic errors were prevented. As explained in chapter three, construct validity and external validity have had to be balanced. To ensure construct validity, the hypotheses and predictions were formulated in a way that allows for a conclusion to be drawn from the data that is available from, especially, cognitive mapping. However, no conclusive, empirical evidence can be given to validate the assumptions about the correspondence of 1st and 2nd order belief-change and changes in aggregated saliency, or of 3rd order change and go-value or paradigmatic orthodoxy. These assumptions, although based on theory, therefore remain such. However, it is beyond the scope of this thesis to empirically demonstrate that these assumptions are correct, therefore, the task of resolving this problem regarding construct validity has to be delegated to future research. To demonstrate the correspondence of 1st and 2nd order change with changes in aggregated saliency, a research subject should be chosen that specifically involves belief-change about the calibrations and use of instruments rather. If co-variance between the two can be demonstrated, the assumption is validated. The correspondence of 3rd order change with go-value and paradigmatic orthodoxy could similarly be established by analysing known changes in beliefs about goals and underlying reasoning. If such study would be undertaken, verifying the correspondence between the go-value and 3rd order belief-change should be a prime objective; during the course of this study, the validity of this measure has been the most uncertain. While it does seem to reliably indicate the goal-orientation of individual concepts, the degree to which these can be added up remains unclear and uncertain. Further examination of its correspondence to paradigmatic goal-orientation should take away these qualms about its validity, or eliminate it as an instrument.

The external validity of the results of this study cannot be indubitably demonstrated either. However, the inclusion of different types of leaders operating under different circumstances makes it likely that the results are applicable to other leaders. At the very least to other western (European) and probably other leaders operating in a democracy . In order to establish external validity for all leaders, the scope, in terms of both the number of leaders studied and the number of situations in which they are studied, will have to be extended. For starters, this study could be extended to include all the European leaders involved in monetary-economic decision-making during the Euro-crisis. This would be a big (and interesting) project. For now, however, this study has established the co-variance of the studied variables for a limited set of leaders, and thereby provides, at a minimum, a proof of concept through its analytical (external) validity.

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Appendix. Interviews used for interview responses for leadership trait analysis

Germany – Angela Merkel:
1) Video interview on BBC news (transcripted)
http://www.bbc.co.uk/news/world-europe-17497656
2) Transcript of interview with Angela Merkel in Der Spiegel, ausgabe 23/2009
http://www.spiegel.de/international/germany/spiegel-interview-with-chancellor-angela-merkel-no-script-for-the-crisis-a-627935.html
3) Interview with the Financial times, 9-11-10
http://www.ft.com/intl/cms/s/0/1291fe90-ebf5-11df-b50f-00144feab49a.html#axzz2Ld5c45lk
4) Embassy
5) Video podcast by the Federal Chancellor - 28 May 2011
http://www.bundeskanzlerin.de/Content/EN/Artikel/_2011/05/2011-05-31-podcast-ausschriftung_en.html
6) 'Here's the exact transcript of Angela Merkel's comments in Brussels' op The Journal.ie, October 2012
http://www.thejournal.ie/merkel-esm-press-conference-transcript-642701-Oct2012/
7) Transcript: Israeli Prime Minister Netanyahu and German Chancellor
Angela Merkel at Joint Press Conference in Berlin.
http://www.theisraelproject.org/site/apps/nlnet/content2.aspx?c=hsJPK0PIJpH&b=689705&ct=7323363
8) Transcript: Obama, Merkel Discuss Middle East 5-7-2009 http://www.cbsnews.com/8301-503544_162-5065163-503544.html
9) Press Conference following Talks with German Chancellor Angela Merkel, 21-1-2007
http://unispal.un.org/UNISPAL.NSF/0/058068BC53C2413B8525727300586C39
10) Wall street journal 24-7-10, Transcript: Merkel Q&A
http://online.wsj.com/article/SB10001424052748704629804575324913545117850.html
11) Merkel on EU Convention during German primetime, 25-8-2012
http://www.democracy-international.org/9035.html
12) Transcript: Press Conference With Secretary of State Rice and German Chancellor Merkel, Tuesday, December 6, 2005
http://www.washingtonpost.com/wp-dyn/content/article/2005/12/06/AR2005120600979.html

Ireland – Brian Cowen:
1) Statements and interview responses retrieved from the official Taoiseach website of the website of the Irish government, Statement 11-12-2008 2) Statements and interview responses retrieved from the official Taoiseach website of the website of the Irish government, Statement 1-1-2009
3) Statements and interview responses retrieved from the official Taoiseach website of the website of the Irish government, Statement 12-2-2009
4) Statements and interview responses retrieved from the official Taoiseach website of the website of the Irish government, Statement 23-5-2009
5) Interview transcript of interview Cowen on Irish radio RTE Morning Ireland, in the Irish times 14-09-2010 http://www.irishtimes.com/blogs/politics/2010/09/14/taoiseach-transcript/
6) An Taoiseach Brian Cowen and Minister Brian Lenihan – Joint Statement, Government Buildings, 21st November 2010
http://www.dfa.ie/uploads/documents/embassy/Madrid%20EM/transcript%20of%20taoiseach%20-%20min%20finance%20press%20conference.pdf
7) Interview with Ireland's PM, Brian Cowen, March 17, 2010
http://www.realclearpolitics.com/articles/2010/03/17/interview_with_irelands_pm_brian_cowen_104825.html

Spain – Luis Zapatero:
1) Interview with CNBC
http://www.cnbc.com/id/40468254/Full_Transcript_of_CNBC039s_Interview_with_Zapateronbsp
2) Interviews retrieved from the personal website of Zapatero
http://www.lamoncloa.gob.es/IDIOMAS/9/home

France – Nicolas Sarkozy:
1) Transcript of interview Sarkozy with French newspaper Le Figaro
2) Interview with Turkish newspaper Hurriyet Daily News
3) Interview with the New York Times
4) Presentation of the French presidency of the G20 and G8 – Press conference given by Nicolas Sarkozy, President of the Republic (excerpts), Paris, 24 January 2011
http://ambafrance-uk.org/President-Sarkozy-s-press,18574
5) Interview given by M. Nicolas Sarkozy, President of the Republic, to the "Osservatore Romano" newspaper, "Vatican Television Centre" and "Vatican Radio" (excerpts)
Vatican City, 20 December 2007
http://ambafrance-uk.org/President-Sarkozy-s-visit-to-the
6) Visit to Egypt – Interview given by M. Nicolas Sarkozy, Minister of the Interior, Internal Security and Local Freedoms, to "France 2" Cairo, 30 December 2003
http://ambafrance-uk.org/Visit-to-Egypt-Interview-given-by,4089
7) Visit to Germany – Interview given by Nicolas Sarkozy, President of the Republic, to the German magazine "Bild am Sonntag" (excerpts), Berlin, 10 May 2009
http://ambafrance-uk.org/President-Sarkozy-talks-to-Bild-am
8) Interview given by Nicolas Sarkozy, President of the Republic, to the weekly news magazine "Les Afriques" (excerpts), Paris, 27 May 2010
http://ambafrance-uk.org/President-Sarkozy-talks-to-Les