Norway and the Joint Programming Initiatives

How does Norway participate and why?

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Centre for Technology, Innovation and
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UNIVERSITY OF OSLO

Autumn 2012

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Autumn 2012
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http://www.duo.uio.no/
Word count: 19 942

Abstract

International science and technology cooperation has become increasingly important when facing the global challenges such as climate change, food security and health issues. Both Norwegian and EU strategies stress the importance of pooling our financial, infrastructure and knowledge resources together. The Joint Programming Initiatives (JPI) are bottom-up, member state driven initiatives set up to coordinate national efforts and pooling together resources to handle the challenges.

This thesis is an explorative case study of Norwegian participation in three of the JPIs, with a focus on national motives and funding structures. The central issues from the principal-agent framework, goal conflict, moral hazard and adverse selection, have been used to highlight some of the governance challenges. I used document studies and semi structured interviews of representatives from the Ministry and Agency level to collect my empirical data.

My studies show that the motives for participation are linked to social, scientific and economical drivers. For one of my cases economic return and strengthening the competitiveness of national research communities was an important driver, for two of my cases the chance to influence the European research agenda is an important motive, and access to knowledge and facing the grand challenges together is important for all my cases. There are slight differences in the governance structures of each JPI, and the funding arrangements mirror this. The case with the strongest strategic influence motive intends to use mostly institutionalized funding, while the two others have only just started to tackle this issue.

Key words: ERA, EU, international STI cooperation, JPI, funding models, principal-agent

Acknowledgements

In 2009 I attended a workshop in innovation policies held by TAFTIE (the European Network of Innovation Agencies) that made me want to learn more. This lead me to the ESST master programme, and I have not regretted one moment.

When it comes to this thesis there are several people that deserve my thanks:

My supervisors Magnus Gulbrandsen and Egil Kallerud for keeping me on track and helping me sort through my ideas, all my informants for taking time out of their busy schedule to talk to me, colleagues at the Research Council of Norway for information and discussions, fellow students at the TIK centre, and last but not least Astrid, Magnus and Asbjørn, you know what you did.

Inga E. Bruskeland

Oslo, september 28. 2012

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1 Introduction

The topic of this thesis is the motivation for and the funding arrangements of European Science Technology and Innovation (STI) cooperation within the European Research Area (ERA) framework, with a specific focus on the Joint programming initiatives (JPI). The JPI is an initiative to increase the impact of European research by bringing together national public research funding to tackle common challenges through cooperation and coordination (European Commission, 2008b).

The Steering Group on Governance of International Co-operation on Science, Technology and Innovation for Global Challenges (STIG) have identified five dimensions of governance that are important for STI cooperation: priority setting, funding and spending arrangements, intellectual property, putting STI into practice, and capacity building (OECD, 2012). I have chosen to focus on the two first, priority setting and funding arrangements, because they are mechanisms that can show how national budgets are spent and who is in control of them. Through my work at the Research Council of Norway I have first-hand experience from European R&D programme collaboration and the challenges found in trying to develop a governance system that is acceptable for different national systems. Therefore this is also an issue that I am personally interested in.

International cooperation is becoming more and more important, and both Norwegian and EU strategies stress the importance of pooling our resources together; financial, infrastructure and knowledge; to face mutual challenges (European Commission, 2011b; Meld. St. 30 (2008-2009), 2009). In their report for the European commission on Drivers of International collaboration in research, Boekholt, Edler, Cunningham, and Flanagan (2009) notes that traditionally the driver for international science and technology cooperation policy has been linked to scientific goals of accessing and attracting state of the art knowledge and sharing the

cost of large infrastructure (Boekholt et al., 2009). With the recent emergence of fast growing economies like the BRIC (Brazil, Russia, India and China) countries, the urgency of global challenges and the increased worldwide mobility of researchers (Boekholt et al., 2009), they found that non science policy objectives are becoming more central, and that policy attention to STI collaboration is:

> *[…] driven by trade, foreign investment, global influence, the flow of research and innovation talent etc. At the same time, collaboration is increasingly seen as a contribution towards or even an essential underpinning of, for instance, education, diplomatic and development policy* (Boekholt et al., 2009, p. 4)

This change can also be seen within EU policy. With the Lisbon strategy in 2000, fostering international cooperation within science and technology was no longer linked only to science policy goals but was becoming increasingly linked to societal and economic policy goals (Edler, 2010; Holzinger, Meyer, & Polt, 2012).

Globally, the so called global or grand challenges have emerged as important drivers for International STI collaboration (OECD, 2012; The Royal Society, 2011). At the beginning of the Swedish EC presidency in 2009, the Lund declaration stated that "*Europe must focus on the grand challenges of our time*" (European Union, 2009). In line with the new EU strategy Europe 2020 that was launched in 2010, the new EU Framework Programme HORIZON 2020 has the societal or grand challenges as one of its three key priorities.

1.1 Joint programming initiatives

The development of the European Research Area (ERA) that started in 2000 opened up for new networking and coordination activities for funding agencies and ministries on a national level, namely the ERA-NETs and Article 169/185 initiatives (Edler, 2010; European Commission, 2000). The move towards a more coordinated European research policy that

came with the Lisbon strategy and the ERA has put pressure on national systems of research and innovation to cooperate. The ERA would give the European Commission (EC) *"[…]more autonomy to initiate projects and programmes that directly affect national research actors and, in addition, would take coordination of National policies more serious."* (Kuhlmann & Edler, 2003, p. 260)

This increased integration of EC R&D and innovation policy with national R&D and innovation policies does of course come with governance challenges. In 2008, the Ljubljana process was launched to tackle this concern and to revitalise the ERA. As noted on the EC web page the goals of the process were *"[…] to develop a common vision and effective governance of the European Research Area"* (European Commission, 2011a). One of the initiatives the EC launched as part of the process was Joint Programming. The concept of Joint Programming Initiatives (JPI) is that by coordinating national STI activities and pooling resources together member and associated states will be better able to handle the grand challenges of our time, such as climate change, food security and health issues. Participation in the JPIs is voluntary and the number of participants in each programme will vary.

The JPIs intervene in the national research and innovation system in a way that cooperation schemes like the ERA-Nets or the Framework Programme do not (European Commission, 2008b). They are member state driven and unlike the ERA-Nets and Art. 185s the themes are not chosen by the Commission, but they have to be approved by the High Level Group for Joint Programming (GPC) (2010a). The knowledge gained through the JPIs will help authorities and policy makers design measures to tackle the societal challenges. The JPIs are broad thematic endeavours that in Norway will affect several ministries, STI programmes and budgets (Research Council of Norway, 2012). The JPIs have the potential to affect the national systems on all levels.

1.2 Research questions

With the coordination of national strategies and resources to tackle common challenges within the framework of the, JPI there is a tension between national and international interests that it would be interesting to explore. In 2011, the Research Council of Norway (2011) launched a new international strategy with several interesting points that show that they are preparing the system for the increased focus on international cooperation. One is the possible restructuring of existing funding schemes to align them with the JPIs and other coordinated initiatives; the other is an enhanced focus on internationalisation in the whole of the organisation. As one of the five main actions point out *"All of the Research Council's activities, -programmes, open competitive arenas, special initiatives, institution-oriented measures and other forms of support- must include clearly-defined objectives and plans for international cooperation."* (Research Council of Norway, 2011, p. 6) The Research Council of Norway's strategy also states that: *"As research funding administrator we must adapt national funding schemes to developments at the international level, seek to establish easy-to-use international funding schemes and serve as a meeting place for the research establishment."* (Research Council of Norway, 2011, p. 6)

The aim of my case studies is to see how the system handles this increased focus on international cooperation and the governance issues that it raises. However, because the JPIs are in an early phase, I can only hope to highlight some of the issues.

My research questions are:

- What motives come into play when policy makers decide to take part in the JPIs?
- How are the national budgets used in cooperation with other countries in the JPI?

1.3 Structure

This thesis is divided into five chapters. The first one gives a short background and rationale for my thesis, and presents the research questions.

Chapter two is an introduction to the principal-agent framework and the central issues of moral hazard, goal conflict and adverse selection, and also gives a short introduction to the Norwegian system, international science and technology cooperation and the background and context of the thesis.

In chapter three I describe my research process and give a summary of the methodological challenges I've encountered throughout my work with the thesis.

Chapter four covers my findings, giving a presentation of the JPIs in general as well as of the three cases I've studied specifically, before I move on to discuss my findings in view of the research questions and theory presented in chapter two.

The fifth and last chapter is the conclusion.

2 Theoretical perspectives and background.

Guston introduced the principal-agent theory to science policy research *"to reinterpret generic science policy problems"* (Braun & Guston, 2003, p. 304). According to Guston (1996) *"[…] the problem of science policy is the problem of delegation."* (p. 229) This view corresponds with the issues that I want to examine. A lot of the literature that applies principal-agent theory to examine science policy deals with the specific issue of research councils and funding agencies as intermediaries between policy makers and the science community (Braun & Guston, 2003). The two problems central to principal-agent theory are *adverse selection* and *moral hazard*. Adverse selection deals with the dilemma of choice, how to choose the best agents for the task. Moral hazard deals with control and how the principal can know if the agent does what they have been delegated to do (Braun & Guston, 2003). To show the wider institutional context, I will complement the principal-agent theory with elements of institutional and organisational theory.

2.1 Principal-agent framework

The principal-agent theory was initially developed within the New Institutional Economics to understand transaction costs between a principal and an agent (Braun, 1993). It has later become a predominant approach to discussing issues of delegation in different fields of political science (Braun & Guston, 2003). At the centre of principal-agent theory is a social relationship between the principal and agent that includes an exchange of resources. In the case of science policy one can say that *"[…] the state is the principal that requires the agent - science – to perform certain tasks because the principal is not capable to perform them directly."* (Guston, 1996, p. 230) The relationship between the state and science is mediated through grants and public funding for research. This relationship can be described as a

contractual one, where the rights and obligations of each actor is specified (Guston, 1996). It is the structure of science policy, the *"processes and institutions"* (Guston, 1996, p. 230) that is investigated with the principal-agent theory. Following Guston's argumentation, the framework is well suited to examine the practice and implementation of science policy, and not just the policy itself.

There are three central dilemmas in principal-agent relations. The first one is that the agent's own interests, strategies and agendas might conflict with the principal's, which is known as the *goal conflict* (Gulbrandsen, 2005; Guston, 1996; Shove, 2003; Van der Meulen, 1998). The second is the problem of information asymmetry, meaning that the principal does not have all the information regarding the agent or the task itself, making it difficult to select the appropriate agent. This is known as *adverse selection* (Braun & Guston, 2003; Guston, 1996). The third dilemma is that of *moral hazard*. How does the principal make sure that the agent does as agreed? Also, within the delegation from principal to agent there is not only an incentive to perform the required task; there is also an opportunity to shirk or cheat and twist the task to fit one's own agenda (Braun & Guston, 2003).

In his article from 1993: *Who Governs Intermediary Agencies? Principal-Agent relations in research Policy-Making*; Braun introduced a triadic structure to the framework. According to Braun (1993), political principal-agent relationships are too complex for the *dyadic system*, especially when it comes to the policy maker / funding agency relationship. The funding agency is an intermediary that is responsible for the implementation of the science policy. By adding a third actor, the science community, Braun shows how the third party also influences the agent. For the agent to be able to perform it has to be accepted by the third party, and the principal's assessment of the agent is influenced by the third party's satisfaction or dissatisfaction with the agent (Braun, 1993). To achieve this, the agent has to cooperate with the third party and accept some of the demands from them. The agent even has to defend

these demands towards the principal, giving the third party what Braun (1993) calls *"secret defining power"* (p. 141).

The relationship between the principal and agent changes: *"While the agent was employed to foster the interests of the principal with regard to the performance of a third party the social system thus institutionalised forces the agent to promote the interest of the third party."* (Braun, 1993, p. 141) In effect the agent ends up with two principals and all three actors are interdependent of each other to fulfil their goals. Braun notes that this can give the agent more autonomy and room to play one principal against the other, which in turn can increase the moral hazard dilemma for the principals (Braun, 1993). The triadic relationship could be conceptualized by two levels of principal agent relationships where the intermediary is both agent and principal, but this would not adequately show the influence of the third party on the principal (Braun & Guston, 2003).

Other researchers such as Shove (2003) and Klerkx and Leeuwis (2008) point out that the principal-agent framework is less suited for *"[…] analysing the complex multilateral relationships between principals and agents, […]"*(p. 194) They claim that because the framework focuses mainly on bilateral or trilateral relationships, the science policy has a tendency to be lifted from the context. Shove (2003) argues that *"Exclusive focus on the mode of delegation between one principal and one agent fosters the illusion that principals are influential in their own right, not in context."* (p. 379)

There are other relationships and informal contact points that complicate the use of principal – agent theory. Klerkx and Leeuwis (2008) mention *"[…] multiple principals, the mitigating role of several intermediary bodies, and the gap between principals' formal requirements and workable procedures in practice […]"* (p. 194) All these complications are present when looking at the JPIs. However, as Klerkx & Leeuwis (2008) notes the issues identified by the

principal agent framework (goal conflict, adverse selection, moral hazard) are still valuable tools to analyse the dynamics of policy, selection and control in science policy.

2.1.1 Goal conflict

One solution used by intermediary organisations to limit the potential goal conflict and information asymmetry between the actors, is to include the third party in the selection process. Through peer review and scientific boards the interests of the science community are institutionalised within the intermediary organisations. The policy is taken care of by the *constitutional* mission or goal of the intermediary mediated by the contract with the principal (Braun, 1998). In other words: political funding agencies have to keep in line with the goals of their ministry, strategic funding agencies have to show that they are committed to problem-solving within their field of specialisation and science- based funding agencies have to support the knowledge development in promising scientific areas. At the same time, the scientific quality of the research is upheld by the science community (Braun, 1998).

The systems the actors are in also influence their relationships and goals. Funding is not just money, the funding helps to structure the system and the norms of research (Benner & Sandström, 2000; Braun, 1998). Braun (1998) argues that it is through *"[…] the organizational, financial and infrastructural environment […]"* (p. 808) that access is provided for political or societal influence over science. Access to resources and appropriate infrastructure influences the choices of individual scientists, research institutions and even whole disciplines. Those that have ample resources will dominate the research process and others will strive to emulate them. This means that economic capital *"[…] may have immediate repercussions on the power positions of scientists in the scientific system."* (Braun, 1998, p. 809), and as Braun notes, those who distribute funds can, to some extent, influence who will investigate what.

2.1.2 Adverse selection

The dilemma of adverse selection is the dilemma of who should do the research. According to Guston,

> *Decisions about the choice of agents fall within the following, among other, dimensions: military versus civilian research; intramural versus extramural research; mission or programmatic research versus disciplinary or unprogrammatic research; large firms versus small firms; and peer-review versus earmarked (or pork-barrel) research.* (Guston, 1996, p. 233)

These dimensions are not exclusive and the decisions in one dimension include the others. The decision of mission versus disciplinary can also include the dimension of peer-review versus earmarked. The adverse selection includes the first dilemma of goal conflict. The alignment of goals between principal and potential agents, and what instruments of monitoring and control are available, are important questions when it comes to choosing the agents (Guston, 1996). It is in the nature of the principal- agent relationship that the principal's lack of information and expertise makes it difficult to select the appropriate agent. This is one of the reasons why policy makers set up intermediary agencies. The intermediaries are closer to the source of information and, as illustrated earlier, to some degree institutionalise the information by including the science community in the agency (Braun, 1993).

2.1.3 Moral hazard

When grants are given to a project the principal expects the work to be done. The work itself may be initiated by the agent or be directly delegated by the principal. However, the actual research that is done might take unexpected turns and veer away from the original plan (Van der Meulen, 1998). This so called shirking is a problem for the funding agencies or programmes, even more so if they are goal or mission driven, and they might respond with

stricter monitoring of their projects. However, agencies that are more open to the autonomy of the agent will be more tolerant of shirking. Shirking can even be welcomed, as it can open up new areas of research and give unexpected results. According to Van der Meulen (1998), some even *"[…] welcome shirking as an indication of good research and sensible project management."* (p. 399) This space for desired shirking opens up for real shirking, where the agent might intentionally shift the direction of the research to prepare for another proposal or even do work for another project that is not covered by the contract (Van der Meulen, 1998). This is reminiscent of what Shove (2003) refers to as the agent's own programming, and shows how the agent's shirking can influence the intermediary in Braun's (1993) triadic system.

When you break it down to the basics, the principal can either monitor or trust the agent, and the agent can either abide by the contract or defect (Guston, 1996; Van der Meulen, 1998). Monitoring of agents takes effort and comes with costs. Incentives and monitoring systems are needed to overcome the information asymmetry. When it comes to science there is an incentive for scientists to monitor each other; they are both producers and consumers of the results and they have an interest in the knowledge and technology that is being developed. In addition, user-involvement, network relations and productivity have become important assessment criteria within some funding agencies and funding programmes, and this influences the monitoring as well as the selection (Van der Meulen, 1998).

2.1.4 Trust

Included in the principal-agent dilemmas of goal conflict, adverse selection and moral hazard is what Van der Meulen (1998) has set up as a fourth characteristic, that of trust. According to Van der Meulen, trust is often neglected in principal-agent literature, but he argues that it is important for the long term stability and continuity of principal-agent relations. I have

included it here because the level of trust between the actors in different national systems will not be the same, and as argued by Van der Meulen (1998) this will influence the shape of the national systems and international cooperation.

Since the early days of science policy, trust has been one of the major ways in which public funding has entered the scientific system (Braun, 2003; Guston, 1996; Van der Meulen, 1998). This *science push* model was supported by the *linear model* of innovation which was the predominant after the Second World War[1], where research eventually leads to development and production (Braun, 2003; Kline & Rosenberg, 1986). Science policy is left to the scientific institutions and scientists, and the dilemmas of the principal-agent framework do not really apply. The principal exerts no cost or effort on selection or monitoring, and the agents can pursue their scientific activities without considering external criteria. In this system policy-makers trust the scientific community to deliver the knowledge that society needs in the long term (Braun, 2003). Institutional funding and *curiosity driven* (basic research) project funding without obligations indicate that science funding with a high level of trust is still a part of national funding systems, even if this blind delegation is no longer the main channel of public funding to science. Van der Meulen (1998) points out that trust is also important to stabilise the system in other modes of funding.

Trust is part of the moral hazard for the principal, and because the actors depend on each other, the agent has to trust the principal as well. It is more likely that the agents will perform well if they can trust the principals to reward them when they comply, for example with continued funding and a certain degree of autonomy.

[1] The Linear model of innovation has to a large degree been discarded. The innovation process is nowadays more seen as a complex set of interactions and feedback best described by the Chain link model of innovation developed by Kline and Rosenberg (1986).

2.1.5 Programmes

In the principal-agent framework, programmes are seen to be used by principals to coordinate and organise multiple agents. A funding agency (principal) initiates a programme to target a specific policy goal and researchers (agent) shape their activities so they can receive funding (Shove, 2003). According to Shove (2003), *"[..,] programmes appear to provide principals with a way of directing research agendas and achieving certain sorts of added value and creative synergy"* (p. 376) However, Shove (2003) also points out that: *"[..,] the formation of a realistic and viable programme is already shaped not only by what programme managers want but what research capacity exists and by the research communities' active involvement in programme making."* (p. 376).

Agents relate to several different principals or sources of funding, both national and within the EU framework. Skilled agents can navigate between different principal-agent relationships. Shove's analysis of the EU social environmental research shows that the agents in a way develop programmes of their own, participating in several programmes and working towards their own strategies and goals. Agents have their own more or less formal programme (Shove, 2003). This again fits with Braun's (1993) triadic structure; the programme set up by the funding agency becomes an intermediary agent between the principal (funding agency) and third party (scientists), and the success of the programme is partly based on the acceptance of the third party .

I will now give an introduction to the Norwegian system before I go on to describe the international and European context of the Joint Programming Initiatives.

2.2 The Norwegian system and previous research

Norwegian policy makers have noted that research is by nature and tradition international, and the internationalisation of national research has been an important part of Norwegian science policy the last decades (Kunnskapsdepartementet, 2008). The EU system is seen as a strategic tool for Norwegian science policy and the EU Framework Programme is an arena to compliment and strengthen national research (Kunnskapsdepartementet, 2008)

The book *Borderless Knowledge* (Gornitzka & Langfeldt, 2008b) presents different studies of the internationalisation of the Norwegian knowledge system. When looking at all the different studies in the book, Gornitzka, Gulbrandsen, and Langfeldt (2008) found little tension attached to the internationalisation patterns of Norway. Cross border activities are becoming more and more common, but this does not appear to be a controversial issue. They find little evidence of internationalisation being seen as a threat to national control or scholarly autonomy in the cases they study. According to Gornitzka et al. (2008), a possible explanation for this can be the characteristics of the Norwegian case. Norway has a small knowledge system, a relatively flexible and open economy and stable politics, that *"[…] combines political intervention with economic liberalisation[…]."* (Gornitzka et al., 2008, p. 178) possibly giving Norway the financial capabilities to *"[…] internationalize without creating any obvious national winners and losers."* (Gornitzka et al., 2008, p. 178) And as seen in the EU strategy, the national authorities encourage international activities.

However, Gornitzka et al. (2008) note that the cases point to a latent tension between different levels of governance. When it comes to science policy, this tension can for instance be between the different ambitions and objectives they have regarding how and where they use public funding for national purposes (Gornitzka et al., 2008). Gornitzka et al. (2008) also note that an apparent challenge to the national political control over national funds is the increase

of public funds being channelled through international programmes like the EUs Framework programme, where there is no national control over funds. However Gornitzka et al. (2008) once again find little evidence that this lack of national control is seen as an *"[…] adequate argument against the internationalization of R&D."* (p. 180) Instead they note that Norwegian authorities work to influence the EU R&D policy through different channels and efforts. These efforts also include an adjustment of national science policies to align with the EU R&D policy, so that national research communities can take part in the framework programme (Gornitzka & Langfeldt, 2008a).

In their recent paper: *Integration modes in EU research: centrifugal versus coordination of national research policies,* Langfeldt, Godø, Gornitzka, and Kaloudis (2012) give a good description of the Norwegian governance processes and coordination of participation in the EU Framework programme. I will give a short summary here. The Norwegian research policy is organised in accordance with a *sector responsibility principle,* meaning that each ministry is responsible for developing national policies within its sector, including research policy and international collaboration. There is little coordination at the ministerial level, and the interaction with European science policy follows the same sectorial lines (Langfeldt et al., 2012).

The Ministry responsible for the overall coordination of the Norwegian Research policy, as well as formulating the overall strategy, is the Norwegian Ministry of Education and Research. Since 2005, this ministry has also had the constitutional responsibility for the Norwegian participation in the EU Framework programme and the ERA. However they have no authority over the other ministries when it comes to these issues (Langfeldt et al., 2012). The Ministry of Education and Research has delegated much of this responsibility to the Research Council of Norway and, again following the sector responsibilities, the Research Council in practice interacts with the sector ministries individually. (Langfeldt et al., 2012)

The ministries share the responsibility for funding the activities and instruments in the Research Council related to international cooperation. The research council is responsible for working out the strategy documents for participation in the different Framework programmes. For the implementation of these strategies the Research Council has to obtain the approval of the relevant sector ministries and R&D institutions (Langfeldt et al., 2012).

2.3 International STI collaboration

As mentioned in the introduction, policy makers have increasingly begun to see international cooperation in science and technology as an important part of solving the mutual challenges society is facing. The communication from the European Commission (2011b) regarding the new Framework Programme HORIZON 2020 stated that: *"Smart investment, notably in research and innovation, is vital in order to maintain high standards of living while dealing with pressing societal challenges such as climate change, an ageing population, or the move towards a more resource-efficient society."* (p. 2)

Recent reports from Boekholt et al. (2009), The Royal Society (2011) and the OECD report by the Steering Group on Governance of International Co-operation on Science, Technology and Innovation for Global Challenges (STIG) on international cooperation have also highlighted this increased focus on societal challenges and the shift from the purely scientific goals to societal and economic goals. The STIG report states that *"Global challenges call for co-operation on a global scale in order to create a public good or protect the global commons."* (OECD, 2012, p. 26)

Many of the challenges that are seen as global challenges are not new; food crises, epidemics, pollution and so on have been around for a while (OECD, 2012). What the STIG report says is new is the complexity of the source of the challenges; many of them are interlinked and

they are produced by a variety of actors that are cross national and interdisciplinary. For example, global climate change and loss of biodiversity can lead to global health challenges and food shortage. Also, the possible solutions for one problem can lead to a worsening of others (OECD, 2012). According to the STIG report (OECD, 2012) there is an urgency to the global challenges. The processes behind some of them are expected to reach so called *tipping points,* points of no return, which*"[…] may lead to irreversible damages to the complex systems that are essential for our survival and welfare."* (OECD, 2012, p. 13)

Science, technology and innovation play important roles when it comes to tackling the global challenges (OECD, 2012). Scientific endeavours both highlight the consequences of the challenges to nature and society, and produces new knowledge on how to handle them. Technological development and innovations can provide new solutions for industry and society's pressing problems (OECD, 2012).

The EC has also recognised the cross border and interdisciplinary nature of the challenges. In the communication *Horizon 2020 - The Framework Programme for Research and Innovation (European Commission, 2011b),* they state that to tackle the societal challenges:

> *A challenge-based approach will bring together resources and knowledge across different fields, technologies and disciplines, including social sciences and the humanities. This will cover activities from research to market with a new focus on innovation-related activities, such as piloting, demonstration, test-beds, and support for public procurement and market uptake.* (European Commission, 2011b, p. 5)

They have also brought together all the existing union research and innovation funding schemes into HORIZON 2020. This includes the Framework Programme for research, the innovation activities in the Competitiveness and Innovation Framework Programme and the European Institute of Innovation and technology (European Commission, 2011b). The key priorities of HORIZON 2020 are Excellent Science, Industrial Leadership and Societal

Challenges. These priorities coincide with the priorities of Europe 2020 and the Innovation Union (European Commission, 2011b). Within societal challenges the funding will be focused on: Health, demographic change and wellbeing; Food security, sustainable agriculture, marine and maritime research and the bio-economy; Secure, clean and efficient energy; Smart, green and integrated transport; Climate action, resource efficiency and raw materials; Inclusive, innovative and secure societies (European Commission, 2011b).

2.4 European Research Area

The European Research Area (ERA) is the concept of an internal European market for research. The free circulation of knowledge, technology and researchers is to be reached through the effective coordination of national and regional activities and initiatives (European Commission, 2007).

2.4.1 Fragmentation

The main objective of the ERA as set out in the communication *Towards a European Research Area* (European Commission, 2000) was that the value added by research to Europe's Economic, societal and environmental goals should be maximised. One of the main rationales behind the development of the ERA is the concept of fragmentation. The first ERA communication from the EC states:

> *Above the European research effort as it stands today is no more than the simple addition of the efforts of the 15 Member States and the Union. This fragmentation, isolation and compartmentalisation of national research efforts and systems and the disparity of regulatory and administrative systems only serve to compound the impact of lower global investment in knowledge.* (European Commission, 2000, p. 7)

This fragmentation was seen as one of the main barriers for cross border cooperation. Other barriers mentioned are the ones between academy and industry, between disciplines and a

general lack of a European policy on research (European Commission, 2008a). However, I will focus on fragmentation because it is the main driver behind the joint programming initiatives (European Commission, 2008b). The Green paper (European Commission, 2007) and the report from the ERA Expert group (European Commission, 2008a) emphasise five negative consequences of fragmentation, for instance: *" 3. Duplication of funding between national/regional programmes dispersing resources, losing spillovers and making Europe's global role sub-critical;"* and *"4. Lack of European perspective and transnational coherence in reforms undertaken at a national level;"* (p. 13) The ERA Expert group point out that these consequences are system level failures, meaning failures at the governance level of research, thus implying a lack of coordination and cooperation or even both among institutions supporting research (European Commission, 2008a).

Biermann, Pattberg, van Asselt, and Zelli (2009) point out that *"All global governance structures[2] are fragmented to some degree; that is, they consist of distinct parts that are hardly ever fully interlinked and integrated."* (p. 17, my footnote) The opposite, non-fragmented or universal architecture would be one where all the countries involved in an issue would follow the same rules and regulations, participate in the same decision-making processes and even agree on a common set of commitments (Biermann et al., 2010). This more integrated governance architecture seems to promise more efficiency and effectiveness when it comes to solving issues. However, Biermann et al. (2010) also note that there is a potential benefit of a variety of agreements and approaches within an architecture or framework.

Langfeldt et al. (2012) are concerned that the new ERA instruments like the JPIs and Art. 185, can cause further fragmentation in the European research system. The new instruments

[2] The term is here defined as "the overarching system of public and private institutions that are valid or active in a given issue area of world politics." (Biermann et al., 2010, p. 15)

demand considerable funding over a long period in addition to the national Framework Programme contribution. They also point out that there are limits to how complex and diverse systems the decision making bodies in small countries can handle. The concern is that the flexible geometry of the new instruments will divide the system between those that can and are willing to pay and those that are not able or willing (Langfeldt et al., 2012). Edler, (2010) on the other hand, sees the development of new instruments and joined up actions as a move towards a more flexible coordination of science policies. Unlike Langfeldt et al. (2012), he finds that the new larger *tool box* for R&D funding has been a catalyst for the development of explicit internationalisation strategies by ministries and funding agencies (Edler, 2010). He refers to a country survey by CREST where

> *[…] 10 out of 22 countries reporting on internationalization strategies claimed to have a comprehensive strategy in place, three of which being part of a general globalization strategy, seven being part of their respective S&T-strategies. Apparently, eight countries were in the process of defining a strategy.* (Edler, 2010, p. 6)

However, Edler (2010) notes that it still remains to be seen if the high strategic aspirations are actually finalised and implemented.

The CREST survey also showed that the drivers for the internationalisation strategies were very similar:

> *In general, the most important drivers are: (1) strengthening (domestic) excellence through access to existing excellence and facilities abroad and through attracting talent into the domestic systems (inward mobility), (2) preparing the ground for domestic innovations to be marketed abroad, and (3) contributing to the solution of global problems.* (Edler, 2010, p. 6)

Edler (2010) sees this as part of the beginning of a paradigm shift within international science and technology collaboration. In their report for the European Commission on *Drivers of*

International collaboration in research, Boekholt et al. (2009) distinguish this shift as the move from a *narrow STI cooperation paradigm* to a *broad STI cooperation paradigm*. The narrow paradigm aims to achieve research excellence and attract resources to enhance the national STI capabilities. The broader paradigm aims to improve national competitiveness, promote development aid, enhance diplomacy and tackle global challenges (Boekholt et al., 2009).

A challenge that arises with the broad STI collaboration paradigm is the coordination of policies. Apart from large initiatives that had to be coordinated, STI collaboration was for a long time something that the science community organised themselves. However, with the competitiveness and the global challenges drivers, policy makers have begun to *steer* researchers towards specific themes and countries, according to national policy and strategies (Boekholt et al., 2009). This can become a source of tension. As Lundvall and Borrás (2005) note; area-specific policymakers tend to identify with and focus on the needs of their sectors and therefore take less interest in global objectives. Both the STIG report (OECD, 2012) and the report by Boekholt et al. (2009) highlight the need for better coordination of the STI policies. Boekholt et al. (2009) point out that the narrow and broad paradigms coexist, overlap and interact at varying degrees from country to country.

2.4.2 Coordination

With a complex set of drivers, two paradigms and new flexible combinations for joint programming, Edler (2010) notes that a clear understanding of *the "[…] nature of coordination and the institutional challenges associated with it"* (p. 7) is needed to reap the benefits of efficiency and effectiveness. Even if the concept of coordination is used a lot in policy rhetoric, according to Edler (2010) we really do not have a common understanding of what is meant. Often coordination is confused with collaboration.

A general understanding of collaboration can be *"[…] 'to work jointly on an activity or project'"* (Edler, 2010, p. 7) and a general definition of coordination is *"[…] to bring different elements (of a complex activity or organization) onto a 'harmonious' or efficient relationship"* (Edler, 2010, p. 8) Integration is also a concept that often is mentioned with or instead of coordination. However, where integration is a process of combining structures and processes to form a new whole, in coordination the various elements being brought together are still autonomous. Following this argument, joint activities are collaboration if they are focused on concrete activities or integration if they are focused on a structural merger.

Edler (2010) defines international policy coordination as *"[…] to undertake activities in order to adjust and combine individual activities in a certain area so that they better interact and synergize with activities of other countries in the same area."* (p. 8) Coordination can range from the mutual sharing of information, minor adjustments to national programmes to concrete collaboration activities and full integration of for example infrastructure. The new flexible instruments allow for the full range of coordination and the understanding that one size does not fit all.

ERA is now based on 27 different national research systems, and as far as it benefits the EU and the individual countries, these will remain distinct and build on their own individual strengths (European Commission, 2012). However, to complete the ERA by 2014 as called for by the European council, there is still a lot to be done (European Commission, 2012). There is still a need for them to *"[…] be more open to each other and to the world, more inter-connected and more inter-operable."* (European Commission, 2012, p. 3) According to the communication (European Commission, 2012) on a *Reinforced European Research Area Partnership for Excellence and Growth*, the most efficient and pragmatic way of achieving this is through a reinforced ERA partnership.

2.4.3 ERA instruments for cooperation

The EC communication on partnership (European Commission, 2011c) gives a good overview of the different forms of partnering that have been developed to achieve the ERA. There are several instruments for joined-up actions within the European system. The existing EU level instruments and concepts that bring together the European and national level in Public-Public- Partnerships are ERA-NET, ERA-NET Plus, Article 185 initiatives, SET (Strategic Energy Technology) Plan, Europe INNOVA/PROINNO Europe and the JPIs (European Commission, 2011c). I will here focus on the instruments; they can all be used within a JPI. The ERA-NETs were first implemented in Framework Programme 6 (FP6), and their aim is to develop and strengthen the coordination of national and regional research programmes by providing a framework for national and regional *programme owners* (funding agencies, ministries, and so on) to coordinate activities and develop joint activities, for instance joint calls for transnational proposals (ERA-LEARN, 2011). The coordination and management activities in an ERA-NET receive funding from the EU. However, the joint projects themselves are funded by the national budgets. The joint calls follow the principle of variable geometry where each country's involvement is based on their problems or capabilities (Harrap & Boden, 2011).

ERA-NET Plus is a development of the ERA-NET scheme where the joint calls include top-up funds from the EU. There has to be an existing commitment to transnational joint calls, and the ERA-NET Plus acts as an incentive to launch joint calls (Harrap & Boden, 2011). This is probably also why most of the ERA-NET Plus actions have been developed by existing ERA-NETs. The duration of an ERA-NET is normally between three to five years. Sometimes they continue under a new contract, some even become self-sustaining networks that continue to work without EU funding (Harrap & Boden, 2011). The ERA-NET Plus, on the other hand, is set up for only one joint call. The ERA-NETs started off as being bottom-up

in nature, but in Framework Programme 7 (FP7) they evolved to became more top-down, answering the more strategic element to coordinate actions. With the ERA-NET Plus there were even more incentives to match ERA-NET actions to the overall strategies within the Framework Programme (Harrap & Boden, 2011).

This has now been taken a step further; the future ERA-NET scheme is emerging as combination of ERA-NET and ERA-NET Plus. Article 20 of the partial general approach on the proposal for a Regulation of the European Parliament and the Council establishing Horizon 2020 (Council of the European Union, 2012) states that:

> *Public-public partnerships may be supported either within, or across, the priorities set out in Article 5(2), in particular through:*
> *(a) an ERA-NET instrument using grants to support public-public partnerships in their preparation, establishment of networking structures, design, implementation and coordination of joint activities as well as Union topping up of no more than one joint call a year and of actions of a transnational nature;* (Council of the European Union, 2012, p. 19)

This implies that all the future ERA-NETs will have one substantial call with top-up funding. This in turn means that the schemes focus is less on the finance of networks and more on the top-up funding of transnational calls (Niehoff, 2012). This is further supported by: *"For the purposes of point (a), top-up funding shall be conditional on a prior indicative financial commitments in cash or in kind of the participating entities to the joint calls and actions."*(Council of the European Union, 2012, p. 19)

Because of the current economic situation with tight budgets, this is an important incentive for cooperation when "in kind" or so called Institutional Funding can trigger top-up from the EU.

The article 185 (formerly 169) initiatives open up for the participation of the EU in joint implementation of national research and development programmes, or parts of them. The objective is integration rather than a coordination of national programmes in a jointly defined

programme. The EU provides top-up funding of the joint programme. Currently there are four article 185 initiatives that have been adopted, and unlike the ERA-NETs the article 185s have to have a dedicated structure like a secretariat or agency to run it (Harrap & Boden, 2011).

2.4.4 Funding models

It has been estimated that 85% of the European civil public research is spent and programmed at the national level (OECD, 2012), and as described above there have been several instruments designed to coordinate and pool these resources together. As stated by the High Level Group on Joint Programming (2010b)*"[..,] it should be noted that the expression 'funding of Cross-border Research' is not synonymous of 'Transfer of National Funds Across Borders'."* (p. 33) Several different approaches to the funding of cross-border research have been proposed. I will here describe the three main categories of funding tools: real common pot, virtual common pot and mixed mode common pot.

The real common pot is where national funds are pooled together in a jointly administered pot. Projects are funded based on their success in the evaluation of proposals and the nationality of the applicant is irrelevant. This results in a cross border flow of funds. The Framework Programme is an example of a real common pot programme. The real common pot can be difficult to set up because it can seem to clash with national interests, there has to be an agreed system for determining contributions, eligible costs, overheads and so on, and national legislation can make it illegal to transfer funds across borders, thereby excluding some countries (High Level Group on Joint Programming, 2010b).

The virtual common pot is where countries and regions pay for their own participants. National rules are followed and there is no cross border flow of funds. This makes it easier for the financial planning for national funding bodies. The disadvantages with virtual common

pot can be that some proposals approved for funding may be declined due to a lack of available national contributions (High Level Group on Joint Programming, 2010b).

Mixed mode pot is a blend of the two others. It is designed to counter the *"Potential conflict between the funding of "excellence" and available national contributions"*. (High Level Group on Joint Programming, 2010b, p. 39) Part of the call budget is earmarked as a real common pot to compensate for this mismatch between available national funds and the budget requests of successful proposals (High Level Group on Joint Programming, 2010b).

Virtual common pot is the main form of funding model used in ERA-NETs and article 185s. A few ERA-NETs have tried out real common pot, and the mixed mode pot seems to be the most common in the ERA-NET Plus actions (High Level Group on Joint Programming, 2010b) As can be seen by the presentation of the funding models, there are many legal and practical obstacles to cross border research cooperation. According to the EC it is not only the differences between national funding rules and selection processes that make it difficult, it is also a question of political will both when it comes to the alignment of policy and how much of the national budget they are willing to spend on cross border research (European Commission, 2012).

3 Research method

Because I am interested in the processes and institutions of science policy, the aim of my thesis is neither to verify nor to generate new theory, but rather to use the theory as an instrument to analyse my cases. This is a multiple case study where I aim to use the cases to give insight into an issue.

3.1.1 Research design

I have followed the simplified model of research as outlined by Punch (2005, p. 39)

- *framing the research in terms of research question*
- *determining what data are necessary to answer those questions*
- *designing research to collect and analyse those data*
- *using the data to answer the questions*

Starting with the research questions:

- What motives come into play when policy makers decide to take part in the JPIs?
- How are the national budgets used in cooperation with other countries in the JPI?

A *how* question can be answered by several methods, Yin (2009) suggests experiments, history and case study. My focus on the contemporary rules out history, and the fact that the relevant behaviour and processes I want to study cannot be manipulated by a researcher makes an experiment out of the question. This leaves a case study. My other research question is what Yin (2009) refers to as an exploratory *what* question. To answer this type of question, several research methods can be used, among them case study. Based on my combination of research questions and these arguments a case study seemed the most appropriate method.

Also, the type of data that I found necessary to answer my questions; document studies and interviews; lead me to do a case study. Again according to Yin (2009), *"[..,] the case study's unique strength is its ability to deal with a full variety of evidence – documents, artifacts, interviews and observations [-]"* (p. 11) Yin (2009) also states the importance of theory as part of the research design to determine the choice of data to collect and strategies for analysing them.

I have chosen to use the principal-agent framework as my main theory, since the issues I focus on in my analysis of the cases are central principal-agent issues. Therefore I have used the framework and literary review to identify the boundaries of my cases (Yin, 2009). My *unit of analysis* is the motives and rationales for three of the JPIs and the governance structures surrounding the funding decisions both nationally and in the JPI. I also used the framework to identify informants to interview; I chose representatives that are in a principal-agent relationship. It was important for me to get different perspectives on the cases. The JPIs are all quite new and my first, original case was chosen for its maturity and the fact that there had already been done a wider case study on it earlier that I could use as background. The two other cases were chosen because they both are quite different from the first case and each other. All three cases will be presented in chapter four.

3.1.2 Reflexivity

"All perception is to an extent shaped by the preconception and purposes of the observer" (Robson, 1998, p. 58)

What Robson (1998) implies is that what is seen depends on more than just what is looked at. Because I work at the Research Council of Norway and my cases are related to my place of work, it is important for me to clarify researcher's bias and be clear about my own past experiences and relationship with some of the informants (Creswell, 2007). Governance

issues related to European STI cooperation have been and will be an important part of my work at the Research Council. However, because this is an exploratory thesis and my aim is to highlight issues and not prove a hypothesis I do not consider this a problem. Rather, my past experience has made it easier for me to identify relevant questions to ask in the interviews and also connect the information gained. I have in the past worked closely with two of my informants. Three others are colleagues that I have a passing acquaintance with, who work in a different division of the Research council than I have.

Having worked with a European STI programme I have some tacit knowledge and experience within this field. This made it easy for my informants within the Research Council to refer to the tacit knowledge we share. I also believe that because I came from within the system it was easy for my informants in the ministries to trust me; a few times I was surprised by the frankness of the answers. However, this closeness to my cases and informants was also a challenge, because I had to try to come into the interviews with an open mind and not let my own experiences colour them. I also think that my experience from working in the Research Council means that I understand the language my informants use. I found it easy to identify and get in contact with my informants, and they were all quick to respond and set aside time for an interview.

I tried to hold the interviews in the form of a conversation, and it was interesting to discover that this actually worked best with the informants that I did not have a prior relationship with. One reason for this might be that I had to establish a bit of rapport with the informants that I didn't know and this small talk helped establish a good interview environment. With the first informants, that are colleagues of mine, this small talk had taken place before the interview situation and therefore I had not managed to establish a conversational environment and they waited more for questions to prompt them than the others. However as I became aware of this

I took care to include some small talk at the beginning of the interviews I had with colleagues and this lead to a better flow in the interview.

3.1.3 Validity

Creswell (2007) considers validation in qualitative research *"[…] an attempt to assess the "accuracy" of the findings, as best described by the researcher and the participants. This view also suggests that any report of research is a representation by the author"* (pp. 206-207) This view and that of others (Punch, 2005; Yin, 2009) suggests that researchers need to use validation strategies to document the reliability of their research. I have chosen to use multiple sources to strengthen the validity of my study (Yin, 2009). Occasionally, some of my informants would refer to tacit knowledge instead of answering my questions. Therefore I had to devise a strategy to prompt them to tell and not hint. The interviews were all done in Norwegian and the quotes used in this thesis are translated by me. This means that their translation could be coloured by my interpretation of the responses (Punch, 2005). To make my translation more reliable I have had a third party review them.

3.1.4 Data collection and reliability

I have chosen to use interviews as a central part of my case studies because I wanted the motives and thoughts from the people who are actually dealing with the issues and choosing how to act in the different situations. All but one of my informants are involved in the governance of the JPIs, the last informant works with research funding in one of the ministries and not directly with the JPIs. My informants are from both the ministry and agency levels.

All my interviews were recorded and partially transcribed, and notes were taken throughout. I dealt with *the hand on the door* phenomenon by turning on my recorder again to catch the last interesting comments (Robson, 1998). I chose to have semi structured interviews with a loose

interview guide that had a list of topics that I wanted the interview to cover. Also, my interview guide evolved after the first interviews as there were issues that emerged in the first interviews that I chose to include in the later ones. This of course raises the issue of reliability (Robson, 1998). To remedy this I have taken care to document what issues came up in what interview and how my interview guide changed.

My interviews took place over two months and were all held either in the informant's office or a meeting room at their place of work. I had asked for one hour of their time however the actual interviews varied from approximately 40 minutes to a bit over an hour. Seven of my interviews were with one individual and the eighth was with two, this means that I had eight interviews and nine informants. In the one interview, it was my informant that wanted another individual to take part because it was felt that the other person would be able to give additional information that was relevant. With this being a group interview it is possible that the informants influenced each other and this could be a source of bias. The interview quotes I have chosen to use in my analysis are the ones that best describe each case.

My other source of data was documents, both historical and contemporary. The documents were both used as background information and to corroborate with information I had collected from other sources. The documents I have used are Norwegian government documents and strategies, communications from the EC and governance and strategy documents from the JPIs; I have also used web pages as sources for background information. It can sometimes be hard to get access to archive material, but my connection to the research council made it easy for me to get what I needed. I was even given access to restricted and unfinished documents. I have used the documents to describe the JPIs and the interviews to see how Norway relates to them.

3.1.5 Generalisability

One of the most common critiques of case studies concerns it generalisability; how can you generalise from a single case? (Punch, 2005; Yin, 2009). Yin (2009) points out that case studies *"[…] are generalizable to theoretical propositions and not to populations or universes."* (p. 15) However, as Punch (2005) notes, one may not always want to generalise from a case. Sometimes the intention of a study is to understand an unusual or unique case in its complexity and entirety and within its context. My aim is not to generalise, but rather to give insight to an issue. As Punch (2005) and Yin (2009) point out this has a value in itself by developing better understanding of the issues and pointing to further areas of research. *"If we want to know why something happens, it is important to have a good description of exactly what happened"* (Punch, 2005, p. 15)

4 Findings and discussion

In this chapter I will first give a description of the JPIs in general, focusing on their funding and how they are organised in Norway. Then I will give a description of each case; the background for the JPI, their governance structure, funding structure and how they are organised in Norway. I will then look at what motives come into play when policy makers decide to take part in international STI cooperation by looking at the different motives for Norwegian participation in my three cases, before I go on to look at the funding arrangements and the issues that they raise.

In my cases there is an interlinking and complex chain of principals and agents. In my discussion I will focus on the central issues of principal-agent theory; those of goal conflict, moral hazard, and adverse selection to highlight some of the governance issues related to funding within the JPIs and the question of how national budgets are used in cooperation with other countries.

4.1 The Joint Programming Initiatives

With the communication *Towards Joint Programming in Research: Working together to tackle common challenges more effectively* (European Commission, 2008b), the European Commission introduced Joint Programming as one of the five initiatives to implement the ERA. As the title of the communication implies, the Joint Programming Initiative (JPI) aims to tackle common European societal challenges by combining national efforts and make better use of the limited research resources to meet common challenges.

According to the Commission, the initiative is a voluntary partnership between Member and Associated States to engage in *"[…] the definition, development and implementation of common strategic research agendas based on a common vision of how to address major*

societal challenges." (European Commission, 2008b, p. 8) It aims to increase the efficiency and impact of national research funding in strategic areas. Whether it is done through strategic collaboration between already existing national programmes or setting up entirely new ones through joint efforts, *"[..,] it entails putting resources together, selecting or developing the most appropriate instrument(s), implementing, and collectively monitoring and reviewing progress."* (European Commission, 2008b, p. 8)

The Communication clearly states that Joint Programming is not a mere relabeling exercise. It is *"[…] concerned with changing the structure of the European research landscape"* (European Commission, 2008b, p. 8) and *"Joint Programming has the potential to become a mechanism that is at least as important as the Framework Programmes in the European research landscape, and to actually change the way in which Europeans think about research"* (European Commission, 2008b, p. 2).This is an ambitious goal that requires commitment and actions from Member and Associated States to reach. To be successful, the communication states, Member States have to rethink and reorganise their national programmes. This possible intervention in national research and innovations systems is one of the reasons why the Joint Programming is a voluntary process (European Commission, 2008b).

Following the communication on Joint Programming, the initiative was launched as a Member States driven process that is supported by the Commission. The possible themes for joint programming are to be selected following a broad consultation process, involving the different regional, national and European scientific communities as well as other public or private stakeholders where appropriate (High Level Group on Joint Programming, 2010a). A High Level Group for Joint Programming (GPC) was set up to implement the JPI process. It is the GPC that is responsible for selecting the JPIs, while the Commission has chosen to be a partner in them because of the high level of commitment from member states. The GPC

consists of representatives of Member States, associated states and the Commission. They were tasked with identifying the themes for the JPIs and the development of voluntary guidelines for Framework Conditions (High Level Group on Joint Programming, 2010a). A JPI pilot on Neurodegenerative Diseases was adopted in 2009 and the first wave of Member State initiatives were adopted by the Commission in 2010.

The Framework conditions set up by the GPC in the Voluntary Guidelines on Framework Conditions for Joint Programming are concerned with the administrative, normative and regulative factors deemed essential for the implementation of the JPIs (High Level Group on Joint Programming, 2010a). The GPC is also concerned with the need to avoid a *one size fits all* approach to the framework conditions. The JPI process should stay a flexible and non-prescriptive approach and the GPC have suggested 2-3 models for each condition (High Level Group on Joint Programming, 2010a). In the guidelines themselves they mention that *"[…] striking the right balance between developing a "standard model" and "flexibility within the model" is crucial to prevent a fragmented landscape deriving from applying a completely different set of rules to each initiative."* (High Level Group on Joint Programming, 2010b, p. 4) However, as one of my informants pointed out: *"These JPIs have all emerged in different ways and the governance of each JPI depends upon what countries initiated them and the background."*(Agency, my translation) In this way they are already a bit fragmented, but the JPIs are an overarching structure and the range of instruments used by the JPIs in variable geometry will be the same and no more fragmented than what is already out there.

4.1.1 Funding structures

As the JPI is mainly about member states pulling together and defining common strategies, the individual JPIs themselves don't involve funding from the European Community (European Commission, 2008b). However, some funds have been made available for the

development of the JPIs through Coordination and Support Actions from the EU framework programme, and Horizon 2020 will also have a connection to the JPIs. The EU envisages three ways that they can take part in the JPIs: one is to set up calls that are relevant for the JPIs, the second is through the ERA-NET initiative, and the third is as a committed partner in art.185 initiatives. As seen in the communication on Horizon 2020:

> *Where the challenge addressed by a JPI is in line with the priorities of Horizon 2020, ERA-NET or co-funding may be used to provide further support. New Article 185 initiatives will only be considered provided there is a clear commitment from the Member States and when a JPI has demonstrated its capacity for significant collaboration and the scale and scope needed to support full integration of national programmes.* (European Commission, 2011b, p. 13)

However, as one of my informants stressed:

> *JPIs are not a new pot, they are first and foremost 60% coordination of existing national activities and 40% common research on new issues.* (Agency, my translation)

and

> *The JPIs can be seen as an overarching structure coordinating relevant activities. A JPI can identify four or five areas or work packages and there can already be existing activities within these areas funded on a national level, by ERA- NETs or the Framework programme, and they will be coordinated. In areas where there are no existing activities, new calls can be organized. It is a bit of a puzzle to get it all in place.* (Agency, my translation)

This is why a mapping process is an important part of the early stages of the JPI; they need to find out who is working on what and where. The Scientific Research Agendas of the JPIs will be important to determine the relevance of the different initiatives within the JPI to national and EU strategies, so they can determine what actions are relevant for them to take part in.

In the guidelines for the JPI, the GPC has not included a preferred instrument or funding model for joint research funding. However, I asked one of the Norwegian members to the

GPC this question and his answer was a virtual common pot with top-up funding from the EC.

Because of the economic situation in Europe more and more countries are turning off the tap when it comes to national funding, they say that we have to pay our membership fee to the EU to take part in the Framework programme and we want most of that back for the JPIs as well. So one operates with a model where 30% of the funds for joint calls in the JPIs come from the EC (Agency, my translation)

The JPIs have chosen different approaches to the funding of activities, as my three cases show. Some have a focus on the strategic impact and coordination of institutionalised funds, while others have started new networking initiatives or are working on new calls. An important concept for the funding of the JPIs is the variable-geometry of initiatives and activities (European Commission, 2008b). The principle of variable geometry means that countries can participate voluntarily in the different actions on the basis of their financial and political commitments (FACCE, 2012a).

4.1.2 Norway

In Norway, the JPIs are organised according to the *sector responsibility principle*. Norway is a member of all the ten JPIs and each of them is anchored in one of the ministries as well as a funding programme in the Research Council, apart from the JPI for Microbial Challenge, which is anchored in the Norwegian Institute of Public Health instead of the Research Council. However, the broad themes of the JPIs affect more than one ministry and one programme in the Research Council (Research Council of Norway, 2012). In this thesis I will focus on three different JPIs; Agriculture, Food Security and Climate Change (FACCE), Healthy and Productive Seas and Oceans (OCEANS) and Cultural Heritage and Global Change (JPICH). FACCE and JPIHC were among the first themes to be selected by the GPC in 2009, and the initiatives were adopted by the commission in 2010 (High Level Group on

Joint Programming, 2010a). Norway has been a member of FACCE from the start, but they were only observers in JPIHC and did not become full members until July 2011. OCEANS was part of the second wave of JPIs and was initiated by Norway in cooperation with Spain and Belgium (Research Council of Norway, 2012). There is no reason to assume that the motives for participation and levels of involvement neither financial nor political are the same in all ten JPIs, and I chose these three to see just how different they are. My focus in this thesis is on the motivation and funding aspects of the JPIs. I will now give brief descriptions of the background and governance structures of the three JPIs before I go on to discuss the Norwegian angle.

4.2 Agriculture, Food Security and Climate Change

4.2.1 Background

Agriculture, Food Security and Climate Change (FACCE) originated from a foresight exercise by the Standing Committee on Agricultural Research (SCAR). The member states and associated countries of SCAR identified food security and climate change as two of the main challenges to impact European agriculture, and following discussions in the European Agricultural Research Initiative (EURAGRI) in 2009, the two were combined to one topic; Agriculture, Food Security and Climate change (FACCE, 2012b). Agriculture[3] depends on climatic conditions; small changes in the environment can have grave consequences for crop yields. This is not just a European challenge but also a global one. Agriculture in tropical and sub-tropical areas is especially vulnerable, and a food crisis here will affect Europe demographically and economically, either directly or indirectly. The global food crisis in 2007/2008 was a sharp reminder of the need to build more resilient food systems to handle expected and unexpected events ahead. *"Due to population growth, urbanization and*

[3] The agricultural sector includes crops, livestock, fisheries, forest, biomass and commodities.

increasing affluence in parts of the developing world" (FACCE, 2009, p. 2), there is an expected increase in food demand globally. As well as being affected by climatic change, agriculture also affects the climate. Agriculture has the possibility of mitigating greenhouse gas emissions, and changing land use can either store more carbon in soil and plants or release it (FACCE, 2009). These are interrelated challenges and need a trans-disciplinary research base. In addition to scientific aspects, economic and social ones are also needed, and multiple actors and stakeholders will be involved (FACCE, 2012a). FACCE's mission is *"[…] to achieve, support and promote integration, alignment and joint implementation of national resources under a common research and innovation strategy to address the diverse challenges in agriculture, food security and climate change."* (FACCE, 2012a, p. 1)

France, UK, Italy, Germany and Spain proposed the topic supported by a number of EURAGRI member states, among them Norway (FACCE, 2009, 2012b). The JPI was officially launched in January 2010 with the first meeting of the Governing Board (FACCE, 2012b). There are currently 21 members in the JPI, and SCAR and the Commission are observers in the governing board. The secretariat is situated in Paris and lead by France (Institut National de la Recherche Agronomique, INRA) and the UK (Biotechnology and Biological Sciences Research Council, BBSRC) (FACCE, 2012b).

4.2.2 Governance

FACCE's permanent governance structure was adopted in February 2012. It consists of a Governing Board, Scientific Advisory Board, Stakeholder Advisory Board and the Secretariat. The Governing Board is the decision making body of FACCE and each participating state is represented by a maximum of two representatives (FACCE, 2012c). The Scientific Advisory Board is an advisory body; their role is to provide advice to the Governing Board on the alignment of activities to the Scientific Research Agenda and updates

of this, the identification, evaluation and impact of the JPI's activities, and review the scientific outputs from the JPI activities (FACCE, 2012c). At the time of writing the Stakeholder Advisory Group is being constituted and their first meeting is scheduled for September 2012 (FACCE, 2012d). The role of the Stakeholder Advisory Board is to be the main forum for stakeholders to interact with FACCE and provide advice on the alignment of FACCE activities to stakeholder needs. The members are European and International organisations or initiatives (FACCE, 2012c).

4.2.3 Funding

The members of the Governing Board have to pay a non-refundable fee to take part in FACCE, which goes towards the administration of the JPI and not funding of projects. In 2011, FACCE received a Coordination and Support Action from the Commission, covering the period from 2011 to 2014. The Coordination and Support Action is to support and develop the management and governance structure of the JPI (FACCE, 2012b). Existing EU instruments will be an important part of the JPI (FACCE, 2012a).

The first joint action undertaken by FACCE is the FACCE JPI Knowledge Hub. Inspired by the Commission's Networks of Excellence instrument and the Nordic Centre of Excellence, the call text defines the Knowledge hub as *"[…] a network consisting of selected research groups from JPI member countries within a defined area of research."* (FACCE, 2011, p. 6) The title of the pilot call is *A detailed climate change risk assessment for European agriculture and food security*. In addition to network building, the knowledge hub also has elements of researcher mobility and knowledge building, and will collaborate with international projects that are already running[4] (FACCE, 2011). 17 countries took part in the call that was a two stage procedure that led to one proposal, and the Knowledge hub was

[4] *"e.g. AgMIP (Agricultural Modelling Inter-comparison and Improvement Project; http://www.agmip.org)."* (FACCE, 2011, p. 3)

launched in June 2012 (FACCE, 2012b). FACCE is currently working on an ERA-NET Plus call that is going to be a Virtual Common Pot.

4.2.4 Norway

The Ministry of Agriculture and Food has the main responsibility for FACCE in Norway. However, FACCE covers fields of interest for other ministries as well, and there are plans to keep them informed and possibly involve them more (Research Council of Norway, 2012). For the time being, FACCE is being handled by resources connected to BIONÆR (the Sustainable Innovation in Food and Bio-based Industries programme), but it is felt that it should not be the responsibility of just one programme. Rather, it should have a cross-divisional organisation because it is relevant for several other national programmes. Some funds were set aside from relevant programmes early in the process to be used for the first calls within this JPI.

4.3 Cultural Heritage and Global Change

4.3.1 Background

This JPI was initiated by Italy and supported by 13 other countries, and had a strong link to several existing ERA-NETs (Research Council of Norway, 2012). As stated in the proposal (JPICH, 2009b) this theme is a key European challenge because cultural heritage is important for the identity of many European citizens. The cultural heritage and the tourism industry that it generates are also important for the European economy, making it important to generate knowledge related to sustainable use and protection. The knowledge generated in Europe related to cultural heritage is also seen as an important export article (JPICH, 2009b).

The proposal for Cultural Heritage and Global Change (JPICH, 2009b) identified three complex challenges related to cultural heritage. The first one is related to how climate change impacts tangible cultural heritage[5], both how the effects of catastrophic events affect cultural heritage, how cultural heritage can open up new avenues for mitigating climate change through re-learning old techniques and traditions, and sustainable use of sites (JPICH, 2009b). The second challenge is related to security and the protection of cultural heritage, wherein both environmental and anthropic risk factors must be taken into account. Sustainable development and sustainable access to cultural heritage is important. The third challenge is related to culture and society. Cultural heritage is the history and memory of the multifaceted European society and therefore important for the European identity. Managed properly it can contribute to social and economic stability (JPICH, 2009a).

4.3.2 Governance

JPICH has a three-layered governance structure consisting of a Governance Board, Executive Board and a number of Task forces. They are supported by a Coordination structure and two advisory committees; the Scientific Committee and the Advisory board. This structure was implemented in 2010 (JPICH, 2010b). Each participating country can have up to two representatives in the Governing Board, but they have only one official spokesperson and one vote. The Executive board is responsible for the management and implementation of the General Board's decisions, and consists of one technical representative from each member country (JPICH, 2010b). The Executive Board is structured into working groups and task forces that report to the General Board. While in the process of writing the Scientific Research Agenda for JPICH, they are organised horizontally and focused on the different work packages, e.g. Work Group State of the Art and Work Group Monitoring. The Task

[5] For example historic cities and towns, historical landscapes, archaeological sites, ancient buildings, museum collections, archives and libraries.

Forces are responsible for the different research areas and will work to implement the Scientific Research Agenda and the Action Programme (JPICH, 2010b). The Scientific research agenda is under development and will be finished in December 2012 (JPICH, 2012). The Advisory Board consists of representatives from relevant European and international bodies and the Scientific Committee consists of 12 experts selected through peer review (JPICH, 2010b).

4.3.3 Funding

Like FACCE, JPICH has received a Coordination and Support Action from the commission to run the secretariat and develop the JPI further. JPICH plans to utilise the wide variety of funding options available and has through the ERA-NET NETHERITAGE already obtained a good overview of existing research programmes and funding mechanisms. They aim to put a lot of effort into linking up already existing activities and research communities, including ERA-NETS, Infrastructure and European Technology platforms (JPICH, 2010a). JPICH is in the process of developing its first application for an ERA-NET Plus call.

4.3.4 Norway

The Ministry of the Environment is responsible for JPICH. They have delegated the handling of it to the Directorate of Cultural Heritage. Within the Research Council it is administered by the programme MILJØ2015 (Norwegian environmental research towards 2015). This programme has set aside funds for international research cooperation, and some of these funds will be available for joint calls within this JPICH (Research Council of Norway, 2012).

4.4 Healthy and Productive Seas and Oceans

4.4.1 Background

The initiators of this JPI were Spain, Belgium and Norway. It was further supported by eight Member States and several stakeholder organisations (JPI Oceans, 2010). The Proposal (JPI Oceans, 2010) and vision document (JPI Oceans, 2011c) for Healthy and Productive Seas and Oceans (OCEANS) points out the importance of seas and oceans for Europe's wealth and the wellbeing of its citizens. This mainly undiscovered territory also offers a huge potential through the largely unexplored marine biodiversity and marine energy. The vision document links this to the EU2020 vision where *"It [Europe] must ensure the sustainability of existing maritime activities and turn the unexploited potential of seas and oceans into sustainable growth and jobs."* (JPI Oceans, 2011c, p. 6) However, the coastlines and marine environment are under pressure from human activity and natural hazards, ranging from overcrowded coastlines, overfishing, oil spills and pollution from land based industry to invasion of foreign species through global transport and the effects of climate change (JPI Oceans, 2010). These challenges are truly cross border; they are not constrained by any legal boundary, and put the whole marine environment at risk. These challenges cannot be tackled by one state or sector alone, *"They require an integrated approach and should be based on sound knowledge."* (JPI Oceans, 2011c, p. 6) OCEANS' Vision document (JPI Oceans, 2011c) states clearly that their aim is to strengthen the knowledge base and, by sharing best practises, create a coherence to European research through data harmonisation and standardisation of techniques, methods and tools. To handle these challenges, existing infrastructure needs continued support and development, and researchers, technicians and engineers need a framework to support the necessary capacity building (JPI Oceans, 2011a, 2011c). They also aim to build on existing initiatives like ERA-NETs, the Framework Programme and European Technology Platforms and create a convergence between them, *"[..,] with a view to produce the necessary*

integrated knowledge that is needed by policy makers and industries to ensure an integrated and sustainable development of sea based activities." (JPI Oceans, 2011c, p. 13)

4.4.2 Governance

OCEANS will have a similar governance structure as FACCE and JPICH, with a Management Board on top as the decision making body, a Strategic Advisory Board that, as the name implies, acts as an independent and neutral advisor, and an Executive Committee that prepares and implements the decisions made by the Management Board. They are all supported by a secretariat that runs the day to day management of the JPI (JPI Oceans, 2011b). Only the Management Board and the Secretariat are in place at the time of writing. The Management Board consists of up to two representatives from each participating state, and as with the other JPIs each state only has one vote. They are in the process of setting up the other bodies in the governance structure and developing a Strategic Research and Innovation Agenda (Research Council of Norway, 2012). The participating states are expected to make an active contribution to the activities in the JPI. The Secretariat was set up early in the process of the JPI to facilitate the development and is run by personnel seconded from several of the participating countries. The secretariat leader is Norwegian (Research Council of Norway, 2012).

Unlike FACCE and JPIHC that have two advisory boards, OCEANS will have one that *"[…] consists of scientists, industrial stakeholders and technologists and societal stakeholders."* (JPI Oceans, 2011b, p. 7) The stakeholders in OCEANS seem to have a more direct interaction with the governance of the JPI. As it says in the Vision document *"The JPI will foster a science- policy-NGO-industry P-P-P-P dialog, bringing stakeholders into the governance structure. The JPI in order to achieve its goal sees the need to take stakeholder involvement to a next step of involvement in the implementation phase."* (JPI Oceans, 2011c,

p. 15) Securing commitment and engagement from stakeholders through a dialogue with the end-users is seen as important for the JPI to be sustainable and fulfil the societal needs and challenges it was set up to tackle (JPI Oceans, 2011b).

4.4.3 Funding

In 2011 the Commission opened up a call for a Coordination and Support Action for JPI Oceans and it is expected that it will be approved during 2012. The funds from the Coordination and Support Action will be used to further develop the JPI both strategically and organisationally (Research Council of Norway, 2012). There is a small fee to participate, but Norway carries most of the cost to run the secretariat in Brussels (Research Council of Norway, 2012). Out of the three JPIs that I have looked at, OCEANS is the one that most clearly states their intention to use institutionalised funding in the JPI. The vision document declares that funding *"[…] may include institutional, project-related or new funds."* (JPI Oceans, 2011c, p. 7) This was also supported by my informants.

4.4.4 Norway

The Ministry of Fisheries and Coastal Affairs has the main responsibility for OCEANS. An interdepartmental group with representatives from 7 other ministries is set up to discuss the Norwegian activities in this JPI. There are several national programmes within the Research council that are relevant for OCEANS, and as the main responsibility is not within one programme, they have hired a new person to handle the coordination towards the relevant programmes. In addition to Norway's contribution of significant funds to the running of the secretariat in Brussels, it has also been partly staffed by the Research Council along with secondments from other participating countries. So far there has not been identified any funds for joint calls (Research Council of Norway, 2012).

4.5 What motives come into play when policy makers decide to take part in the JPIs?

As mentioned earlier, Norway is now a member of all the ten existing Joint Programming Initiatives. Not being a member of the EU, Norway has in some instances struggled to be heard while in others Norway is considered one of the leaders. This can also be seen in Norway's involvement with the JPIs.

In the GPC (2010a) report, some of the issues that were highlighted were member state commitment, the different capacity of regions and countries to participate and the possibility that this could accentuate the scientific divide between member states (High Level Group on Joint Programming, 2010a). This concern is also echoed by Langfeldt et al. (2012), who note that policy instruments in small countries might not be able to handle the diversity and complexity of the new ERA instruments. The GPC (2010a) report notes that these issues can be eased by the principles of variable-geometry and the use of institutional funding.

4.5.1 European influence

What I have found interesting is the fact that limited resources and low priority settings can also be a motive for participating in a JPI, as in the case of Norway's participation in JPICH. According to my informants this was the JPI that took the longest consideration for Norway to join. There are not a lot of research funds for Cultural Heritage in Norway, and Norway was reluctant to use these funds on joint calls. At first Norway attended a few meetings in the JPI as an observer and eventually they decided to join as a full member. *"[…] it was the Directorate of Cultural Heritage that had the strongest desire to join."* (Agency, my translation) It was felt that because Norway is a small country when it comes to research on Cultural Heritage it was important for them to have access to other countries' knowledge

bases, and this is the first real opportunity that Norway has had to influence the European research agenda when it comes to cultural heritage. As one of my informants put it:

There has been some work done on this earlier but this is the first big coordination and we can't not take part. If we don't, we risk being left sitting in the corner watching while the others play. (Ministry, my translation)

and

There have been few [European] funds and projects that have been relevant for us up through the years. (Ministry, my translation)

Because they came in late in the process, Norway does not have an official role within the work packages. Only the countries that were members when the Coordination and Support Action was set up, do, which is why it is important that the latecomers work hard to get involved. The fact that there are no set tasks for newcomers in the work packages is in many ways a disadvantage, but Norway has turned this around and volunteered to assist where it is of the most interest to them. After becoming a full member, Norway has become involved in the Work Package that is dedicated to the development of the strategic agenda, working closely with the other Nordic countries and the UK, who is the work package leader.

While access to networks, new relationships and the chance to angle the grand challenges towards Norwegian issues is an important driver for participating in JPICH, there is also an economic one:

It has been quite difficult to acquire EC funding for Cultural Heritage research throughout the years. So with this new initiative from the EU where the funds will in principle go through these JPIs it was something that MD [the Norwegian Ministry of the Environment] and the Directorate for Cultural Heritage agreed to connect to. (Ministry, my translation)

However, they are dependent on the Strategic Research Agenda to have themes that cover Norwegian issues and that there will be calls that are relevant for the Norwegian research community.

OCEANS, on the other hand, is within an area that is strongly prioritised by Norway, and it was originally a Norwegian initiative. However, the initiators acknowledged the fact that Norway is not a member of the EU and therefore needed to join forces with others. As it was Spain and Belgium that held the EU presidency in 2010, they were approached and asked to develop and initiate the JPI with Norway. As one of my informants put it, *"We came in an initiating position, a leadership position, because we had ambitions in this area and found allies in Spain and Belgium to carry it forward"* (Ministry, my translation)

This little detail shows how strategically Norway has worked with this JPI from the beginning. Norwegian research strategy has the ambition to lift Norwegian marine research both in scope, resources and international cooperation, and EU funding instruments are important tools to do so (Meld. St. 30 (2008-2009), 2009). My informant at the Ministry of Fisheries and Coastal Affairs was very clear that their aim with the JPI was to both strengthen the research communities in the competition for Framework funding and to make better use of the existing infrastructure.

> *Norway pays large fees to the EU and in connection with HORIZON 2020 we will contribute even more, therefore it is important for us to position ourselves to regain as much of it as possible.[…] Participation in JPI OCEANS will facilitate this and facilitate research cooperation across Europe.* (Ministry, my translation)

This positioning towards HORIZON 2020 is an important part of OCEANS, and much of the work so far has been strategic. The focus has been on developing the governance and structure of the JPI as well as working on developing a good network and access to key personnel within the development of marine research in the EU, especially towards those

working on HORIZON 2020. My informant at the Research Council noted that there is some uncertainty regarding how the relationship between the JPIs and HORIZON 2020 will develop.

People are a bit afraid that HORIZON 2020 will be disconnected from the JPI themes, saying that they are handled by the JPIs so we do not need to include them. But what most hope and believe is that they will go together and complement one another. And our impression from working so closely in these processes is that we are being listened to. (Agency, my translation)

OCEANS has branded themselves a player on the marine policy field and seem to have impact and influence, however it still remains to be seen if they actually do. As my informant noted, *"It will be interesting to see what actually ends up in HORIZON 2020*" (Agency, my translation)

4.5.2 Strengthening research communities

Apart from influencing the EU policy makers to develop a theme within HORIZON 2020 that corresponds to OCEANS, they also aim to strengthen the marine research communities through closer cooperation and better use of existing infrastructure. *"If one through close cooperation between countries, between research institutes and universities in the different countries manages to become more competitive in regards to the framework programmes, then that will definitely be a positive spin-off."*(Ministry, my translation)

On a direct question, my informant at the ministry answered that the main motive for Norwegian participation is to strengthen the research communities and regain funds from the Framework programme. This implies that the concept of fair return is a strong motive for participation.

Norway was also one of the initiators for FACCE through their involvement in SCAR. The Research Council represents Norway in SCAR, and it was the Research Council that approached the Ministry and suggested taking part in the JPI. For the ministry, this JPI fit very well with the national strategy and priorities within this field and the White paper on research (Meld. St. 30 (2008-2009)). As my informant at the Ministry of Agriculture and Food put it:

> *It follows up the goals we have in the white paper on research, that we shall contribute to tackle the global challenges, and especially food security and climate is important […] and sustainability.* (Ministry, my translation)

and

> *It is also a government decision that we shall go international, to become more international in the context of research*. (Ministry, my translation)

My informant also noted that these are big challenges that have to be handled together with other countries; they cannot be solved by one country alone and it is important to take part, both to contribute resources and knowledge and also to gain access to knowledge. Influence is also mentioned as a motive. As the research strategy for the Ministry of Agriculture and Food states: "*It is also important to influence so that international research has relevance for Norwegian issues*" (Meld. St. 9 (2011-2012), p. 284, my translation)

The high level participation in the JPI was mentioned as important because it lifts the issues up to a higher policy level, and makes them more visible. By having a representative from the ministry in the JPI it gives them a direct sense of what is going on, they have *their finger on the pulse*, so to speak. This means that the whole ministry can be informed and involved in a more direct way in these high level policy issues. However, as was also pointed out, it is still

early in the process. Knowledge about the JPI still has to be spread in the ministry, and it has to be further anchored.

4.5.3 Return

The STIG group notes that fair return is an important policy issue when dealing with international cooperation; national governments want to make sure that they get a return on their investments. Therefore, policies designed to ensure a fair return are common in intergovernmental STI activities. (OECD, 2012) However, they also note that *"[…] to address global challenges, the principle of fair return must most likely be tempered."* (OECD, 2012, p. 179) My informants have expressed similar views, but my cases show little evidence of such tempering.

The Norwegian motives for participation are linked to social, scientific and economic drivers. For both JPICH and OCEANS the chance to influence and set the agenda are important drivers for participation, while for FACCE this is less explicit. It is also important for JPICH and FACCE to gain access to other research communities and more knowledge. OCEANS is the one that has expressed the strongest economic driver. The motive for participating in FACCE seems to be less driven by specific needs for networking or strategic work and more by the Grand Challenges and the need to develop knowledge in cooperation with others to face them. However, influence and relevance for Norwegian actors is an underlying motive, as seen in the White Papers. One of my informants also pointed out the value of getting to know each other's strategies and funding instruments, that coordination is more than joint calls. Three other informants also pointed out the importance of the sharing of strategies and that the JPI will be important for the development of future national strategies.

It seems that some form of return is a driver for all the three JPIs. The needs of the ministries' national sectors are important, but they have managed to frame them within a global

objective. This relates to the goal conflict issue. For national actors to actually get some return on their investment, they have to manage to influence the Strategic Research Agenda of the JPI so that it is of relevance to them.

Regardless of whether this return is more funds, more knowledge or more influence, it implies that return is an important driver. To find out more about return as a motive I was interested in my informants' thoughts on real common pot. In the White paper *Klima for Forskning* (Meld. St. 30 (2008-2009)), the Norwegian government listed several measures to improve the Norwegian research cooperation with Europe. One of them was for the Norwegian Research Council to investigate the legal and administrative implications of a real common pot funding model within the ERA framework (Meld. St. 30 (2008-2009)). So far the Research Council has started to look at the practical and organisational consequences of more international cooperation; however they have not looked specifically at the real common pot issues yet.

When asked about real common pot, five of the nine informants said that if the knowledge is important enough they could see Norway agreeing to such an arrangement. One of these five even went as far as to say that a real common pot was the only way to get real impact by getting the best researchers and research communities to tackle the common challenges. Two of the others said that it is too early to say and the last two noted that there is no indication that Norway would want to accept a real common pot.

Of course, when we have gotten further and are more secure of the system and have a more integrated wish regarding the knowledge development, then we can possibly say that within this field we do not have a knowledge base but the knowledge is important therefore we will put money into a real common pot. However we are not there yet and I think that most countries are more comfortable with a virtual common pot. (Agency, my translation)

My informant from the Ministry of Fisheries and Coastal Affairs noted that

It is difficult to say how Norway would position itself regarding Real Common Pot. The sector ministries would want fresh funds to be able to do it. This would actualize a more general JPI discussion for all the ministries, if one receives fresh funds they all want some. […] It is more likely that existing schemes and funds that are already in the system will be used. (Ministry, my translation)

This is important not only regarding the use of a real common pot, but to the whole question of funding activities within the JPIs. The three JPIs I have looked at have chosen three different approaches, all utilising the funds that are already in the system.

4.6 How are the national budgets used in cooperation with other countries in the JPI?

It was important for the Research Council that the JPIs have their own budget lines in the national budget, so the ministries would have a conscious grasp of the funding situation. As one informant said:

Early on we thought that the JPIs should have their own budgets, as if they were national programmes, and the reason for that was so that they showed up with budget lines in the budget that we present the to the ministries, and then it will be up to them how much they want to invest in them, and not the national program committees. (Agency, my translation)

However, with the new International strategy the national programmes have a stronger responsibility to identify and take part in relevant international research cooperation, including the JPIs. Isolating the budget lines too much from the national programmes might hinder them from taking part in JPI activities.

The ministries have so far not prioritised funds to JPI activities, but the government's research strategy *Klima for Forskning* (Meld. St. 30 (2008-2009)) and the grant letters from the ministries to the Research council state the importance of international research cooperation. For instance, in the grant letter from the Norwegian Ministry of Agriculture and Food, it says

The Research Council shall target their efforts so that it supports Norwegian agriculture and food policy. An important part of this is to continue to develop the sector's participation in international research cooperation. It is important to solve common challenges, raise the level of research, renew Norwegian research and understand and utilize research results from other countries. (Landbruks- og Matdepartementet, 2012, p. 4, my translation)

The Research Council is the ministry's agent and the ministry expects the Research Council to prioritise within the existing budgets in line with the ministry's strategy. This means that the Research Council has to create room to manoeuvre within the grants that the relevant programmes have. They have to identify the relevant programmes and set aside a certain amount for a certain period. This means that the programme boards will only be able to distribute the funds that are left after the funds for the JPI is taken out.

We have to get the national programme boards to accept this. They are put in place by the research council to give grants to Norwegian actors and they are not the ones who wanted to take part in the JPIs, they have no sense of ownership towards them, so it will be a big exercise to get them on board. (Agency, my translation)

4.6.1 New Calls

This has been done in the case of JPICH. The relevant national research programme involved the programme board in the discussion a few years ago and they set aside a lump sum to be used for international cooperation. This lump sum has been divided among one ERA-NET and three JPIs relevant for this programme, and the funds are still controlled by the programme. *"This means that we have some money within a zero growth budget for these JPIs, and if we hadn't done that we would have been penniless in the current budget situation."(Agency, my translation)* With these funds Norway can take part in the JPICH pilot call currently being developed.

The funds that are used in the FACCE Knowledge hub call and the upcoming ERA-NET Plus call have been set aside by the Research council after a dialogue with the Ministry, and released by relevant national research programmes. When I asked the Ministry of Agriculture and Food if they would prioritise the JPI, the answer I got was that this is something they will have to consider in the future. For now: *"The ministry sends all its research funds to the Research Council. And all decisions regarding grants and calls are taken by the Research council"* (Ministry, my translation) However, they referred to the close dialogue they have with the Research Council, and with the Ministry represented in the Governing Board of the JPI, they are able to follow the process closely and can act if needed.

4.6.2 Institutionalised funds

As noted earlier, OCEANS has a strong focus on institutionalised funds and utilising the infrastructure with guidelines and instructions on when to use them and where to cooperate. The funds are already in the system; the trick is to direct them towards cooperation and joint activities. It is thought that 85 % of the whole European research budget is institutionalised and not subject to competition (JPI Oceans, 2011c) so if one could align these funds and the on-going research one could get a real impact. The ministry has so far not directed the institutes on their use of resources, but as my source at the ministry noted: *"They [the institutes]see what is coming and they have taken the initiative […]we have not come far enough for it to be natural for the Ministry to go in and direct"* (Ministry, my translation)

It is expected that there will be some joint calls, but the main focus on calls will be within the Framework Programme and ERA-NETs. While there so far haven't been reserved any funds for new calls within this JPI, it is thought that the financing of these future calls could come from several sources, both national and in the EU. The themes within the JPI are relevant for several national programmes, and the marine research is already quite internationally oriented.

As one of my informants put it, *"There are no real borders to the marine and oceans, it all floats around."* (Agency, my translation)

4.6.3 Goal conflict and moral hazard

One of the main governance challenges in STI cooperation programmes is funding and the funding module chosen in each programme. (OECD, 2012) This can be especially challenging with the variable geometry of the JPIs. The Joint programming initiative is a Bottom-up process in the European perspective, in that it is a member/associate state driven process. However, when it comes to the JPIs themselves, it is a top down process; they are policy driven and have a high-level political commitment from the participants. The members of the Management or Governing Boards are high level representatives that have a government mandate to commit funds to the JPI (FACCE, 2012c; JPI Oceans, 2011b; JPICH, 2010b).

All of the JPIs have a strong socioeconomic aspect. This means that they are in part societally driven and therefore it is important that stakeholders are involved to enhance the social value of the research initiatives. The links to scientists through the scientific and strategic advisory boards are also important. As Van der Meulen (1998) points out; if one can build up a consensus between policy makers, scientists and other stakeholders, the urge to shirk will be lessened. By having experts and important stakeholder groups as part of the governance structure, one can build a consensus among the actors, thereby lessening the moral hazard related to the agents. The third part (here the scientific advisory board) in the triadic principal-agent relationship can help the intermediary (here the JPI) to develop and improve its strategic position. According to Van der Meulen (2003), focusing on the third part's objectives allows the intermediary to lessen the opportunistic behaviour of the principals and agents. Van der Meulen (2003) also states that in addition to being well informed, it is essential that the

arbitration of the third party is decisive. In the case of the JPIs, however, while the Scientific Advisory Boards are well informed and their arbitration is important, it is not decisive. As the quote below shows, they still allow the JPIs to focus on a scientific strategy that is not stifled by national interests and lessen the goal conflict among the principals.

> *The Secretariat of FACCE JPI noted that focusing the discussion on scientific issues facilitated national representatives' agreement on the scientific research agenda. This was also facilitated by the Scientific Advisory Board which is composed of well-known experts from different world regions who are not constrained by specific national interests.* (Holzinger et al., 2012, p. 163)

The member states nominate and vote on members for the advisory boards. For there to be trust in the system, there also has to be consensus among the policy makers on who should sit on the different advisory boards. The members do not represent a state or institution, and the fact that they act in an individual capacity free from affiliation is important in their role as advisors. Even if they are independent and unconstrained by specific national interests, new members that have been admitted to the Management Board after the process of reaching this consensus may not have the same level of trust as the ones who took part in the process. If this in turn is coupled with the variable-geometry of instruments and initiatives within a JPI and it is not clearly defined who sets the criteria and makes the decisions regarding the separate initiatives, it can add to the moral hazard.

In situations with multiple principals, which the JPIs are, the only way for the principal to be sure that the funds are used according to their goals is to monitor them closely. One of the ways this monitoring happens is by earmarking the funds (Van der Meulen, 2003). With the JPIs that earmarking can be seen to be done through the variable geometry of the programmes, but monitoring also requires a clear strategy, a work plan and clear definitions of who decides what. When asked, one of my informants stated regarding JPICH that this was

one of their concerns regarding their commitment of funds to the pilot call. The JPI wants several members from the Scientific Board to steer the call. This is a concern for Norway, because they became a member after the Scientific Board was appointed and therefore did not have a say in who was appointed. *"[..,] if we are to take part in this call it is important that the countries committing the funds are the ones making the decisions"* (Agency, my translation) Also, the JPI has asked for preliminary commitments of funds before a theme has been selected for the call, and before the Scientific Research Agenda is in place.

One of the concerns in the case study of FACCE done for the OECD report was: *"Do countries that will not participate in specific calls or joint actions also have the right to vote on these issues? Do joint actions or activities depend on the agreement of members who will then not participate in and support these actions?"* (Holzinger et al., 2012, p. 161)

This was not sufficiently addressed in the preliminary Governing Structure of FACCE, but the permanent one states that when it comes to suggestions for specific initiatives, the required vote is: *"[ ] any number of countries willing to participate is enough[1]"* (FACCE, 2012c, p. 6, footnote in original). A footnote further specifies that:

> [1] *In any joint action involving less than the full number of FACCE-JPI participating countries, decisions concerning that action will be the responsibility of the sub-set of participating countries. A Steering Committee will be formed consisting of representatives of countries involved in the action. The Steering Committee will be expected to report progress on the action to the GB.* (FACCE, 2012c, p. 6)

This means that the decision making body for a specific joint action only consists of participants with a commitment to the action. Moral hazard issues are enhanced when there are a lot of Principals, and if some of these principals do not have a financial commitment,

there will also be an issue with free riders[6]. By clearly defining the decision making body, FACCE has limited the free-riding and moral hazard issues. However, FACCE is the only one of my cases that has clearly defined this decision level.

When it comes to JPICH, the Governing Board is responsible for the strategic orientation which includes *"Building up an "à la carte" program in which several countries in variable geometry could participate voluntarily and on the basis of their political and financial commitment."* (JPICH, 2010b, p. 2) The Terms of Reference of the management structure (JPICH, 2010b) does not state what kind of majority is needed to initiate new activities. When I asked one of my informants in the Governing Board, the answer was that "*The Governing Board decides that they want to launch a call, and then the members decide if they want to take part and develop the call. When the theme and guidelines are in place the members decide if they want to participate. "* (Agency, my translation)

JPICH are in the process of working this out now through the process of their first pilot call. All the members were invited to submit suggestions for Call themes and state what administrative criteria they have regarding funding, national processes and cooperation to commit funding. A Memorandum of Understanding for the pilot call is being developed based on the responses from the member countries. The choice of a virtual common pot as funding model for the call helps to mitigate the moral hazard issue. As my informant noted:

We cannot commit without seeing the relevance for us. However we will always cover ourselves because we will only be using our funds for our part of the projects, so if no Norwegian researchers apply we will not use a single penny. So in that way we still have control, and in a start-up phase I think that is good. (Agency, my translation)

[6] The tendency of actors to reduce one's own effort to produce the public good at the cost of others (Braun, 1993)

JPI OCEANS are far behind in this process. With their main focus having been on the strategic work, branding and institutional funding, they have not yet discussed these issues. The Terms of Reference for JPI Oceans states that the vote needed for a new initiative is *"Any number of countries willing to participate."* (JPI Oceans, 2011b, p. 6) However, unlike FACCE they do not specify who should be involved in the decisions concerning the individual initiatives. Programming Boards are mentioned as part of the governance structure in the Terms of Reference (JPI Oceans, 2011b), so one can assume that these will handle the decisions concerning specific actions. When asked about this my informant in the Management Board said that it was *"Too early to say if the lower governance structure would be organized thematically or on the basis of variable-geometry."* (Agency, my translation)

4.6.4 Adverse selection

Adverse selection is an interesting issue when it comes to using the institutionalised funds. As mentioned earlier, in situations with several principals, earmarking the funds is one way of lessening the moral hazard. However, when it comes to the institutional funds, this earmarking can become a hindrance to get the right agents for the task, especially in situations where almost all the funds in the research system are institutionalised.

The EU opening up for using institutionalised funds in ERA-NET activities implies that some of the institutionalised funds can become subject to competition. How will the adverse selection issue of earmarked versus peer review be handled in this situation? FACCE had to find a way around this issue when setting up the Knowledge hub. At first it was planned as a call with cash funding, but they discovered that not many of the countries wanting to participate had available cash, because all their funds are institutionalised. Therefore they ended up with a mix between cash and institutionalised funds. *"But then the prerequisite had to be that the partners that came with institutionalized funds were allowed to change what*

they were doing and make it fit with the project. And apparently that is what has happened" (Agency, my translation)

It can seem like one solution is for the policy makers to give room in the grant letters to use the institutionalised funding in ERA-NET projects. The direct involvement of the ministries in the JPIs' governance could ease the issue of information asymmetry and make it easier for them to do exactly that. As one of my informants noted *"It will be the institutes that have to start thinking strategically with regards to where they use their institutional funding together with others."* (Agency, my translation) As noted earlier by my informant at the ministry of Fisheries and Coastal Affairs, their institutes have started to do so. By working strategically with the JPI, the policy makers will be able to steer the relevance of the projects.

5 Summary and conclusion

The aim of this thesis has been to explore some of the motives and governance issues related to funding arrangements in international STI cooperation, by doing a comparative case study of Norway's participation in three JPIs.

To do this I asked the questions:

- What motives come into play when policy makers decide to take part in the JPIs?
- How are national budgets used in cooperation with other countries in the JPI?

5.1.1 Motivation

International STI cooperation is increasingly being seen as important to tackle the common challenges, both globally and within the EU. The JPIs are set up to help generate knowledge that authorities can use to handle the common challenges. It is reasonable to assume that tackling the common challenges is part of the overall motive for the countries participating in the JPIs. Framed within this overall objective are other national motives.

I found that my cases shared the general motives of influence, return both knowledge and financial, and strengthening the domestic research community. The motives are set within the broad paradigm of Boekholt et al. (2009), and as the white paper (Meld. St. 30 (2008-2009)) and EU strategy (Kunnskapsdepartementet, 2008) show, these motives are part of the general Norwegian strategy. However, what motives are the strongest, varies. The opportunity to influence and set the agenda is a very strong motive for both JPICH and OCEANS. Particularly JPICH have recognised that participation in this initiative may be key to future exchange and interaction for the policy makers. For OCEANS, the JPI is a specific tool to influence international and European processes. The influence motive is less explicit for

FACCE, but it is there. The one that expressed the strongest economic motive is OCEANS, both to utilise the existing institutionalised funds better and to strengthen the competitiveness of the domestic research community within the EU Framework programme. The motivation to participate in FACCE seems to be more about return on knowledge and the general strategy of the ministry rather than a specific strategic or networking need.

Because the variable geometry of the JPIs allows for countries to act on national interests within a framework of global objectives, some of the tension between national and international interests is eased. However, because funding influences who researches and what, lack of funding in some countries can make new knowledge difficult to discover. Influence being this central indicates that the goal conflict issue, the alignment of goals, is still an important one.

5.1.2 Funding Structure

When it comes to my second research question, there is no clear answer. The JPIs are still early in the process and they have not fully found their form yet. However, there are some indications as to how the national budgets are used in cooperation with others within the JPI framework. There are indications that coordination of institutionalised funding will become more central, especially with the new ERA-NET instrument from the EC. As far as I have found, the ministry handling OCEANS is the only one that has the use of institutionalised funds as a clear strategy. With FACCE and JPICH it is still too early to say, as there is no clear strategy regarding the JPI funding, apart from what is already delegated to the Research Council. However, there are indications that they are following the situation closely. The new calls that have been or are under development are all virtual common pot calls allowing national funds to be used according to national rules, but there are still issues of moral hazard,

goal conflict and adverse selection when it comes to the development and governance of the individual actions.

The JPIs have several countries as principals, therefore the Scientific Research Agenda is important to ease the goal conflict issues within the JPI. As seen with the JPICH case where they have started to develop a call before the Scientific Research Agenda is agreed upon, there have been concerns related to goal conflict. The setting up and governing of specific actions raises moral hazard concerns. Even if the variable geometry does ease them some, it is only FACCE that has taken direct steps to ease the moral hazard and free-rider issues related to the decision making process of specific actions. Also, if the JPIs only use a virtual common pot model, the variable geometry of the JPIs themselves can be a source of adverse selection, regardless of the use of institutionalised funds or fresh funds. If participation in the individual initiatives is only based on national resources, there is a possibility that this can hinder the most appropriate or best research communities from taking part in a call and finding a solution to the issue.

5.1.3 Implications for practice and further research

Looking at my cases, the JPIs represent opportunities that the policy-makers utilise on the basis of their own situations. For instance, research on cultural heritage has not been a highly prioritised area in Norway and now they finally have the opportunity to take part in the European arena. This could in turn help to lift the visibility of this research nationally as well. Marine research, on the other hand, is highly prioritised in Norway and the policy makers have seen the possibilities inherent in the JPIs, which enable them to use this strength internationally.

I also find indications in the cases that there is a connection between the existing level of domestic funds and the will to use institutionalised funds. OCEANS, being within a highly

prioritised sector, has more institutional funds than the others, which could imply that they will have a larger effect of using the institutionalised funds. For cultural heritage research there is less funds already in the system. Therefore one could reason that for Norwegian JPICH involvement, there would be a bigger effect from receiving fresh funds than from using the institutionalised funds. However, these are only tentative indications and one would need more research to conclude.

In my opinion, what will be the most interesting to follow in the future is how institutionalised funds will be used in calls that are subject to competition. How will the policy makers, funding agencies and science communities handle this? Influence on the arena that develops these activities can ease the national goal conflict by creating opportunities for domestic actors, or through the creation of new knowledge that is needed. However, there will still be moral hazard and adverse selection issues that have to be handled.

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6 Appendix

6.1 Original interview guide

To what degree and under what conditions will Norway accept the use of a real common pot within JPI framework? What are the thought of the governing Board on funding models? What model does the board prefer? Opening up of national programmes? The Involvement of industry in the JPI's? How? Coordination of existing funding What programmes will be affected What has been done to prepare the programmes Assessing where the funds should be channeled, JPI or national programs Use of ERA net (real common pot)	**Goal conflict** • Motivation • Is it a political question or a science question? • Programs/science communities with a strong international focus versus the ones with a national focus. • Strong / weak science communities • Path dependency • Where are the budgets found? • What guidelines/conditions will the ministries put on the basic funding to institutes and universities, and programs in the RCN? **Adverse selection** • Coordination of national actors and stakeholders - How • Is the Norwegian research community ready for international competition? • How can this be improved? Posisjoneringsmidler? Nettverksmidler? Stimuleringsmidler? • Ministries: Are they pro or reactive? **Moral hazard** • Interoperability • Governance guidelines "optional" • Common contracts/module based contracts • Evaluation • Monitoring • What rules will we accept? • What rules will the EU accept? • Legal aspects
How will the choice of funding model influence the system? (How will the JPIs influence the system?) • What is the effect on internationalization in general?	**Goal conflict** • Strategic consequences • Shift from single scientist strategy to system/sector strategy? • Do the ministries coordinate with other countries? If so, how?

6.2 Revised interview guide

How will we use national budgets in cooperation with others? What are the thoughts of the governing board on funding models? Where will the funds be found? Opening up of national programmes? Coordination of existing funding Institutional funding What programmes will be affected What has been done to prepare the programmes Assessing where the funds should be channelled, JPI or national programs? Use of ERA net (real common pot) **Motive for participation** What is Norway's goal? How do you intend to reach this? Will you adjust national politics? The Involvement of industry in the JPI's? How?	**Goal conflict** • Motivation • Is it a political question or a science question? • Programs/science communities with a strong international focus versus the ones with a national focus. • Strong / weak science communities • Path dependency • Where are the budgets found? • What guidelines/conditions will the ministries put on the basic funding to institutes and universities, and programs in the RCN? **Adverse selection** • Coordination of national actors and stakeholders - How • Is the Norwegian research community ready for international competition? • How can this be improved? Posisjoneringsmidler? Nettverksmidler? Stimuleringsmidler? • Ministries: Are they pro or reactive? **Moral hazard** • Interoperability • Governance guidelines "optional" • Common contracts/module based contracts • Evaluation • Monitoring • What rules will we accept? • What rules will the EU accept? • Legal aspects
How will the choice of funding model influence the system? (How will the JPIs influence the system?) • What is the effect on internationalization in general?	**Goal conflict** • Strategic consequences • Shift from single scientist strategy to system/sector strategy? • Do the ministries coordinate with other countries? If so, how?