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Understanding and Assessing the Impact and Outcomes of the ERC and its Funding Schemes (EURECIA)

Final Synthesis Report

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Executive Summary

EURECIA: aims and objectives

EURECIA is an international research project funded by the ERC as a CSA action (grant no 229286). Its overall aim is to develop and apply a novel conceptual framework and methodology to measure, attribute and assess the impact and outcomes of the ERC and its funding schemes.

In a nutshell, *EURECIA set out to develop a novel methodology for the study of the impact of research funding schemes on knowledge and its social conditions, and to apply this to investigate the impact (effects) of the ERC and its funding schemes on science.* From the outset EURECIA was conceived as a project to explore novel approaches and methodologies to the study of the impact of funding and policy schemes and to collect preliminary data.

EURECIA constitutes a departure from more traditional approaches in two important ways: a) by interrogating the relationship between research funding and the science system rather than the economy and society at large; and b) by broadening the 'impact' question to include not only intended effects as read through the objectives but also other possibilities.

EURECIA Results I: approach and methodology

<u>*Conceptualisation of 'impact'*</u>

- Impact here is defined as 'a difference of B that can be fully or partially attributed to A'. This definition emphasises: a) the notion of impact as attributable change; b) the need to outline the object precipitating change; c) the necessity to outline the changing object(s); and d) the necessity to attribute change causally.
- Two challenges of the study of impact are measuring change *and* uncovering the mechanisms that generate this change.
- It is analytically useful to differentiate between four types of impact: *'straight runs'* are intended and expected; *'long shots'* are intended but not expected; *'collateral'* are the effects that are unintended but expected; and *'accidentals'* are neither intended not expected.
- Studies of impact mostly focus on capturing the 'straight runs'; EURECIA went beyond the intentions and expectations of the stakeholders and included, to varying degrees, all types of impact.

At a general level, the potential object of change in this case is science. Thus, potentially changing affected aspects of the science system at different level of social aggregation were identified for this study of impact.

- Researchers were selected because they are markers for the selection practices of the ERC and because it is likely that they experience strong impact of being ERC grantees.
- The content of research conducted by ERC grantees was selected to study the impact of the grant(s) on the production of knowledge.
- Researchers' careers were selected because to facilitate the independence of younger researchers is a stated objective of the ERC.
- One of the ERC's objectives is to support the move of research organisations to excellence; thus universities and research institutes were included as potential objects of impact.
- The ERC is likely to have impact on national research funders and funding landscapes; and
- The ERC is also likely to impact on the European research and funding landscape.

Measuring and attributing impact

Regarding measuring and attributing impact the following methodological choices were made:

- Registering difference relies on multiple measurements. EURECIA mostly provides stage one measurement of the state of the changing objects.
- Measuring difference is conditional on two kinds of comparison: a) between initial and later state of the object(s); and b) between the initial and later state of the objects and these of a control group. EURECIA used a control group of researchers who passed the quality threshold but did not receive ERC grants.
- EURECIA employed a variety of data collection methods including a survey, interviews, analysis of documents and individual-level bibliometrics.
- EURECIA studied the first cohorts of ERC grantees.
- EURECIA approached attribution by identifying and describing the social mechanisms that links effects and the conditions created by properties of the ERC and its funding schemes. Attribution varies between potentially affected aspects of the science system and can never be 'complete'.

Potentially affected aspect of the science system and the dynamics of impact: a timeline

Each aspect of the science system studied by EURECIA has a different timeline of impact depending on its specific characteristics. Thus:

- Early effects on researchers, research content and research careers may start to unfold at the time of project application (or slightly before that) but the full impact of an ERC grant is not likely to be apparent until well after the end of the grant.
- Research organisations are likely to have started to experience the impact of the ERC (if at all) at the time of its establishment.
- National and European research funders and funding landscapes are likely to have already been affected during the discussions around the establishment of the ERC.

For the study of impact this means that findings are of three kinds: a) impact (effects); b) early effects; and c) conditions for effects to occur. Furthermore, these are in different combinations depending on the changing object.

EURECIA Results II: Stage One findings

Researchers

Three sets of attributes were used to characterise (describe) researchers: ***demographic*** (age, gender, relationships and research field); ***'approach'*** capturing risk-taking and creativity disposition and activities; and 'standing' to measure resource conditions and prestige in terms of organisational career, knowledge community position and features of the local and national research environment. Using these:

1. Nineteen matching pairs of grantees and members of the control group were identified to inform stage two measurements (in three years) and the retrospective causal analysis.
2. Analysis of grantees and controls by 'approach' and 'standing' types shows that these set a very high benchmark for 'early career researchers' but that still there is sufficient space for them to develop along the lines set out by the objectives of the ERC and the conditions of the grant. The ERC grant is expected to have some impact on grantees' 'approach' and a large impact on their 'standing'.
3. ERC grantees and controls were similar at the time of the Stage One measurement in terms of their 'approach' and 'standing'. If the ERC grant really makes a difference for researchers we would expect to register differences between the two groups in the future.

Researchers – early reported impact

The following were reported as early impact of the ERC grants:

1. Increased reputation from writing the proposal and/or getting the grant, and 'halo' effect;
2. Possibility to start, maintain or expand the grantee's research group;
3. Improved ability to pursue their research agenda;

4. Less exposure to local research related politics; and
5. Earlier and faster promotion and/or tenure.
6. In some cases need to move since the organisation cannot support an ERC grant.

Content of research

The ERC grants had an impact on the research of grantees and, potentially, of their communities, by:

1. Funding planned scientific innovations, which we defined as research findings that affect the research practices of a large number of researchers in one or more fields (i.e. choices of problems, methods or empirical objects);

2. Funding planned answers to 'big questions', which we defined as questions that are significantly more general than a common research question of the social sciences and humanities and need to be answered on an exceptionally broad theoretical, methodological or empirical basis; and

3. Funding research that would otherwise not be funded, or would at least have been difficult to fund from other sources. Most of the investigated projects had epistemic properties that required uncommon funding conditions. The time frame, amount of funding, and flexible use of funding provided by ERC grants as well as the explicit invitation to submit risky and unconventional projects made grantees perceive the ERC grants as the only possible source of funding for their projects. Some of the grantees turned ideas they had for quite some time into project proposals because with the ERC, they saw a chance of getting them funded for the first time. Others turned to the ERC after failing repeatedly with national research councils because their projects were deemed high quality but too risky. Yet another group of researchers developed new ideas for their proposals to the ERC.

Researchers' careers

Despite some reported early impact on careers we found that:

1. The most important effect, career change because of the results of the ERC funded research, has not yet happened.
2. Generally, there has been little initial impact on careers because: a) grantees are already relatively autonomous and at a high level of their national career ladder; b) career systems are not sufficiently flexible to enable negotiations on the basis of the reputation of the grant except possibly systems based on early tenure and promotion such as those in the UK and the Netherlands; and c) organisational mobility is constrained by factors such as family arrangements and costs of moving laboratories.

Research organisations

This study looked at the impact of the ERC on universities and research institutes. More specifically, it explored the effects on a) their performance; b) development of better strategies to establish themselves as more effective global players (i.e. organisational capabilities); and c) investing more in the support of promising new talent.

The study found that:

1. Impact is most pronounced in the research organisations that are just below the top research performers since the existence of the ERC as well as attracting some grants is used to overhaul the organisation and develop and implement the practices conducive to research excellence.
2. The ERC and its funding schemes do not have (and cannot be expected to have) strong impact on top research performers and on research organisations that are lagging far behind these. More often than not, top performers are subjected to other pressures for change (national and global) and the ERC merely enhances and/or is used as part of rhetoric for particular developments.
3. ERC grants attracted by second tier research organisations can generate organisational imbalances.
4. In many research organisations change cannot be fully attributed to the ERC and its funding schemes – it contributes to the speed and scope of the changes, in some cases crucially.
5. Impact can be found on various material levels like internal funding or organisational decisions, or career opportunities. One overall impact however is symbolic and strong for all kinds of organisations: ERC success is unanimously seen as a new quality marker for organisations across Europe, which in turn feeds back into actions of research and university leaders.

National research funders and funding landscapes

Four levels at which the impact of the ERC may be observed were outlined: a) the systemic level; b) the level of the structure of the funding organisation; c) the level of strategy, funding instruments and support principles; and d) the level of processes and their modalities. In a nutshell, we found the following.

1. At the systemic level:
   a. In state-led systems with no funding councils, the ERC provided a general model of funding body and/or legitimacy for the creation of a funding council.
2. At the level of the structure of the funding council:
   a. The ERC provided an organizational model for the newly established research councils.

3. At the level of strategy, funding instruments and support principles:
    a. The ERC reinforced the position of the Research Council systems in funding fundamental or bottom-up research or individual researchers.
    b. The ERC provided a model for the support of highly innovative, risky research (Reinhart Koselleck Projects, Germany).
    c. The ERC reinforced the Europeanisation of activities.
4. At the level of processes:
    a. Some research councils subcontracted evaluation of applications to the ERC (Norway for OYI scheme).
    b. The ERC reinforced the importance of internationalisation in peer review, and overall, reinforced cross-European competition.

Europeanisation landscape

We found that:

1. EU research funding policy level: The ERC has brought about a number of principal changes. These include strengthening the importance of excellence on the ERA agenda, changes in traditional principles in EU support to research (support of individuals vs. organisations; no *juste retour*; no pre-allocation of funds to fields or specific areas; fundamental research vs. targeted research), modification of the definition of European value-added in research support (in addition to international collaboration, competition at European level), and providing an important case, the only programme allocating EU money only, where strategy formulation and the implementation of the strategy has been delegated to external stakeholders. The ERC has provided a test ground for simpler administrative procedures that will eventually be adopted in Horizon 2020.
2. European research funding organisations level: The ERC has brought about fewer changes, as the ERC has been defined in such a way that a full overlap does not exist with any other funding organisation in terms of strategy or funding schemes. Where there is overlap in instruments, as with the ESF-EUROHORCs EURYI, the non-ERC instrument has been withdrawn (although there is no evidence that this was necessarily caused by the emergence of the ERC).

Contents

Introduction

At the start of the 21st century Europe embarked on a large-scale science policy project that was ideologically framed by the notion of the European Research Area (ERA)[1] and politically supported by the Lisbon agenda. This included an overhaul of research, innovation and science policy rationales, structures and organisations. At policy level, there was a shift to incorporate as an objective the further integration of national research and science systems (COM (2000), 6, COM (2007) 161; Luukkonen and Nedeva, 2010) in addition to the co-ordination of national research effort; one specific expressions of this was the reframing of the statement of European added value to include 'competition' and 'cooperation' (Nedeva and Stampfer, 2012). Structurally, a number of instruments aiming to enable further alignment of national research and science systems were implemented, albeit with varying levels of success (ERA-NETs, Technology Platforms, Networks of Excellence, Integrated Projects etc.). And organisationally, new principles for science support at European level were developed and implemented. As part of these developments, a dedicated research funding agency to support investigator driven research, the European Research Council (ERC), was established.

After years of intense political debate, the ERC was officially established in February 2007; from the outset, the ERC had two sets of ambitious objectives. On the one hand, the ERC's aim, as set out initially, was to 'stimulate scientific excellence by supporting and encouraging the very best, truly creative scientists, scholars and engineers to be adventurous and take risks in their research'.[2] On the other hand, the ERC was to 'create leverage towards structural improvements in the research system of Europe'[3] by 'setting quality benchmarks', 'assisting strategic thinking' of organisations and 'promoting interactions' amongst organisations (ERC Work Programme, 2008).

These objectives were initially pursued using two main funding instruments[4]. One of these, the Starting Independent Researcher Grant scheme (StG), is targeted at researchers at relatively early career stages; the other one, the Advanced Investigator Grant scheme AdG) is meant for stellar researchers at the forefront of their respective research fields[5]. Both schemes aim to support frontier research defined as 'the pursuit of questions at or beyond the frontiers of knowledge, without regard for established disciplinary boundaries' (ERC Guide for Applicants, 2010).

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[1] For more on the ERA please refer to Chapter 11 of this report.
[2] See http://erc.europua.eu/index.cfm?fuseaction=page.display&topicID=12, last accessed 4 May 2011.
[3] See http://erc.europua.eu/index.cfm?fuseaction=page.display&topicID=12, last accessed 4 May 2011.
[4] More recently the ERC has added two further schemes to its portfolio; these are the Synergy Grants (a pilot scheme for small groups of excellent researchers) and the Proof of Concept Grants allowing ERC grantees to take their research a step further towards establishing its innovative potential. EURECIA focused only on the StG and AdG schemes.
[5] For more information on the ERC, its practices, organisation and structure please refer to Annex 1.

From the outset, the members of the Scientific Council of the ERC recognised that as a new and ambitious organisation aiming to establish itself as a "world-leading institution for science funding" (ERC Work Programme, 2007, p. 15) it raises *high expectations* and that it needs to institute *methods to assess progress towards its objectives*. They also acknowledged that these methods ought to rely on "a broad ranging understanding of quality standards...and methodologies for assessing the qualitative and qualitative impacts of the ERC activities" (ERC Work Programme, 2007, p. 15). Consequently, three objectives of any future monitoring and assessment strategy were set out, namely to: a) assist in future strategy development; b) provide for ongoing improvements/refinement of the operations and quality assurance; and c) contribute to ex-post evaluation.

Following that, and in line with it, the Scientific Council included in the first Work Programme for the ERC (ERC Work Programme, 2007) a provision for commissioning a first set of projects and studies to assist in the tasks around the development of the monitoring and assessment strategy. This portfolio of projects was to approach two separate but related tasks, namely 'to *understand the impact of the ERC based on exploratory, state-of the art, scholarly work on broadly defined areas and questions*' and prepare for 'robust longer term monitoring and evaluation by building up sufficient evidence to enable an evaluation of the functioning, performance and processes of the ERC' (ERC Work Programme, 2007, p. 16).

The first call for proposals was issued in November 2007, just several months after the official establishment of the ERC and the announcement of the first call for proposals under the Starting Grants scheme (StG) the recipients of which started work in early 2008. More specifically, under the first task, the call invited proposals for:

- Exploratory and preparatory studies addressing the possible impacts of the ERC on the functioning and quality of the research environment in Europe, including on policy and research culture in European research, as well as addressing future developments of the ERC in the global context and relevant indicators; and
- Exploring novel and innovative methodologies and preliminary data collection for longitudinal assessment and evaluation of the direct and indirect impacts of the ERC.

EURECIA (Understanding and Assessing the Impact and Outcomes of the ERC Funding Schemes) as a research project was formulated in response to this call and funded by the ERC as a Coordination and Support Action (CSA), grant no 229286. Its overall objective was to develop and apply a novel conceptual framework and methodology to measure and attribute the impact of the ERC and its funding schemes[6]. From the outset EURECIA was conceived as a project exploring novel

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[6] For the detailed EURECIA objectives please refer to Annex 1.

approaches and methodologies to the study of the impact of funding and policy schemes and preliminary data collection.

Here we address the project objectives, by reporting on the novel approach and methodology developed by EURECIA, presenting the results from the first stage data collection[7] and some preliminary findings about impact, and discussing the implications of our work for the methodology and some key messages for the monitoring, evaluation and assessment strategy of the ERC. In this sense, the results achieved by EURECIA, we believe and hope to convey in this report, prepare the future evaluations of the impact of the ERC and its funding schemes.

EURECIA explored novel approach(es) and methodology(ies) for studying the impact of the ERC on the science system for two main reasons. First, the ERC is different from the existing funding organisations and schemes at European level (e.g. the FPs, COST, EUREKA, the ESF etc.) in five substantive ways, namely it: a) explicitly focuses on supporting research at or beyond the frontiers of knowledge, without regard for established disciplinary boundaries; b) supports investigator driven rather than programmatic research; c) has a budget and allocates funding rather than coordinating national funds; d) has very few clear and targeted goals; and e) uses peer-reviewed scientific excellence as the main criteria for funding decisions and section. This warrants different expectations of impact and, respectively, needs different evaluation approaches and methodologies.

Second, our review of impact studies revealed what we consider to be an important methodological issue associated with the existing approaches. Whilst most impact studies assume that 'impact' is a difference that can be traced back to a particular funding scheme and/or policy of interest, they generally do not 'operationalise' this difference and go on to 'pass the question to the object'. In other words, instead of measuring difference directly by comparing measurements at different states of the (affected) phenomenon and tracing it back to the conditions provided by the scheme, these studies rely mostly on the opinion of the respondents about both difference and attribution.

We believe that the approach and methodology for the study of impact developed by EURECIA goes some way towards dealing with both points raised above. In terms of the first point, we clearly focused the study on the relationship between the ERC and the science system. EURECIA is a study of the impact that the ERC and its funding schemes have (could be expected to have) on researchers, their careers, the content of their research, research organisations (universities and research institutes), national funding bodies and the European funding landscape.

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[7] EURECIA proposed and developed a panel-based methodology for the study of impact consisting of two measurements. Here we report on the first measurement.

In terms of the second point, we developed and applied an approach and methodology that build on the understanding of 'impact' as 'difference that can be fully or partially attributed'. Following from that, the methodology combines provisions for direct measurement of difference and for attribution based on un-packing generative mechanisms; it incorporates a panel survey of ERC grantees and controls, comparative case studies of grantees and controls, and case studies with research organisations, national research funders and research policy organisations at the European level. We discuss the approach and methodology developed by EURECIA in Part I of this report.

Moving to the second research task of EURECIA, namely applying the methodology to collect Stage One data, our results are presented in Part II of this report. This part includes findings about impact (structured by the studied elements of the science system) and about the mechanisms that generate this impact(s). Furthermore, it is important to note that we report on three kinds of findings about impact, namely: a) early reported effects of the ERC; b) stage one (initial) measurement of the state of the potentially affected elements of the science system; and c) impact of the ERC in the case of some elements of the science system. This is because of the different nature of the potentially affected elements – individual researchers and organisations – and the different dynamics and timing of achieved and expected impact. It is probably safe to say, for instance, that the impact of the ERC on the European funding landscape has largely already occurred and that only minor adjustments can be expected in the future (provided broader boundary conditions reaching beyond the science system persist). Conversely, relatively few of the main effects of the ERC grants on researchers, their careers and the content of research have already occurred.

We believe that EURECIA's methodological contributions are at two levels: a) its overall approach and design; and b) approach and methodology as applied to the specific elements of the science system. We believe that overall, our contribution unfolds along three inter-related lines: a) we operationalised the science system to discern the actors and phenomena (elements) that can be potentially affected by the ERC and its funding schemes; b) we developed an approach that goes beyond studying the expected and intended impact of policy and funding schemes as read in the objectives ensuring that the results can be used for reflexivity and organisational learning; and c) the methodology is largely designed to measure difference directly and attribute it by un-packing the mechanisms through which it is generated. Furthermore, EURECIA made methodological inroads in respect to the study of impact on the specific elements of the science system by developing a novel framework for characterising researchers, applying a novel approach and methodology to the study of impact on the content of research, introducing an initial typology of research organisations and laying the foundations for developing a comparative framework for funding landscapes.

This report[8] is structured in two parts to reflect the two main objectives of the EURECIA study, namely exploration of new approaches and methodology and initial stage data collecting. Thus in the chapters under Part I we discuss the overall methodological choices that were made; set out the key characteristics of the ERC; operationalise the potentially affected elements of the science system; and hypothesise some impact mechanisms. In Part II of the report we present our empirical finding following Stage One data collection; these are about the different potentially affected elements of the science system and prepare Stage Two measurement and comparison. In addition, we have included some preliminary finding regarding the mechanisms through which we expect change to be (has been) generated.

The concluding chapter of this report examine critically the methodology and identify some early messages to the ERC and its Scientific Council emerging from this research.

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[8] Please note, that the finding reported here build on very detailed reports on the ERC's impact on the different aspects of science. These reports can be accessed on www.eurecia-erc.net.

Part I: EURECIA Approach and Methodology

Chapter 1: Definition of 'impact' and methodological choices

In this part of the report we present the working definition of impact that was used and the methodological choices regarding measurement and attribution of impact that were made. These choices, as noted below, have clear implications for the specific approach and methodology(ies) developed and applied by EURECIA to study the impact of the ERC and its funding schemes on the science system.

1.1 Definition of 'impact'

EURECIA worked from a generalised definition of impact which is in line with other generalised notions of impact, most notably the one by Becker (2001) who defines impact assessment as the process of identifying future consequences of current actions at individual, organisational or system level. According to this, impact is defined as

> *"...any difference and/or change of social actors or phenomena that can be partially or wholly attributed to other social actors or phenomena."*

Specified in terms of the potential impact of the ERC and its funding schemes this definition translates into impact being

> *"...any difference and/or change of the science system that can be partially or fully attributed to the establishment and functioning of the ERC and its funding schemes."*

In other words, this means that the extent, nature and specific manifestations of the impact that the ERC may have on the science system depend on: a) the signals that the ERC sends through its objectives, organisational practices and rules of funding; and b) the properties, characteristics and positioning of the potentially affected elements of the science system. Furthermore, to attribute these effects it is necessary to work out and describe the social mechanisms that generate them. Using this notion of impact makes it imperative to:

- *Describe the signals that the ERC sends through its objectives, selection practices and rules of funding*. Policies and funding schemes generate impact by the fact that some of their attributes and properties change the conditions within which the potentially affected social actors and phenomena operate. Outlining these attributes and properties is imperative both for framing the expectations of change and tracing this back, and attributing it. ERC's objectives, selection practices and conditions provided by its funding schemes are presented in Chapter 2 of this report.
- *'Operationalise' the science system as the potentially affected social domain*. When working from a generalised definition of impact it is imperative to specify what can be expected to change and what change can be expected, as a

result of the policy/funding signals. This is important at three levels of aggregation: a) the broad domain that may be affected; b) the social actors and phenomena that may change and that can be accessed empirically; and c) the possible dimensions of change within these social actors and phenomena. In this case the domain where impact may occur is the science system; this has been operationalised in Chapter 3 of this report.

- *Setting out the mechanisms through which impact is generated*. Our working definition places attribution at the core of the study of impact. Attributing impact, particularly in very complex systems such as the science system, is a very challenging task that can be approached in a number of ways. In EURECIA attribution is approached by describing the social mechanisms linking particular changes of the science system aspects and the conditions and opportunities that the ERC and its funding schemes provide for these to occur. These mechanisms are outlined in Chapter 5 of this report.

1.2 Methodological choices

The definition of impact as 'difference or change that can be wholly or partially attributed' implies two key research tasks, namely identifying (measuring) change and attributing this to the funding or policy scheme that generates this change. Both tasks are non-trivial and entail a number of choices that frame and characterise the overall impact study approach as well as the choice of methodology(ies).

1.2.1 Choices regarding measurement

In the context of EURECIA, it was necessary from the outset to make clear choices regarding five issues associated with measuring impact. These are the types of impact that EURECIA should address; the composition of information entry points and data collection methods; the number of measurements necessary to measure difference; the kind of comparison(s) used by the study; and the timing of the study.

1.2.1.1 Types of impact to address

Using as points of reference the stated intentions for impact as read in the objectives of policy and funding schemes and whether this impact can be reasonably expected, four types of impact can be distinguished. These are illustrated by Table 1 below.

Table 1: Types of impact

	Intended	Unintended
Expected	Straight runs	Collateral
Unexpected	Long shots	Accidentals

Expectations regarding intended and expected impact ('straight runs') and intended and unexpected impact ('long shots') can be identified through the stated objectives of policy and research funding scheme. Whether or not these intentions are realised depends on whether they are supported by the core practices and communicated clearly, on the one hand, and on how these are interpreted and used by the potential beneficiaries, on the other. *Whilst 'straight runs' are intended and anticipated, the 'long shots' are effects that are intended but cannot be expected to occur with any level of certainty within a set time frame.*

Unintended and expected impact ('collateral') is the 'collateral damage' that actors anticipate but cannot avoid because there are many social influences at play that the policy or funding scheme cannot control. Finally, unintended and unexpected impact ('accidentals') is very interesting as a possibility but difficult to measure. It can, however, be captured if an empirical object is studied exhaustively.

Most impact studies and assessments focus entirely on the 'straight runs' and 'long shots' types of impact. This is done by identifying possible change working solely from the objectives of the policy or funding scheme. Here, *EURECIA departed from this practice by developing a methodology that allows all four types of impact to be identified and studied[9].* We believe that going beyond the stated objectives has the advantage of producing results that allow these objectives to be questioned. In other words, EURECIA aimed to produce data allowing the Scientific Councils to address not only the question of whether the ERC is achieving its objectives but also to reconsider, if and when necessary, these objectives.

Choosing to address these four types of impact implied that the methodology developed and applied by EURECIA had to incorporate: a) theory informed operationalisation of potentially affected social actors, phenomena and expectations of specific change; and b) be sufficiently 'open' to cope with the 'collateral' and 'accidental' impact. This was achieved by drawing on the knowledge and experience of broad range of social science research fields to identify possible change and by using a mixture between qualitative and quantitative research methods that were sufficiently open to be able to explore possible change that was beyond the stated objectives of the ERC and our theoretical expectations.

1.2.1.2 Single or multiple data collection methods, information entry points
Depending on the level of complexity of the objectives of the policy and funding scheme and the potentially affected domain different framework choices are possible regarding the data collection methods and information entry points. In light of the layered and multi-faceted objectives of the ERC and the notorious complexity of the science system the methodology developed by EURECIA used multiple data collection

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[9] These four types of impact had different standing for different changing objects. Also, it is clear that 'accidentals' can be captured only by developing a sufficiently open methodology that can cope with unexpected findings.

methods. These are discussed in more detail in Chapter 4 of this report that sets out the empirical approach that was used.

Furthermore, and related to the previous point, the methodology developed and applied by EURECIA build on using multiple information entry points. These varied between the studies focusing on the different aspects of the science system potentially affected by the ERC and its funding schemes and generally incorporated, but did not stop at, the information provided by relevant respondents.

1.2.1.3 Single or multiple measurements

Whether the impact study relies on one or more measurements depends primarily on the notion of impact that has been adopted, on whether change (difference) is measure directly or indirectly through the opinion of respondents about it, and on whether it takes place in real time or ex-post. EURECIA is working from a definition of impact as 'change that can be attributed' and aims to measure change (difference) directly. Furthermore, by necessity, the current study is a real time study of impact.

In this light, the methodology developed by EURECIA relies on two (at least) measurements to register change (difference). This report present data from the first measurement, or what in our proposal and the DoW was referred to as Stage One data. Hence, although some early reported effects[10] of the establishment and operation of the ERC on the selected aspects of the science system presented in Part II of this report the data mainly prepares the second measurement, the comparison of the two states of the relevant aspect of the science system and the testing of the impact mechanisms we have outlined. In this sense, conclusions regarding impact as 'difference that can be attributed' cannot be reached before the second measurement is conducted with the possible exceptions of the changes to the different funding landscape[11].

1.2.1.4 The issue of control groups

It is entirely possible to measure the difference in time within a group of beneficiaries; this, however, raises some question regarding attribution because it naturally excludes from the study any alternative opportunities for the measured outcomes to occur. This is why, many studies of impact use control groups to discern difference (change) and to attempt to attribute it to particular policy and/or funding schemes. This in turn, brings to the fore the need to select control group(s) that are methodologically and empirically useful.

EURECIA used control groups in the study of all potentially affected elements of the science system except, and for obvious reasons, the European funding landscape and the national funding organisations and landscapes. Thus, the study of impact on

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[10] To a degree the methodology we developed was proposed because the ERC and its funding schemes were established only relatively recently and most of the impact these may have has not occurred yet.
[11] This is because these changes started much earlier during the debates regarding the establishment of the ERC (see Chapter 4 of this report).

research organisations included universities that had no ERC grants and the study of the impact on researchers, careers and content of research used controls of ERC applicants and project proposals shortlisted for but not in receipt of a grant.

In the case of researchers and research proposals our choice of controls was un-orthodox in that we selected for similarity rather than difference. In other words, we intentionally selected controls that we expected, at least initially, to match the recipients of grants in most if not all their characteristics except receiving the grant. We believe that this similarity is analytically useful in terms of registering, or not, differences at the second stage measurement and tracing these back to the ERC grant.

1.2.1.5 Timing of the impact study

According to when these are conducted during the life cycle of the policy, impact studies can be placed under three distinct groups: ex-ante impact assessments, real-time studies of impact and ex-post impact studies.

Ex-ante impact assessments are carried out before the policy is launched and aim to estimate effects by using prior knowledge, mathematical models and simulation. This kind of impact study has little relevance in the context of EURECIA.

Real-time studies of impact attempt to monitor the effects of policy as these unfold; hence it is very powerful in capturing relatively short term effects. This kind of study has some advantages in that it enables timely feedback, learning and possibly correction of policy instruments as they are being used. These studies, however, have problems dealing with attribution and are time consuming and costly.

Ex-post impact studies are carried out when the policy has been around long enough to have already generated effects in the system that can be measured directly. Ex-post studies can define the intervention and look for its effects, or they can start from a specific situation and trace it back to the intervention(s) that generated it. Ex-post impact studies are best suited to process tracing and attribution but the information collected can be tainted by time. Another disadvantage is that these studies are, by their very nature, backwards looking and timely corrective measures are impossible.

Since EURECIA as a research project started work shortly after the establishment of the ERC and the awards of the first cohort of StGs (2007 call) conducting ex-anti or ex-post study of impact is clearly impracticable. Hence, EURECIA developed and applied a real-time impact study methodology with some elements of retrospective 'process tracing'. This methodology also prepares an ex-post impact study of the impact of the ERC on the science system by developing and applying methods for the multiple collections of comparable data. In addition, EURECIA collected only Stage One data; e.g. measurement of the initial state of the potentially affected aspects of the science system and information about the mechanisms that could generate change. A second measurement is absolutely necessary to be able to draw conclusions about difference

(change) and to ensure that the social mechanisms that were already identified have generated the hypothesised differences.

1.2.2 Choices regarding attribution: impact mechanisms

Attribution in social science is notoriously problematic and has been approached in variety of ways. One way to approach the matter of attribution, for instance, is to rely entirely on the opinion of respondents about it[12]. Particular effects can be also attributed by demonstrating that these coincide with the policy measure. This is achieved by using quantitative studies; given appropriate sampling these can establish whether the occurrence of change is statistically significant.

Yet another way of attribution involves identifying the mechanisms that generate change. In this case, one could claim that 'causality' is established if the mechanisms generating particular difference (change) can be described. These are described by identifying particular properties of the policy or funding scheme, and the conditions that these offer, and the way(s) in which these relate to specific changes that may affect the relevant social actors and phenomena. A further condition for attribution is that these conditions ought to be unique to be able to claim that they cause rather than crystallise the change.

In EURECIA we opted for the last option, namely attribution by describing the mechanisms linking the properties of the ERC and its funding schemes and the conditions these create and specific change in the selected aspects of the science system. These impact mechanisms are presented in Chapter 5.

It is worth emphasising, however, that in the social realm attribution is neither straightforward nor 'complete'. In other words, effects usually have multiple origins and 'causes'.

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[12] These approaches build on what is known in social science as the Thomas theorem and stating that "If men define situations as real they are real in their consequences". In other words, this means that if respondents believe that particular effect can be attributed to a policy scheme they behave as if it were and make it 'real' by their actions.

1.2.3 EURECIA methodological choices at a glance
 The methodological choices made by EURECIA are set out in Figure 1 below.

Figure 1: EURECIA methodological choice

(Choices in green)

Type of impact	Straight runs	Long shots	Collateral	Accidentals

Data collection	Single		Multiple	

Control group	Yes		No	

Timing of study	Ex-ante	Real-time	Ex-post

Attribution	Statistics		Mechanisms	

Chapter 2: Characterising the ERC and its funding schemes

As discussed in Chapter 1, the extent, nature and specific manifestations of the impact that the ERC can be realistically expected to have, depends on the signals that it transmits through its objectives, practices of selection and rules of funding.

In this chapter of the report we address these in turn. Thus, in section 2.1 we examine the key objectives of the ERC as these were set initially; in section 2.2 we address the distinctive characteristics of the practices used by the ERC to select researchers and projects proposals for funding; and in section 2.3 we set out the main properties of the funding schemes of the ERC. For more detailed account of the origins, structure and structural position of the ERC, please refer to Annex 2.

2.1 Aims, objectives and remit of the ERC

The European Commission included the establishment of the ERC in its proposal for the Seventh Framework Programme (FP7). Under this proposal the ERC was to implement 'the Community activities' in investigator-driven 'frontier' research at the European level within a dedicated Programme, namely the IDEAS Programme. The proposal was approved by Decision No 1982/2006/EC of the European Parliament of December 18, 2006 (EP, 2006). Following that, the ERC was established with a Commission Decision of February 2, 2007 and the ERC Executive Agency was set up with a Commission decision of February 14, 2007 (EC, 2007).

These documents approved also framed the rationale for the IDEAS Programme in general, and for the ERC in particular, in terms of the understanding that: (a) investigator-driven research is a key driver of wealth creation and social progress; (b) Europe is not making good use of its scientific potential and resources; and (c) an Europe-wide funding structure for 'frontier' research is an essential part of the ERA.

Accordingly, the primary aim of the ERC and its funding schemes, as set out initially, was to *'stimulate scientific excellence by supporting and encouraging the very best, truly creative scientists, scholars and engineers to be adventurous and take risks in their research. The scientists should go beyond established frontiers of knowledge and the boundaries of disciplines'*.[13]

This overall objective was to be achieved by *developing and supporting European researchers (researchers based in European research organisations) and by supporting the research organisations of Europe (universities and research institutes) to develop their research strategies and priorities to become global players in research.* Furthermore, the ERC had the ambition to *'create leverage towards structural improvements in the research system of*

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[13] See http://erc.europa.eu/index.cfm?fuseaction=page.display&topicID=12, last accessed 11 Feb 2008.

Europe'[14] and to *support research that can form the basis for new industries, markets and innovations*.

Reading through the official documents on the ERC three points emerge. First, its missions and objectives are still evolving as evidenced by sequential formulations. Hence, recently the core aim of the ERC was re-formulated as being '...*to encourage the highest quality research in Europe through competitive funding and to support investigator-initiated frontier research across all fields of research, on the basis of scientific excellence.'*[15]. This is only subtly different in that the emphasis has shifted to properties of research (excellence and frontier), remit and operating principles (competition and excellence) rather than characteristics of researchers. Such continuous clarification and sharpening of the missions and objectives of the ERC should be expected since it is still a very young organisation and the process of its institutionalisation is incomplete.

Second, a distinction between objectives-goals and objectives-means can be discerned. Objectives-goals relate to the support of research with specific properties, namely *excellent, highest quality research beyond the existing frontiers of knowledge*. Objectives-means, on the other hand, refer to the social conditions that increase the probability of the objectives-goals to be achieved. These include *selecting proposals with particular properties (risky, excellent, outside the mainstream) and researchers with specific characteristics (talented, creative, at particular stage of their epistemic and organisational careers), and enabling conditions conducive to carrying out the research and developing researchers in organisational environments* (enable research organisations to develop strategies, mechanisms and structures to become global players).

And third, these objectives are diverse and include sometimes conflicting demands. This is very likely a result of the compromises that had to be made were the ERC to be established. However, the missions and objectives are a combination between ones that target directly the content of research, researchers and research careers, ones aiming to enable the transformation of research organisations which by its very nature can be only indirect, and objectives expressing a more 'usual' for the European Union level research and innovation policy approach and aiming to meet the demands of the knowledge society, make economic and societal contribution and lead to the development of new industries.

For the purposes of EURECIA, it is analytical useful to distinguish between three sets of objectives.

Objectives related to researchers, content of research and careers

In this respect the ERC aims to:

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[14] ERC Work Programme, 2008.
[15] See http://erc.europa.eu/about-erc/mission, last accessed 15 Feb 2012.

- Support the best of the best scientific efforts in Europe across all fields of science, scholarship and engineering.
- Promote wholly investigator-driven, or 'bottom-up' frontier research.
- Encourage the work of the established and next generation of independent top research leaders in Europe.
- Reward innovative proposals by placing emphasis on the quality of the idea rather than the research area.
- Harness the diversity of European research talent and channel funds into the most promising or distinguished researchers.
- Raise the status and visibility of European frontier research and the very best researchers of today and tomorrow.
- Put excellence at the heart of European Research.[16]

Objectives specific to the StG scheme

These include the provision of suitable resources and conditions for 'up and coming research leaders...to **establish or consolidate a proper research team** and...start **conducting independent research in Europe**.' [17]

Objectives specific to research organisations

Regarding research organisations, the ERC aims to '*help universities and other research institutions gauge their performance and encourage them to develop better strategies to establish themselves as more effective global players. The ERC aims to stimulate research organisations to invest more in the support of promising new talent ...*' [18]

These objectives, by a) their emphasis on supporting investigator-driven, frontier research and research excellence; and b) their stated intention to support the very best researchers and research based solely on criteria of excellence signal the emergence of an ambitious, and potentially high visibility and reputation, research funder at European level. Furthermore, the objectives offer an early indication that the ERC is fairly unique in that it deviates from the 'customary' objectives of both European and national funder. In the case of the former it is different by clearly targeting the of investigator-driven research supported on the basis of excellence rather than coordinating national research effort or research closer to industrial application. In the case of the latter it is different in that it explicitly aims to support research that is not only excellent but also frontier, risky and potentially path-breaking.

Whether the ERC is positioned to achieve these objectives to a large degree depends on its selection practices (discussed in section 2.2) and the outcome of this selection (presented in Chapters 6 and 7).

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[16] See http://erc.europa.eu/index.cfm?fuseaction=page.display&topicID=12, last accessed 15 June 2011.

[17] See http://erc.europa.eu/index.cfm?fuseaction=page.display&topicID=65, last accessed 24 August 2011.

[18] Mission statement: http://erc.europa.eu/index.cfm?fuseaction=page.display&topicID=12

2.2 Selection practices

The ERC has developed and instituted practices for the selection of proposals for funding using a two-stage peer review process involving external referees. At the first stage of the peer review procedure consensual peer review is used to establish the ranking of the proposals; these rankings are agreed by the peer review panel.

Each panel has a membership of about 10 scientists or scholars and a chair-person. Panel members review a certain number of proposals – the number of proposals does vary between panels but panel members report that reviewing takes on average about a week work[19]. Since there are two panels per research field (these work in alternate years) in case of overload it is possible to call on the help of the members of the alternate panel. Also where necessary, the panel members draw on the specific knowledge and expertise of external referees. There are currently 25 panels to cover the three domains of the ERC, namely social sciences and humanities, life sciences and physical and engineering sciences.

According to the rules for peer review operated by the ERC each proposal is assessed by a minimum of three reviewers. Initially (step 1) all proposals are reviewed by designated panel members. In step 2 more formal reviews are carried out by panel members (usually 3) and external referees (2-3). Each application is assigned to a lead reviewer who introduces it for discussion and is responsible for producing the feedback to the applicant.

The formal instructions to peers reviewers provided by the ERC stipulate that each proposal should be assigned a mark between 1 (non-competitive) and 4 (outstanding) for the proposed research, the investigator and the host organisation. Reviewers are advised to reserve the top mark for the top 10% of the proposals, mark between 4.0 and 3.5 for the top 20% etc. The quality threshold is higher or equal to 2 (ERC Guide for Peer Reviewers, 2010). In reality, panels use their discretion and adapt these scales to the specific demands of the research field.

Decisions regarding the ranking of proposals are taken by consensus. In our interviews we explored this matter is some detail. It appears that there are two common positions of discord in the individual assessment of proposals: one arises when a panel member from a neighbouring research field has mis-understood a particular point (in other words, this originates in limited knowledge and expertise) and the other one develops in the 'middle ground' of decisions and judgment (different opinion). These are resolved in different ways but here of particular interest is the discord founded in different expertise.

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[19] This section of the report draws on information collected by a research project funded by the *Stiftelsen Riksbankens Jubileumsfond*, Sweden and entitled "Peer Review Practices and the Legitimacy of the European Research Council" (PEERS). This was carried out by Dr T. Luukkonen and Dr M. Nedeva.

ERC peer-review panels are not discipline based but constructed around broader research areas. In other words, these are by their very nature cross-cutting and include scientists and scholars from different albeit neighbouring research fields. In turn, this can provide the variety necessary to ensure that consensus does not select only proposals above the field's norm but also proposals that are interesting from the perspective of different research fields (shift of consensus) (Nedeva, 2012).

Here we are not going to expand on the ways in which criteria and judgements are negotiated within the panels; a detailed analysis of that is provided by Luukkonen (2012).

In a nutshell, the ERC's peer review mechanisms focus on the assessment of the proposed research and on the potential of the applicant[20]. Only after that are the other conditions for carrying out the research are examined.

2.3 ERC funding schemes

To achieve its objectives, the ERC operates two funding schemes[21]. One of these, the ERC Starting Independent Researcher grant scheme (StG), targets researchers who are at a relatively early career stage and aims to enable them to transit into the highest echelons of their respective knowledge communities[22]. The second funding scheme operated by the organisation, the ERC Advanced Investigator grant scheme (AdG), is designed for stellar scientists and scholars and aims to provide support for highly innovative research ideas at the frontier of the respective research fields.

These funding schemes are somewhat different in terms of their objectives. Whilst both schemes aim to support high quality investigator driven research, the StG scheme also aims to provide opportunities to early and mid-career scientists and scholars; the AdG scheme focuses exclusively on supporting highly innovative, frontier research projects (ERC Guide for Applicants, 2010).

Both schemes support 'frontier research' which in the documents is defined as 'the pursuit of questions at or beyond the frontiers of knowledge, without regard for established disciplinary boundaries.' (ERC Guide for Applicants, 2010, p. 12). These cover all fields of research, including social sciences and humanities. Support is relatively generous and successful StG and AdG applicants are awarded up to 2 and 2.5 million euro over up to five years respectively.

Both schemes support research teams headed by a single Principle Investigator. It is important that the teams can be within a single organisation or transgress

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[20] Here the balance can vary depending on the research field. Panels in the life sciences, for instance, are more likely to accord primacy the applicant and their 'career history'.

[21] Recently two additional funding schemes were added to the portfolio – the Synergy Grants and the Proof of Concept grants. These are not discussed in any detail here since the time reference for EURECIA is 2007-2008 when only the two initial schemes were operational.

[22] There have been several changes to this since the establishment of the ERC. The most recent guide for applicants distinguishes between 'starters' and 'consolidators' thus distinguishing between the early and mid-career stages.

organisational and national boundaries – this is determined only by the nature of the research and the competencies, equipment and facilities necessary to carry it out. In other words, the ERC grants are not subject to conditions for international collaboration which often accompany research funding at the European level. To the extent to which the work is to be carried out in a research unit within EU member or associate states the PIs can be from any part of the world. Conditions regarding the status of the PI refer only to their career stage and/or their professional standing in knowledge communities.

Table 2 (below) offers a comparison between the two funding schemes according to their key characteristics. Here, it is particularly important to emphasise that the both funding schemes offer three conditions key conditions for research, namely research funding is relatively generous, it is relatively long term and it allows flexible use between funding lines.

Table 2: ERC starting grant and ERC advanced grant schemes by key characteristics

	ERC Starting Grant	ERC Advanced Grant
Objectives	To provide adequate support to the independent careers of excellent researchers, regardless of nationality or current location, who are at the stage of establishing or consolidating their own independent research team or programme.	To promote substantial advances in the frontiers of knowledge, and to encourage new productive lines of enquiry and new methods and techniques, including unconventional approaches and investigations at the interface between established disciplines.
Eligibility	• The PI can be any age and any nationality, who intend to conduct the research in EU MS and Associated Countries. • The PI must have been awarded his/her first PhD no less than 2 and no more than 10 years prior to the publication date of the call for proposals.	• The PI can be any age and any nationality, regardless of age and current location • The PI should have a track record of significant research achievements in the last 10 years.
Type of research	• 'Frontier research': the pursuit of questions at or beyond the frontiers of knowledge, without regard for established disciplinary boundaries, in any area of research (apart from nuclear fission and fusion). • Projects of an interdisciplinary nature which cross the boundaries between different fields of research; • Pioneering projects which address new and emerging fields of research; • Unconventional, innovative approaches and scientific inventions so long as the expected impact on science, scholarship or engineering is significant. • Aiming to broaden scientific and technological knowledge – so projects should not be linked to commercial objectives.	• Substantial advances in the frontiers of knowledge, to encourage new productive lines of enquiry and new methods and techniques, including unconventional approaches and investigations at the interface between established disciplines. • Research that aims high, in terms of the envisaged scientific achievements as well as the creativity and originality of its approaches. • Pioneering and far-reaching challenges at the frontiers of the field(s) addressed, and involving new, groundbreaking or unconventional methodologies, whose risky outlook is justified by the possibility of a major breakthrough with an impact beyond a specific research domain/discipline.
Size of grants	Up to 2 Million Euro for up to 5 years (pro rata for shorter projects).	Normally up to 2.5 million Euro for up to five years pro-rata (can be up to 3.5 million Euro if there is 'Co-Investigator'; interdisciplinary; purchase of major research equipment; or PI coming from outside Europe).

2.4 Summary

In brief, looking at the objectives, selection practices and conditions of funding of the ERC, we can say that it transmits the following signals:

- It clearly invites researchers with particular characteristics and at specific career stages to apply (the very best, talented etc.).
- It explicitly invites researchers to submit research proposals that are 'beyond the existing frontiers of knowledge', unconventional and inherently highly risky.
- It states its commitment to research excellence and has implemented peer-review practices that use this as the sole criterion for selection.
- ERC grants offer generous funding, over a relatively long period of time.
- ERC grants are flexible in that funding is not 'locked' into particular pre-determined expenditure line.

Chapter 3: 'Operationalising' the potentially affected aspects of the science system

At the most general level, the ERC's impact is on the science system. This, however, is far too general to be useful for empirical study of this impact. Hence, in this part of the report, we operationalise the aspects of the science system that can be potentially affected, and thus were included in EURECIA, at two level of aggregation. First we outline seven empirical objects at different levels of aggregation that can, at least in principle have been affected by the establishment and operation of the ERC and its funding schemes. And secondly, we identify the specific change (dimensions of change) that can be expected.

3.1 The science system and its elements

Few would dispute that science is a complex and composite social phenomenon. Numerous studies have interrogated its different aspect and relationships depending on their disciplinary foundations. Thus, knowledge dynamics and change is traditionally the subject of the philosophy of science and the sociology of knowledge. The organisations and institutions of science and the ways in which it is organised are the traditional domain of the sociology of science. Similarly, science policy and its efficiency and effectiveness are approached by political science and science policy studies. These different approaches share little beyond their implicit assumption of 'unity of object'.

In other words, these studies usually focus on a specific aspect or relationship and give it ontological and methodological priority whereby the relationships between the specific aspect and the rest are largely ignored. We know and understand much about policy, research organisations and knowledge, for instance, but very little about the dependencies between these. EURECIA, by focusing on the relationship between a policy (funding organisation) and the science system, had to work from notions and assumptions about science that are different from the ones used by these discrete accounts, whilst building on them.

One notion that attempts to reach beyond the fragmented accounts focusing on a specific aspect is this of National Innovation/Research Systems (NRSs). This however, is very descriptive and fails to operationalise the link between policy and the content of knowledge (Nelson, 1993, Lundval, 1988, Boden et al., 2004). Another notion is this of science as a relationship between research spaces and research fields put forward by Nedeva (2010). This goes some way towards remedying the most obvious shortfalls of the NRSs but is still at fairly early stage of development to allow systematic theory based identification of empirical object.

Through a combination of theoretically derived choices and ones informed by the objectives of the ERC, EURECIA identified seven empirical objects. These are: a) researchers; b) content of research; c) research careers; d) research organisations; e) knowledge communities and networks; f) national funding organisations and funding landscapes; and g) European landscape. In the next section of this report we discuss these changing objects in turn[23].

3.2 Operationalising the empirical objects of EURECIA

3.2.1 Researchers, content of research and research careers

Reading into the stated objectives of the ERC these relate mainly to researchers, research and research careers (see section 3.2.1). Given that (a) researchers are the direct beneficiaries of the ERC grants, (b) these grants create specific conditions for carrying out research, and (c) getting a grant, as well as carrying out the research, often affects the reputation of the grantees and their organisational position, they were selected as changing objects.

In principle it is difficult to draw clear distinctions between the characteristics of researchers, the research they carry out and their careers. These are in complex interdependencies whereby researchers with particular characteristics carry out research with particular properties, which in turn affects some of the characteristics of researchers, and their career progression. However, distinguishing between these is useful analytically because they provide different entry points to the study of impact and demand somewhat different approaches and methods.

3.2.1.1 Characterising researchers and the impact of the ERC

In the context of the study of ERC's impact, characterising researchers is important in two ways: on the one hand, characterising the funded researchers (both as individuals and as a group) describes the selection and whether this selection corresponds to the objectives of the ERC (see section 2.1). On the other hand, this prepares the measurement and attribution of the impact that the ERC and its funding schemes may have on researchers.

Correspondingly, the study of the ERC's impact on researchers asks the following questions:

- What are the characteristics of the researchers funded by the ERC and how different are these when compared to the controls?
- What changes have occurred to the characteristics of the ERC's grantees and how do these compare to the changes of non-grantees?

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[23] The study of knowledge communities and networks is not included in the discussions. We developed and experimented with an approach different from the usual use of bibliometrics. This is based on co-nomination and regretfully we did not get sufficient response to be able to map the dynamics of the knowledge networks over time.

- What changes to the characteristics of the ERC's grantees can be attributed to the ERC grant?

Each of these demands the use of a set of key characteristics (profile) that describe a researcher comprehensively and is sufficiently robust to ensure the validity and reliability of measurement. Furthermore, this profile should allow repeat measurement for purposes of comparison. Looking at the literature, we failed to identify a framework that meets these conditions by reaching beyond the psychological[24] and/or the discussion of obvious technical research competencies[25].

Broadly, attempts to characterise researchers fall under two groups. One of these focuses on 'exceptional' skills and competencies of academic researchers but these are operationalised in the context of PhD training (see Boyatziz 2008; Rowley and McCulloch 1999; Lee 2009) and employability debates (Boden & Nedeva, 2011). A second group of studies, sets out to identify the characteristics that enable researchers to undertake highly innovative research that can potentially become 'pioneering' and 'path-breaking' (Braben, 2004; Heinze et al. 2007; Dowd and Kaplan 2005). This includes the growing literature on creativity (Heinze et al. 2007; Heinze and Bauer 2007, Udwadia 1990).

Overall, the literature suggests that researcher characteristics could not be addressed in isolation,[26] as organisational and institutional factors affect the realisation of research outcomes with specific properties, not just individual traits alone. In other words, any characterisation of researchers ought to combine measures of individual's approach to research and their standing in their knowledge communities and organisations.

The DAS Framework

We developed a framework (DAS) to characterise researchers along three sets of characteristics: '**_demographic_**' characteristics to capture gender, age, relationship and dependents factors, and research domain; '**_approach_**' characteristics to capture a spectrum from mainstream to more outlier markers of researchers' risk-taking and novelty-seeking activities and dispositions; and '**_standing_**' characteristics, to measure resource and prestige related status for three aspects of researcher conditions (organisational career, knowledge community career, and some local and national

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[24] Whilst we content that psychological characteristics of people are likely to play in terms of their choice of topics and approach for research, as well in terms of the conditions for research they strive for and aim to create for themselves we are to build a sociological rather than psychological 'profile'.

[25] Technical competencies (like research skills, core competencies etc.) are discussed in the literature but we believe that these are relevant at a very early stage of research career. At the time of applying for, and receiving, research grants from the ERC, we believe, researchers are at a level of mastery that is broadly comparable. This means that what distinguishes them are not technical research competencies but something else.

[26] Basalla (1988) also stresses multiple 'factors influencing the emergence of novelty' – not only individual psychological and behavioural factors (even invention following dreams and the overall 'irrationality of the playful and fantastic' of which human beings are capable) but also organisational and institutional factors such as 'the rationality of the scientific, the materialism of the economic, and the diversity of the social and cultural' (p.134).

characteristics of research environment). DAS consists of twenty four elements which can be seen in Annex 3.

In EURECIA, the DAS framework was used to describe the groups of grantees and controls, and to prepare the ground for the second measurement of change and the retrospective causal analysis. More specifically, this model was used to:

- Characterise the group of researchers funded by the first call of the StG scheme (2007) and the controls (Stage One data).
- Identify matching pairs of grantees and controls to prepare the Stage Two measurement and attribution of the impact of the StG on researchers.
- Develop four 'approach' and eight 'standing' types and use these to analyse the grantees and controls data.

Possible change dimensions

Using the DAS framework we could also identify the dimensions we can realistically expect to change as a result of a researcher being awarded an ERC StG and hypothesise the rough timeline of these changes.

Table 3: Expected change by DAS component and timeline

Researcher profile component	Influence before receiving ERC StG	Impact(s) undergone after receiving ERC StG	Status
DEMOGRAPHIC	Might affect a researcher's chances of receiving funding, their access to particular enabling conditions and/or other research opportunities/conditions	Not affected by receiving the ERC StG (or any other type of funding)	*Independent* variable
APPROACH	Might highlight researchers more predisposed to undertaking more risky, path-breaking research (and the types of funding they obtain)	Unlikely to be altered by receiving ERC StG. Receiving a certain type of grant may only manifest – to a greater or lesser extent – an already established 'approach'	*Independent* variable
STANDING	Might influence the changes of receiving certain types of funding	Very likely to be affected by the ERC StG – given its amount, duration and other conditions	*Dependent* variable

In a nutshell, the *demographic* characteristics of researchers may affect their chances of getting a grant but are unlikely to change as a result of getting a grant. The situation is somewhat more complex in the case of researchers' *approach*. This depends to a large degree on psychological and behavioural factors that can be moderated but not

entirely transformed[27]. Because the ERC explicitly invited more risky proposals we expect that high proportion of the grantees and controls will have non-standard approach. This however, doesn't mean that their approach has changed; more likely it means that they finally have an opportunity to apply this approach. Hence, after receiving the ERC StG we may see a difference in approach but this cannot be interpreted as an impact of the ERC; rather the ERC is an enabling opportunity. The set of characteristics that we expect to be dramatically transformed as a result of receiving an ERC grant is 'standing' (see Table 3 above).

3.2.1.2 Content of the research conducted by ERC grantees

Ultimately, funders of research aim to support research with particular properties (e.g. excellent research, path-breaking research, pioneering research etc.) and can be expected to generate impact on the content of research conducted by grantees and on the content of knowledge of research fields. Supporting 'frontier' research in all areas of science, scholarship and engineering has been an explicit goal of the ERC since its inception (see section 2.1). Hence, studying the impact that the ERC and its funding schemes may have on the content of research is an important element of EURECIA.

The key question here is:

- What are the epistemic properties of the ERC grantees' research and how do these compare to the epistemic properties of controls?
- Could these characteristics be attributed to the ERC and its funding schemes?

To answer these questions, and in line with our definition of impact, we ought to be able to characterise the research projects funded by the ERC along possible dimensions of change and attribute this change to the ERC (for the impact mechanisms see Chapter 5).

There has been little systematic research of the impact of science policy measures on the content of research by the sociology of science, science policy studies, and evaluation research. For instance, the sociology of science, dominated for three decades by constructivist studies of laboratory life (Latour and Woolgar 1986 [1979]; Knorr-Cetina 1981; Fujimura 1987; Myers 1990), provides some empirical evidence that researchers adapt their knowledge construction processes to opportunities and constraints produced by science policy measures. However, this literature has not produced systematic accounts of the mechanisms of such adaptations, nor has it produced any account of the outcomes of adaptations beyond descriptions of individual cases. Hence, it doesn't provide a basis for interrogating and explaining the impact of science policy measures on the content of research.

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[27] Research shows, for instance, that people have preference for different kind of creativity (insight or stabilising); furthermore researchers moderate their creativity and dissent to meet the levels they perceive are the ones at which it is most likely to be rewarded etc.

Science policy studies approach the question of the impact of policy measures on the content of research by focusing on governance variable and rarely include the content of research. Despite this, science policy studies have found that: (1) science policy measures affect the content of research through the individual level, i.e. through decisions made by individual researchers; (2) researchers try to keep their autonomy by proactively influencing science policy or changing the appearance of their research (window-dressing); and (3) science policy measures nevertheless 'reach through' to the content of research, particularly when expectations concerning the content of research are linked to funding. The causal mechanism(s) through which these effects occur, however, have not been explored. Evaluation studies aiming to assess the impact of policy and funding schemes share some of the features of the science policy studies.

According to the definition of impact used by EURECIA and the methodological choices discussed elsewhere in this report (see section 1.2) the study of the impact of the ERC and its funding schemes on the content of research demands: a) operationalisation of the notion 'frontier' research; and b) specifying the links between the effects on the content of research conducted by grantees and the impact on the knowledge of their field or field(s).

The ERC uses the notion of 'frontier' research[28] to refer to the properties of research they aim to support. Since this notion combines very different messages it is difficult to operationalise. This is why we don't operationalise 'frontier' research but instead, building on the statement of riskiness, *we ask about the extent to which the ERC funding supported well-established lines of research, enabled scientific innovations, or sustained such innovations at an early stage.*

Furthermore, when referring to the 'content of research' and the changes that can be traced back to the ERC funding schemes it is necessary to account for two levels of aggregation: the level of the individual[29] and the level of the research field. Ultimately, research funding schemes aim to affects the content of research at aggregate level by funding high quality research proposals for conducting research with particular properties. In other words, the impact at aggregate level is inevitably achieved by selecting individual proposals; hence changing the properties of research globally is preceded by, and conditional upon, changes in the content of the research conducted at individual level.

The relationship(s) between the content of research of individual researchers and the content of research of the field is complex and multi faceted. Thus, the content of

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[28] The latest definition of frontier research on the ERC website reads: 'The term 'frontier research reflects a new understanding of basic research. On one hand it denotes that basic research in science and technology is of critical importance to economic and social welfare, and on the other that research at and beyond the frontiers of understanding is an intrinsically risky venture, progressing on new and most exiting research areas and is characterized by an absence of disciplinary boundaries.'
[29] It is important to note that the individual level may include, and indeed most does include, research collectives. When referring to the individual here we mean the researcher who is the PI of the research project.

research at the individual level is shaped by two contexts - the context of the scientific communities that shape topic selection and the use of results, and the host research organisations providing the operating conditions of research. What links the properties of individual research projects to the state of knowledge within research fields, or for that matter a number of research fields, are the *innovativeness of the research* and *its relationship to the mainstream*.

For the purposes of this study, research innovation is defined as '*research findings that affect the practices of a large number of researchers in one or more fields'*. Research innovation can be identified in scientific fields but are more problematic in social science and humanities fields where the relationships between different research results are somewhat less direct or obvious. Thus, for social science and humanities we use the notion of '*big questions'* where such question needs to be answered on an exceptionally broad theoretical, methodological or empirical basis.

Possible change dimensions

In terms of the innovativeness of research we looked at whether:

- The research project is planning an innovation (new method, enhanced empirical base or general explanation);
- The research is planning to answer 'big questions' or
- The research project planned to exploit and stabilise recent innovations.

In terms of the relationship between the research project and the mainstream we looked at four different kinds of deviation:

- Contradicting majority opinion;
- Addressing a community's blind spot;
- Applying non-mainstream approach or methods to mainstream problems; and
- Linking otherwise separate communities (bodies of knowledge).

Furthermore, we identified five 'local' epistemic properties of projects that characterise the individual knowledge production process (Glaser at al. 2010). These are specific for each project and to a degree shape the conditions under which it can be successful. These are:

- Complex-task specific equipment;
- Complex task-specific approaches;
- Long 'Eigentime'[30];
- High strategic uncertainty (uncertainty concerning the existence of an outcome);
- High technical uncertainty (lack of knowledge about the way in which the outcome will be achieved).

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[30] The 'eigentime' of a research process is defined by properties of empirical object and research technologies. An example here is the growth and reproduction of biological objects.

3.2.1.3 Academic careers

Individual academic careers were identified as a changing object because any research grant can potentially affect these by properties of the grant itself and by the research that is carried out using it. Furthermore, the ERC made explicit its intention to affect individual researchers' careers (particularly at their early stage) through the objective for 'facilitating early independence'. Thus, the main research question here is:

> *"Are there any atypical developments in the careers trajectories of grantees that can be attributed to the ERC and their research grants?"*

At a minimum, to be able to answer this question, we ought to: a) operationalise the relationship between the ERC and individual careers; b) compare the career trajectories of ERC grantees with some measure of 'normality'; and c) account for the differences between national and organisational career paths.

There is a large body of literature on academic careers but there is little that addresses the relationship between research policy or funding schemes and the academic careers of individual researchers. Broadly speaking, the literature focuses on: a) the relationship between selected properties of career stages and attainment (Reskin 1979; Long and McGinnis 1985; McGinnis and Long 1988; and Miller et al. 2005); b) international and intersectional mobility (Mahroum 1999; Stephan and Levin 2001; Melin 2004; Laudel 2005; Solesbury & Associates 2005; Fontes 2007; Jöns 2008; Musselin 2004); c) the relationship between gender and careers (see the reviews from Zuckerman 1991; Fox 1995; and Prpić 2002); and d) traditional labour market research ((e.g. Altbach 1996; 2000; Enders 2001).

This literature contains very little that is useful in terms of answering our research question; the question how (by what mechanisms, with what effects) governance shapes patterns of academic careers has been neither formulated nor answered. While terms like 'career pattern' and 'career path' are routinely borrowed from organisational sociology's career theory, the longitudinal structures of academic careers are rarely described, and don't feature as dependent variables. Thus, while there is little doubt that science policy measures affect academic careers by both changing research conditions of specific career stages and paths through the career system, there is very little research on the mechanisms and effects of this impact. Furthermore, there are no comparative frameworks that account for variations in national and organisational career paths.

For the purposes of this study we:

1. Apply a notion of research/academic career that accounts for the position of the individual in the contexts of the development of knowledge (epistemic career), knowledge communities (knowledge community career) and organisations (organisational career).

2. Operationalise 'research independence' as a composite variable including researcher's ability to raise resources for research, level of independence to decide his/her long term research agenda and personal funding situation.
3. Measure the difference in individual career positions (as part of the DAS model) by using comparison over time and with a control group.
4. Distinguish between a) structural change relating to national career systems (e.g. speeding up; extending career phases; moving across labour markets; and compensation for nationally specific barriers to career advancement) and b) providing opportunities that are not usually available at the grantees career stage.

Possible change dimensions

Changes in academic careers can be expected to the extent to which the ERC funding schemes change the structure of national career patterns by providing alternative sub-paths in career patterns or provide researchers with opportunities that are unusual for the stage of their organisational career in their country.

(a) The *structural change* of national career systems may include one or more of the following:

- Shortcuts/speeding up: The ERC schemes may enable an earlier transition into more advanced career stages by increasing the visibility of grantees and/or by enabling a scientific production that provides earlier access to higher organisational positions.
- Extension: The ERC schemes may extend career phases that are usually much shorter in a national career system, e.g. by providing an extended 'research only' phase before academic standard employment is entered.
- Transition: The ERC funding schemes may provide additional options for moves between labour markets, e.g. by increasing visibility and/or production in a way that career move into industrial research or other mobility are enabled.
- Compensation: The ERC funding schemes may help women or minorities to overcome nationally specific barriers to their career advancement.

The extent of structural changes in national career patterns depends on the existence of functional equivalents in a national career system. If a national career system already includes positions that provide the structural opportunities listed above, the ERC funding schemes will produce a gradual rather than qualitative difference. If functional equivalents don't exist, the change produced by the ERC is likely to be highest.[31]

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[31] It is important to note at this point that there are so few grantees that the current change of national career patterns is unlikely to be significant anyway. This may change in the future.

(b) The *provision of researchers with specific opportunities* that are not usually accessible at a grantee's career stage includes the provision of

- Early independence; and
- Exceptionally generous resources for an exceptionally long period of time.

While these opportunities can be identified now, their impact on knowledge production cannot be measured yet.

3.2.2 Research organisations

Research organisations were included in EURECIA as a changing object because impact on universities and research institutes is an explicit part of ERC's overall mission (see section 2.1). Furthermore, research organisations provide the organisational conditions for researchers to perform and thus are highly likely to change as a result of powerful signals by funding schemes.

The question here is:

"What are the effects on universities and research institutes in terms of their performance/reputation, strategic capabilities and ability to attract talent that can be attributed to the ERC and its funding schemes?"

To answer this question, it is necessary to: a) operationalise the relationship between the ERC and research organisations accounting for a range of intervening factors; b) operationalise organisational performance/ reputation, strategic capabilities and ability to attract talent into empirical indicators; and c) distinguish between the different changes that the ERC may precipitate in research organisations from different 'positioning' groups.

In the literature, change of universities has been discussed extensively and predominantly in the context of: a) the entrepreneurial university (Clark 1998 and 2001; Etzkowitz 1994, 1998 and 2002; Jakob et al., 2002; Marginson and Considine 2000; Yokoyama 2006; Nedeva and Boden 2006); b) the rise of the 'third mission' and its transforming potential (Floud 2003; Molas-Gallart et al. 2002; Jones 2002; Thorn and Soo 2006; Martin and Etzkowitz 2000; Nedeva 2007; Laredo 2007); c) university governance (Shattock 2003; Fuller 2007); and d) the strategic actor-hood of universities (Whitley, 2008). Whilst the relationship between 'the state' and science generally has been interrogated (Shore and Wright 2000; Nedeva and Boden, 2006; Whitley and Glaser 2007; Bence and Oppenheim 2004; Henkel 1998; and Cooper and Otley 1998) there are no empirical accounts that measure and attribute the impact of a specific policy or funding scheme. There is recognition, however, that the strategic actor-hood of universities, or in other words their capacity to change, is shaped by the regulatory and political frameworks of national science systems (Paradeise et al., 2009a; Jongbloed, 2009; Geuna/Martin, 2003; Bleiklie/Kogan, 2007; OEU, 2006, Whitley 2008).

Any changes that can be expected to occur in research organisations are mediated by a set of characteristics at two levels of aggregation: this of the national funding landscape and of the organisation itself. These create a level of complexity and variety that requires the use of typologies. However, our extensive search of the relevant literature failed to identify empirically and analytically useful typologies of research organisations.

Thus, this study identified three intervening frameworks that outline the positioning of research organisations. These are: a) the level of organisational autonomy or degree of self-determined steering of and within the organisation; b) the level and allocation mechanisms of funding to and within the organisation; and c) human resource policy related to whether the organisation has discretion over recruitment procedures and retention strategies and how are these organised. These were used to develop a basic typology of research organisations.

Basic typology of research organisations

This basic typology was developed following an analysis of the landscape of research organisations across Europe. The typology was built around the dimensions of organisations that we assumed to influence the impact of the ERC most and serves to simplify the analysis given the heterogeneity of organisations by allowing for organisations.

A *typical, stylised organisation* in the **top** *basket* is well endowed and can draw on considerable funds available to perform research.[32] Furthermore, top organisations are characterised by a high level of organisational autonomy. This allows those organisations to actively respond and act to changing environments. Finally, these organisations have established recruitment and human resources development strategy, that has already resulted into hiring of a larger pool of top people, by offering favourable, highly competitive employment conditions (including salary levels) as well as incentive oriented human resources development activities. Overall, organisations in this group regard themselves – and are regarded by others – as delivering excellent research. It is not necessary for these characteristics to be found at organisational level for a research organisation to be considered "top"; these may be found at lower levels of the organisation.

A *typical, stylised **in-between** organisation* is characterised by a sufficient overall endowment for research but is constantly under pressure to raise more funds. It shows some capability to realise and act upon emerging opportunities to improve its own status, but its capability as a strategic actor is limited (for historical institutional and/or legal reasons). While those organisations may not yet have a clear recruitment

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[32] In this first approach we did not – for our basket definitions – distinguish the different financing models, i.e. we did not systematically distinguish between organisations that rely on grants and those that can heavily or exclusively draw on institutional funding. In the actual analysis, however, we did find differences and report on them.

or human resources development policy, at the level of operating units recruitment is often professional and strives to fulfil the highest standards. Furthermore within these organisations we find acknowledged fields of excellence (with sometimes highly autonomous and strategic units), but often these are limited to specific areas. In sum, these organisations both have a basis for research excellence and for strategic actor capability to react to the external "shock" of a new, high level and highly demanding ERC funding scheme.

A *typical, stylised **weak** organisation* is characterised by a low level of research funding available; this funding may also be earmarked for activities and cost categories different from research. Normally, these organisations have low levels of organisational autonomy and strategic leadership; this is further translated into very low capability to adequately handle human resource policies on the level of the organisation. However, this lack of overall strategic capability to act as an organisation does not necessarily imply that weak organisations are not able to perform high quality research in certain areas or 'pockets of excellence'. Also weak organisations do host top people that do perform competitive research. However, these remain individual pockets of excellence do not put an excellence mark on the organisation as a whole.

Possible change dimensions

The following groups of possible change were identified:

- *Improving (perceived and expected[33]) performance* relates to quality and quantity of research output (impact, level of journals, setting new research agendas etc.), to increased visibility of the university or individual units, to extraordinary growth of research groups, and to the increased capability in raising further research income (high level grants);
- *Enhancing strategic capability* involves the development and implementation of *strategies* to succeed in a global competition for talent, resources and reputation. This includes attempts to raise the profile and coherence of organisations and to increase regional and global recognition, as well as strengthening or building up of organisational capabilities to define goals and develop structures and processes to achieve them;
- *Supporting and attracting talent* means to support better outstanding researchers and to increase the capability to successfully incorporate these talents into the university's research environment. This also translates – more broadly – into the creation of the conditions and support mechanisms within organisations that best suit (*current or future*) grantees in their drive to set up and implement challenging frontier research projects which might need new levels of

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[33] The performance of organisations in terms of research output cannot yet be determined; a proxy here will be the perception and expectation of performance and its justification in interviews.

autonomy and co-operations to allow for different kinds of research. This furthermore includes (intended or sometimes unintended) effects on staff retention, i.e. staying attractive for both grantees and other, already existing staff not directly profiting from an ERC grant.

3.2.3 National research funders and funding spaces

Whilst this is not an explicit aim of the ERC, its establishment could have discernible impact on national funders of research and funding landscapes. This is because the establishment of the ERC signals the emergence of a European research space comparable to, as well as, overlapping and competing with national spaces (Nedeva & Stampfer, 2012). In turn, this is likely to precipitate re(adjustment) of organisational objectives and modes of operation.

The question here is:

> *"What change of national research funding organisations and spaces can be attributed to the establishment of the ERC?"*

Answering this question is not straight forward because of variety and mediation. National research funders vary according to their position in the national space (state led or agency led), their remit, their organisational characteristics (overall goals, structure, practices and funding tools) and the stage of their institutionalisation. These different organisations are likely to respond to the signals of the ERC in different ways (change in different ways and at different rates). Furthermore, the response is mediated by a range of factors including characteristics of national funding landscape, organisational characteristics and self-perception of strengths and weaknesses.

For the purposes of this study, at the level of organisations the focus was on national research councils and functionally equivalent bodies. Whilst this reduced the variety somewhat it still remained considerable. Further reduction of variety is possible by using typologies and comparative frameworks for national funding spaces and funding organisations. Our search of the literature failed to identify such typologies and frameworks.

Previous research of research funding organisations focuses on the study of research councils. These studies largely use 'principle-agent' theory and discuss the research councils as intermediaries mediating the relationship between the state and science (Braun 1993; van der Meulen and Rip 1998; Caswill, 1998; Guston, 2003; Caswill, 2004; van der Meulen 2003, Gulbrandsen, 2005). This approach, whilst productive, doesn't account for the relationships of the research councils with other intermediaries form the same funding landscape or across landscapes.

Hence, building on assumptions drawing on the notion of research systems and spaces (here references) and organisation studies (references here) we outlined four levels at which change may occur as a result of the establishment of the ERC.

Possible changing dimensions

- *At systemic level*, or the level of national funding space, the ERC can provide a model for structural change in countries which do not have a system of research councils. For instance, in countries where the funding landscape is state-led (Braun 2011) and funding is allocated by Ministries as (predominantly) block grants, such as Italy, Spain and Poland, it may precipitate the establishment of research councils and change of the overall funding principles.
- *Changing the organisational mission and structure of a national research funder* to emulate the organizational structure of the ERC is a second level of influence, less fundamental than the adoption of the funding council system *per se.*
- Change may occur at the *level of funding instruments*. This would normally involve the abandonment of some instruments, changing the operating principles of existing one and/or starting entirely new funding instruments to mirror the ones used by the ERC.
- Change may also happen at the *level of procedures and practices* of the research funding organisation. This includes proposal structure and submission, peer review practices and procedures, and procedures for reporting and accountability.

3.2.4 European research funding landscape

Last but not least, the establishment of the ERC is highly likely to precipitate important change of the European funding landscape. Indeed, it has been argued that the ERC is a dramatically different funding organisation at European level which marks the beginning of a move from a policy period of 'science in Europe' to 'European science' (Nedeva & Stampfer, forthcoming) and that it is the core element of an emerging European research funding space of a different kind.

Thus, the broad research question here is:

> *"What changes of the European funding landscape can be attributed to the establishment and functioning of the ERC."*

This question was approach by developing a framework along three analytical dimensions that capture the levels at which change can be expected to occur (for more information on the framework please refer to the EURECIA WP7 report).

Possible change dimensions

- The *research policy level* that refers to the arenas in which the principles of public funding for research are negotiated. The essential aspects for this analysis consist of changed concepts, changed policy models, and changed research funding principles which are the outcome of this process.
- *Organisational level* refers to the consideration of the new body as a funding organisation in a context which has other, similar or nearly similar, funding

organisations, or other relevant associations and organisations active in the field ('organisational field'). The new body has to take into account and define itself with regard to the existing organisations; these may also adjust to the newcomer by modifying their objectives, instruments or processes.

3.3 EURECIA potentially affected empirical objects and changing dimensions at a glance

The table below (Table 4) offers an overview of the potentially affected empirical objects studied by EURECIA and their changing dimensions. They structure the account of empirical finding from the Stage One study discussed in the part of this report.

Table 4: Empirical objects, change dimensions and findings

Empirical object	Change dimensions	Kind of findings
Researchers	*Approach to research* (cognitive mobility, perceived novelty and risk of research etc.; highlighting existing characteristics) *Standing* (organisational position and conditions, research resources, research independence, productivity etc.)	Characterisation of the StG cohort 2007 and controls (Stage One data); Identification of 'matching' pairs of grantees and controls for Stage Two study; Analysis of grantees and controls by 'approach' and 'standing types;
Content of individuals' research	Innovativeness of research; Relationship to the mainstream 'Local' epistemic properties of the research process	Characterisation of grantees' and controls' research projects in terms of the change dimensions (Stage One data)
Academic careers	Shortcuts/speeding up of career; Extension of career phases; Transition between labour markets; Compensation for 'disadvantaged' groups;	Early reported effects; Measure of career positions of grantees and controls (Stage One data); Opportunities for these changes to occur and whether these have been taken up.
Research organisations	Change in perceived performance of quality and quantity of research; Change in strategic capabilities to compete globally for talent, resources and reputation; Changing structures to attract and support research talent;	These by type of research organisation.
National funders and funding spaces	Systemic changes Changes of organisational mission and structure Change of funding instruments Change of procedure and/or practice	Impact
European research funding landscapes	Change of research policy Change of organisations and schemes	Impact

Chapter 4: EURECIA Empirical Approach

4.1 Research methods and instruments

Because of the variety of research objects EURECIA used a combination of research methods including qualitative and quantitative one. Thus, the following research methods to study the impact of the ERC on researchers, the content of their research and careers, research organisations, and national, and European level funding spaces and organisations:

- A descriptive survey of ERC first cohort StG grantees and controls was used to measure the impact on researcher; this survey also provided other descriptive data to feed into the analysis of other changing objects.
- Comparative case studies were used to study the impact of the ERC on the content of individual's research and careers;
- Case studies of universities and research institutes were used to study the impact of the ERC on research organisations;
- Case studies of national research councils (and comparable) were used to study the impact of the ERC on national funding bodies and landscapes; and
- Semi-structured interviews and analysis of policy documents were used to capture the effects of the ERC on the European funding landscape.

All studies, bar the descriptive survey, also used documentary analysis. In addition, the comparative case studies of researchers, research and careers used individual based bibliometrics. For more detail on the methods used by EURECIA please refer to the separate reports work packages reports (www.eurecia-erc.net).

Correspondingly, the following research instruments were developed by EURECIA:

- Survey questionnaire for ERC grantees and for controls;
- Interview frame for the study of researchers, research and careers;
- Interview frame for the study of research organisations;
- Interview frame for the study of national funding bodies; and
- Interview frame for the study of the European funding landscape.

All instruments can be found in Annex 4 of this report.

4.2 Selection and sampling

4.2.1 Country selection

The selection of instances for each of the study objects was shaped by both general and object-specific considerations. The most general decision, which affected all empirical investigations, except the studies the ERC's impact on researchers and the European

research landscape, was the selection of countries to be studied. EURECIA followed a suggestion by Dietmar Braun and based country selection on a taxonomy derived by comparing application and success rates of the first cohort of starting and advanced grantees. The properties of countries that produce applications and success were likely to be most pronounced in cases showing consistent patterns for starting and advanced grantees. Table 5 shows the countries with such consistent patterns (Braun, 2010):

Table 5: Clustering of countries according to levels of ERC applications and success (first cohort of StG and AdG data)

		Success in ERC calls	
		High	Low
Application	High	Netherlands, Switzerland	Italy, Greece
	Low	France, Finland, UK, Germany	Czech Republic, Denmark, Norway, Poland, Portugal

From these countries, EURECIA aimed to cover fully:

- UK;
- France;
- Italy;
- Switzerland;
- Netherlands;
- Poland; and
- Norway.

Germany was included only in the qualitative study of researchers, research and careers, the survey and the study of national funding spaces and bodies. Austria was covered fully using additional resources. In contrast, Italy was covered by the study(ies) of researchers, research and careers but had to be dropped from the study of national funders and funding landscapes.

This uneven coverage of countries is explained by predominantly practical considerations. Thus, Poland and Norway had none or just one grantee from the first calls of the ERC, which made them unsuitable for the interview-based study of research and careers. On the other hand, interviews from a parallel project on academic careers in Germany provided additional information from a control group, which made it advantageous to include Germany in the study. Because of personnel changes in Italian ministries our repeated attempts to identify and recruit interviewees for the study of national funders and landscapes failed. However, none of these

alterations affected the major intention of EURECIA to cover countries from all four cells of Table 1.

4.2.2 Selection and sampling of cases

Having selected the countries to be included in EURECIA, a second level selection and sampling was used; this selection largely followed the logic specific to the changing objects. Thus:

- Because of the timing of EURECIA and our general approach, the first cohort of StG grantees constituted the population for the *descriptive survey*. A control group consisting of applicants who passed the quality threshold and were shortlisted for funding but didn't receive any was also included in the study. This was selected so that the difference between grantees and controls are minimised to ensure that comparison following the second stage measurement reflects differences generated by the ERC grant and mediating variables.
- The selection of cases (interviewees) for the *study of researchers, research and careers* was guided by three considerations: a) inclusion of grantees and controls; b) selection by kind of ERC grant (StG and AdG); and c) selection by research field (ERC domain).
- *Research organisations* were selected along five dimensions, namely: a) number of ERC grantees in the organisation; b) type of organisation; c) level of specialisation; d) size; and e) international standing.
- The selection of *national research funding organisations* largely followed the selection of countries; furthermore, this study focused on research councils (and equivalent).
- The study of the *European funding landscape* included a variety of funding and policy organisations at the European level.

4.3 Impact timing and dynamics

It is worth noting that the different changing objects are experiencing the effects of the ERC and its funding schemes at different time. This is summarised in Figure 2.

Thus, the ERC changed the European research landscape even prior to its existence, namely during the discussions about its institutionalisations. In such a strategic discussion, the actors involved inevitably reassessed the European research landscape and their own position in it. Naturally, the impact of the ERC increased after it was actually there. Its future impact depends on the success of its grantees, feedbacks from scientific communities and national science policy actors, and the future dynamics of interactions at the European level. One can assume an increasing impact of the ERC but it is equally possible that a new stable equilibrium between European-level actors will be achieved and the impact of the ERC will fade into the background of these relationships.

The national funding councils were involved in the discussion about the creation of the ERC and thus can be expected to have changed since this discussion. More significant effects of the ERC on national funding councils can be expected from the publication of the funding schemes, and subsequently from the success of researchers from the respective countries. As is the case with the European research landscape, the impact of the ERC may either remain or grow stronger with an increasing number of grantees and the resulting various feedback loops, or may fade into the background of newly adjusted funding council policies.

Figure 2: Assumptions about the dynamics of effects and position of the EURECIA (Stage One) empirical investigation relative to that dynamics
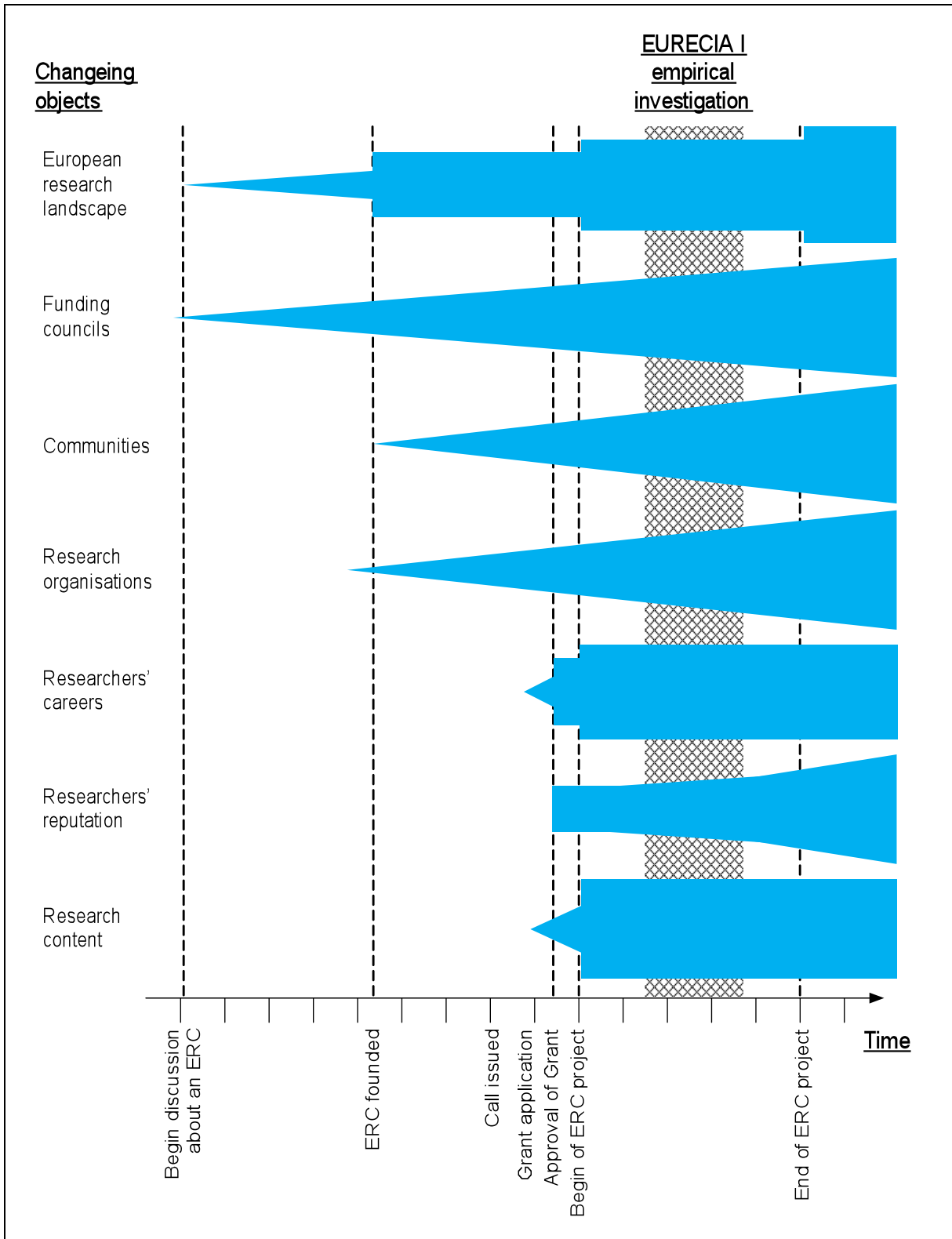
The international scientific communities can be assumed to be affected by the involvement of their elites in the funding practices of the ERC in the newly created roles of ERC review panel members and ERC external assessors. The ERC is likely to trigger reconsiderations of research priorities in scientific communities and discussions among the elites about directions in research that their communities should take. After research funding begun, scientific communities are also likely to be affected by the grantees themselves, i.e. by the results of ERC-funded research (if the ERC makes a difference for the kind of research being conducted in Europe) and by the reputational gains of grantees.

Research organisations (universities and publicly funded research institutes) might have noticed the emergence of a new funding agency early, i.e. prior to the establishment of the ERC. They are likely to become increasingly aware of the ERC's existence to the extent to which they become confronted with their researchers' successes and failures in receiving ERC grants, and to the extent to which they are affected by the mobility enabled by ERC grants.

Researchers are likely to be affected from the moment the actual funding opportunity occurs. The opportunity to apply for and receive ERC grants is likely to trigger reconsiderations of research strategies and career plans. A researcher's reputation will be affected by a successful application, and is likely to grow from then on due to being an ERC grantee and due to the research results produced with the grant. Careers may be affected by the fact that the grant is received, and may benefit further from the grantee's increased reputation. The content of research might already change in the application process but is likely to change significantly only if the application was successful.

This presented a range of opportunities and limitations for EURECIA. In practical terms, however, this means that EURECIA generated three kinds of findings:

1) Findings about impact that has occurred;
2) Findings about early reported effects; and
3) Level one measurement of the initial state of the object.

Chapter 5: The issue of attribution: impact mechanisms

In line with EURECIA's objective and definition of impact, attributing the change that occurs (may occur) in terms of researchers, careers and content of research, research organisations and research funding landscapes and bodies is important. This was approached by experimenting with identifying, describing and exploring empirically the mechanisms that generate change; here we refer to these as 'impact mechanisms'. Despite some similarity, rather different impact mechanisms are at work in relations to the changes at micro level and these at the level of organisations.

These impact mechanisms link particular properties of the ERC and its funding schemes, the social conditions created by these, and specific changes that have occurred or may occur. Impact can be generated directly or indirectly and it depends on the kind of signals and their relative strength.

5.1 Direct and indirect impact

In the context of identifying and describing the mechanisms by which the ERC and its funding schemes generate impact on the elements of the science system it is important to distinguish between *direct* and *indirect* impact. *Direct impact* is the change that can be immediately attributed to a policy measure because actors respond mainly to that very measure. *Indirect impact* refers to change that occurs indirectly, mostly because actors adjust to other actors' response to a policy measure (e.g. researchers adjusting to their organisations' responses to the ERC). Visually, *direct* impact can be presented as a star-like network with the ERC as the centre of the star, while *indirect* impact is a more distributed network where changing objects are linked by a variety of exchanges (Figure 3)[34]. Identifying and attributing indirect impact is notoriously difficult because the signal triggering a response is delayed, modified by the actors involved, and overlaid by a potentially large number of other signals.

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[34] Please note that for reasons of tidiness and simplification this diagram is slightly misleading. Even the direct impact is mediated although the level of complexity of this mediation is different depending on the empirical object; organisations and funding landscapes, for instance are highly mediated.

Figure 3: Direct and indirect impacts of the ERC on the objects studied by EURECIA
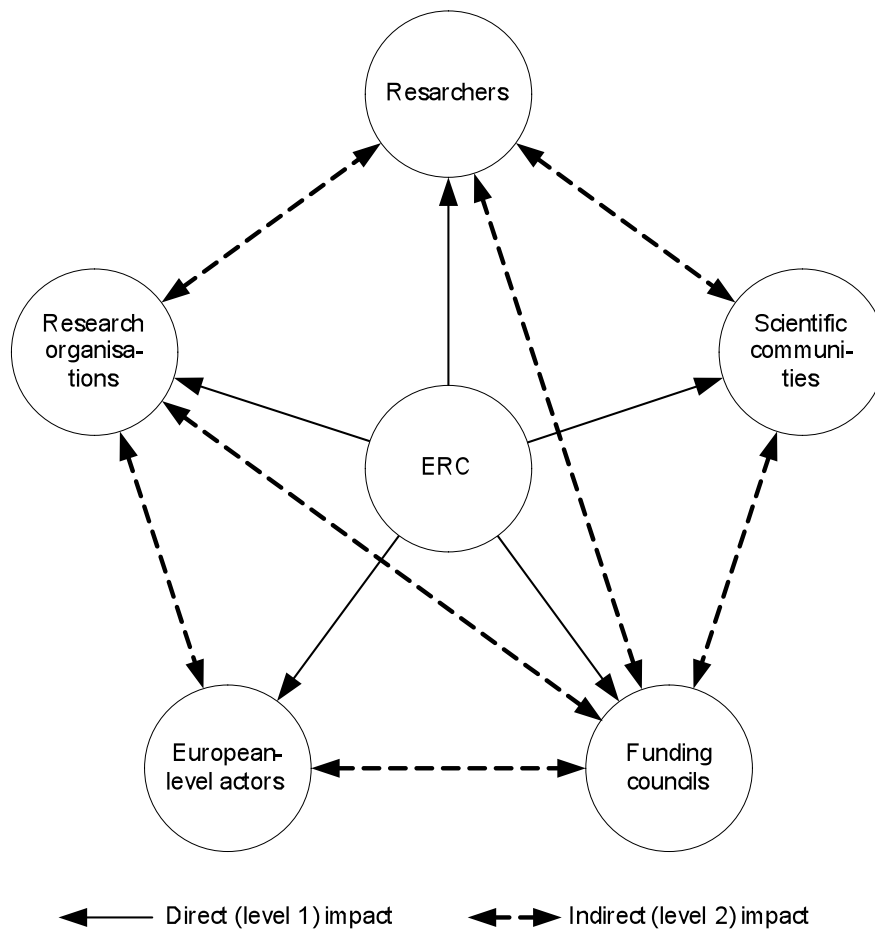
While such indirect impact certainly exists, this can be expected to be both delayed and weaker than the direct impact. Since it is highly unlikely that the indirect impact will 'overwhelm' the direct impact of the ERC *the methodology developed and applied by EURECIA focuses systematically on direct impact*. It is, however, open to the observation of indirect impacts.

5.2 Kinds of signals

It is also methodologically useful to distinguish between three different kinds of signals through which the ERC could generate impact, namely **material, symbolic and normative**.

First, the ERC could generate impact by its funding channelled through its funding schemes. This impact is generated by sending signals about the conditions for research that these grants offer and by mobilising these conditions. In this context, the change is linked to the conditions that the grant offers; however, impact can be achieved by

applying for a grant, being awarded a grant or even aspiring for grant awards. This type of signal we refer to as '**material**'.

Next, the ERC can generate impact by the fact of its existence and reputation; in other words, the ERC can generate impact because it has become a symbol embodying properties coveted by and important for the actors. More specifically, the ERC may generate impact because it has come to be regarded by the actors as a marker for 'excellence' and 'fairness'. In this context, it is important to explore issues of legitimacy and reputation. This type of signal we refer to as '**symbolic**'.

Last but not least, the ERC can send **normative** signals by changing the rules and practices of research funding. In this case, impact can occur either directly or by other funding agencies using the ERC and its practices as a model.

The relative weight of each of these kinds of signals is different for different groups of empirical objects. Thus, at the micro level - in the case of researchers, research content and careers – the material and symbolic signals are likely to be very important; at the level of organisations the symbolic and normative signals are likely to be more effective than the material ones.

5.3 Strength and distinctiveness of signal
Whether and to what extent the ERC generates impact depends on the strength and clarity of the signals it emits.

Research policy and funding spaces are very 'noisy'; in other words there is a chorus of signals; some of these discordant, others partially or even entirely overlapping. This is why, studies of impact working from a definition emphasising attribution ought to *establish, and make a clear statement of, the strength and distinctiveness of the signals the changing agent sends*.

Generally, attributing impact fully is not possible – in other words, the changes occurring in the science system are, as a rule, the aggregate effect of a fairly large number of policy interventions. This is probably one of the reasons why impact assessment methodologies generally work from the objectives of the scheme and resort to entirely opinion based methodologies. Complete attribution is also problematic because of distance and mediating of effects.

However, attribution is possible given that the signal is clearly different from other signals and it is sufficiently strong. In other words, attribution is possible if the policy or funding scheme provides unique opportunities and conditions, has exceptionally high reputation and legitimacy and/or uses rules and practices substantively different from any other ones that are in use.

How different and unique are the signals that the ERC emits is an important question and it was explored by EURECIA in the context of the different changing objects. Our finding about this are set out in Chapter 12 of this report.

5.4 Impact mechanisms

The specific impact mechanisms that can be identified at the level of researchers, content of research and careers, and the level of organisations and funding landscapes are somewhat different. At the former, the ERC generates impact mainly through its selection and the conditions of its funding schemes; at the latter impact is generated through the objectives of the ERC, its reputation and the perceived trustworthiness of its organisational practices (mainly practices for selection). In the case of research organisations this impact is also mediated by whether the organisation has grantees or not.

5.4.1 Impact mechanisms: researchers, content of research and careers

The ERC can change the 'approach' and 'standing' of researchers in two principle ways: 1) material, through the properties of the research grant and the conditions for research and career change this affords; and 2) symbolic, through the reputation of the ERC as a research funder and the reputation of the ERC's research grants[35]. Impact through the properties of the grant should be found only amongst grantees; impact through the reputation of the ERC and its grants could be found amongst both successful and not-successful applicants.

More specifically, this means that ERC impact on researchers can be traced back to the ERC if:

- ERC grant application was made; and

- ERC grant was awarded; and

- The opportunities this grant offers can be linked to change in 'approach' and 'standing'

then we can say that the change was caused by the ERC grant. If the opportunities that this grant affords are also unique and are not offered by any other funding scheme, it is possible to say that the change was generated (caused) *only* by the ERC grant.

Or

- ERC grant application was made; and

- The ERC and its grants have exceptionally high reputation and there is confidence in the selection practices; and

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[35] This is also known as the 'halo' effect.

- This reputation and confidence can be linked to changes of 'approach' and 'standing'.

then we can say that the changes were caused by the perception of ERC's reputation (symbolic value).

Whether and the extent to which impact will be observed also depends on the characteristics grantees. In other words, a researcher who already has very high 'standing' is likely to be affected less than a researcher with lower 'standing' and great potential.

Impact on research content/career can be expected **if** a change emerges because

- An ERC application was written and a project was funded by the ERC; and
- The application or the funding of the project led to decisions by the grantee which resulted in the observed change;

then we can say the ERC funding was a sufficient condition for the change to occur. **If** furthermore

- No alternative funding schemes exist that could have produced a similar change,

then we can say that the change can be produced *only* by the ERC funding scheme.

5.4.2 Impact mechanisms: research organisations, funding organisations and spaces

Specific changes within research organisations can be attributed to the ERC if

- The ERC and its funding schemes are considered to be relevant and thus attracting grantees or enabling existing staff to win grant is highly desirable; and
- The ERC is considered to have high reputation and be a symbol of research excellence.

Furthermore, the impact is moderated through whether or not the research organisation hosts any grantee. Thus:

- Hosting grantees can make a difference because of ERC's material, symbolic and normative value; the change may be strategic and supportive. This means that universities and PROs may react at strategic level or at the level of the operational units (that define the context for the grantee) in order to create the environment that is most favourable for the grantee to be successful.
- Organisations not hosting grantees can be affected through the *symbolic* (i.e. the high prestige and reputation coming with the instrument as such) and *normative* value (through its widely accepted contribution to the definition of excellent

research and the role and autonomy of young researchers within organisations) of the ERC. This can lead to changes of the organisation's incentive structures and the support these offer for ERC bids.

Identifying impact mechanisms is most tricky in the case of the European funding space and the national funding space, and landscapes. Although some differences can already be identified these cannot be linked functionally to the ERC for two reasons. One, because it is possible to identify a different social force – policy ideas and rationales as embodied in the notion of the ERA – that are likely to be causing both the establishment of the ERC and the changes in these empirical objects. And two, changes in these contexts are mediated by multiplicity of factors that often reach beyond the science systems as such (general politics, for instance, or the state of the economy).

We believe that in these cases it is much more appropriate to think of co-evolution and mutual adjustment than 'impact' in the sense of our strict definition incorporating attribution.

5.5 Impact mechanisms: key questions

Unpacking the impact mechanisms in play where the impact of the ERC and its funding schemes are concerned, implies answering the following questions:

- Are the signals sent by the ERC strong and distinctive?
- How are these signals perceived by different constituencies?
- What are the opportunities that the ERC and its funding schemes provide and how do these match the properties and needs of the empirical objects?

Part II: EURECIA empirical study: stage one data

Chapter 6: Characterising researchers, content of research and careers

6.1 Characterising ERC grantees and controls

Characterising the ERC grantees and controls has twofold importance for the study of impact: on the one hand, it describes the selection of grantees, and on the other it is the Stage One, comparative measurement. In this section of the report we turn our attention to the question 'what are the characteristics of the researchers funded by the ERC and how do these compare with the controls'. This is answered through the analysis of the data collected using a survey with the ***first cohort of ERC StG grantees and controls*** using the DAS framework developed specifically for this study.

Here, the following kinds of findings are presented: a) characterisation of the survey population using the DAS framework; b) identifying matching pairs for stage two study; c) analysis by 'approach' and 'standing' types; and d) early reported impact of the ERC grants.

6.1.1 Survey response rates

Our online survey focused on the first cohort of StG grantees (2007) and controls; thus 276 grantees (all grantees excluding the once approached by other CSA projects) and 105 controls were included. The overall response rate to the survey was 48 percent, with 184 usable responses. The 'grantee' group response rate was 50 percent (138 usable responses from an original sample of 276); the 'control' response rate was slightly lower at 44 percent (46 usable responses from 105). The overall response is illustrated in Figure 4 below.

Tests were run to ensure that our response offers a fair representation of the variety of the population by ERC domain (LS, PE or SH); distribution of responses by specific ERC peer review panel (e.g. PE4); distribution of responses by country of residence; nationality; gender; and age.[36] These indicated that the response is a reasonable representation of the distribution of variety present in the population. Please note, that generalising from our response set is problematic since we studied only the first cohort of the ERC grantees and controls.

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[36] The latter two could only be checked for grantees. Control group data on for these aspects was not provided by the ERC.

Figure 4: Summary of survey response – response rates; gender, ERC domain and age coverage
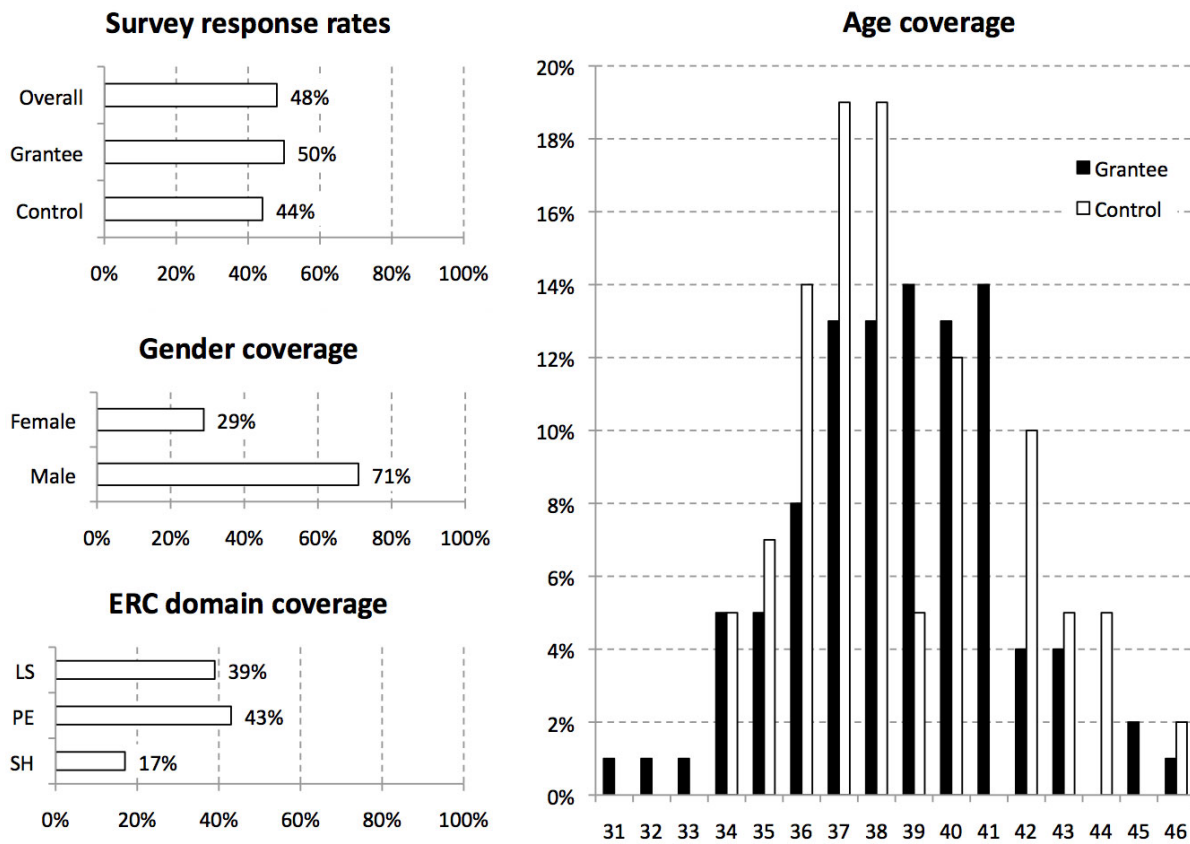
6.1.2 Characterising ERC grantees and controls

6.1.2.1 Overall description of population (grantees and controls)[37]

The survey results indicated that the respondents were a reasonably homogenous set of very highly qualified, highly productive, largely 'tenured', and formerly highly geographically and intellectual mobile people – who appear now to be quite settled (married with dependents, and had moved little since their ERC StG application).

Overall the respondents set a very high benchmark for an 'early career' cohort; this 2007 call 'first cohort' may be exceptional for a variety of reasons (e.g. selection bias during the first round of a new funding scheme). The ERC has also since changed its StG approach to differentiate between 'starters' (2–6 years post-PhD) and 'consolidators' (6+ years) to ensure there is scope for more 'early career' characteristics.

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[37] Please note, that all results presented here apply only to the two groups that responded to this survey and, at this stage, cannot be extrapolated to the broader populations of researchers.

Box 1 below shows an illustrative summary of finding highlights about the overall respondent set:

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┌──────────────────────────────────────────────────────────────────────────┐
│                              MOBILITY                                       │
│                                                                            │
│ Geographic mobility (2+ countries)      = ~90% respondents                 │
│ Geographic mobility (3+ countries)      = ~55%                             │
│ Geographic mobility (only in EU)        = ~40%                             │
│ Workplace mobility (median)             = 4 workplaces                      │
│ Significant intellectual field changes (2+)  = ~50%                        │
│ Post-StG intra-organisation move        = 8%      (Grantees=9%, Controls=3%)│
│   (within same workplace)                                                  │
│ Post-StG inter-organisation move        = 12%     (Grantees=11%, Controls=16%)│
│   (within same country)                                                    │
│ Post-StG international move              = 6%      (Grantees=3%, Controls=6%)│
│   (to a different country)                                                 │
│                                                                            │
│                  DEMOGRAPHICS & OTHER CONDITIONS                           │
│                                                                            │
│ Age (average)                           = late-30s                         │
│ Married (or equivalent)                 = ~90%                             │
│ 1+ dependents                           = >70%                             │
│ Permanent contract                      = 76%                              │
│ At highest career level or 1 step away  = 55%    (Grantees=58%, Controls=47%)│
│ Principal investigator on most important = 88%   (Grantees=85%, Controls=97%)│
│   recent research project                                                  │
│ Based at a university                   = ~70%                             │
│ At a research institute                 = ~25%                             │
│ Main research funder                    = National ministry                │
│ Research conditions                     = Good or excellent                │
│ Research time (median)                  = ~60%   (Grantees=63.5%, Controls=60%)│
│ Team size                               = 2–5 people                       │
│ Research collaborators                  = 8–10 (external, global)          │
│ Most recent project duration            = 4 years                          │
│ Most recent project budget              = 400,000 Euros                    │
│ Most important output type              = Multi-authored articles          │
│ Submitted article acceptance rates      = 70–80%                           │
└──────────────────────────────────────────────────────────────────────────┘
```

Box 1. Descriptive finding highlights (grantee and control respondents overall, undifferentiated)

This survey was conducted in late-2010/early-2011 – i.e. three years after the respondents' StG applications in 2007. It may have registered StG-related impacts already, e.g. promotions, improvement of employment contract length conditions, indicative of mid-career stages. Whilst this may distort somewhat our impression of the respondent set, our grantee/control matched-pairing approach controls for any such distortion, by only matching grantees and controls observed to be similar at the actual time of measurement.

Our methodology included the selection of a control group that consists of researchers as similar as possible to the grantees; this is to ensure that differences of researcher profiles registered by a later measurement are accounted for only by the different conditions following the ERC grant. Our analysis shows that at the initial stage the

groups of grantees and controls are very similar and the only statistically significant different between these is their reported perception of the reputation of their workplaces. This shouldn't present methodological issues since the slightly better perception of grantees of their workplace may be already an indication of a positive bias following the award of the ERC grant.

6.1.2.2 Characterisation of researchers using the DAS framework

To characterise the grantee and control group included in the survey we used a novel approach developed specifically for EURECIA to which we refer as DAS framework. This framework consists of three components, namely demographic characteristics, characteristics of 'approach' and characteristics of 'standing'. The main advantage of using the DAS framework is that it allows systematic comparison, and direct measurement of difference in three dimensions: a) comparison between grantees and controls at stage one; b) longitudinal comparison within groups; and c) comparison between grantees and controls at stage two.

Cross-tabulations of the DAS elements were done by respondent group (grantee, control), country grouping (Tier 1/2/3) and ERC domain (Life Sciences (LS), Physics and Engineering (PE), Social sciences and Humanities (SH)).

The country groupings used by our research were developed following work by Braun (see Braun, 2012, www.eurecia-erc.net) and the membership and principles of selection are in the next table (Table 6).

Table 6: Country groupings

Classification	Sub-classification	Countries
Tier 1	-	Austria [AT], France [FR], Israel [IL], Switzerland [CH]
Tier 2	2a. Improvement intentions	Germany [DE], Sweden [SE]
	2b. Low or no apparent improvement intentions	Belgium [BE], Netherlands [NL], Spain [ES], United Kingdom [UK]
Tier 3	3a. Improvement intentions	Ireland [IE], Norway [NO]
	3b. Low or no apparent improvement intentions	Greece [GR], Italy [IT], Poland [PO]
Other	Not classified or intentions not yet clear	Cyprus [CY], Hungary [HU] + remaining others

Highlights of the findings are shown in Table 7 below, for the 'demographic' and 'approach' aspects:

Table 7: Finding highlights for 'demographic' and 'approach', based on the characterisation using the DAS variables, as differentiated by respondent, country and research domain groupings

DAS element	Findings
D1. Gender	- Proportionally more male respondents in the control group, i.e. the ERC funded an atypically high proportion of females
D2. Age bracket	- More 'below average' control group respondents, i.e. either the ERC selected older and/or more advanced people to receive the StG for the first cohort (2007) or younger and/or less experienced people were less likely to succeed in getting this particular StG
D3. Relationship / dependent status	- Most (84%) Tier 1 country group respondents had 'high' (married/equivalent, and cared for dependents); Tier 3 respondents had the largest proportion of 'low' (not married/equivalent; no dependents) – i.e. Tier 1s were the most settled group
A1. Geographic and workplace mobility	- Controls had proportionally more 'medium' or 'high' values than grantees (56% versus 45%) - Tier 1s had the most geographic/workplace mobility, followed by Tier 2s then Tier 3s, i.e. this factor was linked to national setting, with higher research performance/ambition linked to greater geographic/workplace mobility - SH were the most mobile research domain group (26% 'high') closely followed by PE (22%) but some way ahead of LS (6%)
A2. Cognitive mobility	- Grantees had higher cognitive mobility than the controls (30% 'high' or 'very high' versus 19%), i.e. grantees were more atypical - Tier 1 country group respondents had greater cognitive mobility than Tier 2s and 3s (12% of Tier 1s had 'very high', 3% of Tier 2s and no [0%] Tier 3s), i.e. this factor appears linked to national setting, with higher performance/ambition linked to greater cognitive mobility - SH were the most cognitive mobile group
A3. Perceived research novelty and risks	- Grantees were divided (they had the largest proportions of both 'high' and 'low' values); most controls had average (68% compared to 57% for grantees) - Tier 3 country group respondents had the highest values (22% 'high'), suggesting 'pockets of excellence' in otherwise lower research performance/ambition settings - LS were the least risk-taking group (with no 'high' values at all)
A4. Job security indifference	- Grantees ranked slightly higher than controls - Tier 3s had the most indifference (30% 'high') followed by Tier 2s (22%) then Tier 1s (16%), i.e. more aversion to job security risk in higher performance/ambition national settings - LS had the highest indifference (28% 'high')
A5. Atypicality of project funding track record	- Grantees ranked slightly higher than controls (37% 'high' vs 28%) - Tier 3 country group respondents had the greatest atypicality (45% 'high'), i.e. the least mainstream project funding track record, perhaps necessitated by having to seek varied funding sources in lower performance/ambition national settings - SH had the highest atypicality (50% 'high') perhaps reflecting its variety of activity as a research domain; LS were the most associated with a main national research funding source
A6. Atypicality of journal targeting approach	- Controls ranked slightly higher than grantees (31% 'high' vs 19%) - Tier 3 had the lowest atypicality (11% 'high') perhaps suggesting more conservatism in lower performance/ambition national settings (e.g. for career progress reasons) - PE had the largest proportion of 'high' atypicality (25%); SH the least (16%) suggesting relatively the greatest journal targeting conservatism in SH

It appears that the highest proportions of geographic/cognitive mobility and journal targeting atypicality, lowest job security indifference and least atypical funding track

records were found amongst respondents from Tier 1 countries. Respondents from Tier 3 countries displayed 'pockets of excellence' features, i.e. high apparent risk-taking, highest job security indifference and funding track record atypicality.

Looking at research domain differences, the highest level of geographical and cognitive mobility was found amongst SH researchers; they were also the most risk-taking, indifferent to job security, atypical according to their funding track record. LS respondents were reportedly the least geographically/cognitively mobile, least risk taking[38] and least atypical funding track record ones albeit having the highest apparent job security indifference. Highlights for 'standing' are shown in Table 8 below:

Table 8: Finding highlights for 'standing', based on the characterisation using the DAS elements; differentiated by respondent grouping, country and research domain

| DAS element	Findings
S1. Ability to raise needed research resources	- Grantees ranked slightly higher than controls (25% 'high' vs 17%) - Tier 1s ranked highest (27% 'high') followed by Tier 2s (24%) then Tier 3s (11%) - LS had the highest indifference (28% 'high')
S2. Time for research	- Grantees ranked slightly higher than controls (43% 'high' vs 32%) - Tier 1s ranked slightly highest (43% 'high') followed by Tier 2s (41%) then Tier 3s (38%)
S3. Long-term research direction independence	- Grantees ranked slightly higher than controls (44% 'high' vs 34%) - Tier 1s ranked highest (61% 'high') followed by Tier 2s (41%) then Tier 3s (29%) - SHs ranked highest (50% 'high') followed by PE (43%) then LS (37%)
S4. Personal funding situation	- Grantees ranked slightly higher than controls (44% 'high' vs 29%)
S5. Own team size growth	- Controls ranked only very slightly higher than grantees (64% 'high' vs 59%) - Tier 1s ranked highest (67% 'high') followed by Tier 2s (57%) then Tier 3s (53%) - LS had the largest proportion of 'high' (67%); SH the lowest (47%)
S6. Amount of academic service tasks undertaken	- Tier 1s ranked highest (35% 'high') followed by Tier 2s (30%) then Tier 3s (24%) - SH had the largest proportion of 'high' (42%) followed by LS and PE (both 27%)
S7. Prestige of academic service	- Grantees ranked slightly higher than controls (18% 'high' vs 11%) - There were only small differences by country grouping, but Tier 2 ranked the highest (19% 'high')
S8. Number of research collaborators	- SH had the largest proportion of 'high' (27%) followed by PE (21%) then LS (17%)
S9. Output productivity	- Grantees ranked slightly higher than controls (23% 'high' vs 14%) - PE had the most 'high' responses (30%) followed by LS (17%) then SH (8%)
S10. Number of accolades	- Grantees ranked slightly higher than controls (23% 'high' vs 17%) - Tier 1s ranked highest (34% 'high') followed by Tier 2s (20%) then Tier 3s (0%) - PE had the most 'high' responses (27%) followed by LS (22%) then SH (8%)
S11. Article acceptance rate	- Tier 1s had the least 'high' responses (37%) whereas Tier 2 and Tier 3 had more (46% and 47%, respectively)
S12. Perceived workplace reputation and performance	- Grantees ranked *statistically significantly* higher than controls (8% 'very high' and 26% 'high' vs 0% and 16% of controls, respectively) - Tier 3s ranked highest for 'very high' responses (10%) followed by Tier 2s (8%) and Tier 3s (0%); Tier 3s had the largest proportion of 'very low' (29%)

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[38] Please note that pre-disposition to risky taking here is deduced from the perceived risk taking in previous projects applications. Most funders in the LS expect proof of concept at the moment of application. This reduces the level of riskiness of proposals.

DAS element (cont'd)	Findings
S13. Assumed research / performance of national setting	- PE had the largest proportion of 'very high' (10%) followed by SH (7%) then LS (0%); SH had the smallest proportion of 'very low' (7%) followed by PE (19%) then LS (31%) - SH had the lowest proportion of 'high' (14%)

The only statistically significant difference between 'grantees' and 'controls' we found at the time of the study was that grantees had self-reportedly better 'workplace reputation and performance' than controls. All differences are summarised below in Figure 5.

Figure 5: Radar plot of mean 'approach' (A) and 'standing' (S) variable values for grantees and controls.

NB. All values normalised to 0.00–1.00 range, with 0.00 least 'frontier-potential', 1.00 most (grantee 'n'=61–137, missing=1–77; control 'n'=25–42, missing=4–21; standard error of mean ~0.05–0.10).
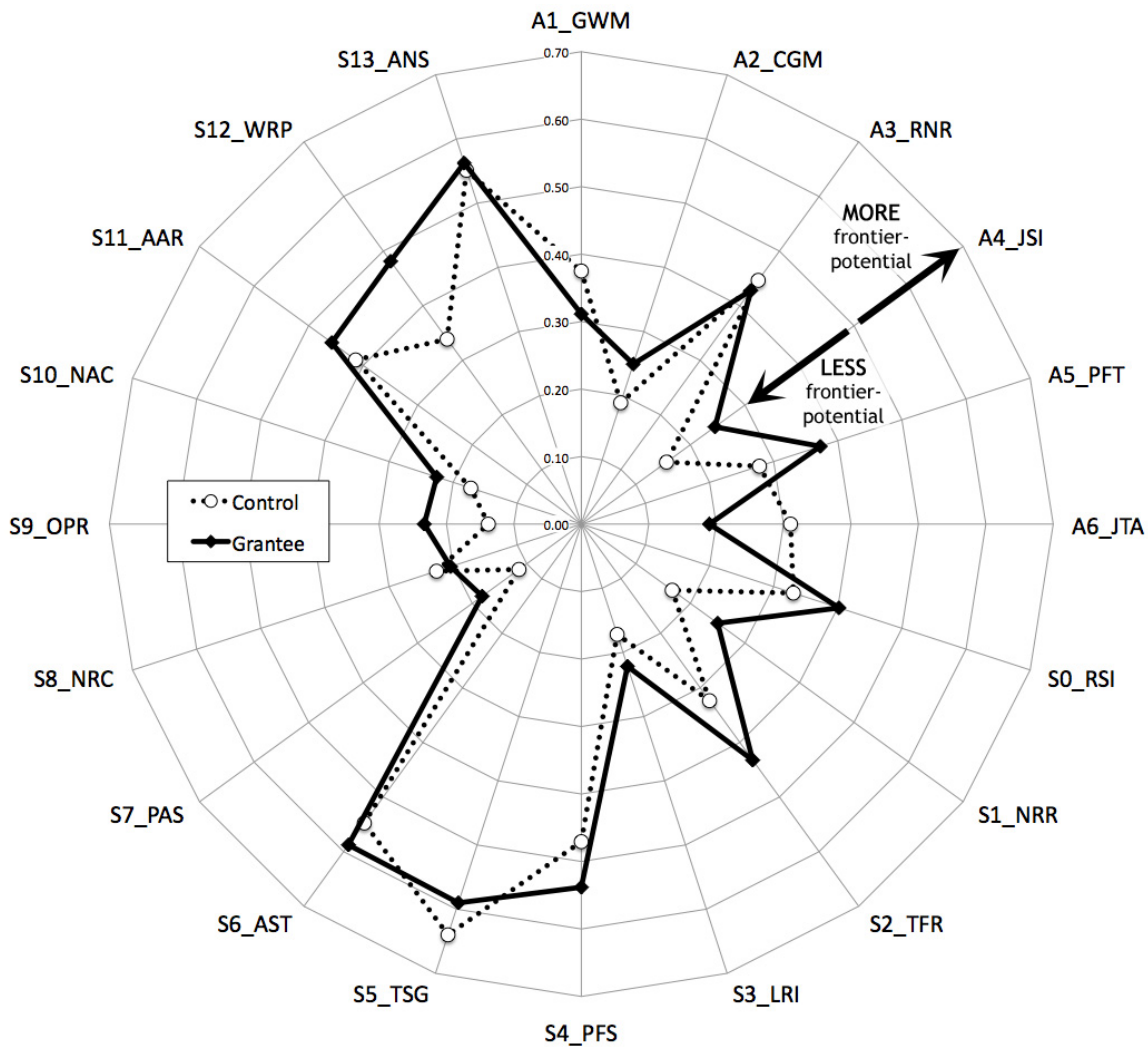
6.1.3 Identifying matching pairs

Using the DAS framework we identified 19 matching pairs of 'grantees' and 'controls'. These are part of the preparation for Stage Two of the study and will allow a robust measurement of difference, the certainty that the differences (if any) at stage two are linked to the ERC grant (and possibly other mediating influences) rather than differences at the outset, and the opportunity for retrospective causal analysis (retrospective process tracing) using the methodology developed by Glaser and Laudel for this study (see WP 4 report on EURECIA website). For more technical information about how these pairs were identified, please refer to the report on the EURECIA survey (www.eurecia-erc.net).

Confirming the difference between 'grantees' and 'controls' and the causal mechanisms generating this difference will hopefully enable the monitoring of the impact of the ERC by measuring the conditions that generate specific difference (change) rather than the change itself.

6.1.4 Description of researchers by type

Building on the DAS framework elements and integrating these further we developed sets of 'approach' and 'standing' types. Our **'approach' types** are based on two variables, namely intellectual mobility (the 'number of significant changes of intellectual field'); and perceived research novelty and risks (respondents' StG proposal perceived novelty, StG proposal perceived risk, most important recent research project reported chance of success and reported immediacy of applicability of its outputs). This generated four 'approach' types.

Furthermore, three sets of **'standing' types** were developed: a) one building on level of research independence and level of output productivity; b) another one accounting for level of researcher independence and workplace reputation; and c) our final set of types using the level of output productivity and the reputation of the workplace. These generated eight 'standing' types of researchers.

All 'approach' and 'standing' types, as well as the distribution of respondents by type across these, are illustrated by Figure 6.
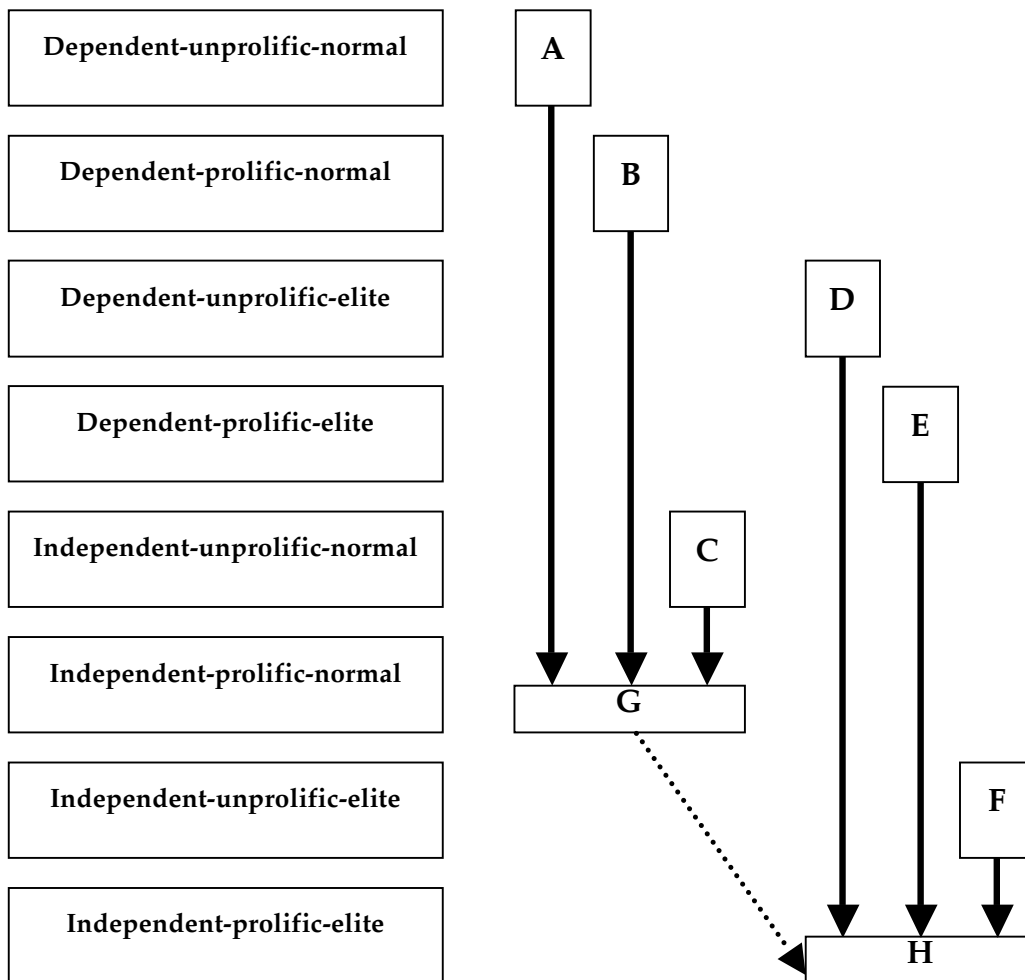
Figure 6: Standing and approach types
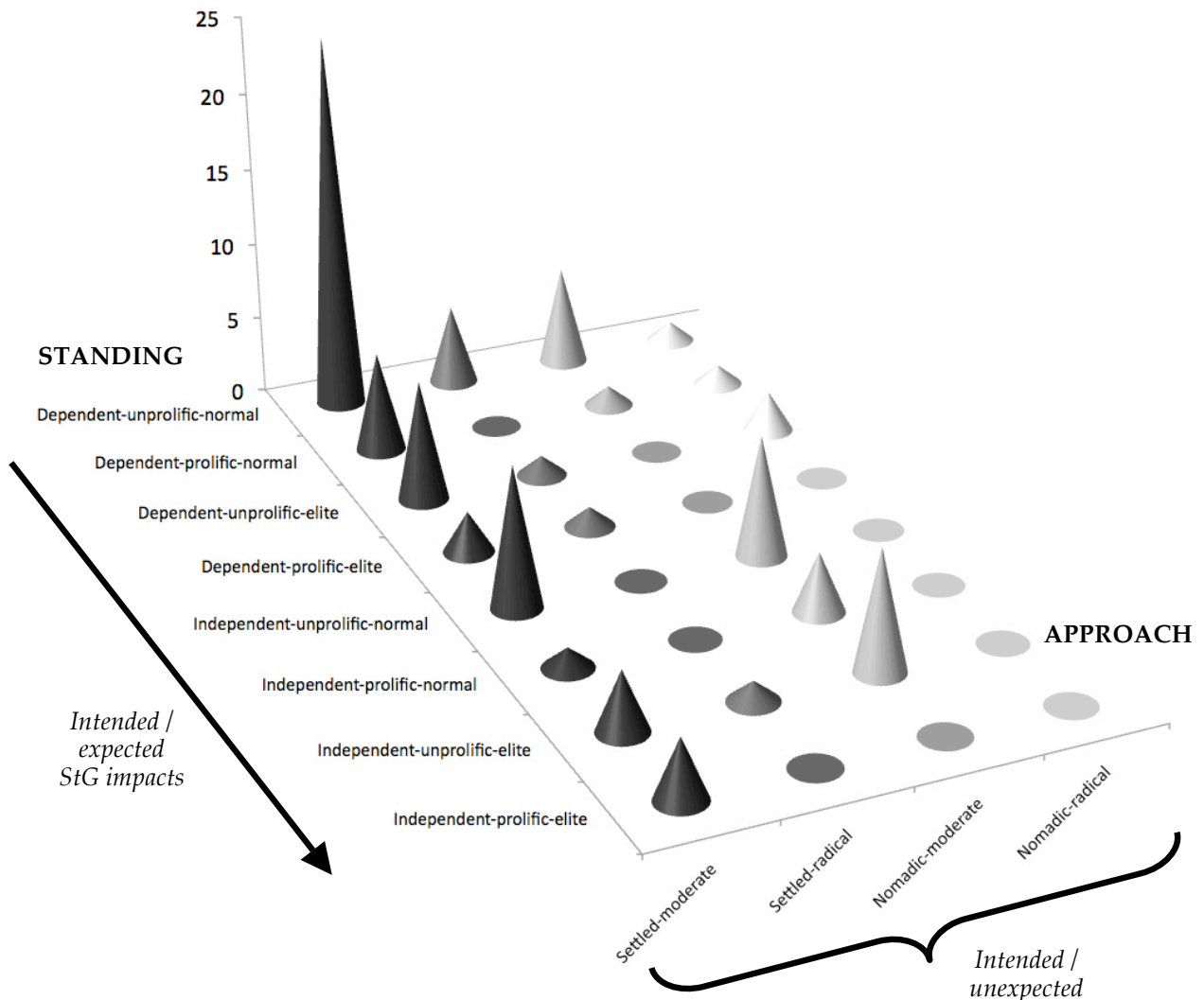
Please note that these typologies build on relative categories derived empirically from a very 'elite' set. In other words, the fact that a large proportion of the grantees fall in the 'dependent-unprolific-normal' and 'settled-moderate' types only means that *the ERC has selected grantees that can develop in line with its objective for supporting 'early career' researchers to 'research independence'.*

We also developed hypothetical 'impact pathways', illustrated in Figure 7.

Using the composite 'standing' types we can indicate our intended/expected StG impact pathways in more detail.

Figure 7: Impact pathways along our composite 'standing' type dimension (considering 'settled-moderate' 'approach' only)

NB. Grantees in positions A, B or C at the baseline stage should have moved to position G by the time of the repeat measurement; those in positions D, E or F at the baseline should have moved to H following a repeat measurement. Grantees in position G ('pocket of excellence') may move to position H but this is likely to require workplace mobility, for which this respondent set has shown little propensity. (Changes would be StG attributable if proportional movements are greater for grantees than controls.)

Dependent-unprolific-normal	**A**
Dependent-prolific-normal	**B**
Dependent-unprolific-elite	**D**
Dependent-prolific-elite	**E**
Independent-unprolific-normal	**C**
Independent-prolific-normal	**G**
Independent-unprolific-elite	**F**
Independent-prolific-elite	**H**

At the baseline stage grantees and controls were concentrated in the 'dependent-unprolific-normal' 'standing' type and 'settled-moderate' in 'approach', on the whole. If the StG has had impact along this composite 'standing' type dimension we would expect this 'dependent-unprolific-normal' concentration to move to the 'independent', 'prolific' and 'elite' types. For this impact to be attributable to the StG this shift must be proportionally greater for grantees than controls. Because of un-predictability of

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funding, we would expect controls to become dispersed among types rather than becoming more concentrated in the higher/stronger types.

We found some grantees in positions A, B and C via our baseline data. These we expect to move to position G by the time of a second-stage, repeat measurement. Grantees at baseline positions D, E and F should have moved to repeat measurement position H. If the proportion of grantees exhibiting these pathways is greater than for the corresponding proportion of controls (who may also have made such moves without a StG but via others means) then these will be StG-attributable impacts.

These changes would represent grantees achieving independence and increasing their output productivity. Changes of workplace standing (normal/elite) – either through moves to new research workplaces or by negotiation with current workplaces, as already discussed – may occur but we believe may be secondary effects and/or take more time where grantees are already quite advanced in their careers or may have already found their desired workplace conditions and be unlikely to move (as suggested by our baseline data). Overall workplace conditions may be harder to change than conditions like dependence/independence within a team, group or department and personal factors (such as output productivity) – that is, without moving workplace (which we have currently found to be a rare occurrence).

There are also the cases where researchers are in the positions G or H at the baseline stage. For G a move to H may be possible, say by moving to a new workplace (or changing current workplace conditions). A move from G, which may be a 'pocket of excellence' position of sorts, to H may be likely, but may therefore require workplace mobility. For H, the only option would be to maintain these excellent 'standing' conditions (or see them deteriorate, say because of reduced time for research as an unintended but expected StG impact). Case H would probably require an interview follow-up if the position is maintained (our survey approach may be unable to determine impacts beyond say, 'sustainability of position' as a StG impact, in this case).

6.1.5 Early reported impact
Early effects reported by the respondent to the survey appear to be:

- Both grantees and controls reportedly increased their *internal* reputation (i.e. within their current workplace/country) due to their StG application;
- Both reported increased *external* reputation (i.e. outside their current workplace/country) – although this effect was weaker for the controls;
- Grantees were able to attract additional *internal* and *external* research funding from their own workplace and from external funders ('halo' effect) due to getting the StG; and
- Some controls attracted additional *internal* research funding, more attracted additional *external* funds, as a result of applying for the StG and being shortlisted for award.

These perceptions correlate with our later survey questions about the overall effect of the StG application on respondents' career so far and their overall impressions of the ERC. Thus:

- 96% of grantees (and 57% of controls) reported a 'quite' or 'very positive' career effect so far; 99% of grantees (87% of controls) reported a 'neutral' or 'positive' effect; only 1% of grantees and 3% of controls reported a negative effect (and this was only 'quite negative' rather than very 'negative');
- 99% of grantees (87% of controls) would recommend the ERC's funding schemes to their research colleagues/collaborators; and
- 93% of grantees (79% of controls) would re-apply to the ERC for a grant in the future.

When asked to describe apparent impacts to date from their StG application some *control* group respondents noted that their StG application – and passing Stage 1 of the process – was widely seen as a sign of their quality and led them to getting an alternative grant. Controls also stated they learned a lot from writing their StG application and from related feedback. Some later re-applied to the ERC – some successfully; others not.

Additionally *grantees* reported having more influence over financial and human resources, improved international visibility, greater ability to do novel research and take risks, greater control over their own workloads, improved ability to buy equipment, they were able to produce high-quality and high-impact outputs, and had improved long-term planning about their research because of the long duration of the StG funding. For some grantees winning a StG from the 'first cohort' was clearly a life-changing event; it gave them the stability and confidence to be ambitious. Others enjoyed the experience of being headhunted for the first time.

Some adverse effects for both grantees and controls were reported. For controls these included lost time and energy that could have been better spent doing research, writing papers, writing other grant proposals and so forth; and slower overall career progress than hypothetically would have occurred had they won the StG. Adverse impacts for grantees included additional, unwanted responsibilities or burdens related to managing more people (e.g. as a result of starting a research group or promotion to a role with line management duties) and/or bureaucratic and administrative reporting obligations related to the StG. Tensions – some so strong they led to having to change workplace – were reported by some respondents who were reportedly based in a research team or organisation unable to accommodate their sudden new research activity, new research group and generally increased autonomy arising from them having won a StG.

An indicative selection of some of these reported positive and negative StG impacts are presented in Box 2 below, excerpted from responses by grantees.

Box 2: Early reported impact by grantees

Positive Impacts

'[T]he most important aspect of this grant is the sense of freedom it has given me, I feel that I can do whatever I want, that I am not bound by funding or strategic steering from anyone in the institution, I feel completely independent. In a nutshell, this ERC grant has given me wings.'

'I have started a new group, pursuing a challenging goal. I am independent, and my hands untied for 5 years. This is priceless.'

'It gave me the long-term stability to pursue ambitious goals.'

'Above all, it has strengthened my belief in my own capacities as a researcher and given me more self-confidence to continue doing research in the direction the ERC grant has allowed me to explore.'

'It has greatly enhanced my reputation both in my institute and nationally, and potentially also internationally. It has allowed me to pursue a very ambitious research project, take on a number of students and researchers and carry out the research with the tools and to the rigour I feel is necessary without worrying about having enough funds. It is a fantastic program!!'

'I became visible for a number of people in my research area and became known as a researcher independent of my supervisor.'

'At the time of applying for the ERC grant, I was also applying for various professor positions. Before I received the ERC grant, I was shortlisted several times, but never offered a job, after having received the grant, I was immediately offered a job. I suspect that rich brides are more attractive.'

Adverse Impacts

'I had to pass through very important struggles in order to reach my independence as a researcher. In fact, I had to learn that not everybody is happy when you get an ERC grant and I lost about one year through changing my host institution which had become necessary in order to be able to build my own research group.'

'Our institute does not have enough resources to accommodate the addition of such a big group.'

'My organization is not organized for supporting ERC projects.'

In summary these early, reported StG-related impacts fall into three clusters:

- *Resource*-related impacts – money, time, people, equipment;
- *Symbolic* impacts – increased reputation, prestige, visibility, networking, quality hallmarks leading to additional funding ('halo' effect); and
- *Norm*-related impacts, concerning organisational career and knowledge community career patterns –faster than typical promotion, greater than typical workload/resource autonomy, rapid ability to start a research group, more freedom to pursue risky/ambitious research content than typical (all sometimes resulting in tension with the existing host workplace).

6.1.6 Summary

Overall, our characterisation of the ERC grantees and controls leads us to believe that:

- Our respondents, both grantees and controls, are a homogenous set of very highly qualified, productive, largely 'tenured and formerly geographically and intellectually mobile people who are currently 'settled'.
- This cohort sets a very high benchmark for 'early career' researchers.
- Grantees and controls are very similar in all but their opinion of the reputation of their work place; this is a good basis for analytical comparison after the Stage Two data collection.
- Our analysis by approach and standing types shows that the ERC grantees and controls that took part in our survey are mainly still dependent, think of themselves as not highly prolific, work in 'normal' research organisations, and are settled and moderately risk taking. This allows space for the grantees to develop and move to other types. The ERC grants has had impact to the extent to which more grantees than controls make the transition.
- Our analysis identified nineteen matching pairs for investigation at Stage Two of the study.
- Early reputational and resource generating effects were reported by both grantees and controls. It seems that in some cases simply being shortlisted for an ERC grant is enough to generate impact.
- The reported early impact is not only positive; some researchers have experienced problems as a consequence of receiving a grant.

Chapter 7: Characterising the content of research conducted by the ERC grantees

Following from the considerations set out in section 3.3.2.3 of this report, the empirical study of the impact of the ERC grant on the content of research conducted by grantees interrogated the innovativeness of the research proposals, the relationship between the proposed research and the mainstream of the field and the 'local' epistemic properties of the research. This was done using comparative case studies of grantees and controls consisting of individual level bibliometrics, mapping of research and careers trails and ethnographic interviews.

7.1 Epistemic properties of the research funded by the ERC

7.1.1 Innovations and 'big questions'

An important aspect of the relationship between research and the state of the art of a scientific community is its innovative character. We empirically categorized the funded research as planned innovations, planned answers to 'big questions', and the exploitation of recent discoveries.

Planned innovations

We defined *innovations* as research findings that affect the research practices of a large number of researchers in one or more fields (i.e. choices of problems, methods or empirical objects). About half of the grantees we interviewed planned such innovations and promised them in the grant proposal. Planned innovations included the *development of new methods* which, when applicable, will provide new research opportunities to many members of the community.

> I have for a long time been trying to find ways to improve the [sensitivity] of
> these [microscopes] […]. So it's a natural thing for me to think about and
> then I think I came up with a good idea and therefore I pursued it and then I
> think because it has the potential of really giving a breakthrough in biology
> by determining the structure of […].
>
> **-Starting grantee, Physical Sciences and Engineering[39]**

A second type of planned innovation, which occurs across all discipline groups, promises to significantly *enhance the empirical basis of a community's research* by

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[39] For reasons of privacy protection, we can provide only very little information on the interviewees we quote. For each quote, the most relevant information is provided to the extent to which the grantee's identity remains protected. Quotes from interviews conducted in German are our translations. Square brackets indicate changes or omissions that have been introduced to protect the identity of interviewees.

providing access to new empirical objects that will become central to the community's research.

> I think we could never fail in the sense that, already the [group members] who work on it are producing editions of new relevant texts. So even if the synthetic study doesn't come at this moment these text editions will be out there and people will be able to use them. So we will, in any case, have increased the data pool of this period.
>
> **-Starting grantee, Social Sciences and Humanities**

Similar to the development of new broadly applicable methods, the provision of new empirical objects opens up new research opportunities for a community. A third type aimed at *general explanations* that, once achieved, will alter the community's understanding of its empirical objects. Examples include the search for a mechanism that influences protein biosynthesis or for general patterns of plant adaptation.

Answers to 'big questions'

This kind of innovations is found in the social sciences and humanities. A typical 'big question' is more general than a common research question of the social sciences and humanities and needs to be answered on an exceptionally broad theoretical, methodological or empirical basis. Researchers would, for example, study a major society-shaping historical process by incorporating all available sources across languages, locations, and types of sources for the relevant period of time. Three grantees and one unsuccessful applicant had designed research projects that addressed such big questions of their respective fields.

Recent discoveries

Several projects planned to exploit recent innovations. These recent innovations were serendipitous discoveries. Naturally, innovations of this type cannot be aimed for with ERC grants (or any other grants). Serendipitous discoveries occur in the course of research without being anticipated at the beginning of a project. They result from unexpected observations during experiments, or they emerge as ideas triggered by the current research. Serendipitous discoveries are innovations if they affect research practices of a large number of researchers from a field. Three ERC grantees exploit their recent serendipitous discoveries (two discoveries of effects and one discovery of a new empirical object), which meet the definition of an innovation.

> And in 2007 we made – I think – an important discovery, namely that [phenomenon]. And this opened up new directions for research, and this is exactly the topic of the ERC grant.
>
> **-Advanced grantee, Life Sciences**

> That's exactly part of these … experiments, where you try something new without much hope for success. You just try, really, because it is fun and

because it doesn't take much time to try. And then, it was really like this. So we used to run few, a few experiments like this. And some of them are successful …. some of them never end up in any publication at all. And, [our discovery] was one of those.

-Starting grantee, Physical Sciences and Engineering

The table below (Table 9) summarises the distribution of interviews by kind of research innovation.

Table 9: Empirical categorisation of interview by kind of innovation (some projects belong to more than one category)

| | Planned Innovations | | | Planned answers to 'big questions' | Recent Innovations (Exploitation of previous discoveries) | |
	New method	New empirical basis	New general explanation		New objects	New effects
LS		1	4			3
PE	5	1	1		1	
SSH	1	4		4		
Nf	1 LS 1 PSE					

This table excludes six projects funded by the ERC, one non-funded applicant (Nf) and all non-applicants (na) because these projects, which we consider excellent research, did not meet the definitions of innovations, 'big questions' or recent innovations. For many of these projects ERC funding was still essential. This is an important finding because it indicates that normal grant funding is insufficient not only for certain types of exceptional research, but also for excellent research on topics that were crucial for the progress of one or more fields. There are also cases where the ERC funding excellent researchers who are funded well enough from other sources.

About half and the interviewed grantees planned research innovations and promised them in the research proposal. Given the highly individualised formulation of problems, the non-mainstream character of some of these innovations and their dependence on specific funding conditions, it is reasonable to assume that at least some of them would have been delayed to some extent if there were no ERC.

7.2 Relationship of ERC funded research to the mainstream

An ERC research project can also be characterised in terms of the project's position vis-à-vis the community's mainstream. In our analysis, we identified four different types of deviation from a community's mainstream that we describe below.

Contradicting the majority opinion

Several projects contradicted the majority opinion, either by attempting something the community considers impossible or by addressing problems that were considered as irrelevant by the community.

> And I think people just don't do it because the processes are so far apart. In the beginning I said that there are many consecutive steps. And people believe that the second influences the third, the third the fourth; but that a process influence another which is even spatially separate, this is new. And this is where people are relatively sceptical.
>
> **-Starting grantee, Life Sciences**

> the community is not totally convinced that this is a good method. So, I want to change that because I strongly believe that this is not true.
>
> **-Advanced grantee, Physical Sciences and Engineering**

Addressing a community's blind spots

Another version of non-mainstream research addresses a community's 'blind spot' by doing something that does not at all contradict any majority opinion but has not yet been done because nobody else seems to have thought of it.

> And the problem with the study of [X's] history is that all the narrative sources we have … they all were written down 200 years later. So we don't have anything contemporary for this period which means a lot of people have said 'we cannot study this early period because we don't have anything contemporary'. But the [texts] are contemporary. So in a way, it's almost natural to understand what's happened [in this early period]; the [texts] is such a fantastic source. So if you're interested in looking at the [texts] it's a very easy topic to get to. It's such a big blind spot in our knowledge and our understanding of [X's] history.
>
> **-Starting grantee, Social Sciences and Humanities**

Applying non-mainstream approaches or methods to mainstream problems

A third non-mainstream relationship occurs when projects apply non-mainstream approaches or methods to mainstream problems.

> The basic methodology in [the field] was a success story, was set up by […] great 19th century [researchers]. Basically, it hasn't changed since then. In some sense, the field has been a bit a victim of its own success. It was a very important field and the discovery of […] was a big success in the 19th century. But then the field got frozen a bit. I think it is time for new techniques to come in.
>
> **-Advanced grantee, Social Sciences and Humanities**

Linking previously separate communities

Finally, non-mainstream research includes attempts to link communities that have no previous epistemic connections. Such links are created by combining approaches from two communities in one experiment, or by demonstrating the relevance of one community's empirical object to the research of the other community.

> But the real theme of the ERC proposal is combining two fields that nobody has combined yet. We were established in one field. We had done little things in the other field. And that's what we want to build and to combine.
>
> **-Advanced grantee, Physical Sciences and Engineering**

> Normally these are two separate fields. They have separate meetings, separate conferences, they are separate communities... But these are two very big fields which are far apart. Since we deal with everything between these two fields, we naturally have a big area to cover.
>
> **-Starting grantee, Life Sciences**

Where the investigated projects fit according to the way(s) in which they deviate from the mainstream in their respective fields is presented in Table 10.

Table 10: Deviations from the mainstream by the investigated projects[40]

Contradicting majority opinion	Addressing a community's blind spots	Applying non-mainstream approaches or methods to mainstream problems	Linking otherwise separate communities
4	8	5	3
	1 na		1 na

These versions of non-mainstream research are not mutually exclusive. The link between two communities may be a blind spot for both, the application of non-mainstream methods to mainstream problems may contradict the majority opinion, and so on. Several of the investigated projects fell into more than one category of non-mainstream research including one that fell into all four.

7.3 'Local' properties of the research
In addition to its relationships to the field, the research of our interviewees also has 'local' properties, i.e. properties that characterise the individual research process.

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[40] One control group project (unsuccessful applicant) could not be categorised so is not included in the table.

In our empirical investigation we found that in some cases there were indivisible resource requirements, i.e. necessary conditions that cannot be created partly but are met either fully or not at all. We found three types of such indivisible resource requirements, namely the need for complex task-specific equipment, the need for complex task-specific approaches, and a long 'Eigentime' of the research. Two further important properties are the strategic and technical uncertainties inherent to research.

Complex task-specific equipment

The need for complex task-specific equipment for specific experiments occurred in four projects. In each case, the generation or observation of empirical objects required a complicated large instrument or the integration of several instruments into a task-specific experimental system. Interestingly, all such requirements refer to projects from the Physical Sciences and Engineering. The equipment for life sciences research was often more universal and more modular, and thus could be accumulated by standard grants and utilised across projects.

Complex task-specific approaches

In the social sciences and humanities we observed an equivalent to the need for complex, task-specific equipment in the natural sciences. In these projects, complex task-specific approaches took the form of the integration of different approaches in an 'interdisciplinary' group, in which the joint work on a common subject matter requires the co-presence of researchers mastering these approaches during the whole time of the project. 'Interdisciplinary' is meant here in the weakest possible sense and may include the mastery of different languages or the familiarity with different types of sources.

This co-presence requirement can be traced to the central role of the human mind in the selection and interpretation of empirical evidence. Approaches in the social sciences and humanities are often holistic. This is why collaborative designs that define sequential, sub-task specific contributions of collaborators who may be separated in space are not applicable.

Long 'Eigentime'

The 'Eigentime' of a research process is defined by material properties of empirical objects and research technologies, for example growth and reproduction cycles of biological objects. In our analysis, we found one example for an unusually long 'Eigentime', namely a project that included the observation of a biological process that takes years and required an observation time of at least three years.

A specific epistemic property of some research processes, which we assume to be an equivalent of 'Eigentime' in the humanities and non-empirical sciences, is the need for uninterrupted research time. All knowledge about the research object must be

constantly kept and actualised in the mind of the researcher, which makes it extremely difficult to enter the necessary 'research mode'. In more technical terms, the properties of the human mind as the major research tool create the necessity to constantly 'run' - engage in research - without interruption by other tasks, because each interruption requires a major recalibration.

Strategic uncertainty

An important and very consequential epistemic property of research is its uncertainty. S*trategic uncertainty* is the uncertainty concerning the existence of an outcome. Effects might either not exist at all or not be observable with the current experimental setting. Attempts to generalise effects might fail because what has been found is idiosyncratic. This kind of strategic uncertainty we found in seven projects, all of them from the natural sciences.

There were also cases of high strategic uncertainty where it was already clear at the time of the interview (about three years into the project) that the hoped-for effects did not exist and the most ambitious aims of the projects could not be achieved.

Technical uncertainty

Technical uncertainty refers to the lack of knowledge about the way in which a certain goal can be achieved. The building of experiments might include a lot of trial-and-error manipulation of equipment before the intended effects can be achieved. Stages of experiments might fail, either because the outcome is partly random or because the experimental conditions cannot be fully controlled. The equivalent in the social sciences and humanities is a situation in which data that are necessary for answering the question cannot be found in time. We identified a significant technical uncertainty in 11 projects. One of them belonged to the social sciences and humanities, where technical uncertainly emerged from the possibility that the sources would not yield enough information to answer the question. But even in this particular case the interviewee's understanding of failure was to produce different and maybe worse results than intended. None of the projects in the social sciences and humanities could fail completely.

Table 11 presents the 'local' epistemic properties of the projects by the broad research fields.

Table 11: Specific 'local' epistemic properties of the investigated projects

	Life Sciences	Physical Sciences and Engineering	Social Sciences and Humanities
Complex task-specific equipment		4	
Complex task-specific approaches			6
Long 'Eigentime'		1	1
High strategic uncertainty	2	5	
High technical uncertainty	4	6 1 nf	1

Not all of the investigated projects were strategically or technically uncertain. The question we asked all interviewees – "In what ways could your project fail?" - was in some cases answered by unambiguous statements to the effect that the project could not fail. In other cases, no unusual risk was described.

It is important to note that the ERC already with its first round triggered adaptive behaviour. For at least some grantees, the common response to a funding opportunity - writing what they think the funding agency wants to read – involved framing their projects as more risky than they were, or writing about risk although this would not have come to their minds without the ERC asking about it.

7.4 Summary
In a nutshell, our research shows that:

- A sizeable proportion of the projects that were selected for funding in the first calls of the ERC (StG and AdG) have proposed planned innovation or have raised 'big questions'.
- A proportion of the proposals selected for funding deviate from the mainstream in their respective research fields in a number of ways.
- A proportion of the projects have 'local' epistemic properties that are met by the conditions of the ERC grants, like high levels of strategic and technical uncertainty, demanding complex task-specific approaches and equipment.
- These are all characteristics of risky and, potentially, 'frontier' and path breaking research.
- The ERC has also supported a number of proposals which are for excellent research buy are not likely to generate community level knowledge

transforming effects. For these proposals ERC funding was essential because of their 'local' epistemic properties.

Only time will show whether, and what proportion, of this research will have dramatic, community level effects (become path breaking). However, the ERC appears to have selected a proportion of research proposals that have the potential for that.

Chapter 8: ERC's impact on careers and research independence

The most important effect on grantees' organisational careers appears to be that some organisations respond to the reputation of ERC grants by promoting grantees or by offering them permanent positions. These effects occurred only for starting grantees. As was the case with the other reputational effects, the changes in organisational positions were often difficult to attribute unambiguously because the impact of the ERC grants was overlaid by other factors. We observed similar effects for non-grantees who were awarded prestigious national grants. Owing to the career systems being nationally specific, we could identify a pattern across countries (Table 12).

Table 12: Effects of ERC grants on grantees' organisational positions (interviews)

Country	Move to a permanent position	Promotion	Extension of fixed-term contract
NL	1 1 non-applicant (other prestigious grant)	3 1 non-applicant (other prestigious grant)	
D			1
UK	1	2	
CH			
IT		1 (research institute)	
F			
AT			1
Other	Move from a fixed-term position in one country to a permanent position in another country, grant helped.		

The table clearly demonstrates the importance of national career systems for the impact of ERC grants on career progress. The variation in effects can be explained by the difference between the 'lecturer system' of the Netherlands and the UK and the 'chair system' that is in place in Germany, Austria, Switzerland, France, and Italy. In the lecturer system, most academics enter the university at a low-level entrance position (Lecturer or Senior Lecturer in the UK, *Universitair Docent* in the Netherlands) and subsequently can be promoted through several levels and, in the end, can become professor at the same university. In the chair system, positions below the professorial level are often untenured, and the move to a professorial position requires applying for such a position at a different university. As a result, there are only very few – if any – opportunities to be promoted in a chair system.

In the UK and the Netherlands, grants play an important role as performance indicators in standard situations of promotion and recruitment. Interviewees describe the impact of the ERC grants as "the grant helped". This 'help' is possible in the lecturer systems because decisions on promotions and tenure are made by the host organisation, which also benefits from the ERC grant because it potentially influences the block grant of the university.

However, ERC grants also differ from most national grants in that they are portable. This means that in addition to being a marker of performance in recruitment and promotion situations, ERC grants create a negotiation situation in which the grantee has the power to provide or withdraw a benefit to the host organisation (the prestige and income of an ERC grant). Several of our interviewees used that opportunity for negotiating their situation with their (potential) host organisation.

> [I]t's totally dependent on your negotiation skills and that is something that really must remain – the ability to move the monies – because otherwise you're locked. This really enables you to manoeuvre in a way that won't harm the project but would answer the goals of the ERC which is [to become an] independent researcher.
>
> **-Dutch starting grantee**

In chair systems there are very few situations in which having a grant can be utilised in negotiations. Fixed-term positions cannot usually be turned into permanent professorial positions. The only way of receiving tenure is to be appointed as a professor, which traditionally requires a move to a different university. Universities can break with this tradition but not all of them do, as the following quote describes.

> And this is the big difference between ERC and Emmy Noether [funding programme]. Noether is ultimately considered as equivalent of the funding of *habilitations*. The framework is different but it has clearly the status of a qualification, while the ERC starting grants of the first round were decidedly different. They were aimed at funding the highest scientific excellence. It is a different question whether they actually do that but this was the aim. This aim was clearly that the people who were funded shall achieve scientific independence, which in the German context means a professorship.
> And this [my university] does not do. They treat it like Emmy Noether. With regard to the structure, they treat it like Emmy Noether, which means it is not linked to tenure or something similar. And of course there are other universities that link it to a professorship. I know examples of people who received an associate and also one full professorship.
>
> **-Germany, starting grantee**

Even though higher education reforms are currently eroding the chair systems in many countries, table 10 indicates that the systematic differences between the two systems still remain. More generally, we would tentatively conclude that the impact of

ERC grants on career positions crucially depends on the number and distribution along careers of 'negotiation situations' (promotion and recruitment) in which grants can be utilised. Generally, ERC grantees can negotiate career progress more easily in lecturer systems than in chair systems.

Promotions and the move to permanent positions usually also increased the independence of grantees. However, in some countries starting grantees who were not yet full professors still depended on professors in one important respect, namely the supervision of PhD students. Control group interviews confirm that this formal limitation exists in the lecturer system in the Netherlands and in chair systems. However, only one grantee actually mentioned this as a problem, which indicates that the grantees have found working arrangements with their professors.

Although the portability of the grant – the opportunity to take it to another organisation – is an important property of ERC grants, the grants played only a minor role in promoting organisational mobility. Only three of the interviewed thirty grantees took their grant and changed their research organisations before starting the project. All three grantees were from the Social Sciences and Humanities panel.

There are three reasons why mobility, and thus the ERC grants' capability to bring researchers to the best possible environments, is limited. The first and most obvious reason is that the grantees work in an optimum research environment.

> Answer: Well the environment is very, very good for what we intend to do. And this was the main reason to come here [prior to the ERC grant] and nowhere else. The other reason was that the institute is known for my research area, which means that I also get intellectual input and feedback. It is enormously important, I believe, especially when one starts with his own group, that one is embedded in an institute that as a whole works at a high level. If you work completely alone somewhere, the quality is not going to be as high as when you are integrated in an institute.
>
> **Question: Theoretically you could have taken the ERC grant and could have gone someplace else. The rules make this possible.**
>
> Answer: Yes, in principle. However, one of the criteria of the ERC grants is the host institution, i.e. the institute that takes you. And I can imagine that in my case this was a big bonus form because the conditions for this kind of research are ideal. I don't believe it would have been … one could have done it but I don't believe it would have been wise.
>
> **-Starting grantee, Life Sciences**

The second reason is personal. Both starting and advanced grants are given to researchers several years after their PhD, mostly in fairly advanced career stages. At this time, most grantees have a partner and children. This means that moves to another university that require a move of the whole family are difficult to accomplish because the complex interests of a whole family have to be accommodated.

Question: Did you think about moving? Was there a particular reason that you stayed where you are at the moment?

Answer: Well... Mostly it's family reasons, I never thought about moving, actually – because I have a family in […]. So anyway, I never thought about moving because my husband has work there and so I don't think I could move.

-Starting grantee, Physical Sciences and Engineering

The Netherlands are an exception in this regard because the distance between most cities is small enough to enable daily commuting after a move.

The third reason is field-specific. In the sciences, researchers at a grantee's career stage already have their own laboratory, PhD students, staff, and collaborators. Moving to another university requires an enormous investment of time and effort, which again makes scientists stay.

> Especially for an experimental physicist this would have been a disaster, you know. You cannot put these experiments in your suitcase and reassemble them in Paris. I mean you can, but it takes two years.
>
> **-Starting grantee, Physical Sciences and Engineering**

It can be safely assumed that as a result of these obstacles to mobility, at least some grantees remained in sub-optimal research environments.

8.1 Summary

The following points are important in terms of the ERC's impact on researchers' careers:

- Career effects are more pronounced for StG researchers than for AdG ones.
- At this early stage, it appears that the most pronounced impact is on the organisational career of StG researchers; some organisations promote grantees or offer them more favourable conditions of employment. This is specific to the national environment and national career structures.
- Portability of grants is recognised by grantees as an opportunity but relatively few have moved. This is mainly because: a) grantees are already in the best research environment; b) they are 'settled'; and c) there are very considerable problems associated with moving complex lab equipment and research groups.

Chapter 9: ERC's impact on research organisations

In this chapter we look at the effects that the ERC is having on the different categories of organisations ('top', 'in-between' and 'weak') in the context of the three dimensions of change identified in section 3.2.2. More specifically, these are: perceived performance and visibility of organisation, strategic capabilities and support, attraction and retention of talent. Since we found no substantive differences between universities and research institutes in the categories, here we refer to 'research organisations' and 'universities' interchangeably.

9.1 ERC's impact on top research organisations

9.1.1 Perceived performance and visibility

Interviewees from top research organisations see the ERC grants, because of their funding conditions and duration that are more generous than most national grants, as potentially enhancing the quality of the research. Furthermore, these organisations perceive the ERC as being a *visible* indicator of and a catalyst for quality. Attracting ERC grants is seen as a **new and more telling indicator for research excellence**, and for some the ERC is even regarded as a means to overcome the more obvious shortcomings of more traditional rankings of universities.

Top organisations, however, use the number of grant they receive to **confirm their position as part of the elite**. Pre-existing quality is seen by interviewees as the most important condition for successful grant getting; hence the ERC grants, both AdG and StG, reinforce the position of these organisations as top performers.

It is not surprising, therefore, that the leadership of the top research organisations do not see a *special* need for investment in activities and structures aiming to increase their quality and reputation. Where such investments are made this usually occurs at lower organisational levels.

9.1.2 Strategic capabilities

The impact on strategic capabilities at the top leadership level in top organisations is <u>not obvious</u> since important decisions and conditions are set at lower organisational level; effects on strategic capabilities are therefore at lower (and sometimes intermediate) level. Most sub-units we studied already show a high level of strategic capabilities although research strategies and support activities are developed within the constraints of funding conditions and tough internal assessment exercises alongside discipline based criteria.

As the ERC grant itself, not only the outcome produced by it, is *perceived as excellence indicator*, it allows a change of research direction which often necessitates investment

of time and patience that is not possible in more traditional funding modes. Thus, interviewees reported that with the ERC they "can be much bolder" and do things they "could not do otherwise".

In this light, the material effects of having ERC grants is important; these grants contribute to funding the sub-units competing for institutional and project grants. This is particularly important in times of growth when having a number of ERC grants can catalyse and accelerate the process of transformation and profiling.

In top organisations, the ERC is increasingly used to *benchmark units within* the organisation and thus is a tool for internal competition for prestige and resources. In two examples serial ERC success has considerably enhanced and strongly confirmed the reputation of a specific area within a top organisation. In other cases units take extra care that the ERC success is reported not only externally, but within the organisations, expecting an improved bargaining position at higher levels and vis-à-vis other units.

In brief, the main effects on strategic capabilities here is not on at the level of organisation but at the level of sub-units. We also found that lower organisational levels offer more support for ERC grants preparation than for national or EU FP applications. However, top organisations (and their units) *do not change fundamentally the way they organise their internal support of research quality and income generation;, they take advantage of existing structures and have strengthened and tailored them where necessary*.

9.1.3 Support, retention and attraction of talent

Generally, the ERC, and its grants, are considered to be a way to increase the attractiveness of research organisations because this is another confirmation that the top organisations recruit, support and retain high performers. Since the organisational mechanisms for that, as well as concentration of talent, is already there, the ERC grants were used as a confirmation rather than as a vehicle for changing recruitment and promotion practices to attract grantees. Hence, we *didn't find major change in these organisations*. Existing structures and incentives are merely extended to ERC grantees; existing practices are efficient enough to attract and support performers and high potential performers. For these organisations the ERC adds an additional (symbolic and normative) currency in the market, a mutual signalling device for the individual researcher and for employing organisations, but the key criterion still is output and publications. In some cases, the larger grant is used to pay an additional bonus for the researcher who succeeded in the ERC competition.

In terms of *recruitment*, the ERC has not yet had much impact. In our interviews there were *not many cases of recruitments of grantees*; most grants (AdG and StG) were submitted by researchers who have already been employed there for some time. In

some organisations, the ERC grants provide opportunities for retaining high performers by offering the resources to extend their contracts.

> *"No changes in recruitment strategies come along with ERC: We primarily go for people who we think are outstanding … We do not especially look for people that might then get an ERC grant, usually people are already some time with us and then succeed in landing an ERC grant".*

Even in top organisations, *individual strategic leaders* at the lower organisational levels *perceive a potential downside* of the ERC grants. First, it puts normative pressure On of these is that the ERC grants, by the prestige and reputation they carry, afford more autonomy to researchers to the expense of academic leaders and limit the possibilities for influence of the strategic managers. This is not a widespread phenomenon, as in most of the top organisations, and their units, researchers who attract funding or have a strong institutional funding base often are already relatively autonomous in their research strategy planning and implementation. Another reported problem is that the large ERC grants *can endanger the balance within units* and groups and distort cohesion. This is especially the case if the grant allows for multiple recruitments by the PI, thus leading to a group building that is not planned for strategically and may not spill over to the unit more generally (leading to a "two class system"). Some organisations have already started to be *restrictive with grant applications*, taking care of a balanced growth rather than an accidental growth within their portfolio. Internal pre-selection procedures do play a decisive role here.

The abovementioned challenges of large grants, especially if units have attracted multiple grants, *trigger new efforts and structures to plan, handle and support* large grants in sub-units, simplifying internal rules and procedures. In addition, more senior management has been mobilised to support applicants and higher level administration support has been improved. Even in organisations that have been reluctant to apply for external funds – as not many schemes meet the criteria of their research - staff are now encouraged to consider ERC applications.

9.2 ERC's impact on 'in-between' research organisations

9.2.1 Perceived performance and visibility

All interviewees agree that the ERC is a *quality brand that arises from its symbolic and normative value*: The ERC is expected to impact on quality of research as it allows focusing on basic research without further conditions. However, for in-between organisations, ERC's impact on the perceived performance of organisations or sub-organisational levels (divisions, departments, institutes, labs, groups) is closely *linked to whether these are hosting ERC grantees or not*. Having (the right number of) ERC grantees is perceived as bringing visibility and reputation for the respective organisation or sub-division – nationally and internationally. These organisations, and

their sub-units, are under pressure to succeed and either get, or attract, more ERC grants so that they continue being visible and make the transition into the top.

Furthermore, the *ERC grants allow certain units or research groups within an organisation to grow extraordinarily or faster than comparable units without any grantees*. This growth of research capabilities includes numbers of researchers as well as infrastructure, which as a consequence leads to more competitive research performance in the years to come. Some in-between research organisations see this inherent risk of uncontrolled and imbalanced growth at lower organisational levels triggered by multiple ERC success as threatening organisational cohesion and stretching the resources of the organisation.

9.2.2 Strategic capabilities

The evidence here *is mixed*. We found no evidence that a major re-orientation of research strategies or completely new research priorities has occurred because of the ERC and its funding schemes. We did find, however, that ERC grants have three kinds of effects on already on-going policies and research priorities: (i) made these visible or justified, (ii) considerably strengthened in their research capacities and (iii) in some cases the ERC grant was used as seed money directed into new, more risky lines of research within the field.

For these organisations this chance of increased visibility also acts as a *driver to adapt internal incentive structures in order to motivate existing staff to apply for ERC grants.* Furthermore, due to the considerable size and the favourable funding conditions of ERC grants, *research may be re-organised in flexible* and non-bureaucratic manner. ERC grants are considered an *opportunity to catch up with excellence strategies* and helping to raise a unit's research capabilities, be it via new infrastructure, via building up critical mass, via extraordinary growth of research groups, via more incentive-driven overall financial endowment but also via the different research methodologies or approaches that are applied. As regards the latter, ERC funding – primarily in the case of AdG – also *catalyses new, more risky lines of research (within already existing priority research areas),* particularly as it comes with a favourable time span. In many cases ERC money functions as seed money and allows units or research groups within an organisation to *grow extraordinarily or faster* than comparable units without any grantees. This often comes with re-directions:

> *"The ERC grants have allowed us to almost instantly start new research directions – or more precisely to very quickly acquire 'critical mass' for certain research directions, by acquiring the right people and the right equipment".*

However, the definition of research directions sometimes follows the money:

> *"ERC grants are also indicators where in the future to put our internal money for research priority programs."*

This presents a challenge to some organisations because of the inherent risk of uncontrolled and imbalanced growth triggered by multiple ERC success; this can push in-between organisations towards its limit in terms of space allocation, resources and infrastructures.

All in all, while the strategic merit of the ERC more likely unfolds at the sub-organisational levels of organisations (faculties, departments, institutes, labs) than at the highest leadership level, the perceived material and symbolic value of the ERC has triggered strategic reaction at top leadership level as well. There is awareness that the ERC grants are an opportunity to' catch up' and the will to use these as a signal for this. ERC has become part of the organisational discourse and practices for reinforcing quality strategies and internal allocation for resources. Thus, in some cases the research organisation allocates additional money to the groups or sub-units of grantees, in others ERC grants are considered a useful indicator for quality based allocation of competitive university budgets. The main challenge for the top organisational level here lies with balancing conflicting strategies of sub-levels.

9.2.3 Support, attraction and retention of talent

Within this group, the existence of ERC and of having ERC grantees triggers diverging promotion structures: ERC grantees are – by means of being branded as ERC-excellent – often *entitled to leap-frog* certain career steps, i.e. are promoted to positions with more autonomy than colleagues of comparable academic age, are already tenured at an earlier stage or are entitled to a full professorship. However, the ways in which this happens varies, ranging from mere expansion of already existing exceptional promotion rules, to newly created staff categories and positions for ERC grantees that are considerably different from pre-existing staff profiles (e.g. research only positions in a teaching-heavy environment).

Even more so than in top organisations, in-between organisations face a *challenge* here: this reward system puts a lot of pressure onto existing staff structures and organisational capabilities, and threatens existing cohesion among the unit's staff members. This relates closely to the issue of motivating and retaining existing staff and thus closely linked to the attraction of talent dimension. Empirical evidence in this group of organisations shows that *ERC related reputation and prestige are* very likely lead to further *internal differentiation* among staff members. Generally, ERC grantees are – given the amount of funding they bring and the reputation and autonomy they enjoy – in a privileged bargaining position towards their hosting university.

> *"The ERC is important in our career policy, … personal grants become increasingly important in our decision to take someone's career to the next level."*

For in-between organisations those pressures are critical, as large ERC grants are potentially more disruptive than in top organisations that, generally speaking, have better funding endowments and more success in other high level schemes. Whether

and how this challenge can be handled depends on the size and tasks of the unit as well as on previous experience with comparable grants.

Our empirical evidence shows that a *talent-oriented strategy prevails over a (top down pre-defined) research priorities strategy*. This means, in essence, that the urge to attract and retain top class researchers is top priority, the definition of a research strategy follows from that.

Applying for ERC grants or having attracted ERC grants strengthens and extends existing mechanisms for recruitment and retention of top talent. Thus, some organisations have been setting up *internal peer committees* to further develop proposals in terms of content as an important means for ERC grantee support. These peer committees play an additional role in terms of assuring internal quality control over research conducted by potential grantees.

> *"We make a pre-selection; we select only those researchers who have a high chance of success when applying […] If a researcher decided to apply, the faculty will involve a financial expert and they will appoint a sparring partner for the researcher".*

This latter finding, the internal filter for ERC applications, is an expression of a deeper tension between objectives. On the one hand, the ERC schemes target individuals and seek to fund risky, unconventional research. On the other hand, the ERC is intending to support research organisations to become strategic actors and thus defines an organisational role in supporting ERC grants and grant getting. But by doing that organisations and their units could counteract an essential part of the spirit of the ERC, by pre-selecting proposals and potentially eliminating 'risk' at this level.

9.3 ERC's impact on 'weak' research organisations

9.3.1 Perceived performance and visibility

The impact of the ERC on weak organisations is ***fairly low*** and limited to isolated sub-fields and sub-units. At the level of sub-units ERC grants seem to make a difference and allow institutes and labs to position themselves better internationally and to gain further reputation.

Further, ERC grants afford the opportunity to establish new fields or research avenues. These grants allow researchers and organisations to bypass traditional, national hierarchies and fields. In this respect ERC grants seem to contribute to the *creation of additional pockets of excellence* within weaker organisations.

9.3.2 Strategic capabilities

This group of organisations are normally characterised by very low level of financial endowment, limited discretion over spending decisions, rigid recruitment structures, problems with recruitment more generally and a lack of top-down quality policies, steering and priority setting processes. Thus, in line with our expectations, we found

that *impacts on strategic capabilities* appear *only* on the *level of individual research groups, labs or institutes*. Because the ERC grant(s) is disproportionately large compared to the finances of the organisation (sub-unit) its effects at the lower organisational levels can be considerable.

> *"Real research can only be performed when additional external funds are acquired; this substantially impacts on (the organisations') ability for steering of research strategies".*

In weak organisations ERC grantees with loads of funds, flexibility and freedom are (and are seen) truly outliers. They change the geometry, habits and perceptions within their immediate surroundings.

In these organisations, grantees are role models and they are highly visible. There is low level of strategic research planning at all levels; where this exists, it is driven by the grants rather than by developing the conditions for getting grants.

As some weak organisations saw the **ERC grant(s) as an important source of income, they developed considerable efforts to rush scientists into applications.** The subsequent lack of success led to disillusion, positively speaking to a stronger sense of reality: the ERC story highlights existing weaknesses, but is not seen as a remedy. Consequently, these organisations turn their sight to more 'local' and/or specific opportunities. For instance, some interviewees emphasised the importance of the Structural Funds and its bureaucratic burdens.

Weak organisations, with or without grantees, do not experience ERC's impact at the overall organisational level. The organisations interviewed share (i) a high degree of decentralisation and (ii) lack of vigour as regards priority setting, recruiting, providing incentives or quality policy. These practices have not seen changes due to ERC as such or through grants. In sum, in weak organisations the symbolic and material value of the ERC is insufficient to induce change.

9.3.3 Support, attraction and retention of talent

Weaker organisations in general face greater problems to recruit and retain top people. Many weak organisations are not in the position to offer favourable conditions of employment and for research and they lack structured recruitment policies. Within the organisations in this group, change can be and is being introduced on a *lower level*, but mainly *erratic and unplanned*. For example, they try to attract researchers from their own countries' origin who have started or successfully mastered their career abroad. Another strategy includes the already mentioned creation of pockets of excellence in some labs or parts of the organisation, and therefore become internationally attractive at least in a few sub-fields.

Both strategies are used as regards ERC and ERC grants: excellent expatriates are lured back with the possibility of a (Starting) Grant, and ERC grants help in building pockets of excellence. However evidence is unclear, due to the small number of grants and the

competitive nature of the ERC. The same holds true for support offered to potential grantees during the application phase; even though individual solutions may turn out to be helpful, there are no formalized structures in place.

For weak organisations that do host grantees, the impact is twofold: first they have something to offer (in case of success and paid by ERC) they could not offer on their own. Second through ERC grants they can establish special areas where different dynamics apply: more freedom, more flexibility, more focus on competition and quality.

For weak organisations without grantees, there is no impact; for them the record of not hosting any grantee merely confirms the unfavourable conditions they have to operate within. The performance gap is just too high, the requirements of ERC are too stringent, the ERC is too far away to send any signals that could trigger any response that can be read as impacts.

9.4 Summary

In a nutshell, our investigation of the effect of the ERC on different kinds of research organisations at this stage shows that:

- The ERC and its funding schemes do not have (and cannot be expected to have) strong impact on top research performers and on research organisations that are lagging far behind these. More often than not, top performers are subjected to other pressures for change (national and global) and the ERC merely enhances and/or is used as part of rhetoric for particular developments. 'Weak' organisations, on the other hand, are too much behind to realistically hope to be able to compete for ERC grants and grantees.
- Impact is most pronounced in the research organisations that are just below the top research performers since the existence of the ERC as well as attracting some grants is used to overhaul the organisation. This enables the development and implementation of structures and practices conducive to research excellence and enabling more favourable outcome in wining, attracting and retaining ERC grants.
- ERC grants attracted by second tier research organisations can generate organisational imbalances by creating imperatives for redirecting resources.
- Many changes occur at lower organisational levels which makes us question whether the university or research institute as such is the appropriate study level.
- Change found in different research organisations cannot be fully attributed to the ERC and its funding schemes – but it contributes to the speed and scope of the changes, in some cases crucially.

Chapter 10: ERC's impact on national research funders and spaces

In this part of the report we discuss changes of national funding organisations and spaces (research councils and equivalent) at four different levels of aggregation: a) systemic level, the level of the organisations, the level of funding instruments and the level of procedures and practices.

These changes cannot be attributed to the establishment of the ERC in the strict sense (see Chapter 5). Since there are other social forces that underpin both the establishment of the ERC and some of the changes described here, these are more a result of mutual alignment and adjustment. This, however, doesn't mean that these changes are not significant or important.

10.1 Systemic level

Our results show that there have been effects associated with the establishment of the ERC at systemic level. These are evident in state led national funding spaces where a transformation to a research council led system has occurred.

At the time of establishment of the ERC only few EU member states still had a state-led system for funding research. These were France, Italy, Poland, and Spain. France and Poland were part of this study and in both we found profound processes of transition to a council led system.

Thus, Poland recently underwent a change (2007-2010) whereby the previous Ministry-centered system was changed into a council led system. Two councils were set up: the National Science Centre focusing on basic research and the National Centre for Research and Development the remit of which is more applied and innovation based. Our interviewees pointed out that the change from state-led to research council based national research space was discussed a number of times after 1989. This debate, however, did not gather sufficient legitimacy so the transformation can be enacted. What brought legitimacy to the proponents of a council based system was the poor performance of Poland in the ERC calls; this was framed in terms of the old fashioned funding system of the country that doesn't provide an environment conducive to competition and selectivity. In turn, this means that Polish researchers are at a disadvantage when it comes to competing for prestigious, international project grants.

France is another country that did not have an actual system of research councils allocating research funds extramurally, but these were allocated by the Ministry of Research. In addition, France had, and still has, a powerful public research centre CNRS which funds besides research in its own labs, that carried out in the universities. The new funding body was decided in 2004, and started its activities in 2005. In effect, it precedes the establishment of the ERC and thus this change cannot be interpreted as

one of its impacts. According to one interviewee, the model for the ANR was obtained from the German DGF; and the examples of the US NSF and the Canadian Research Council were also important. However, the debate for establishing the ERC was used to lend legitimacy to the establishment of a dedicated research funding agency for project based funding.

In brief, whilst the changes of the two science systems, these of France and Poland, have been profound the debate about and the establishment of the ERC provided legitimacy to the introduction of a novel characteristic – move towards project based-funding – and a model of good practice for setting up dedicated research funding agencies.

10.2 Impact of the ERC at the level of organisations

In this section we take a snap shot of the support principles of the research funding bodies included in our study and compare these with the principles of support of the ERC. A summary of our findings is presented in Table 13.

Table 13: Similarity of the principles of support of the funding agencies with those of the ERC (not including Polish National Science Centre, established in 2011)

	Promotion of excellence an important goal	Promotion of frontier research, risky research	Bottom-up principle	Support of individuals	Support of collaboration / networks	Thematic support areas	Socio-economic challenges
Austria FWF	**X**	-	x	**X**	x	x	(x)
CH SNSF	**X**	-	x	x	x	x	(x)
France ANR	**X**	(x)	x*	**-**	**X**	**X**	**X**
Germany DFG	**X**	x**	x	x	x	x	x
The Netherlands NWO	**X**	x	x	x	x	x	(x) (increasing)
Norway RCN	In science part (17% of funding)	-	(x)	(x)	x	**X**	**X**
UK EPSRC	**X**	-***	x	x	**X**	**X**	**X**
UK ESRC	**X**	-***	**X**	x	x	x	**X**
ERC	**X**	**X**	**X**	**X**	-	-	-

Key:
X (in BOLD) means of great importance; x, of medium importance; (x), of low or uncertain importance.
* = 35% of ANR funds are to non-thematic research proposals, 65% to thematic research programmes.
** = Reinhart Koselleck Projects
*** = 'all supported research is frontier research' thus no specific funding instruments adopted.

Looking at Table 13, the support principles of the ERC and of the national research councils studied by EURECIA are very similar[41] with one exception: the ERC is the only one to explicitly promote and support risky, path-breaking, 'frontier' research on a large scale. We found that DFG has a scheme specifically promoting risky research (the Reinhart Koselleck Projects) and our interviewees from the Dutch NWO and Swiss SNSF noted that the promotion of frontier and risky research was important for their organizations.

We could not trace this as funding support principle through the official documents of the Swiss SNSF, however, which lets us question its importance as a policy concern. By contrast, supporting path-breaking, risky research was clearly stated to be a policy concern in the official strategy documents relating to the Dutch research council system (2007-2010 and 2011-2014). This is certainly a change that can be associated with the establishment of the ERC, since frontier research or risk-taking were not mentioned in research policy documentation *before* the ERC highlighted them and posited them as a central part of its mission. It is a different question whether and the extent to which the formulation of the strategy is translated into funding practices and support forms.

Generally, research councils, originally established to fund basic research, have in recent decades been faced with increasing demands for *widening their activities towards fulfilling a variety of societal objectives* and expanding their activities to include mission-oriented research. The ERC model is one which focuses – at least, so far – on a narrower mission, the promotion of excellence and frontier research – and at a symbolic level, reinforces the rationale for basic research funding council. This model could influence the national-level funding bodies by the provision of support or arguments to maintain a balance in the promotion of non-thematic research and bottom-up activities vs. thematic and top-down activities. The Austrian FWF is, according to the interviews, facing increasing pressures towards more societal relevance, and it was reported that in this situation, *the establishment of the ERC provided arguments to support scientifically top-level research*. This type of impact is symbolic and reinforces the traditional values of a research council system funding basic research.

Finally, another way to measure the impact of the ERC on the strategies and principles of the national funding agencies and bodies would be to consider the share of funds

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[41] This is not surprising given that European level developments are inevitably a result of interaction with stakeholders, negotiation and compromise.

going to a responsive and non-programmatic support of research and the development of this share over time, to the extent that such breakdown data are available. If there is impact from the ERC we can assume that this share will increase after the emergence of the ERC. This could not be done in this explorative study, but it is mentioned as a way forward.

10.3 The impact of the ERC at the level of support instruments
Table 13 offers a comparison between the support instruments of the national research councils in our study and the ERC.

The German Reinhart Koselleck Projects were started in 2008 and are an emulation of the Advanced Grants of the ERC. The projects are for five years, the funding ranges from 500 000 EUR to 1.25 million per project, and they are for research projects "that are highly innovative and risky in a positive sense" (Press release, 7, February, 2008, DFG). The formulation of the goals of the scheme closely resembles the goal-setting of the ERC grant schemes. They are, nevertheless, smaller than the AdG. We also found that the Dutch NWO has a scheme to support risky research since 2001, thus preceding the launch of the ERC schemes. None of the schemes of the national funding councils we looked at is identical or even sufficiently similar to the schemes of the ERC – these schemes provide conditions for research and researchers that are different from the conditions provided by the ERC in terms of amount of funding, time and portability of grant.

A mechanism for interaction between the national research councils and the ERC at this level is through overlapping researcher applications. Here, we find that the ANR issued a special support scheme for French StG applicants who passed the quality threshold in the first StG call but were not funded. In Norway, OYI applicants are obliged to submit an application to the ERC StG scheme as well, and if they pass the threshold, but do not obtain the grant, they get 75% of the funds from the national council. These developments, however, are 'adjustments' to rather than impacts of the existence of the ERC.

10.4 Processes
In terms of the similarity of the processes, we focused on peer review which is the cornerstone of the selection process in research councils and thus crucial to the selection outcome. We compared the national research councils in our study and the ERC in terms of two dimensions of peer review, namely whether it is international or not and whether selection is done by rating or ranking as a proxy for the relative influence of peers and council officials in the process.

Table 14: Similarity to the ERC in processes (peer review)*

	FWF Austria	SNSF CH	ANR French	DFG Germany	NWO The Netherlands	RCN Norway	EPSRC UK	ESRC UK
Inter-national peer review	Yes (for longer than the last decade)	Varying by scheme, in general, more and more international	Varying depending on the panel (25-40%)	To some extent, varies	In 80% international; the 20% where not used are focused on Dutch areas	Almost all are international peers	To some extent (10 % of the panelists)	To a very small extent
Role of Peer review (ranking, rating)		Rating, advisory	Ranking	Ranking	Ranking (interpretation)	Ranking	Rating, the ERSRC makes the final selection	Rating
					NWO "is the Mercedes of Europe"			

*The table does not include the Polish National Science Centre that started its activities in 2011. The Polish system, however, emulates the peer review system of the ERC.

International peer review and one in which the peers have the power of selection are the features of the ERC peer review. It seems that peer review is over the years, increasingly, becoming international though in the studied countries it varies by scheme type. In most systems for which we have information the reviewers rank the applicants, that is, the experts effectively make the selection. There are many other features which also matter, but for which we do not have information. The criteria of the review, the information base, inclusion of interviews etc. also matter for the outcome of peer review, but we do not have enough information of them to be able to make far-reaching comparisons.

10.5 Summary
Our study of the changes of national research funders and funding spaces that can be linked to the debates, establishment and functioning of the ERC show that:

- At the systemic level:
  - In state-led systems with no funding councils, the ERC provided a general model of funding body (Poland) and/or legitimacy for the creation of a funding council (France).
- At the level of the structure of the funding council:
  - The ERC provided an organizational model for the newly established research councils (e.g. the National Science Centre in Poland)
- At the level of strategy, funding instruments and support principles:
  - The ERC reinforced the position of the Research Council systems in funding fundamental or bottom-up research or individual researchers (Austria, Germany, the Netherlands, Norway)
  - The ERC provided a model for the support of highly innovative, risky research (Reinhart Koselleck Projects, Germany)
  - The ERC reinforced the Europeanisation of activities (Germany, Norway)
- At the level of processes:
  - Some research councils subcontracted evaluation of applications to the ERC (Norway for OYI scheme)
  - The ERC reinforced the importance of internationalisation in peer review, and overall, reinforced cross-European competition

Chapter 11: Impact of the ERC on the European funding landscape

11.1 Findings at the level of research policy

11.1.1 Changes in the notion of ERA

The notion of the European Research Area (ERA) was adopted in 2000 in parallel with the adoption of the Lisbon Strategy targets and can be regarded as one of the means to achieve it. The notion has evolved during its life-time of about ten years. The process of promoting the idea of a European Research Council has affected the notion of ERA.

The range of questions which the ERA concept includes has become wider, and towards the end of the decade, environmental and social issues gained importance (Luukkonen, 2010). Since 2007, however, *excellence* has gained prominence on the policy agenda. ERA has embraced, besides the 'internal market' in research and better coordination of national research activities and programmes with each other and those of the Community, the promotion of research excellence, more effective knowledge sharing and transfer, and addressing pressing societal problems.

11.1.2 Moving excellence to the core of European research policy

Our analysis shows that during the debate on a European Research Council, *support of basic research became legitimate for EU* through reference to the underlying assumptions about the need to build up excellent research organisations, which were part of the ERA vision and were part of the broader knowledge-based society objectives. At the same time, *this debate changed the way European research policy was framed*. It put forward the question of basic research and research excellence on the EU research and innovation policy agenda. While this debate continued, it highlighted the importance of excellence for the whole ERA initiative. It thus got fuel from the ERA but also changed the way in which the ERA and the achievement of its targets were perceived. Issues of excellence became part of the way in which both the 'causal' and 'normative' ideas were framed (see Edler, 2003)[42]. This development was visible in the gradual evolution of the way in which excellence was dealt with in important policy documents of the EU (Luukkonen, 2010).

This process of aligning European level research policy along lines of basic research and excellence culminated in the summer of 2004 when the Spring Council concluded that there is "merit in enhanced support for basic research of highest quality". Similarly, the informal Competitiveness Council of 1-3 July 2004 welcomed the creation of "a mechanism to support research conducted by individual teams in a

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[42] The distinction is based on Edler (2003, p. 102–103). Causal ideas "help define the current situation and explain what action leads to what outcome", normative ideas "suggest where one should head and what is perceived as legitimate".

competition at European level and expressed its will to conclude before the end of 2004 on the principles for such a funding mechanism" (Interim Working Document, 2004).

Henceforward, *promotion of excellence has featured as an important target among the ERA objectives*. For example, the Green Paper on ERA (Inventing our Future Together, 2007) highlighted excellence of researchers and research institutions as well as world-class infrastructures as ERA targets. Further, the Lund Declaration (2009) noted the fact that meeting the Grand Challenges requires, among other things, "strengthening frontier research initiated by the research community itself" and "excellence and well-networked knowledge institutions". The report by the European Research Area Board of 2009, entitled "Preparing Europe for a new Renaissance", advocated "an ERA to deliver excellence … where risk-taking in research, regardless of its public or private origin, will be the guiding principle for ERA policy" as one of the six areas of action the Board outlined (Preparing Europe for a New Renaissance, 2009). These quotes seem directly to point to the principles of the ERC to promote excellence, frontier research and risk-taking[43]. The proposal for the new framework programme, Horizon 2020, adopted in 2011, highlights the importance of the excellence agenda by the fact that excellence is one of the three major objectives and priorities of the programme[44].

However, the ERC is not the only inspiration behind this concern for excellence. In the Framework Programme projects are selected on the basis of evaluation using S&T quality as one of the criteria. However, it is not the only criterion and attention to potential impacts and the consortium composition have played an equally important role. ***Thus, the ERC is the only part of the EU funding tools regarding excellence as the sole criterion of selection, though there are other EU programmes, such as Marie Curie, infrastructure programme and in the FET (Future Emerging Technologies) which support basic research.***

11.1.3 Redefining European value added
Traditionally the European added value in research policy was framed in terms of the general principle of subsidiarity which is expressed in the consolidated Treaty of Lisbon (art. 5) as follows:

> "Under the principle of subsidiarity, in areas which do not fall within its exclusive competence, the Union shall act only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States, either at central level or at regional and local level, but can rather, by reason of the scale or effects of the proposed action, be better achieved at Union level."

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[43] See http://erc.europa.eu/index.cfm?fuseaction=page.display&topicID=12.
[44] http://ec.europa.eu/research/horizon2020/index_en.cfm?pg=h2020-documents

This principle has traditionally been interpreted to justify the funding of research *collaboration through transnational consortia* (Muldur et al., 2006, p. 186) and enabling *cooperation*. This had to be re-defined were the establishment of the ERC to be possible.

The Communication from the Commission "Europe and Basic Research" (COM(2004)9 final, 14.1.2004) already expressed a new definition of European added value justifying the establishment of the ERC, namely "the *added value which comes from competition at EU level*" (p. 13). At the Dublin Conference on the ERC entitled "Europe's Search for Excellence in Basic Research" on 16-17 February, 2004, Dr. Achilles Mitsos, the then Director-General for Science, Research and Development, presented this new interpretation of European value added, and referred to the fact that "competition is to be on a European scale, drawing on an enlarged pool of researchers" (p. 36).

In a nutshell, during the debate regarding the establishment of the ERC, the notion of European added value was re-defined from 'cooperation and collaboration' to 'competition'.

11.2 The impact of the ERC at organisational level

We studied four organisational entities at European level to gauge the impact of the ERC. These were selected on the basis of their (assumed) membership in a European level organisational field; this field is outlined by the similarity between organisations in terms missions, objectives and activities. The organisations studies by EURECIA are presented in Table 15.

Table 15: European-level organisations/schemes in descending order of presumed closeness to the ERC

FP: NEST; FET
ESF; EUROHORCs
EMBO
COST

Our findings regarding similarity and difference between different research funding and policy organisations at the European level are summarised in Table 16 (for a more detailed description of the organisations included in EURECIA please see the WP6 report).

Although all these organisations share basic values and principles associated with the promotion of excellence and bottom up and in some cases even risky research the differences are large enough to make it possible to avoid the need for major 'organisational' adjustments. In many respects, their aims, remit and activities complement rather than compete with these of the ERC. Furthermore, these set out to achieve these aims by using policy and funding instruments that are substantive different from the ones used by the ERC.

Thus, despite the fact that the ERC is universally regarded as having achieved a high level of excellence in its activities and practices (particularly peer review) positive coordination and/or policy learning at the European level have been limited. Interestingly, we found some effects on the FP in that administrative principles first applied by the ERC (including re-imbursement levels, time keeping rules and audit principles) have been included in the proposal for the next programme, Horizon 2020.

Table 16: Comparison of the ERC and the other European funding organisations or schemes

	ERC	FET and NEST in FP	ESF + EUROHORCs	EMBO	COST
Promotion of excellence an important goal	x		X	x	
Promotion of frontier research, risky research	x	x			
Promotion of goal-oriented research		x			x
Bottom-up principle	x	partially	X	x	x
Support of individuals	x			x	
Collaboration a precondition for funding		x	X		x
No thematic support areas	x	partially			
The organization allocates, in contrast to coordinates, money to carry out research	x	x		(x)	
Peer review and final selection of projects at European level	x	x	Peer review	x	
Peer review and final selection of projects at national level			X	(x)	x

There is some evidence of negative coordination, namely the discontinuation of some policy instruments to make room for the instruments of the ERC. Examples here are provided by the ESF-EUROHORCs EURYI and the FP6 NEST Programme.

None of the interviewees mentioned that there existed any competition between their organisation and the ERC as such. Some (COST) hoped for positive coordination with the ERC in the form of linking their activities with those of the ERC, like suggesting that they could provide opportunities for networking the ERC grantees with each other. Our interviewees tended to emphasise the joint principles they had with the ERC, for example, the bottom-up principle in their support. Like several of the European scientific and scholarly associations interviewed[45], most of these

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[45] ALLEA, EUA, EASAC, Academia Europaea, EARTO, EIRMA, and BUSINESSEUROPE.

organisations had been actively involved in the process of promoting the emergence of an ERC and felt that the ERC supported values they believe in, and share.

In a nutshell, with regard to the impacts of the ERC on the above organisations, very little could so far be seen apart from very few examples of negative coordination.

11.3 Summary

We found that:

- The ERC has brought about a number of principal changes in the EU **research funding policy**. These include strengthening the importance of excellence on the ERA agenda, changes in traditional principles in EU support to research (support of individuals vs. organisations; no 'just retour'; not pre-allocation of funds to fields or specific areas; fundamental research vs. targeted research), modification of the definition of European value-added in research support (in addition to international collaboration, competition at European level), and providing an important case, the only programme allocating EU money only, where strategy formulation and the implementation of the strategy has been delegated to external stakeholders. The ERC has provided a test ground for simpler administrative procedures which will eventually be adopted in Horizon 2020.
- At the level of **European research funding organisations**, the ERC has brought about fewer changes. The ERC has been defined in such a way that a full overlap does not exist with any other funding organisation in strategy or funding schemes. Where there is overlap in instruments, as with the ESF-Eurohorcs EURYI, these have been withdrawn. There is no evidence that this has been necessarily caused by the emergence of the ERC.

Chapter 12: Impact mechanisms: preliminary findings

At this stage of the research (before conducting Stage Two data collection) the impact mechanisms set out in Chapter 5 cannot be discussed in much detail. It is possible, however, to approach the three sets of issues noted in Chapter 5, namely:

- Are the signals sent by the ERC strong and distinctive?
- How are these signals perceived by different constituencies?
- What are the opportunities that the ERC and its funding schemes provide and how do these match the properties and needs of the empirical objects?

This chapter builds on data collected by the different parts of the study and by different methods.

12.1 Are the signals sent by the ERC strong and distinctive?

The issues around the strength and distinctiveness of the ERC signals are inter-related. In fact, it can be argued that signals strength is increased by their distinctiveness. At any rate, the ERC sends strong signals in two ways: a) by being in charge of a generous budget (during the 7th FP ERC's budget was €7.51 billion set to increase during H-2020) and offering relatively generous grants for research; and b) by becoming a marker for research excellence.

As to the distinctiveness of the signals, our research provides indications that the ERC and its funding schemes are fairly unique; this is equally valid where the European level is concerned and regarding the national level. At European level, the ERC is different from the organizational arrangements discussed above in five substantive ways: (i) explicitly focuses on supporting research at or beyond the frontiers of knowledge; (ii) supports investigator-driven, rather than programmatic, research; (iii) has a budget and allocates funding (unlike the ESF and COST); (iv) has few clear and targeted goals (unlike the FPs); and (v) uses peer-reviewed scientific excellence as the sole criterion for selection rather than as a discourse for achieving other political goals (Nedeva & Stampfer, 2012). At the national level it is different mainly in its clear call for more risky, 'frontier' research proposals and by the fact that it operates at trans-national level; hence in effect it selects from a much broader pool of outstanding researchers at different career stages.

12.2 How are these signals perceived by different constituencies?

Our survey provide information about the way in which respondents – both grantees and controls – regard different characteristics of the ERC as compared to these of a range of other funder. The results are presented in Tables 17 and 18.

Table 17: The ERC and other funding organisations: Starting Grant recipients

	High reputation/prestige	High quality peer review	Low administrative burden	Appropriate grant size	Enables novel / innovative research	Enables inter-national collaboration	Helps significant research findings to be achieved
Own university	19%	9%	25%	7%	19%	28%	12%
National funding agency	14%	27%	21%	20%	28%	23%	28%
ERC	66%	49%	26%	66%	64%	46%	56%
ESF	4%	4%	2%	1%	5%	9%	1%
EU FP (excluding ERC)	15%	6%	3%	17%	12%	33%	12%
Industry	3%	1%	9%	6%	7%	1%	6%
Charities	9%	5%	25%	10%	14%	12%	12%

Source: Thomas, Nedeva, 2011

Table 18: The ERC and other funding organisations: control group

	High reputation / prestige	High quality peer review	Low administrative burden	Appropriate grant size	Enables novel / innovative research	Enables inter-national collaboration	Helps significant research findings to be achieved
Own university	17%	11%	26%	15%	22%	22%	22%
National funding agency	17%	24%	22%	26%	22%	17%	26%
ERC	57%	33%	13%	65%	43%	28%	46%
ESF	13%	13%	0%	9%	9%	11%	9%
EU FP (excluding ERC)	15%	11%	0%	24%	15%	30%	17%
Industry	0%	0%	15%	13%	2%	4%	9%
Charities	11%	11%	13%	15%	13%	7%	12%

Source: Thomas, Nedeva, 2011

It is apparent that very shortly after its establishment the ERC was seen by its grantees and by the members of the control group as a research funding organisation that outperforms other research funders in terms of: reputation, quality of peer review, appropriate grant size and the opportunity it affords for the conduct of highly innovative research.

Our interviews with representatives of research organisations provided evidence that the ERC is seen as a 'marker of excellence'. ERC grants assign prestige and symbolise excellence of individuals and of host organisations. There is high awareness amongst strategic leaders and the ERC has already acquired a high level of credibility. It is used as benchmark for quality between organisations and within organisations. By and large, this impact could be found at all organisational levels. Although our sample is biased towards grant getting organisations, it is obvious that the symbolic value is relevant across the board. This symbolic effect is strongest for top organisations and those in-betweens who claim to compete on excellence. Weaker organisations see less symbolic value in the ERC, for them the prestige – excellence gap is just too big.

We also found that *the initial opinion expressed in the interviews with European stakeholder groups (their list in the appendix) is that the ERC has achieved excellence in its operations and panels within a short time.* However, there was also recognition of the tension(s) between the rules and procedures of the scientific and scholarly communities and the EU Commission. This is in line with and complements the findings of the EURECIA team exploring the effects of the ERC on research organisations (WP5). This results show that the symbolic value of the ERC is already vast for European research organisations (Edler et al., 2011). ERC grants carry high prestige and are regarded as symbols for excellence which differentiate individuals and host institutions. ERC grants are in some cases already used as benchmarks for quality across organisations and units within organisations.

According to one of the interviewees for this study, the US National Science Foundation "belongs to the same league" of funding organisations and is a real competitor of the ERC in terms of organisational performance, rather than the national level funding organizations. The ERC is attracting review panel members and researchers to return or to move to Europe from all over the world. The willingness of scientists and scholars to serve on the panels or to apply and move to Europe is dependent on how they perceive the ERC. Thus, in addition to other funding organizations in Europe, at the European and national level, and other stakeholders (public and private bodies) in Europe, stakeholders all over the world play a role in the building of the legitimacy and institutionalisation of the new organization.

Discerning the ways in which national level funders regard the ERC was somewhat more problematic are depends on the type of funding space and its level of institutionalisation and perceived reputation. Building on the perceived reputation and importance of the ERC as European level funder of frontier, risky and excellent

research forces in France and Poland managed to mobilize discourses for the transformation of their national research spaces. In the UK, on the other hand, the attitude towards the ERC can be expressed by the phrase 'live and let be'.

12.3 Opportunities provided by the ERC funding schemes and grants

Figure 8 provides an illustration of the relationship(s) between the epistemic properties of research discussed elsewhere in this report, the conditions for success of the projects funded by the ERC and the conditions that the ERC grants offer to researchers.

Figure 8: Links between epistemic properties of research, conditions for project success, and properties of ERC grants
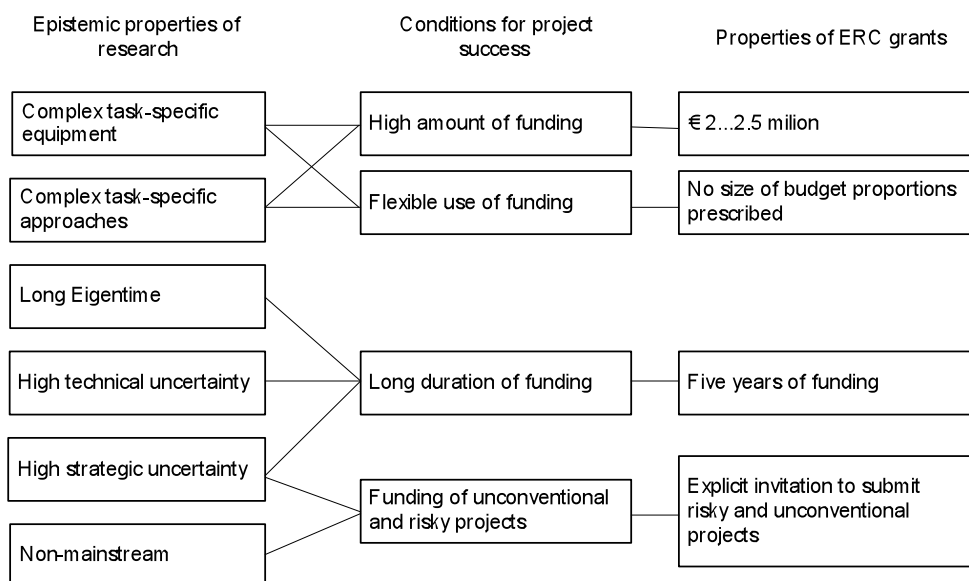
The ERC funding does offer the particular conditions of project success. In the eyes of grantees from some countries, it is the only source of funding that provides the necessary conditions described above, at least for researchers of the 'starting investigator' category. It is important to note here that it is not important whether this perception by grantees is correct. It might well be that a national funding agency would indeed fund a risky project or exceptionally expensive equipment. However, if potential applicants don't believe this and therefore don't apply, the research will not be conducted. People base their actions on their perceptions, and the perception that the ERC behaves in a certain way is the ultimate reason that projects with certain properties are conducted today.

It is also worth noting that the conditions for success of the selected research projects that are provided by the ERC funding schemes are necessary but not sufficient for this

research to come to be regarded as path-breaking. The other conditions, however, are beyond the remit and control of the ERC.

There are other opportunities provided by the ERC's funding schemes, like the opportunities for mobility, but at this stage it is too early to attempt to link these with specific 'approach' and 'standing' changes.

12.4 Summary

Whilst it would be too premature to attempt a detailed tracing the impact mechanisms before Stage Two data collection has been conducted there are early indications that changes in the science system, particularly the ones affecting the researchers, research and careers, can be attributed to the ERC and its funding schemes. Attribution is likely to be much weaker in the case of research organisations and highly problematic in the case of the European and national funding landscapes. For the time being, we can say that:

- The ERC and its funding schemes appear to give reasonably fairly strong signals through the conditions of funding and becoming a symbol of research excellence.
- These signals are also fairly unique since the ERC and its funding schemes are distinct from, and provide different opportunities when compared with, the other research funding organisations at European and national level.
- There is evidence that the ERC and its funding schemes have come to be regarded as having (and carrying) very high reputation and prestige as a funder, high quality peer-review and as enabling innovative research by both grantees and controls responding to our survey. Furthermore, they placed the ERC far ahead of other funding agencies and opportunities in these respects.
- The ERC was overwhelmingly seen as a marker of excellence by our respondents in research organisations and European steak-holder groups. This means that it already has considerable symbolic value. The situation is much less clear at the level of national funding organisations and landscapes.
- The ERC funding schemes appear to provide the opportunities matching the epistemic properties and conditions for project success of the kind of research that the ERC aims to support.

Chapter 13: Conclusions and next steps

In line with our overall objectives, EURECIA explored novel approaches and methodologies for studying the impact of the ERC on aspects of the science system and applied these to collect data on impact, early reported impact and information about the state of the potentially affected empirical objects at the first level of management.

In this concluding chapter of this report, we offer a brief assessment of the methodology and summarise our preliminary empirical findings and the key messages that emerge from these. Finally, we offer some points regarding Stage Two data collection, measuring difference and the matter of attribution.

13.1 Conclusions about methodology

EURECIA explored approaches and methodologies to register and attribute the impact of the ERC and its funding schemes on six potentially affected aspects of science, namely researchers, the content of individual research, researchers' careers, research organisations, national funders and funding spaces and the European research funding landscape. Since these demanded somewhat different approaches, the methodology that EURECIA developed and used was at two levels: overall methodological choices and methodologies tailored to the specific empirical objects.

In terms of overall choices, EURECIA worked from a generalised definition of impact as a partially or wholly attributable difference and set out to explore methodologies that capture all four type of impact (see section 1.2.1). Furthermore, this is a real-time study the methodology of which builds on multiple (two) data collection points, uses a control group and aims to attribute impact by describing its 'generative mechanisms' or the mechanisms through this impact occurs (can occur). EURECIA also developed and tested multiple data collection instruments.

13.1.1 The issue of measurement

Following an assessment of the methodology(ies) developed and applied by EURECIA the following points emerge.

- *Survey with StG 2007 cohort grantees and controls*. This approach allowed us to identify nineteen matching pairs of grantees and controls for further study at Stage Two of the study and to identify a number of 'researcher' types that will be used to analyse and compare data after Stage Two. The questionnaire also provided useful information regarding the views of the respondents about their research organisations and the conditions they expect and their funding landscapes. This approach has an 'inbuilt' risk in that it relies on repeat measurement of the exact same respondents and hence response rate at Stage

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Two may be an issue. It is also worth noting that we have identified a range of minor changes to fine tune and focus the questionnaire; these changes are not likely to affect the comparability of collected information.

- *Comparative case studies with grantees and controls*. These developed a methodology to identify and attribute causally changes in the content of research and careers. It demonstrated that while it is too early to identify all changes and assess their depth and breadth, the potential change can be estimated and causally attributed to the ERC grants. It was also possible to explore how the ERC may produce change in the fields in which the grantees work. Using this methodology, we identified characteristics of ERC-funded research indicating that the research of grantees has already changed in response to the ERC funding schemes and that, in case of success of the project, this is likely not only to change individual research trails but also affect the research directions of their communities.

- *Complementarities between the survey and the comparative case studies*. Both methods focus on empirical objects at the micro level approaching these in two different but complementary ways. By identifying 'matching pairs' to measure difference robustly, the survey prepared the ground for applying the methodology for causal attribution developed by the comparative case studies at Stage Two of the study.

- *Case studies of universities and research organisations*. The approach developed in the context of these allowed us to identify change in universities and research organisations. There are three issues to consider here, however, namely a) the importance of the intervening organisational and funding landscape variables which make the changes difficult to predict and attribute; b) a more fruitful level of study may not be the organisation as a whole but its sub-units; and c) since there are still many 'unknowns' regarding the ways in which universities and research organisations translate policy signals and act on these, it may be empirically and analytically useful to increase the depth of the case studies.

- *Case studies of national research councils*. At this stage the cases studies relied mainly on interviews with representatives of the selected national research councils which were very informative in terms of allowing further development of the framework (levels of aggregation at which impact can occur) and provided information regarding the opinion of key people currently working in the organisations. This information, however, was complemented by other sources of data (like policy documents, budgetary information, documents about rules and structure etc.) only in a very limited way for reasons reaching beyond methodological considerations. This can be, and shall be, remedied at the Stage Two data collection. Apart from that, the instruments worked well.

- **Semi-structured interviews with representatives from European policy and funding organisations**. This approach usefully collected information regarding

the complex and multifaceted processes of change and adjustment in both policy and research and funding organisations at European level.

13.1.2 Next steps

Conducting a Stage Two study is necessary to be able to complete the development of the methodology and to measure and attribute the impact of the ERC and its funding schemes on the science system reliably. More specifically:

- Since we already have some awareness of what impact can be expected to occur in terms of *researchers' approach and standing*, the questionnaire used by EURECIA can be considerably shortened. Furthermore, the survey could explore respondents' perceptions of pressures for change of their organisations and funding environments in a more focused way. This will contribute to maintaining the response rate; methodologically, it is important to ensure that the respondents from Stage One do respond to the survey at Stage Two.
- We believe that further work using the *'matching pairs' approach* could be particularly fruitful in terms of the study of the impact of the ERC on researchers approach and standing and attributing it causally to the ERC. This will be done by using a combination between the survey methodology (to measure the difference between ERC grantees and controls robustly) and the comparative case studies methodology developed during EURECIA (to explore the possibilities for causally attributing these differences to the ERC grant).
- Furthermore, the comparative case studies with grantees and controls should be complemented with a stage two investigation. This is to explore questions that could not be answered because the research funded by the ERC was not completed. These include: investigation of 'functionally equivalents' to the ERC grants funding schemes; the differential impact of the ERC grants across different research fields; the fate and effects of the exceptional research supported by the ERC; conditions for becoming an ERC grantee; and mid- and long term effects on careers.
- Whilst we do believe that a next study of the effects of the ERC on *research organisations* is necessary, this will have to be revised. In light of the fact that the differences appear to be much more pronounced across types of universities rather than across national funding spaces it may appropriate to explore in more depth this dimension and design more detailed case studies. Moreover, we know that the effects are most pronounced and distinct at lower organisational levels.
- The study of *national funding agencies* is also worth doing again but with somewhat changed emphasis. Because our the limitations in our understanding of how impact unfolds in the context of research funding organisations and national funding spaces the study carried out in EURECIA was necessarily exploratory. Stage Two will rely more on documents (such as policy documents, annual reports, and equivalent documents informing of the nature of the system

and on the strategy of the major funding organisations), and statistical data on the relative shares of funding streams. The data could be complemented with interviews, especially to obtain the necessary documentary and other data, possibly also to clarify the interpretation of the data. Documentary analysis will be done retrospectively.

- At Stage Two, the study of the European funding landscape ought to be fairly light touch to ensure that 'there are no surprises' and to provide additional background to the study of national funding organisations and spaces.

13.1.2.1 The issue of attribution.

Our exploration shows that attribution is possible to different degrees at the micro level and the level of organisations. Partial causal attribution is possible in the case of researchers, content of research and careers. In other words, and conditional on carrying out Stage Two measurement, it may be possible to discern the impact mechanisms linking specific changes to the conditions provided by the ERC and its funding schemes so that we can claim that the conditions 'cause' the changes. This also implied that the changes can be expected to occur when the specific conditions are present.

Such level of attribution is impossible to achieve in the case of research organisation because of the very high level of mediation and multiplicity of policy signals. In other words, linking the changes to the specific signals of the ERC in this case is a bit like being in a room of distorted mirrors: there is an overall likeness but it is by far not certain. Although the impact mechanisms can be described it is not likely to be ever possible to claim that the ERC is the 'cause' of such change; more likely than not the ERC could be expected to be a catalyst of certain developments.

Attribution is probably most problematic in the case of the changes at the European and national funding landscapes. Whilst these can be related to the ERC and its properties, the processes we found can be more appropriately described as 'mutual' adjustment' rather than as impact.

13.1.3 Standardisation of the methodology

At this stage of research and testing, full standardisation of the methodology is somewhat problematic. We believe, that this would be easier to achieve after a Stage Two measurement has been carried out and the impact mechanisms have been empirically confirmed.

Even at this stage, however, it is possible to use the survey questionnaire and results to develop a fairly light touch instrument for continuous data collection that will allow the ERC to monitor their selection and the difference(s) that the grants have made (are making) in terms of the 'approach' and 'standing' of grantees.

13.2 Conclusions about empirical findings

Our empirical finding provide initial evidence that the ERC, through its ambitious objectives, practices of selection and the conditions its funding schemes create for research with particular properties ('frontier', risky, innovative) to be carried out, can be expected to generate impact (affect) the science system and its different aspects in variety of ways. Whilst the ERC has already come to be considered by researchers, academic leaders of research organisations and others as a marker of research excellence, it is still a very new organisation. This means that: a) the ERC and its funding schemes are likely to develop and change, indeed these have been changing; and b) that at the time of data collection most effects were either at a very early stage or had not even started to occur.

Thus, in terms of researchers and researchers' careers, whilst some early effects related to the ERC grants have been reported, it is far too early to be able to draw any definite conclusions regarding their spread and/or persistence. These effects can be broadly placed under three categories: a) resource related effects; b) symbolic effects; and c) career related effects. Our respondents reported that the ERC grant has allowed them to leverage research funding from other sources; that an ERC grant, or even a shortlisted application for one, has increased their visibility and reputation, prestige and recognition; and that researchers got promoted faster than typical for their research field and organisational environment, had greater than typical resource autonomy, ability to start a research group and more freedom to pursue more risky/ambitious research. There were some adverse effects reported mainly related to the mismatch between the organisational conditions of the researchers and the conditions necessary to accommodate the ERC grant and the research it supports.

It is worth noting that these early impacts, albeit to a somewhat lesser degree, were reported also by respondents from our control group who were shortlisted for the award but did not get it. This may be an early indication that the ERC can be expected to generate impacts on the 'approach' and 'standing' of European researchers not only through the conditions for research that its grants afford but also through the reputation and visibility of the ERC as a funder.

More importantly, our research shows that the ERC and its funding schemes, through their selection practices and the characteristics of the grants, have created conditions for impact to occur. Thus, we found that both, Starting grantees and controls are a fairly homogenous set of very highly qualified and productive researchers setting a very high benchmark for 'early career'. At the same time, our analysis shows that the researchers supported by the ERC have space to develop. Whether they do, how and what extent this occurs, and to what degree this can be attributed to the ERC and its funding schemes can be discerned only after another measurement and further testing of the impact mechanisms at play. EURECIA prepared the ground for that by collecting 'stage one' data about 'approach' and 'standing', identifying nineteen

matching pairs for 'stage two' data collection and analysis, and developing a number of 'types' to be used to analyse 'stage two' data.

We also found the ERC grants had an impact on the research of grantees and, potentially, of their communities, by a) funding planned scientific innovations, which we defined as research findings that affect the research practices of a large number of researchers in one or more fields (i.e. choices of problems, methods or empirical objects); b) funding planned answers to 'big questions', which we defined as questions that are significantly more general than common research questions of the social sciences and humanities and need to be answered on an exceptionally broad theoretical, methodological or empirical basis; and c) funding research that would otherwise not be funded, or would at least have been difficult to fund from other sources. Most of the investigated projects had epistemic properties that required uncommon funding conditions. The time frame, amount of funding, and flexible use of funding provided by ERC grants as well as the explicit invitation to submit risky and unconventional projects made grantees perceive the ERC grants as the only possible source of funding for their projects. Some of the grantees turned ideas they had for quite some time into project proposals because with the ERC, they saw a chance of getting them funded for the first time. Others turned to the ERC after failing repeatedly with national research councils because their projects were deemed as being of high quality but too risky. Yet another group of researchers developed new ideas for their proposals to the ERC.

Despite some reported early impact on careers we found that a) the most important effect, career change because of the results of the ERC funded research, is still ahead; and b) generally, there has been relatively little initial impact on careers because: grantees are already relatively autonomous and at a high level of their national career ladder; career systems are not sufficiently flexible to enable negotiations on the basis of the reputation of the grant (except possibly in the UK and the Netherlands); organisational mobility is constrained by factors such as family arrangements and costs of moving laboratories.

We also found that the ERC and its funding schemes do not have (and cannot be expected to have) strong impact on top research performers and on research organisations that are lagging far behind these. More often than not, top performers are subjected to other pressures for change (national and global) and the ERC merely enhances and/or is used as part of rhetoric for particular developments. In fact, impact is most pronounced in the research organisations that are just below the top research performers since the existence of the ERC as well as attracting some grants is used to overhaul the organisation and develop and implement the practices conducive to research excellence. At the same time, ERC grants attracted by second tier research organisations can generate organisational imbalances. Although the change we found in different research organisations cannot be fully attributed to the ERC and its

funding schemes – it contributes to the speed and scope of the changes, in some cases crucially.

Where changes of national research funders and funding spaces is concerned we found that: a) in state-led systems with no funding councils, the ERC provided a general model of funding body (Poland) and/or legitimacy for the creation of a funding council (France); b) the ERC provided an organizational model for the newly established research councils; c) the ERC reinforced the position of the Research Council systems in funding fundamental or bottom-up research or individual researchers; and d) the ERC provided a model for the support of highly innovative, risky research and, in some cases, reinforced the Europeanisation of activities.

At the level of the European funding landscape the ERC has brought about a number of changes in the EU research funding policy. These include strengthening the importance of excellence in the ERA agenda, changes of traditional principles in EU support to research (support of individuals vs. organisations; no 'just retour'; not pre-allocation of funds to fields or specific areas; fundamental research vs. targeted research), modification of the definition of European value-added in research support (in addition to international collaboration, competition at European level), and providing an important case, the only programme allocating EU money only, where strategy formulation and the implementation of the strategy has been delegated to external stakeholders. At the level of European research funding organisations, the ERC has brought about fewer changes. The ERC has been defined in such a way that a full overlap does not exist with any other funding organisation in strategy or funding schemes. Where there is overlap in instruments, as with the ESF-Eurohorcs EURYI, these have been withdrawn. There is no evidence that this has been necessarily caused by the emergence of the ERC.

Most impact we found, or have serious grounds to expect, is still not stable and there is no certainty that it will occur. This is either because of inherent characteristics of the potentially affected area(s) of change or because of the multiplicity of intermediate factors that are outside the remit and/or control of the ERC. In other words, the highly innovative, risky and excellent projects supported by the ERC can fail exactly because they are highly innovative and the exceptionally high level of uncertainty that such research involves. Effects on research organisations can be overshadowed by policy developments at national and regional level and changes at national funding level can be slowed down, or for that matter cancelled, by broader economic and policy developments.

13.3 Three key messages

There are three key messages that follow from our findings. These are:

- First, although the ERC supports highly innovative projects ('frontier' potential) it could be difficult to fund only path breaking, frontier science and it may be more realistic to *recognise that its schemes will contribute to at least three types of research: path breaking innovations, developing radically new innovations, and excellent work within established trajectories.*

- Second, national research systems variations affect how research organisations responded to ERC funding schemes, both in terms of hosting, enticing or losing grantees and indirectly as sources of prestige and finance. In many respects, though, the responses of senior administrative staff in PROs are probably less significant than those of practicing researchers, especially those leading teams, at least in the short to medium term. Given the limited strategic capability of most central managers of research organisations, and the lengthy period required for most resource allocation changes to take effect in them, the impact of ERC programmes on whole organisations will take some time to discern. Insofar as such managers do attempt to use these schemes for boosting their prestige and reallocating resources, it is quite likely that their efforts will be counterproductive. *These points suggest that the ERC may be best advised not to concern itself overmuch with improving research organisations' performance or strategic capabilities.*

- And third, our finding may have some implications for future evaluations of the performance of the ERC and its funding schemes. Their objectives, by their very nature, presuppose that their main intended impact is both very mediated and far into the future. In turn, this means that it is highly likely that conditions and factors outside and beyond the control of the ERC can interfere and influence the outcome. All that the ERC can do in this case is to ensure that the optimal conditions for impact have been created. In other words, it will be probably difficult to assess the work of the ERC by assessing the extent to which impact has really occurred (at least for some time). It may be more appropriate to develop evaluation techniques focusing, at least initially, on the conditions for impact to occur.

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Annex 1: EURECIA objectives

The overall aim of EURECIA (Understanding and Assessing the Impact and Outcomes of the ERC Funding Schemes) is to develop and apply a novel conceptual framework and methodology to measure, attribute and assess the impact and outcomes of the ERC funding schemes. More specifically, the objectives of the research project are to:

- develop a conceptual framework to analyse the impact(s) of the ERC funding schemes in their interaction with existing national and transnational governance regimes;
- develop a bespoke methodology for the identification and attribution of ERC impact;
- apply this methodology, thereby both testing it and providing Stage One data on (a) the researchers, (b) research organisations, (c) research funding organisations, and (d) the wider context of national and transnational governance of science;
- propose methodologies for discrete (panel) assessment of progress towards the ERC achieving its desired and expected outcomes and impact;
- ensure that the framework for assessing outcomes and impact of the ERC incorporates a statement (and understanding) of its 'added value'; and
- provide output to aid ERC's strategy (including scrutinising its objectives) in consultation with ERC key stakeholders.

These objectives can be placed under three groups, namely to:

- develop the conceptual framework for impact and a methodology for measuring and attributing the impact of the ERC;
- apply this methodology thus testing it[46] and providing stage one data on the different aspects of science; and
- support the ERC to develop methodologies for discrete assessment of impact and provide input to support them in their strategy development.

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[46] EURECIA proposed an overall approach to the study of impact that is a real-time, panel study consisting of two stage measurement (at the beginning of the allocation of ERC projects and five years after that). This is emphasised in the proposal and also means that during this study the methodology is only partially tested; it could be exhaustively tested only after the second stage of the study.

Annex 2: Characterising the ERC as an organisation

The European Commission included the establishment of the ERC in its proposal for the Seventh Framework Programme (FP7). Under this proposal the ERC was to implement 'the Community activities' in investigator-driven 'frontier' research at the European level within a dedicated Programme, namely the IDEAS Programme. The proposal was approved by Decision No 1982/2006/EC of the European Parliament of December 18, 2006 (EP, 2006). Following that, the ERC was established with a Commission Decision of February 2, 2007 and the ERC Executive Agency was set up with a Commission decision of February 14, 2007 (EC, 2007). These documents outlined the rationale, activities, structure, operating principles, relationships with the EC and financial arrangements of the first pan-European organisation funding investigator-driven 'frontier' research in all fields of science.

Furthermore, these documents set out the decision regarding the budget for the Ideas programme and the ERC. It was decided that the amount necessary for the execution of the Ideas programme, for the duration of FP7) would be EUR 7 510 million[47]. The Council decision also stipulates that the costs of the Scientific Council and the dedicated administrative structure cannot, combined, exceed 5% of this amount.

This decision to set up a pan-European research-funding agency aiming to support investigator driven 'frontier' research based of scientific excellence has been interpreted in a number of ways. It has been discussed as part of the much broader objectives of the European Research Area (ERA) for further research integration (Nijkamp, 2003; Luukkonen, 2011, Luukkonen and Nedeva, 2010). Also, the story of the establishment of the ERC can be told through the content, structure and tensions in the European policy debate. These to a large degree shaped the organisation it is today (Gronbaek, 2003; Nedeva et al. 2003). More recently, Nedeva (2011) argued that the ERC was established as the next organisational step in the continuous attempts to alleviate the inherent tension between localised, mainly national, research spaces and global research fields.

Here it suffices to note that the act of the establishment of the ERC was preceded by a decade of gradual change and by three years of intense politicking (2002-2004). It should be expected that the intensity of the debate and the need to accommodate large variety of diverse pressures, expectations and demands affected the way in which the objectives, legal status and key organisational practices of the new organisations were defined. Whilst the organisational contradictions that this may entail are important these are not part of the current discussion.

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[47] There is a proposal for the next FP, Horizon 2020, for this amount to double.

Rather, in the context of EURECIA and the study of the impact of the ERC it is important to present its key organisational characteristics. These are its objectives, its principles of selection, its practices of accountability and reporting, its internal structure and the conditions of its funding schemes.

Aims, objectives and remit of the ERC

The official documents approved by the Council and the EC framed the rationale for the IDEAS Programme in general, and for the ERC in particular, in terms of the understanding that: (a) investigator-driven research is a key driver of wealth creation and social progress; (b) Europe is not making good use of its scientific potential and resources; and (c) an Europe-wide funding structure for 'frontier' research is an essential part of the ERA.

Accordingly, the primary aim of the ERC and its funding schemes, as set out initially, was to *'stimulate scientific excellence by supporting and encouraging the very best, truly creative scientists, scholars and engineers to be adventurous and take risks in their research. The scientists should go beyond established frontiers of knowledge and the boundaries of disciplines'*.[48]

This overall objective was to be achieved by *developing and supporting European researchers (researchers based in European research organisations) and by supporting the research organisations of Europe (universities and research institutes) to develop their research strategies and priorities to become global players in research.* Furthermore, the ERC had the ambition to '*create leverage towards structural improvements in the research system of Europe*'[49] and to *support research that can form the basis for new industries, markets and innovations.*

Reading through the official documents on the ERC three pointers emerge. First, its missions and objectives are still evolving as evidenced by sequential formulations. Hence, recently the core aim of the ERC was re-formulated as being '...*to encourage the highest quality research in Europe through competitive funding and to support investigator-initiated frontier research across all fields of research, on the basis of scientific excellence.*'[50]. This is only subtly different in that the emphasis has shifted to properties of research (excellence and frontier), remit and operating principles (competition and excellence) rather than characteristics of researchers. Such continuous clarification and sharpening of the missions and objectives of the ERC should be expected since it is still a very young organisation and the process of its institutionalisation is incomplete.

Second, a distinction between objectives-goals and objectives-means can be discerned. Objectives-goals relate to the support of research with specific properties, namely *excellent, highest quality research beyond the existing frontiers of knowledge.* Objectives-

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[48] See http://erc.europa.eu/index.cfm?fuseaction=page.display&topicID=12, accessed 11 Feb 2008,
[49] ERC Work Programme, 2008.
[50] See http://erc.europa.eu/about-erc/mission, accessed 15 Feb 2012.

means, on the other hand, refer to the social conditions that increase the probability of the objectives-goals to be achieved. These include *selecting proposals with particular properties (risky, excellent, outside the mainstream) and researchers with specific characteristics (talented, creative, at particular stage of their epistemic and organisational careers), and enabling conditions conducive to carrying out the research and developing researchers in organisational environments* (enable research organisations to develop strategies, mechanisms and structures to become global players).

And third, these objectives are diverse and include sometimes conflicting demands. This is very likely a result of the compromises that had to be made were the ERC to be established. However, the missions and objectives combine ones targeting directly the content of research, researchers and research careers, ones aiming to enable transformation of research organisations which by its very nature can be only indirect and objectives expressing a more 'standard' for the European Union level research and innovation policy approach of aiming to meet the demands of the knowledge society, make economic and societal contribution and lead to the development of new industries.

For the purposes of EURECIA, it is analytical useful to distinguish between three sets of objectives.

Objectives related to researchers, content of research and careers

In this respect the ERC aims to:

- support the best of the best scientific efforts in Europe across all fields of science, scholarship and engineering.
- promote wholly investigator-driven, or 'bottom-up' frontier research.
- encourage the work of the established and next generation of independent top research leaders in Europe.
- reward innovative proposals by placing emphasis on the quality of the idea rather than the research area.
- harness the diversity of European research talent and channel funds into the most promising or distinguished researchers.
- raise the status and visibility of European frontier research and the very best researchers of today and tomorrow.
- put excellence at the heart of European Research.[51]

Objectives specific to the StG scheme

These include the provision of suitable resources and conditions for 'up and coming research leaders...to **establish or consolidate a proper research team** and...start **conducting independent research in Europe**.' [52]

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[51] See http://erc.europa.eu/index.cfm?fuseaction=page.display&topicID=12 (accessed 15 June 2011).
[52] See http://erc.europa.eu/index.cfm?fuseaction=page.display&topicID=65, last accessed 24 August 2011.

Objectives specific to research organisations

Regarding research organisations, the ERC aims to 'help universities and other research institutions gauge their performance and encourage them to develop better strategies to establish themselves as more effective global players. The ERC aims to stimulate research organisations to invest more in the support of promising new talent ...'[53]

Organisational practices

Selection practices

The ERC has developed and instituted practices for the selection of proposals for funding using a two stage peer review process involving external referees. At the first stage of the peer review procedure consensual peer review is used to establish the ranking of the rated proposals; these rankings are agreed by a peer review panel. Each panel has a membership of about 10 scientists or scholars and a chair-person. Panel members review a certain number of proposals – the number of proposals does vary between panels but panel members report that reviewing takes on average about a week work[54]. Since there are two panels per research field (these work in alternate years) in case of overload it is possible to engender the help of the members of the alternate panel. Also where necessary, the panel members draw on the specific knowledge and expertise of external referees. There are currently 25 panels to cover the three domains of the ERC, namely social sciences and humanities, life sciences and physical and engineering sciences.

According to the rules for peer review operated by the ERC each proposal is assessed by a minimum of three reviewers. Initially (step 1) all proposals are reviewed by panel members. In step 2 reviews are carried out by panel members (2-3) and include external referees (2-3). Each application is assigned to a lead reviewer who introduces it for discussion and is responsible for producing the feedback to the applicant.

The formal instruction to peers provided by the ERC stipulate that each proposal should be assigned a mark between 1 (non-competitive) and 4 (outstanding) for the proposed research, the investigator and the host organisation. Reviewers are advised to reserve the top mark for the top 10% of the proposals, mark between 4.0 and 3.5 for the top 20% etc. The quality threshold is higher or equal to 2 (ERC Guide for Peer Reviewers, 2010). In reality, panels use their discretion and adapt these scales to the specific demands of the research field.

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[53] Mission statement: http://erc.europa.eu/index.cfm?fuseaction=page.display&topicID=12

[54] This section of the report draws on information collected by a research project funded by the Stiftelsen Riksbankens Jubileumsfond, Sweden and entitled "Peer Review Practices and the Legitimacy of the European Research Council" (PEERS). This was carried out by Dr. T. Luukkonen and Dr. M. Nedeva.

Decisions regarding the ranking of research proposals are taken by consensus. In out interviews we explored this matter is some detail. It appears that there are two positions of discord in the individual assessment of proposals: one is when a panel member from a neighbouring research field has mis-understood a particular point (in other words, this originates in limited knowledge and expertise) and the other one develops in the 'middle ground' of decisions and judgment (different opinion). These are naturally resolved in different ways but here of particular interest is the discord founded in different expertise.

ERC peer review panels are not discipline based but are formed around broader areas. In other words, these are by their very nature cross-cutting and include scientists and scholars from different albeit neighbouring research fields. In turn, this can provide the variety necessary to ensure that consensus does not select only proposals above the field's norm but also proposals that are interesting from the perspective of different research fields (shift of consensus).

Here we are not going to expand on the ways in which criteria and judgements are negotiated within the panels; a detailed analysis of that is provided by Luukkonen (2011).

In a nutshell, the ERC's peer review mechanisms focus on the assessment of the proposed research and on the potential of the applicant[55]. Only after that the other conditions for carrying out the research are examined. The peer review process is panel based and decisions are founded on consensus.

Accountability and reporting

Accountability and reporting practices are important at two levels of aggregation, namely the level of the ERC as organisation (this is about the accountability and reporting practices in which the ERC is involved) and the level of the ERC grantees (this is about the accountability and reporting practices that the ERC has introduced). Both sets of practices depend largely on the structural position of the ERC or, in other words, on the way in which the ERC is included in a number of relationships; most notable amongst these is the relationship between the ERC and the European Commission which manifests as 'the issue of the autonomy of the ERC'.

The issue of the autonomy of the ERC was a key point during the debate preceding its establishment. At the time, it was widely recognised, by scientists as well as policy operators, that the ERC would need a high degree of autonomy from the structures, requirements, mechanisms and rules of the EC which were regarded as restrictive and administratively cumbersome. In fact, the then Director of DG Research, A. Mitsos firmly stated that he 'would not give an inch' on the issue of the autonomy of the ERC

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[55] Here the balance can vary depending on the research field. Panels in the life sciences, for instance, are more likely to accord primacy the applicant and their 'career history'.

(THE, 2004). When the ERC was established, however, there were two legal choices entailing somewhat different levels of autonomy. These were either to establish the ERC as an executive agency of the EC or to set it up as an 'article 171' organisation. Whilst the latter option represented a higher level of autonomy it was decided that the ERC would have the status of an 'executive agency' of the EC. This has implications for the reporting and accountability rules that the ERC has to abide by and the ones that it could implement.

This means that legally the Commission is responsible for the implementation of the Ideas programme and, by implication, for the work of the ERC. Furthermore, the Commission is to guarantee the Council's autonomy by ensuring that it 'acts in accordance with the principles of excellence, autonomy, efficiency and transparency' (EP, 2006). Although the Scientific Council has full autonomy in developing the Work Programme the Commission 'can abstain from following' their position if it considers that the provisions of the programme have not been respected. In practice, the Commission annually adopts the Work Programme developed by the Scientific Council of the ERC and draws up an Annual Report to the European Parliament and the Council on its work. As one of our interviewees pointed out:

> "The ERC has a birth defect and that is the assumption, which is really wrong' that you can separate scientific strategy from the administrative side...the Scientific Council...was given independence, in terms of scientific strategy matters...At the same time the administration was set up inside the Commission first and then the Executive Agency.'

There is a discrepancy between the autonomy of the Scientific Council to formulate and decide upon scientific strategy and the way in which this strategy is enacted through the rules of administration. The ERCEA has little discretion over the rules and mechanisms that it operates because of its legal status and the fact that it award public funding - in fact, according to an interviewee it is hard for the leadership of the Council to work for changing the financial rules under which they operate since they are not normally invited to the discussions and also carry little political clout.

The ERC(EA) is embroiled in the strict and often cumbersome accountability rules and regulations of the European Commission and its performance is subjected to a number of formal and interim evaluations[56]. Furthermore, the legal status of 'executive agency' has clear implications for the reporting and accountability procedure involving grantees stemming from the fact that the ERC ought to operate under EU financial regulations.

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[56] There have been two recent reviews of the administrative structures of the ERCEA – Review of the European Research Council's Structures and Mechanisms and the European Council Task Force. The former made a number of suggestions regarding ways to bridge the divide between scientific and administrative governance of the ERC and the latter recommended that the ERCEA needs more autonomy.

One such implication is that formally the beneficiaries of ERC funding are not 'grantees' but 'contractors' of the Commission with the ensuing requirements for strict and firm accountability and control. According to the relevant documents there are important differences between the grant agreement of the ERC (this is the document that sets out the conditions of the grant and reporting) and the general FP7 grant agreement (ERC, 2008). At a closer examination, however, most differences are a matter of reference rather than substance. However, one important difference is that according to Article 4 of the ERC MGA, reporting is done in two distinct streams: 1) scientific reporting which is less frequent and is done by the PIs at the end of each project 'period'; and 2) financial reporting which is done by the host organisation and is done more frequently.

In light of the overall objective of the ERC, the support of 'frontier', path-breaking research, it is important whether and how research plans can be changed. According to Commission rules any change to the Grant Agreement has to be officially approved; in the case of the ERC, however, the research plan can be revised and expenditure re-allocated across budget lines without a request for official amendment – to the extent to which the research is still in line with the original scientific objectives. Until very recently, any change of the core part of the Grant Agreement – the Description of Work (DoW) – necessitated an amendment of Grant Agreement (ERC, 2008). Recently this was revised and formal amendment is required only when the tasks specified in the DoW have been changed and/or third parties have been included in the project. Whilst this is a move in the right direction, the DoW is still far too specific for the type of research projects (high risk, path breaking research) that the ERC aims to support.

Another controversial part of the accountability practices of the ERCEA is that its grantees (or legally 'contractors') ought to submit timesheets for the duration of the project. Even assuming that completing time sheets may not be that unreasonable to expect, because of the strict rules on the number of hours that grantees are allowed to include, these cannot capture the obsessively long days. In other words, time sheets become a wasteful fiction rather than appropriate accountability tool.

Organisationally, the accountability and reporting procedures (and practices) are the aspect where, as Luukkonen's empirical investigation confirmed (Luukkonen, 2012 WP report), it is particularly evident that the ERC is still caught up between two sets of, sometimes, contradictory demands. On one side is the existing accountability and reporting regime of the EC and on the other, the demands for a much more flexible approach generated by the objectives and remit of the ERC. These practices constitute an important part of the 'signal' that the ERC sends to the constituencies that it aims to affect.

Internal structure of the ERC

This inherent contradiction between 'autonomy' and 'control' characterising the relationship between the ERC and the EC is reflected by its internal structure. At a general level the ERC consists of an independent Scientific Council (SC) and a cost effective implementation structure (ERCEA). The SC comprises leading members of the scientific community and its members are appointed by the Commission for a period of four years renewable once. The SC is responsible for the overall scientific strategy of the organisation and has complete authority over decisions regarding the type of research to be carried out (set out in the annual Work Programme). It also follows the establishment and work of the peer review process. The Chair of the SC is the President of the Council and is assisted by two Vice-Presidents.

The implementation structure, the ERC Executive Agency (ERCEA) implements the peer review and selection process and carries out the financial and scientific management of the grants. The *President* is the official representative of the ERC with the EC and other bodies. He/she chairs the ERC Board meetings and the meetings of the SC. The *ERC Board* is the organisational platform for bridging the SC and the ERCEA and the space for the establishment of healthy working relationships between these. Membership of the Board consists of the following: the President and two Vice Presidents of the ERC, the ERC Secretary General and the Director of the ERCEA. The ERC *Secretary General* ensures the effective communications between the SC, the ERCEA and the EC and is appointed by the SC.

Apart from that the ERC has a *Steering Committee*; a body designed to supervise the work of the ERCEA. The EC appoints the members of the Steering Committee for a (renewable) period of two years. Currently the Steering Committee consists of EC officials and members of the SC.

ERC's funding schemes

To achieve its objectives, the ERC operates two funding schemes[57]. One of these, the ERC Starting Independent Researcher grant scheme (StG), targets researchers who are at a relatively early career stage and aims to enable them to transit into the highest echelons of their respective knowledge communities[58]. The second funding scheme operated by the organisation, the ERC Advanced Investigator grant scheme (AdG), is designed for stellar scientists and scholars and aims to provide support for highly innovative research ideas at the frontier of the respective research fields.

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[57] Recently two additional funding schemes were added to the portfolio – the Synergy Grants and the Proof of Concept grants. These are not discussed in any detail here since the time reference for EURECIA is 2007-2008 when only the two initial schemes were operational.
[58] There have been several changes to this since the establishment of the ERC. The most recent guide for applicants distinguishes between 'starters' and 'consolidators' thus distinguishing between the early and mid-career stages.

The two funding schemes currently operated by the ERC differ somewhat in terms of their objectives. Whilst both schemes aim to support high quality investigator driven research, the primary focus of the Starting Independent Grant scheme is to provide opportunities to early and mid-career scientists and scholars whilst the Advanced Investigator scheme has predominantly cognitive dimension and aims to support highly innovative, frontier research projects (ERC Guide for Applicants, 2010).

Both types of grant aim to support 'frontier research' which in the documents is defined as 'the pursuit of questions at or beyond the frontiers of knowledge, without regard for established disciplinary boundaries.' (ERC Guide for Applicants, 2010, p. 12). ERC's remit covers all fields of research, including social sciences and humanities. Support is relatively generous and successful StG and AdG applicants are awarded up to 2 and 2.5 million euro for up to five years respectively. All decisions are taken on the basis peer review using only criteria related to scientific excellence.

Both schemes support research teams headed by a single Principle Investigator. It is important that the teams can be within a single organisation or transgress organisational and national boundaries – this is determined only by the nature of the research and the competencies, equipment and facilities necessary to carry it out. In other words, the ERC grants are not subject to conditions for international collaboration which often accompany research funding at the European level. To the extent to which the work is to be carried out in a research unit within EU or member states the PIs can be from any part of the world. Conditions regarding the status of the PI refer only to their career stage and/or their professional standing in knowledge communities.

In addition, both types of grants are comparatively generous and provide support over a long(er) time period.

Table 19: ERC starting grant and ERC advanced grant schemes by key characteristics

	ERC Starting Grant	ERC Advanced Grant
Objectives	To provide adequate support to the independent careers of excellent researchers, regardless of nationality or current location, who are at the stage of establishing or consolidating their own independent research team or programme.	To promote substantial advances in the frontiers of knowledge, and to encourage new productive lines of enquiry and new methods and techniques, including unconventional approaches and investigations at the interface between established disciplines.
Eligibility	• The PI can be any age and any nationality, who intend to conduct the research in EU MS and Associated Countries. • The PI must have been awarded his/her first PhD no less than 2 and no more than 10 years prior to the publication date of the call for proposals.	• The PI can be any age and any nationality, regardless of age and current location • The PI should have a track record of significant research achievements in the last 10 years.
Type of research	• 'Frontier research': the pursuit of questions at or beyond the frontiers of knowledge, without regard for established disciplinary boundaries, in any area of research (apart from nuclear fission and fusion). • Projects of an interdisciplinary nature which cross the boundaries between different fields of research; • Pioneering projects which address new and emerging fields of research; • Unconventional, innovative approaches and scientific inventions so long as the expected impact on science, scholarship or engineering is significant. • Aiming to broaden scientific and technological knowledge – so projects should not be linked to commercial objectives.	• Substantial advances in the frontiers of knowledge, to encourage new productive lines of enquiry and new methods and techniques, including unconventional approaches and investigations at the interface between established disciplines. • Research that aims high, in terms of the envisaged scientific achievements as well as the creativity and originality of its approaches. • Pioneering and far-reaching challenges at the frontiers of the field(s) addressed, and involving new, groundbreaking or unconventional methodologies, whose risky outlook is justified by the possibility of a major breakthrough with an impact beyond a specific research domain/discipline.
Size of grants	Up to 2 Million Euro for up to 5 years (pro rata for shorter projects).	Normally up to 2.5 million Euro for up to five years pro-rata (can be up to 3.5 million Euro if there is 'Co-Investigator'; interdisciplinary; purchase of major research equipment; or PI coming from outside Europe).

Annex 3: Measuring 'approach' and 'standing': the DAS Framework

We developed a range of potential areas to measure by survey, drawing upon respondents' opinions and recalled facts to be answerable within a reasonable time and without relying upon extensive memory recall or a need for respondents to seek information from sources outside of the survey (increasing the likelihood of non-response):

Table 20: Measuring 'approach' and 'standing' characteristics through a survey-based approach

	Characteristics	Possible researcher activity areas to measure
Approach	Mobility	Geographic, workplace and cognitive mobility (e.g. any atypicality, high mobility across countries, workloads and intellectual field)
		Educational/study track record (e.g. atypical number of degrees at various levels)
	Track record of funded research projects	Atypicality of overall research project funding track record (e.g. funded by unusual funding schemes?)
		Motivation to undertake a research project (e.g. organisational career progression reasons or intellectual reasons?)
		Degree of novelty or peripherality of their research projects (e.g. undertaking new, marginal lines of research in the eyes of their knowledge community?)
		Risk levels in research projects proposed to research funders (e.g. proposing research with no precedent or proof-of-concept?)
		Risk levels for the success of research projects (e.g. chances of meeting minimum and exceptional goals?)
		How immediately applicable were the outputs of their research projects, both to their knowledge community and beyond?
	Organisational career choices and ambitions	In workplaces with low promotion prospects (e.g. due to otherwise desirable research-related conditions)?
		Urgency of next promotion
		Overall security of employment conditions
		Motivations for undertaking academic service tasks
	Research workplace features	Workplace international reputation and scientific performance
		Own research team size
	Approach towards research outputs	Research output types compared to norms and expectations for research area (e.g. atypical?)
		Why did they consider their research outputs to be important?
		What strategies did they pursue when targeting journals to have their research outputs published and disseminated

Cont'd	Characteristics	Possible researcher activity areas to measure
Standing	Organisational career	Ability to raise needed resources (e.g. availability of resources for international conferences and visits)
		Workloads and time for research; multiple appointments (reputational and network-bridging effects)
		Independence – autonomy over research direction, job security
		Personal funding situation, funded research project portfolio
		Team size (absolute, relative to research area, growth over time)
	Knowledge community career	Number and prestige of academic services, and number of outputs (relative to own career stage and research field) and accolades
		Collaboration patterns – number, stakeholder types involved
		Acceptance rates of outputs, chances of success of outputs, and applicability for academic and non-academics.
	Research environments	Workplace reputation and performance factors (e.g. best place in the world for the researcher's work, having high scientific performance, having outstanding international reputation)

These measures were translated into specific questions to provide data to characterise each respondent via our 23-part demographic-approach-standing (DAS) scheme (Table 21 below). For 'approach' and 'standing', the elements were scaled for 'high' to represent most/strongest 'frontier-potential'; 'low', the least/weakest.

Table 21: Overview of the 23-part, demographic-approach-standing (DAS) scheme used to profile the first cohort (2007 call) StG grantees and controls

	Element name	Description	Values
Demographic	*D1. Gender*	-	1=Female, 2=Male
	*D2. Age bracket**	Respondent's reported age as compared to the response distribution for their own ERC domain	1=Below average, 2=Average, 3=Above average
	D3. Relationship/dependents status	Combined measure of respondent's reported long-term relationship and dependent caring responsibilities	1=Low, 2=Medium, 3=High
	D4. Research domain	ERC research domain category	1=LS, 2=PE, 3=SH
Approach	*A1. Geographic and workplace mobility*	Combined measure of number of countries, and research workplaces worked in, during respondent's entire study and research career to date	1=Low, 2=Medium, 3=High
	A2. Cognitive mobility	Combined measure of reported number of significant changes of intellectual field during respondent's entire study and research career to date, and atypicality of respondent's study track record (UG, PG, PhD and more advanced degrees)	1=Low 2=Medium 3=High 4=Very high
	*A3. Perceived research novelty and risks***	Combined measure of perceived novelty and risk of respondent's StG application, with reported research output success and applicability risks for their most important research project during past two years	1=Low, 2=Medium, 3=High
	A4. Job security indifference	Reported job security increase after respondent's most recent research workplace move	1=Low, 2=High
	A5. Atypicality of project funding track record	Divergence from typical pattern in overall respondent set for number of respondent's research projects supported by national funding	1=Low, 2=High

Standing	*A6. Atypicality of journal targeting approach*	Divergence from typical pattern when choosing in which journal to publish own research outputs (journal reputation and impact factor considered important but not essential)	1=Low, 2=High
	Organisational career		
	S1. Ability to raise needed research resources	Combined measure of respondent's opinion on absence of internal and external research resource constraints, including those for essential international conferences and research visits	1=Low, 2=High
	*S2. Time for research**	Percentage of work time available for research, compared to own ERC domain, and whether lack of research time was a reported constraint	1=Low, 2=High
	S3. Long-term research direction independence	Reported research direction freedom and job security sufficient for long-term research activity	1=Low, 2=Medium, 3=High
	S4. Personal funding situation	Opinion of own funding amount for most important research project of the past two years compared to peers and actual amount (in Euros) compared to overall respondent set	1=Low, 2=Medium, 3=High
	S5. Own team size growth	Growth in proportion own research team represents of the respondent's overall laboratory/department size, after most recent research workplace move	1=Low, 2=High
	Knowledge community career		
	S6. Amount of academic service tasks undertaken	Combined measure of amount of professional associations joined, reviewing and editorial activities undertaken, funding and expert panels served on, conferences organised, and fellowships received, compared to the distribution for the overall response set	1=Low, 2=Medium, 3=High
	S7. Prestige of academic service	Opinion on how prestigious respondent's reportedly most important academic service is perceived to be by peers	1=Low, 2=High
	*S8. Number of research collaborators**	Absolute, and relative (self-reported, relative to peers), number of regular research collaborators	1=Low, 2=High
	S9. Output productivity	Overall output productivity (self-reported, relative to career stage and research field peers)	1=Low, 2=High
	S10. Number of accolades	Combined measure of number of patents (direct or indirect), prizes/special awards, and prestigious fellowships (or equivalent) compared to the overall response set	1=Low, 2=High
	*S11. Article acceptance rate**	Percentage of articles submitted in the past two years to respondent's own 'first choice' journal finally accepted, compared to own ERC domain	1=Low, 2=High
	Research environments		
	S12. Perceived workplace reputation and performance	Combined measure of respondent's opinions on whether their research workplace is the best place in the world to do their research, and has an outstanding international reputation, and a ranking of its scientific performance	1=Very low, 2=Low, 3=Medium, 4=High, 5=Very high
	*S13. Assumed research performance/ambition of national setting^*	Proxy classification based on nation's GERD as a percentage of GDP in 2008, number of FTE researchers and 2008, and national success rates (up to 2010) in both 'starting' and 'advanced' ERC grant applications	1=Low, 2=Medium, 3=High

*Notes: *=Element scaled for ERC domain specifics (i.e. LS, PE or SH); **=Sub-elements scaled by ERC domain; ^=Non-survey data supplied by Dietmar Braun, within EURECIA, covering 93 percent (167/180, missing=4) of respondents' reported current countries of residence.*

The survey provided sufficient data to characterise the survey respondents (only a proposed measure of multiple appointments was too indirect and had to be abandoned). In most questions we asked for 'most important' and recent project and outputs. This was to create a baseline from recent, significant information. When asked again (say, in five years time) this question structure will capture new information, meaning we will be able to determine *actual* changes, based on a comparison of two snapshots of the exact same respondents, rather than *perceived* StG impacts.

Wherever possible, multiple questions were used so DAS elements could be built upon multiple sub-measures or else we could chose from the apparently most robust data. The questionnaire was ordered according to distinct aspects of research life to appear

relevant to respondents – research projects, research workplaces, research funders, research collaborators, and research outputs. A specific section was included on respondents' ERC grant applications. Passport-type questions covered gender, age, country of residence and so on – for the 'demographic' component of the DAS-scheme. This left us with 86 final survey questions in total.

Two versions of the questionnaire were used – to enable slightly different questions to the grantee and control respondent groups in the final section on their ERC grant applications (about alternatives to ERC funding). The two questionnaires were otherwise identical. The questionnaire sections and issues addressed are shown below:

Table 22: Section titles and summary content of the online survey questionnaire sections of questions addressed to the first cohort (2007 call) StG grantees and controls

Survey section	Issues addressed
1. About You	Gender, age, relationship/dependent details, educational qualifications, geographical mobility, intellectual field mobility, reason for most significant intellectual and geographic moves, current country of residence, track record (number and types) of academic services
2. Your Research	Research project funding track record, most important recent (past two years only) research project features (name, duration, team size, budget), reason why project was the 'most important', time spent on work activities (research, teaching, supervision, admin), standardised career stage scale, and current promotion plans
3. Your Workplaces	Workplace mobility, details of current and previous workplace features, perceptions of current workplace performance, recruitment strategies and reputation, apparent workload constraints and research-related resources at current workplace
4. Research Funders	Perceived attractive features of ERC and other national and European research funders, perceived main evaluation criterion used by ERC and other research funders when deciding whether to fund research
5. Your Collaborators	Absolute and relative number of regular research collaborators, types of regular research collaborators (excellent researchers outside own lab/dept, excellent researchers outside own country, global leaders of research field, excellent industrial researchers, policy/government stakeholders, charity/foundation stakeholders)
6. Your Outputs	Number, types and importance of research outputs (single- and multi-authored journal articles, books, policy reports, other), output productivity (self-reported, relative to peers), number of accolades received (patents, prizes/special awards, prestigious fellowships), features of two most important recent (past two years only) research outputs, names of two most important journals in own research area (and why they are important), personal selection strategies for journal-based outputs, average percentage acceptance rate of own submissions to 'first choice' journals (past two years only)
7. Your ERC Grant Application	Prior submission of ERC grant application idea to another research funder, alternative ways of funding that project idea, changes made to project idea after not getting grant (control group only), research content features of ERC proposal, attractive features of ERC grants, perceptions about ERC application process (fairness, feedback quality), research workplace and other support received for ERC application (admin, intellectual), overall impressions about ERC application, overall perceived career effect of ERC application/grant, final impressions about the ERC's grant schemes (recommend to others, apply again)

To identify matching pairs it was necessary to aggregate to elements of the DAS framework even further. These are in Table 23 below:

Table 23: The reduced set of 11 DAS-scheme elements used to create the grantee/control matched-pairs

Category	Element name
Demographic	D1. Gender
	D2. Age bracket
	D4. Research domain
Approach	A2. Cognitive mobility
	A3. Perceived research novelty and risks
Standing	*Organisational career*
	S0. Researcher independence
	S2. Time for research
	S3. Long-term research direction independence
	Knowledge community career
	S7. Prestige of academic service
	S9. Output productivity
	Research environments
	S12. Perceived workplace reputation and performance

Annex 4: Research instruments

Survey Questionnaires

ERC Starting Independent Researcher Grant Scheme

SURVEY OF APPLICANTS: 2007 COHORT

Welcome ${m://FirstName} ${m://LastName}, to this survey for researchers who applied for an European Research Council (ERC) Starting Independent Researcher Grant in 2007. You have been asked to participate because you either received an ERC grant or passed Stage 1 of the evaluation process. (Please note: You will be able to fully answer this survey irrespective of whether you received an ERC grant.)

This survey is an important part of the 2009 to 2011 EURECIA academic research project, funded by EU Framework Programme 7 (grant number 229286). We aim to develop a better understanding of how the ERC and its funding schemes affect researchers across Europe. Via the questions in this survey we aim to collect information about you as a researcher and about the opportunities, organisational, funding and others, you have and/or need to carry out research of outstanding quality. This approach builds upon a methodology intended to register and attribute impact by taking two measurements (this one being the first one) and surveying two groups of ERC applicants: the group of ERC grantees and a control group consisting of applicants who passed the quality threshold but were not funded by the ERC.

It should take around 30 to 45 minutes for you to complete this survey. There are seven sections, divided into seven pages, asking about: your current details; your research; your research workplaces; research funders; your collaborators; your outputs; and, lastly, your ERC grant application. We would ask you to please try to complete all questions in each section as fully as possible. Please note that you can click to go 'back' to revise any of your answers. Please also note that you can leave the survey and return to complete it using the original link you were sent. (However please first click 'continue' on the bottom of the page you are currently viewing, to ensure your responses are correctly saved.)

You will see that we ask for brief details about your projects and publications. This means that your response cannot be anonymous. However it is most strictly confidential. No names or individual level data will be reported to the ERC (or to any other funding organisation). Our survey results will only ever be presented in an aggregated form.

We stress that your participation in this survey is entirely voluntary. You are free to exit at any stage. You may contact us to have your responses permanently deleted at any stage. Our full privacy policy for this survey is available for you to view here. Detailed further information about the EURECIA project is publicly available here.

If you are happy to proceed, please click the button below to continue.

Survey progress: **[1. ABOUT YOU]** > 2. Your research > 3. Your workplaces > 4. Research funders > 5. Collaborators > 6. Your outputs > 7. Your ERC grant application

Section 1 of 7 -- About You

This first section asks you please to describe your educational qualifications, current details and professional / academic service activities.

Your responses here allow us to develop a picture of some of the important roles you undertake within your research community.

A. YOUR EDUCATIONAL QUALIFICATIONS

Q1 **A1. Please indicate how many of each of the following types of educational qualification you currently hold:**

(Please include ALL your qualifications, not just the highest one you hold.)

1.1 | 0 | Undergraduate (i.e. Bachelors or equivalent)
1.2 | 0 | Postgraduate (i.e. Masters or equivalent)
1.3 | 0 | Doctorate (i.e. PhD or equivalent)
1.4 | 0 | Other (please specify) [   ]

Q2   **A2. Overall in how many countries have you studied and worked?**

(Please count once from the start of your UG studies until the present time.)

[⬍]

Q3   **A3. If applicable, please indicate your most significant geographical move during this time:**

(Otherwise please leave this question blank.)

The OLD country you moved FROM	[ ]	3.1
The NEW country you moved TO	[ ]	3.2
WHY was this a significant move for you?	[ ]	3.3

Q4   **A4. How many significant changes of intellectual field / research area have you made during your entire career so far?**

(For this question please count from the start of your UG studies until the present time. You may include significant changes that have taken you into a different field and significant changes within the SAME field.)

[⬍]

Q5   **A5. If you have significantly changed intellectual field / research area during your entire career, please indicate below your most significant change:**

(Otherwise please leave this question blank.)

The OLD intellectual field / research area you moved FROM	[ ]	5.1
The NEW intellectual field / research area you moved TO	[ ]	5.2
WHY was this a significant change for you?	[ ]	5.3

B. YOUR CURRENT DETAILS

Please note that we ask for these details because previous studies have shown they are important factors that do affect researchers' careers.

(Please feel free not to answer - or use the 'prefer not to say' options - if you find any of these questions too personal or intrusive.)

Q6   **B1. In which country do you currently reside?**

[⬍]

Q7   **B2. Please what is your age?**

Age in years (on 1 December 2010)   [   ]

Q8   **B3. You are:**

[⬍]

Q9   **B4. Are you married, in a civil partnership or in a long-term relationship (or equivalent)?**

Yes	No	Prefer not to say
○	○	○

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B5. Do you currently have one or more dependents, such as children, friends or relatives whom you care for?

Yes	No	Prefer not to say
○	○	○

C. YOUR ACADEMIC SERVICES

Q11 **C1. Please indicate overall how many:**

	None at all	A small number	A moderate number	A large number	A very large number	Don't know / Not applicable
11.1 PROFESSIONAL ASSOCIATIONS you have joined	○	○	○	○	○	○
11.2 REVIEWING activities (e.g. of articles, of proposals) you have undertaken	○	○	○	○	○	○
11.3 EDITORIAL activities (e.g. of journals, of books) you have undertaken	○	○	○	○	○	○
11.4 FUNDING panels you have served on (e.g. to decide research funding allocations)	○	○	○	○	○	○
11.5 EXPERT panels you have served on	○	○	○	○	○	○
11.6 CONFERENCES you have organised	○	○	○	○	○	○
11.7 FELLOWSHIPS you have received	○	○	○	○	○	○

Q12 **C2. Choosing from all your roles, activities and accolades, please answer the questions below for just the one that you consider to be the most important to you (for any reason):**   **Q13**   **Q14**

	WHAT is it?							WHEN did it start?	How PRESTIGIOUS do you think your research community considers it?		
	Professional association membership	Reviewing activity	Editorial activity	Funding panel	Expert panel	Conference organiser	Fellowship	(YYYY format, e.g. 1985)	Highly prestigious	Moderately prestigious	Not prestigious at all
Your most important ...	○	○	○	○	○	○	○	☐	○	○	○

Q15 **C3. Why do you consider this one role / activity / accolade to be your most important?**

[ ]

Section 2 of 7 -- Your Research

This second section asks about funded projects you work on to pursue your research ideas.

Your responses here indicate to us the kinds of research you undertake - and help us to understand the wider research community within which you carry out your specific research activities.

A. YOUR OVERALL RESEARCH PROJECT PORTFOLIO

Q16 **A1. Since completing your PhD (or equivalent), please indicate how many funded research projects you have worked on, supported by each of these funders:**

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(Please note these are research projects you have worked on in any capacity, e.g. as a project head or as a project team member. However please only include projects for which you have had to apply for project funding. Please do not include research supported by your normal salary etc.)

		NONE of my projects have been supported by this funder	A SMALL number of my projects have been supported by this funder	A MODERATE number of my projects have been supported by this funder	A LARGE number of my projects have been supported by this funder	Don't know / Not applicable
16.1	Your own university / research institute / workplace	○	○	○	○	○
16.2	Your main national funding agency / ministry	○	○	○	○	○
16.3	European Research Council (ERC)	○	○	○	○	○
16.4	European Science Foundation (ESF)	○	○	○	○	○
16.5	Framework Programmes (NOT including ERC)	○	○	○	○	○
16.6	Industry	○	○	○	○	○
16.7	Charities / foundations	○	○	○	○	○
16.8	Other (please specify)	○	○	○	○	○

B. YOUR RECENT FUNDED RESEARCH PROJECTS

B1. Please describe one funded research project that you have worked on in any capacity during the past two years only - and NOT including your ERC project (if applicable) - that you consider your most important (for any reason):

(Please note: If your ERC project is your ONLY funded research project from the last two years then please do describe it here. However please be aware that the final section of the survey will also ask some questions about it - albeit when it was still at the application stage.)

Q17

	What is the research project TITLE?	What is the main FIELD of the research project?				What is your main ROLE for the research project?				
	Project title	Physical sciences / engineering	Life sciences	Social sciences / humanities	Inter-disciplinary	Principal investigator	Co-investigator	Thematic expert	Administrator	Other
Your most important research project in the past two years only		○	○	○	○	○	○	○	○	○

Q18 (under FIELD columns), Q19 (under ROLE columns)

Q20 **B2. Why do you consider this particular project to be your most important one during the past two years?**

B3. For the same project, please indicate the size of your total share of the research grant - i.e. the portion allocated specifically to you / your local team:

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The AMOUNT of research grant for you from the total duration of the project:

	Grant for you (in Euros)	Compared to TYPICAL amounts in your research area, the grant is:				
		Very large	Large	Moderate	Small	Very small
Your research project's grant size	**Q21**	○	○	○	○	○
				Q22		

B4. Once again for the same project, please indicate the funding arrangements:

The MAIN FUNDER of the research project is:

	Your own university / research institute / workplace	Your main national funding agency / ministry	ERC	ESF	Framework Programme (NOT including ERC)	Industry	Charity / foundation	Other
Your research project's main funder	○	○	○	○	○	○	○	○
					Q23			

B5. For the same project, please indicate its team size (i.e. only team members supported by the project's funding):

Approximately HOW MANY people are in your local team for the research project?

	Number of people	Compared to TYPICAL team sizes in your research area, the team is:				
		Very large	Large	Medium	Small	Very small
Your research project's team size	**Q24**	○	○	○	○	○
				Q25		

B6. Once again for the same project, please indicate its duration:

	In which years does the research project START and END?		Compared to TYPICAL project lengths in your research area, the duration of the project is:				
	Start (YYYY format, e.g. 1985)	End	Very long	Long	Moderate	Short	Very short
	26.1	**26.2**					
Your research project's duration			○	○	○	○	○
	Q26				**Q27**		

Q28 **B7. Please indicate the contributions of the same research project:**

(Please tick ALL that apply.)

	Developing / using a new APPROACH	Developing / using new DATA	Developing / using a new THEORY	Developing / using a new METHOD	Developing / using new EQUIPMENT	Developing / using new MATERIALS	Addressing an UNDERSTUDIED research area	Other
Your research project's contributions	☐	☐	☐	☐	☐	☐	☐	☐

Q29 **B8. Once again for the same project, how advanced was its main research idea at the stage when it was submitted as a proposal to seek funding:**

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	No proof-of-concept / no supporting evidence from fieldwork (or equivalent)	Some proof-of-concept / some supporting evidence from fieldwork (or equivalent)	Already proven / supported by evidence from fieldwork (or equivalent)	Don't know / Not applicable
Your research project at proposal stage	○	○	○	○

Q30 **B9. What is the percentage chance your project will achieve (or has achieved) the minimum goals required of its main funder?**

	0-20%	21-40%	41-60%	61-80%	81-100%	Don't know / Not applicable
Your research project's chances of meeting its minimum goals	○	○	○	○	○	○

Q31 **B10. What is the percentage chance that your project will reach (or has reached) significantly higher goals than the minimum expected from it by its main funder?**

	0-20%	21-40%	41-60%	61-80%	81-100%	Don't know / Not applicable
Your research project's chances of meeting significantly higher goals	○	○	○	○	○	○

Q32 **B11. How long will it be before the outputs from your research project will be used by people within your own research community:**

	0-5 years	6-10 years	11-15 years	16-20 years	>20 years	Don't know / Not applicable
Your research project's outputs being used within your research community	○	○	○	○	○	○

Q33 **B12. And by people outside of your research community (e.g. by non-academics):**

	0-5 years	6-10 years	11-15 years	16-20 years	>20 years	Don't know / Not applicable
Your research project's outputs being used outside your research community	○	○	○	○	○	○

C. YOUR TIME FOR WORK ACTIVITIES

Q34 **C1. Please adjust the sliders to indicate the approximate percentage of your work time you currently spend doing the following:**

0	10	20	30	40	50	60	70	80	90	100

34.1 Research %

34.2 Teaching %

34.3 Administration %

Other (please specify)

34.4 %

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D. YOUR RESEARCH CAREER PLANS

Q35   **D1. If you consider the typical career pattern in your country, how many steps are you still away from the highest level that an academic / researcher can normally reach (e.g. full professor / chair in most countries)?**

5 steps	4 steps	3 steps	2 steps	1 step	I am already at the highest achievable level
○	○	○	○	○	○

Q36   **D2. When do you plan to apply for your next promotion?**

Already applied	Within 12 months	1-2 years from now	>2-3 years from now	>3-4 years from now	>4-5 years from now	>5 years from now
○	○	○	○	○	○	○

E. RESEARCH CONSTRAINTS

Q37   **E1. Do any of the following constraints upon your research activity apply to you, in your current academic / research position:**

	Yes, this is a MAJOR constraint	Yes, this is a MODERATE constraint	No, this is NOT a constraint	Don't know / Not applicable
37.1 Limited time available for your research?	○	○	○	○
37.2 Limited autonomy in selecting your research topics?	○	○	○	○
37.3 Limited access to resources in your current research organisation?	○	○	○	○
37.4 Limited opportunities to acquire external research funding?	○	○	○	○
37.5 Limited opportunities to collaborate with people outside of your current research organisation?	○	○	○	○
37.6 Other (please specify)	○	○	○	○

Section 3 of 7 -- Your Workplaces

This third section asks about your workplaces - specifically your research workplaces (i.e. places where you have worked to pursue your research, as opposed to purely teaching or other activities).

Your responses here will tell us about workplace features that are important for researcher's undertaking your kind of research activity.

Please note: For this section, moving within the same overall organisation counts as moving to a different 'workplace' (e.g. such as moving from one lab/dept to another within the same organisation).

A. YOUR WORKPLACE MOBILITY

Q38   **A1. At how many workplaces have you worked during your entire study and work career?**

(Please count from the start of your UG studies until the present time. Please include any moves within the same organisation.)

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B. FEATURES OF YOUR WORKPLACES

B1. Please indicate your current research workplace:

Q39 — Laboratory / department level — Name of lab / dept

Q40 — Overall university / organisation level — Name of uni / org

Q41 — What TYPE of organisation is the workplace?

	Name of lab / dept	Name of uni / org	University	Research institute	Industry	Charity / foundation	Other
CURRENT workplace			○	○	○	○	○

B2. Please indicate your most recent, previous research workplace:

(You may leave this question blank, and proceed to the next, if you have never worked at a different workplace.)

Q42 — Laboratory / department level — Name of PREVIOUS lab / dept

Q43 — Overall university / organisation level — Name of PREVIOUS uni / org

Q44 — What TYPE of organisation was the workplace?

	Name of PREVIOUS lab / dept	Name of PREVIOUS uni / org	University	Research institute	Industry	Charity / foundation	Other
PREVIOUS workplace			○	○	○	○	○

B3. Please indicate when you worked at each of the two workplaces:

Q45 — When did you START at the workplace? (YYYY format please, e.g. 1985)

Q46 — When did you FINISH at the workplace? (Please write 'Ongoing' if you still work there, e.g. hold a visiting position)

	Start year	Finish year
Current workplace		
Previous workplace		

Q47 B4. Please indicate the longest employment contract term that you have held at each of the two workplaces:

(Example: if you spent your first 5 years at the workplace on a series of 'probationary / fixed-term' contracts but then secured a 'permanent' contract during your last year, you would answer 'permanent / open-ended' for your 'longest term' employment contract at that workplace.)

Your LONGEST employment contract term at the workplace was:

	1-year probationary / fixed-term	2-years probationary / fixed-term	3-years probationary / fixed-term	4-years probationary / fixed-term	5-years probationary / fixed-term	Permanent / open-ended
47.1 Current workplace	○	○	○	○	○	○
47.2 Previous workplace	○	○	○	○	○	○

B5. Please indicate the number of research active staff at each of the two workplaces:

(Please DO count post-docs as research active staff. However please do NOT include PhD / other students - unless they are independently active on research projects.)

Research team level — Number of research active staff in your RESEARCH TEAM

Laboratory / department level — Number of research active staff in your LAB / DEPT

	Number of research active staff in your RESEARCH TEAM	Number of research active staff in your LAB / DEPT
Current workplace	**48.1**	**49.1**
Previous workplace	**48.2**	**49.2**

Q48   Q49

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C. YOUR OPINIONS ABOUT YOUR WORKPLACES

Q50 **C1. Now please consider only your current workplace. Please indicate whether you disagree or agree with these statements about your working conditions:**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know / Not applicable
50.1 My current job contract is SECURE enough for me to pursue long-term research goals	○	○	○	○	○	○
50.2 I am free to determine the DIRECTION of my own research	○	○	○	○	○	○
50.3 My current workplace is the BEST place in the world to do my research	○	○	○	○	○	○
50.4 My current workplace offers me excellent PROMOTION PROSPECTS	○	○	○	○	○	○
50.5 My current workplace has an outstanding INTERNATIONAL REPUTATION	○	○	○	○	○	○

Q51 **C2. Once again for your current workplace, please indicate whether you disagree or agree with these statements about your various workloads:**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know / Not applicable
51.1 My TEACHING workload prevents me from undertaking my research	○	○	○	○	○	○
51.2 My SUPERVISION workload prevents me from undertaking my research	○	○	○	○	○	○
51.3 My ADMINISTRATIVE workload prevents me from undertaking my research	○	○	○	○	○	○

Q52 **C3. Still considering only your current workplace, please indicate whether you disagree or agree with these statements about research-related resources:**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know / Not applicable
52.1 I have sufficient resources to allow me to attend the main INTERNATIONAL CONFERENCES in my research area	○	○	○	○	○	○
52.2 I have sufficient resources to allow me to undertake essential INTERNATIONAL RESEARCH VISITS	○	○	○	○	○	○
52.3 My research is hindered by inadequate ADMINISTRATIVE SUPPORT	○	○	○	○	○	○

Q53 **C4. Finally, comparing to other workplaces where people carry out similar research, how would you assess your current workplace in terms of:**

	Very strong	Strong	Average	Weak	Very weak	Don't know / Not applicable
53.1 Scientific performance / reputation	○	○	○	○	○	○
53.2 Funding for research	○	○	○	○	○	○
53.3 Overall support provided to researchers	○	○	○	○	○	○
53.4 Policies / strategies to recruit new researchers	○	○	○	○	○	○

		Very strong	Strong	Average	Weak	Very weak	Don't know / Not applicable
53.5	The amount of overall autonomy granted to researchers	○	○	○	○	○	○

Section 4 of 7 -- Research Funders

This fourth section asks you please to rank a variety of organisations that fund research.

Your responses here indicate to us which kinds of organisations are suited to support your particular research activities. They also tell us what features you believe these organisations look for when they decide to fund research.

A. FUNDERS' ATTRACTIVE FEATURES

Q54 **A1. From the selection below, please indicate what you consider to be the attractive features, from your point of view, of each of the following funding organisations:**

(Please note: You can choose as many 'attractive' features for each funder as you wish. You can select different attractive feature(s) for each funder - i.e. you do not have to select the same feature(s) for each funder.)

		High reputation / prestige	High quality peer review	Low administrative / bureaucratic burden	Appropriate grant size	Enables novel / innovative research	Enables international collaboration	Helps significant research findings to be achieved	Don't know / Other / Not applicable
54.1	Your own university / workplace	☐	☐	☐	☐	☐	☐	☐	☐
54.2	Your main national funding agency / ministry etc.	☐	☐	☐	☐	☐	☐	☐	☐
54.3	ERC	☐	☐	☐	☐	☐	☐	☐	☐
54.4	ESF	☐	☐	☐	☐	☐	☐	☐	☐
54.5	Framework Programme (NOT including ERC)	☐	☐	☐	☐	☐	☐	☐	☐
54.6	Industry	☐	☐	☐	☐	☐	☐	☐	☐
54.7	Charities / foundations	☐	☐	☐	☐	☐	☐	☐	☐
54.8	Other (please specify)	☐	☐	☐	☐	☐	☐	☐	☐

B. FUNDERS' MAIN DECISION-MAKING CRITERION

Q55 **B1. From the selection below, please indicate what you believe to be the one main criterion (i.e. the most important one) applied by each of the following funders when they decide whether or not to fund a typical research project proposal:**

(Example: If you considered that the 'ESF' is mainly interested in an 'applicant's track record', i.e. as its main way to decide which person / research to fund, then you would tick only that box for the 'ESF' row. Please note: You can select a different 'main' criterion for each funder if you so wish; you do not have to select the same 'main' criterion for each.)

		Applicant's track record	Applicant's reputation	Reputation of applicant's host organisation	Appropriateness / quality of project team	Project's quality / rigour	Project's novelty / innovativeness	Project's socio-economic impact / relevance	Don't know / Other / Not applicable
55.1	Your own university / workplace	○	○	○	○	○	○	○	○
55.2	Your main national funding agency / ministry etc.	○	○	○	○	○	○	○	○
55.3	ERC	○	○	○	○	○	○	○	○
55.4	ESF	○	○	○	○	○	○	○	○

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	Applicant's track record	Applicant's reputation	Reputation of applicant's host organisation	Appropriateness / quality of project team	Project's quality / rigour	Project's novelty / innovativeness	Project's socio-economic impact / relevance	Don't know / Other / Not applicable
55.5 Framework Programme (NOT including ERC)	○	○	○	○	○	○	○	○
55.6 Industry	○	○	○	○	○	○	○	○
55.7 Charities / foundations	○	○	○	○	○	○	○	○
55.8 Other (please specify)	○	○	○	○	○	○	○	○

Section 5 of 7 -- Your Collaborators

This fifth section asks you please to describe people with whom you regularly work.

Your responses here tell us about your peer group, about your research community - and your relations within it.

Please note: Where applicable, you may include people related to your ERC-funded project.

A. NUMBER OF COLLABORATORS

Q56 **A1. Overall how many regular research collaborators do you currently have?**

('Collaborators' here indicates people with whom you work on projects, with whom you co-author publications, i.e. all people with whom you regularly work on research-related activities.)

[dropdown]

Q57 **A2. Comparing to what is typical for your research area, is your number of collaborators:**

○ Very high?   ○ High?   ○ Moderate?   ○ Low?   ○ Very low?

B. WITH WHOM YOU COLLABORATE

Q58 **B1. Thinking about your collaborators, please indicate whether you disagree or agree with these statements:**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know / Not applicable
58.1 I often work with excellent researchers who are based outside my own LABORATORY / DEPARTMENT	○	○	○	○	○	○
58.2 I often work with excellent researchers who are based outside my own COUNTRY	○	○	○	○	○	○
58.3 I often work with excellent researchers who are considered to be the GLOBAL LEADERS of my research area	○	○	○	○	○	○
58.4 I often work with excellent researchers from INDUSTRY	○	○	○	○	○	○
58.5 I often work with people in POLICY or GOVERNMENT	○	○	○	○	○	○
58.6 I often work with people from CHARITIES or not-for-profit FOUNDATIONS	○	○	○	○	○	○

Section 6 of 7 -- Your Outputs

This sixth, penultimate section asks about publication practices in your research area and for you please to describe your own outputs.

Your responses here tell us about the kinds of outputs you produce and about the variety of outputs produced by different research areas.

A. OUTPUT TYPES, PRODUCTIVITY AND AWARDS

Q59 **A1. In your research area, how important are each of the following kinds of research outputs:**

	Very important	Quite important	Not important	Don't know / Not applicable
59.1 Single-authored books / monographs?	○	○	○	○
59.2 Multi-authored books / monographs?	○	○	○	○
59.3 Single-authored journal articles?	○	○	○	○
59.4 Multi-authored journal articles?	○	○	○	○
59.5 Single-authored policy reports?	○	○	○	○
59.6 Multi-authored policy reports?	○	○	○	○
59.7 Other? (Please specify)	○	○	○	○

Q60 **A2. How many of each of the following kinds of research outputs have you produced:**

(Please only include published outputs, i.e. NOT works in progress, only submitted for publication, or at any other pre-publication stage.)

	I have produced NO research outputs of this kind	I have produced SOME research outputs of this kind	I have produced MANY research outputs of this kind	Don't know / Not applicable
60.1 Single-authored books / monographs	○	○	○	○
60.2 Multi-authored books / monographs	○	○	○	○
60.3 Single-authored journal articles	○	○	○	○
60.4 Multi-authored journal articles	○	○	○	○
60.5 Single-authored policy reports	○	○	○	○
60.6 Multi-authored policy reports	○	○	○	○
60.7 Other (please specify)	○	○	○	○

Q61 **A3. Given your career stage - and what is typical for your research area - would you say your overall output productivity is:**

○ Very high?   ○ High?   ○ Moderate?   ○ Low?   ○ Very low?

Q62 **A4. How many of the following you have received:**

	None at all	A small number	A moderate number	A large number	A very large number	Don't know / Not applicable
62.1 Patents (i.e. directly or indirectly contributed to)	○	○	○	○	○	○
62.2 Prizes or special awards	○	○	○	○	○	○
62.3 Prestigious fellowships (or equivalent)	○	○	○	○	○	○

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B. YOUR IMPORTANT OUTPUTS

B1. Please describe two of your own outputs - during the past two years only - that you feel have been very important for your own research career:

(Please note, you may describe fewer than two if you wish.)

		Q63 What TYPE of output is it?					Q64 What is its TITLE?	WHEN did you produce it? Q65	
		Book / monograph	Book chapter	Journal article	Policy report	Other	Title	Year (YYYY format, e.g. 1985)	
63.1	Your important output 1	○	○	○	○	○	64.1	65.1	
63.2	Your important output 2	○	○	○	○	○	64.2	65.2	

Q66 **B2. Please briefly explain why the outputs you described above (in B1) have been very important for your research career:**

C. JOURNALS IN YOUR RESEARCH AREA

C1. Please describe the two most important journals in your research area:

(You may describe fewer than two if you wish.)

	Q67 What is its NAME? Journal name	Why is it IMPORTANT? Q68 Reason(s)
Important journal 1	67.1	68.1
Important journal 2	67.2	68.2


D. SELECTING JOURNALS

Q69 **D1. Please indicate the importance of each of the following factors when you select to which journals to submit your work:**

		Essential	Important	Irrelevant
69.1	The journal's reputation	○	○	○
69.2	The impact factor of the journal	○	○	○
69.3	The chance of acceptance	○	○	○
69.4	Publishing in your native language	○	○	○
69.5	Reaching your target audience	○	○	○

E. ACCEPTANCE RATES FOR YOUR PAPERS

Q70 **E1. Please adjust the slider below, to indicate approximately what percentage of the papers you have submitted**

to peer-reviewed journals - during the past two years only - were finally accepted by the journal to which you originally submitted them (i.e. by your 'first choice')?

	0	10	20	30	40	50	60	70	80	90	100
Percentage accepted											**0**
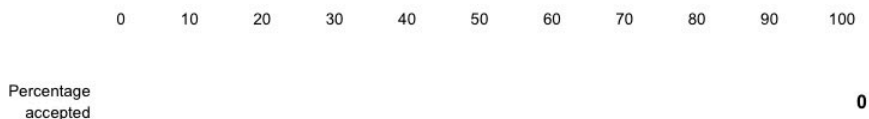
Q71 **E2. What is the one main reason you suspect why any of your papers - once again in the past two years - have not initially accepted by your 'first choice' journal:**

○ I submitted novel / non-mainstream material to journals that prefer to publish more 'mainstream' material

○ I submitted material without sufficient proof-of-concept / supporting fieldwork (or equivalent)

○ I submitted material of insufficient quality (in my own opinion)

○ Other (please specify)

○ ALTERNATIVELY: I have never had a paper initially rejected by my 'first choice' journal

Section 7 of 7 -- Your ERC Grant Application

This seventh, final section asks you please to describe your ERC grant application.

Your responses here tell us about key features of the ERC grants and any effects your application for one has had on your career so far.

A. YOUR APPLICATION OPTIONS

We understand your ERC grant application was entitled: '${e://Field/ERCAcronym}: ${e://Field/ERCTitle}'.

Q72 **A1. Before your ERC grant application, had you already submitted roughly the SAME research project idea to:**

	Yes	No
72.1 Your own university / research institute / workplace?	○	○
72.2 Your main national funding agency / ministry?	○	○
72.3 A different European-level funding organisation / scheme? (Please specify)	○	○
72.4 Any other funding organisation? (Please specify)	○	○

Q73 **A2. We understand that you received an ERC grant. However this question is about alternative ways of funding your ERC project had you not received your grant. Therefore, please read these statements carefully then choose one that best applies to your situation:**

○ I received an ERC grant - but if I had not there was an EQUIVALENT grant in my country that would have provided the same conditions to allow me to pursue fully the same research

○ I received an ERC grant, but if had not I would have needed to combine SEVERAL research grants to pursue fully the same research

○ I received an ERC grant, but if had not there would have been NO equivalent grant funding available in my country to allow me to pursue fully the same research

○ Other (please specify)   'Grantee' only version

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Q73 A2. We understand you passed Stage 1 but did not finally receive an ERC grant. This question therefore asks about any alternative ways you may have found to fund the research originally proposed in your ERC grant application. Please indicate which one of these statements is most applicable to your situation:

○ I used an EQUIVALENT grant in my country - i.e. one that provided the same conditions - to FULLY realise the research I had originally planned to do

○ I combined SEVERAL research grants to FULLY realise the research I had originally planned to do

○ Due to their being NO suitable alternative funding sources, I DROPPED my originally proposed research project entirely

○ Other (please specify)

'Control' only version

Q74 A3. If you modified your original research plan, please indicate whether you then did any of the following:

(Please tick ALL that apply. If you have dropped your originally proposed research, please skip this question.)

74.1 ☐ I increased the TIME needed to complete the planned research

74.2 ☐ I reduced the number of PROBLEMS I would work on within the planned research

74.3 ☐ I reduced the number of METHODS I would use to do the planned research

74.4 ☐ I reduced the scope of the EXPERIMENTS / OBSERVATIONS I had would use to do the planned research

74.5 ☐ I changed the RESEARCH TOPIC (please briefly indicate how)

74.6 ☐ Other (please specify)

B. THE RESEARCH PROPOSED IN YOUR APPLICATION

Q75 **B1. How was the project you applied for related to the major interests of your research community?**

○ It addressed core research interests of the community

○ It addressed a new topic of whose importance the community still has to be convinced

○ It addressed a topic that is important for the progress of the community's research but in which only a few groups are interested

○ Other (please specify)

Q76 **B2. How was the project you applied for related to your own previous research?**

○ It represented a complete change of my line of research

○ It was a new research line significantly different from my other research which I also continue

○ It was a logical continuation of my previous research

○ Other (please specify)

C. FEATURES OF ERC GRANTS

Q77 **C1. To what extent were the following features of ERC grants important for your ERC grant application?**

	Essential	Important	Irrelevant
77.1 Total sum of money	○	○	○
77.2 Duration (i.e. 5 years)	○	○	○
77.3 The possibility to move between research organisations	○	○	○
77.4 The encouragement to submit risky projects	○	○	○
77.5 The opportunity to build a research group	○	○	○
77.6 The reputation of the grant	○	○	○
77.7 The support of interdisciplinary research	○	○	○
77.8 Other (please specify)	○	○	○

D. YOUR ERC GRANT APPLICATION PROCESS

Q78 **D1. Please indicate whether you agree or disagree with the following statements concerning the process of your ERC grant application:**

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know / Not applicable
78.1 My ERC grant application took less TIME to write than my other, typical research project grant applications	○	○	○	○	○	○
78.2 The ADMINISTRATIVE requirements (e.g. project costings) of my ERC grant application were less demanding than for my other, typical research grant applications	○	○	○	○	○	○
78.3 The overall financial COST of preparing / submitting my ERC grant application was lower than for my other, typical research grant	○	○	○	○	○	○

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		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know / Not applicable
	applications						
78.4	The evaluation / peer review process for my ERC grant application seemed to be FAIRER than for my other, typical research grant applications	○	○	○	○	○	○
78.5	The official feedback I received from my contacts with the ERC was more USEFUL than I typically receive from other funders	○	○	○	○	○	○

E. TYPES OF SUPPORT YOU RECEIVED

Q79 **E1. Please rate the usefulness of any support you received from the workplace you were at at the time you made your ERC grant application:**

Very good	Good	Average	Poor	Very poor	Don't know / Not applicable
○	○	○	○	○	○

Q80 **E2. Please briefly describe any structures or systems your workplace provided to support your ERC grant application:**

(For instance, any formal or informal administrative and / or financial help that was made available to you to assist your application.)

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Q81 **E3. Please rate the quality of any advice / feedback you received from your research colleagues / collaborators / peer reviewers when you made your ERC grant application:**

Very good	Good	Average	Poor	Very poor	Don't know / Not applicable
○	○	○	○	○	○

Q82 **E4. Please briefly describe what was most useful about the advice / feedback you received from your research colleagues / collaborators / peer reviewers:**

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F. YOUR OVERALL IMPRESSIONS

Q83 **F1. Please indicate whether you agree or disagree with the following statements concerning some possible effects of your ERC grant application:**

		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know / Not applicable
83.1	Applying for an ERC grant has increased my INTERNAL reputation (i.e. within my current workplace)	○	○	○	○	○	○
83.2	Applying for an ERC grant has increased my EXTERNAL reputation (i.e. outside of my	○	○	○	○	○	○

		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know / Not applicable
	current workplace)						
83.3	Applying for an ERC grant has enabled me to attract additional INTERNAL research funding from my own workplace	○	○	○	○	○	○
83.4	Applying for an ERC grant has enabled me to attract additional EXTERNAL research funding from my external funders	○	○	○	○	○	○

Q84 **F2. Overall, has the effect on your career so far of your ERC grant application been:**

○ Very positive?   ○ Quite positive?   ○ Neutral / none?   ○ Quite negative?   ○ Very negative?

Q85 **F3. Please briefly explain why:**

[ ]

Q86 **F4. Lastly, please indicate whether you agree or disagree with the following overall impressions about your ERC grant application:**

		Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know / Not applicable
86.1	I would recommend the ERC's funding schemes to my research colleagues / collaborators	○	○	○	○	○	○
86.2	I would apply for an ERC grant again in the future	○	○	○	○	○	○

Survey Complete !!!

Thank you for taking the time to complete this survey. Please now click the button below marked 'finish survey'. (This also ensures all your responses are properly saved.)

You will then be re-directed to the EURECIA project website. There you can find further information about our work along with details of how to contact us (should you wish to do so).

Interview guide: ERC grantees

I Former projects

1. Before we come to the ERC project, I would like to know how your research developed. Let's begin with your PhD Thesis. It has the title .... Which question did you answer with this project?

2. Can you tell me how you arrived at this topic?

- Has anybody else (your supervisor, colleagues) influenced the formulation of the topic?

3. I would like to know how your research topics developed after the PhD. Therefore, I've collected information from the internet, that is your research (your publications) and your positions, and I've put them on a time scale. *[show picture]* **How did your research continue after the PhD topic-wise?**

- In what way is this topic related to your PhD project – what remained the same, what is different?

- Have the methods changed that you use?

II ERC project

4. How is the ERC project rooted in what you have done before?

- What has changed?

5. To what extent do you need knowledge from other fields?

6. To what extent could you fail?

III Collaborations

7. You currently collaborate with ……………………. How did you find your collaborators?

IV Positions

8. You took on a position as …………………………………… Why ?

9. You could have gone somewhere else with your grant, however you stayed here. Why?

V Research conditions

10. I would like to know something about your research conditions at these positions. Therefore I draw a second picture where I would like to reconstruct your discretion over time for research and the availability of the resources you needed. Let's begin with the time: During the last ten years – did you have other tasks than research?

11. How has the time for research developed since then?

- Which other tasks did constrain your research time most?

12. Let us turn now to the funding. What do you need money for in your research?

- Equipment? Consumables? - personnel? - Conference travel? - rooms/ lab space?

13. Did you have sufficient funding for that before the ERC funding started?

14. How is your funding situation currently?

- Is the ERC grant sufficient for your work? If not: how did you solve the problem? [additional sources]

- Did you apply for the maximum amount of ERC funding? Why not?

15. Did you consider alternative funding sources for the ERC project?

- What would have happened if you didn't get the funding?

16. You are now a [position] at [university]. Are you happy with this position?

VI Intentions and plans

17. Are there any research topics that you would like to work on but can't? (

- If yes: Which ones? Why can't you realise them?

18. Do you already have an idea what to research after your current project?

- Have you already a topic in your mind?

19. You have now a considerable amount of funding. How do you intend to keep this level of funding?

20. Which kind of position are you aiming for next?

VII Final

21. Is there any aspect of your career and of the ERC project that we haven't talked about and that is crucial in your eyes

Interview Guide: Research organisations

Preface:

- We are approaching **three different levels** in our interview phase: top level, school/faculty level, lab level
  Note: We developed one core interview guide which is the same for all levels and additional modules which differ among the levels. To improve readability we finally produced this document, which lists three separate interview guides for each level, one after another.

- We are doing **qualitative interviews**, i.e. the questions do not necessarily have to /will be asked in every detail. However, as a basis, we wanted to elaborate an as complete and precise interview guide as possible to catch the overall picture. This particularly seems important as different people are performing interviews.
  Further, an interviewing manual (i.e. briefing document), being developed on the basis of the pilot interviews (and – as we aim at methodology development - further elaborated along all our interviews) will finally provide further guidance for interviewers.

- Note: In addition **organisational factsheets** and **country factsheets** will provide basic information and allow to properly prepare each individual interview.

TOP LEVEL

1. Please, shortly describe your concrete function at the [… name of university/research organisation…].
    Particularly thinking of: responsibility and decision making power for basic strategies, competence, autonomy etc. as regards research (strategies/ competences regarding research, teaching, overall administration)

2. How do you see the European Research Council (ERC)? What is the main difference and impact it can make both in general and for your organisation?

3. At the level of the organisation: What is the general division of labour between the organisation and its sub-units? Who is responsible for...
    i) ... defining the mission, research direction, organisational re-structuring?
    ii) ... Human Resources issues, particularly thinking of recruitment, remuneration and promotion, requirements of staff, etc.?
    ii) ... steering issues, like internal performance measurement and incentives, re-allocation of funds?

4. More generally: What do you consider the major pressures and ongoing transformations your organisation faces at the moment?

1. **what kind of organisation?**
    a. How would you position [… name of university/research organisation…] compared to others? What are the ambitions of the [… name of university/research organisation…]?
        Thinking of: international profile, in which "league" does it aspire to play, international frontrunner, if so, in which areas, etc.

    b. What is the relative importance of research vis-a-vis teaching? Any other missions of your organisation?

2. **research strategies and content**
    a. Is there an explicit strategy as regards research and research profiles? If yes, which? If no, how are research issues handled then?

        Who takes the decision for research strategies and profiles and on which levels? (individual professors, collectives?, top down vs. bottom up?)

        Can you explain how the organisation then implements the research strategy?
        Thinking of: formulation of strategy documents, control of progress, incentive structures, internal performance critria and assessment,

    b. What are the major changes as regards research at your university/ research organisation over the last years? What/who has triggered these changes?
        i) *thinking of:* trends towards stronger profiling, focusing on excellent areas, international benchmarking, competition for people / talents? etc. 'local' pressures vs. 'European' pressures?
        ii) *thinking of content:* Frontier research is often used as a term - what does it mean for you / in your organisational context? Are there any other shifts as regards content, you

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would identify (eg. towards economic benefits)?
Does the ERC play a role in all this? What kind of role?

Does the ERC contribute to research content profiling, e.g. development towards more "frontier" research (discussion about the term: what is it for the interviewee)

Is the ERC and the grants used in internal discussion around performance and governance?
In case of grantees: Does the existence of ERC grantees trigger anything?

3. funding issues

    a. What is the funding portfolio of [… name of university/research organisation…], particularly as regards research?
        What is the relative importance of grants/ programme funding? Any kind of important changes in the last years?

    b. How relatively important are international grants (at various levels), how important are ERC grants? What makes them important or not?

4. focus on ERC's impact

    a. Does the ERC, its existence or the fact that the organisation has at least one grant, have any impact on the organisation at your level at all?
        (*no details here, just awareness and general "feeling", almost in a "yes, very much, yes a bit, almost not at all, not at all – fashion", to wrap up with the last two questions*)

    b. Do you see the ERC and its funding schemes as triggering / being a catalyst for ongoing changes as regards the European/international research landscape?
        thinking of: European wide competion of organisations, benchmarking or proof of excellence, signalling excellence, competition for talent, content of resrach, etc.

    c. Do you consider the ERC and its funding schemes as triggering / being a catalyst for any internal change processes within your university/research organisation? Please explain how?
        thinking of: re-defining strategies (explitcit as well as implicit), discussions about autonomy and leadership, strategic decision making (e.g. more power to the faculties/schools), changing internal performance criteria (ERC grants as a benchmark), distribution of money and other resources (additional investments, new positions, signalling), responsibilities and additional support, etc.

        In case of grantees: What concrete difference does it make for [… name of university/research organisation…] to have/to host ERC grantees?
        thinking of reputational efffect vs. monetary effect, how important is ERC money compared to other funding, national grants?

    d. Do you think the existence of the ERC and your way to deal with it can contribute to an improvement of …
        i) … your performance as an organisation? If so, please explain how.
        ii) … the attractiveness of your university/research organisation? Particularly thinking of competition for talent?

Let's talk about attraction and support of talent, i.e. (potential) grantees:

1. perceived attractiveness

    a. What do you think, how relatively attractive is the [… name of university/research organisation…] compared to your main competitors for talents?
        Do you have any explicit strategies or targets as regards attraction of talents? Please shortly elaborate.

2. recruitment strategies

    a. Could you please elaborate your recruitment strategies at [… name of university/research organisation…]? How is staff concretely recruited within your organisation? What are your strategies and criteria?
      thinking of pro-active, re-active, internal recruiting, international recruiting, active recruiting of ERC grantees etc. ?

    b. Do you think the existence of the ERC and its funding schemes already changed or will change your recruitment strategies? Are their any current discussions to alter recruitment strategies?
      In case of grantees: What is different now?

3. support measures

    a. What kind of mechanisms or measures are provided to support your staff in order to get an ERC grant? (*thinking of* administrative as well as strategic support) At which level are these designed and implemented (top level, school/faculty level, lab/institute level, individual staff)? Are these established organisation-related rules or principles?

    b. What kind of support do you provide in case of success? Are there any specific mechanisms or measures for ERC grantees to start their grant resp. during the duration of the grant?
      Thinking of: administrative support, incentives, additional ressources, different responsibilities (teaching, administrative work…), more autonomy etc.

Summing up: General open questions on the relevance of ERC

1. In which area does the organisation change most because of ERC, or does it make no difference at all? What do you consider the single most important impact/change (no matter what dimension)? How relatively important is this in relation to other changes you experience?

2. Is this change an additional push to something already happening or is it an original impact?
Or to put it differently: Is the ERC (as such or as regards specific grants already in your organisation) used for *active* change or does it DRIVE you in a certain direction? (proactive or reactive

SCHOOL / FACULTY LEVEL

Let us start with some general information…

1. Please, shortly describe your concrete function at the [… name of school / faculty …].
Particularly *thinking of*: responsibility and decision making power for basic strategies, competence, autonomy, as regards research (strategies/ competences regarding research, teaching, overall administration)

2. How do you see the European Research Council (ERC)? What is the main difference and impact it can make both in general and for your organisation?

3. At the level of the organisation: What is the general division of labour between the organisation and its sub-units? Who is responsible for...
i) ... defining the mission, research direction, organisational re-structuring?
ii) ... Human Resources issues, particularly thinking of recruitment, remuneration and promotion, requirements of staff, etc.?

ii) ... steering issues, like internal performance measurement and incentives, re-allocation of funds?

4. More generally: What do you consider the major pressures and ongoing transformations your organisation faces at the moment?

Let's focus on research issues: strategies and content

1. **what kind of sub-unit?**

   a. How would you position [… name of school / faculty …] compared to others? What are the ambitions of the [… name of school / faculty…]?
   Thinking of: international profile, in which "league" does it aspire to play, international frontrunner, if so, in which areas, etc.

   Compared to other schools/ faculties at the [… name of university/resaerch organisation…]: Do you think [… name of school / faculty…] is different? If yes, please explain in what respect.

   b. What is the relative importance of research vis-a-vis teaching? Any other missions of your school / faculty?

2. **research strategies and content**

   a. Is there an explicit strategy as regards research and research profiles? If yes, which? If no, how are research issues handled then?

   Who takes the decision for research strategies and profiles and on which levels? (individual professors, collectives?, top down vs. bottom up?)

   Can you explain how the organisation then implements the research strategy?
   Thinking of: formulation of strategy documents, control of progress, incentive structures, internal performance critria and assessment,

   b. What are the major changes as regards research at your university/ research organisation over the last years? What has triggered these changes?
   i) *thinking of*: trends towards stronger profiling, focusing on excellent areas, international benchmarking, competition for people / talents? etc.
   ii) *thinking of* content: Frontier research is often used as a term - what does it mean for you / in your organisational context? Are there any other shifts as regards content, you would identify (eg. towards economic benefits)?
   Does the ERC play a role in all this? What kind of role?

   Does the ERC contribute to research content profiling, e.g. development towards more "frontier" research (discussion about the term: what is it for the interviewee)

   Is the ERC and the grants used in *internal* discussion around performance and governance?
   In case of grantees: Does the existence of ERC grantees trigger anything?

3. **funding issues**

   a. What is the funding portfolio of [… name of school/faculty…], particularly as regards research?
   What is the relative importance of grants/ programme funding? Any kind of important changes in the last years?

b. How relatively important are international grants (at various levels), how important are ERC grants? What makes them important or not?

4. **focus on ERC's impact**

   a. Does the ERC, its existence or the fact that the organisation has at least one grant, have any impact on the { organisational unit } at your level at all?
   (*no details here, just awareness and general "feeling", almost in a "yes, very much, yes a bit, almost not at all, not at all – fashion", to wrap up with the last two questions*)

   b. Do you see the ERC and its funding schemes as triggering / being a catalyst for ongoing changes as regards the European/international research landscape?
   thinking of European wide competion of organisations, benchmarking or proof of excellence, signalling excellence, competition for talent, content of resarch etc.

   c. Did the ERC and its funding schemes triggering any internal change processes within your organisation resp. school / faculty? Or did it enforce on-going change ? Please explain how? What level is affected most?
   thinking of: re-defining strategies (explitcit as well as implicit), discussions about autonomy and leadership, strategic decision making (e.g. more power to the faculties/schools), changing internal performance criteria (ERC grants as a benchmark), distribution of money and other resources (additional investments, new positions, signalling), responsibilities and additional support, etc.

   d. Do you think the existence of the ERC and your way to deal with it can contribute to an improvement of
   i) … your performance as an organisation and as a unit (faculty etc.)? If so, please explain how.
   ii) … the attractiveness of your university/research organisation (your unit)? Particularly thinking of competition for talent?

5. **impact of grantees** – *only if there are grants within the school / faculty:*

   a. In case of grantees: What concrete difference does it make for [… name of school / faculty…] to have/to host ERC grantees?
   thinking of reputational efffect vs. monetary effect, how important is ERC money compared to other funding, national grants?

   Do you think the ERC grantee/grantees improve the standing of your unit (or subunit) within the university / research organisation? In what ways does the grant support and raise the profile of the unit internationally?

   b. How does the research theme of the grantee fit into the existing profile? Is it complementary, same but better, entirely new area, new linkages between groups etc.?

   Does the ERC contribute to research content profiling, e.g. development towards more "frontier" research (discussion about the term: what is it for the interviewee)

   Is the grant part of a re-orientation strategy or an add-on to existing activities? Does it trigger a re-orientation ("frontier research")?

Let's talk about attraction, support and autonomy of talent, i.e. (potential) grantees:

1. **perceived attractiveness**

   a. What do you think, how relatively attractive is the [… name of university/research organisation…] compared to your main competitors for talents? Please shortly elaborate,

why your university /research organisation resp. school / faculty is / is not the most attractive place for a young talent?

2. **recruitment strategies**

   a. Could you please elaborate your recruitment strategies at [… name of university/research organisation…]? How is staff concretely recruited within your unit? What are your strategies and criteria, *thinking of* pro-active, re-active, internal recruiting, international recruiting, active recruiting of ERC grantees etc. ?

   b. Do you think the existence of the ERC and its funding schemes already changed or will change your recruitment strategies? Are their any current discussions to alter recruitment strategies?

      In case of grantees: What is different now?

3. **support measures**

   a. What kind of mechanisms or measures are provided to support your staff in order to get a grant? (thinking of pro-active strategies from staff also) At which level are these designed and implemented (top level, school/faculty level, lab/institute level)?

   b. What kind of support do you provide in case of success? Are there any specific mechanisms or measures for ERC grantees to start their grant resp. during the duration of the grant?
   Thinking of: administrative support, incentives, additional ressources etc.

4. **researchers' autonomy**

   a. What is the level of autonomy granted to researchers at your school / faculty?
   Thinking of: possibilities to organise their individual research context, to create appropriate micro-structures, to influence recruiting decisions, to build up teams, to spend the money they have raised?

   b. Within the last years did you experience any changes in the way talent is provided with autonomy more generally? If so, did the existence of ERC resp. of ERC grantees at your institution play a role in this?

Summing up: General open questions on the relevance of ERC

1. In which area does the school / faculty change most because of ERC or is there no difference at all? What do you consider the single most important impact/change (no matter what dimension)? How relatively important is this in relation to other changes you experience?

2. Is this change an additional push to something already happening or is it an original impact? Or to put it differently: Is the ERC (as such or as regards specific grants already in your organisation) used for active change or does it DRIVE you in a certain direction? (proactive or reactive)

LAB / INSTITUTE LEVEL

Let us start with some general information…

1. Please, shortly describe your concrete function at the [… name of lab/institute…].
   Particularly *thinking of*: responsibility and decision making power for basic strategies,

competence, autonomy etc. as regards research (strategies/ competences regarding research, teaching, overall administration)

2. How do you see the European Research Council (ERC)? What is the main difference and impact it can make both in general and for your organisation?

3. What is the general division of labour between the [… name of lab/institute…] , the organisational top level and other sub-units? Who is responsible for...
i) ... defining the mission, research direction, organisational re-structuring?
ii) ... Human Resources issues, particularly thinking of recruitment, remuneration and promotion, requirements of staff, etc.?
ii) ... steering issues, like internal performance measurement and incentives, re-allocation of funds?

4. More generally: What do you consider the major pressures and ongoing transformations your [… name of university/research organisation…] and particularly the [… name of lab/institute…] faces at the moment?

Let's focus on research issues: strategies and content

1. what kind of lab / institute?

a. How would you position the [… name of lab/institute…] compared to others? What are the ambitions of the [… name of lab/institute…]?
Thinking of: international profile, in which "league" does it aspire to play, international frontrunner, if so, in which areas, etc.

Compared to other labs/institutes at the [… name of university/resaerch organisation…]: Do you think the [… name of lab / institute…] is different? If yes, please explain in what respect.

b. What is the relative importance of research vis-a-vis teaching? Any other missions of your organisation?

2. research strategies and content

a. Is there an explicit strategy as regards research and research profiles? If yes, which? If no, how are research issues handled then?

Who takes the decision for research strategies and profiles and on which levels? (individual professors, collectives?, top down vs. bottom up?) Who implements control of progress, incentive structures, internal performance critria and assessment etc. ?

b. What are the major changes as regards research at your lab/instiute over the last years? What has triggered these changes?
i) *thinking of*: trends towards stronger profiling, focusing on excellent areas, international benchmarking, competition for people / talents? etc.
ii) *thinking of* content: Frontier research is often used as a term - what does it mean for you / in your organisational context? Are there any other shifts as regards content, you would identify (eg. towards economic benefits)?
Does the ERC play a role in all this? What kind of role?

Is the ERC and the grants used in *internal* discussion around performance and governance?
Does the existence of ERC grantees trigger anything?

3. funding issues

a. What is the funding portfolio of [… name of lab / institute…], particularly as regards research?
What is the relative importance of grants/ programme funding? Any kind of important changes in the last years?

b. How relatively important are international grants (at various levels), how important are ERC grants? What makes them important or not?

4. **focus on ERC's impact**

   a. Do you consider the ERC and its funding schemes as triggering / being a catalyst for any internal change processes within your university/research organisation? Please explain how?
   thinking of: re-defining strategies (explitcit as well as implicit), discussions about autonomy and leadership, strategic decision making (e.g. more power to the faculties/schools), changing internal performance criteria (ERC grants as a benchmark), distribution of money and other resources (additional investments, new positions, signalling), responsibilities and additional support, etc. . (*distinguishing b- if possible at all – between the ERC as such and the fact that they have a grant*)

   b. Do you think the existence of the ERC and your way to deal with it can contribute to an improvement of …
   i) … the performance as an organisation? If so, please explain how.
   ii) … the attractiveness of your lab / institute?
   Particularly *thinking of* competition for talent, becoming a frontrunner/starting something new, etc.

   c. Do you see the ERC and its funding schemes as triggering / being a catalyst for ongoing changes as regards the European/international research landscape?
   thinking of European wide competion of organisations, benchmarking or proof of excellence, signalling excellence, competition for talent, content of resarch, etc

Let's talk about the grantee / the grantees themselves…

5. **impact of grantees**

   a. Please shortly explain the "story" of the grant.
   thinking of the application history (who pushed/decided on supporting the application, why), kind of research, position of the grantee, condition the grant offers

   b. What concrete difference does it make for [… name of lab / insitute…] to have/to host ERC grantees?
   thinking of reputational efffect vs. monetary effect, how important is ERC money compared to other funding, national grants?

   Do you think the ERC grantee/grantees improve your standing within the university / research organisation? In what ways does the grant support and raise the profile of the unit internationally?

   c. How does the research theme of the grantee fit into the existing research profile? Is it complementary, same but better, entirely new area, new linkages between groups etc.?

   Does the ERC resp. the grantee contribute to research content profiling, e.g. development towards more "frontier" research (discussion about the term: what is it for the interviewee)

   Is the grant part of a re-orientation strategy or an add-on to existing activities? Does it trigger a re-orientation ("frontier research")?

Let's talk about attraction, support and autonomy of talent, i.e. (potential) grantees:

1. **perceived attractiveness**

    a. What do you think, how relatively attractive is the [… name of lab / institute…] compared to your main competitors for talents?
    Please shortly elaborate, why your university /research organisation resp. school / faculty is / is not the most attractive place for a young talent?

2. **recruitment strategies**

    a. Could you please elaborate your recruitment strategies at the [… name of lab / institute…] ? How is staff concretely recruited within your unit? What are your strategies and criteria, *thinking of* pro-active, re-active, internal recruiting, international recruiting, active recruiting of ERC grantees etc. ?

    b. Do you think the existence of the ERC and its funding schemes already changed or will change your recruitment strategies? Are their any current discussions to alter recruitment strategies?

    c. Having an ERC grantee / x ERC grantee at [… name of lab / institute…]: What is different now?
    Thinking of: changes in internal lab structure, ERC being primus inter pares or even privileged, level of internal competition vs. team approach etc.

3. **support measures**

    a. What kind of mechanisms or measures are provided to support your staff in order to get a grant? (thinking of pro-active strategies from staff also) At which level are these designed and implemented (top level, school/faculty level, lab/institute level)?

    b. What kind of support do you provide to ERC grantees themselves? Are there any specific mechanisms or measures for ERC grantees to start their grant resp. during the duration of the grant?
    Thinking of: administrative support, incentives, additional ressources etc.

4. **researchers' autonomy**

    a. What is the level of autonomy granted to researchers at your lab / institute?
    Thinking of: possibilities to organise their individual research context, to create appropriate micro-structures, to influence recruiting decisions, to build up teams, to spend the money they have raised?

    b. Within the last years did you experience any changes in the way talent is provided with autonomy more generally? If so, did the existence of ERC resp. of ERC grantees at your institution play a role in this?

Summing up: General open questions on the relevance of ERC

1. In which area does the [… name of lab/institute…] change most because of ERC or is there no difference at all? What do you consider the single most important impact/change (no matter what dimension)? How relatively important is this in relation to other changes you experience?

2. Is this change an additional push to something already happening or is it an original impact?
Or to put it differently: Is the ERC grant used for *active* change or does it DRIVE you in a certain direction? (proactive or reactive)

Interview guide: National funding organisations and spaces

All questions in the following list are intended for representatives of the funding bodies. Questions marked with * are also for interviewees outside the funding agency, but, nevertheless, well-informed of the development of the funding agency.

1. Background information*
   - When was the organization founded; if there have been any major reorganization, when did this happen?
   - What has been the development of the funds in the past few years?

2. Current and future strategy of the organization within the national research system*
   a. How would you define the current role of the organization within the national research system? (e.g., is it the only or one among many funding bodies to finance basic or any other type of research)
   b. Has there been a recent change or are there any changes foreseen of this position in the near future?
   c. How autonomous is the funding organization vis-à-vis the government?
      i. Who formulates the overall strategy
      ii. Degree of independence in implementing the strategy
      iii. Composition and appointment of the governing board of council

3. How important are the following principles in the overall strategy of the funding organization? For each principle, how recently were they adopted?
   a. Scientific excellence
   b. Frontier science/ground-breaking or path-breaking research
   c. Bottom-up
   d. Support of individuals vs. support of collaborations
   e. Support to specific socio-economically important research areas (or societal challenges; Grand challenges)
   f. Support to internationalisation

4. What are the main funding instruments of the research council esp. with regard to funding of
   a. Excellent research
   b. Frontier science/ground-breaking or path-breaking research
   c. Grants to support individual researchers in their research careers
   d. Support to specific socio-economically important research areas (or societal challenges; Grand challenges)

e. Support to own institutes
f. Support to internationalisation

5. How recent are the previous funding tools? Did the funding organization adopt models from other respective organizations from another country or any other organizations (e.g., European-level funding bodies)?*

6. How is the selection procedure organized, esp. on issues:
   a. Uniformity of selection procedures across organization / possibility for panels or others to deviate from procedures
   b. Use of peer review vs. quantitative indicators
   c. How is the peer review organized:
   - the use of international peers;
   - do the panels meet;
   - the use of remote evaluation;
   - one or two stages, where only short application in the first stage,
   - the use of interviews;
   - do the proposers obtain feedback etc
   d. Do the panels *de facto* select or just grade the applications
   e. When were the above-described procedures introduced

7. Current and future strategy of the organization within the European Research Area.
   f. Can the organization award funding to researchers, or research teams in another country? If yes, how frequent is this and when did this become possible?
   g. Is the organization active at the European level?
      o in relation the Framework Programme (ERAnets, Joint Programming, other, e.g., the various public-private partnerships) (ask for the list mentioned in the data section)
      o in the European-level organizations of the research funding bodies?
      o collaboration with corresponding national councils

8. Relation between the role of the organization and that of the ERC*
   h. Is there any complementarity, overlap, competition between the organization and the ERC?
   i. Has the organization specific instruments and/or regulations in relation to ERC (eg grants for preparing ERC grants, complementary funding for ERC grantees, etc.) What is the rationale of these?

9. What have been the three major changes in the organization since 2003? If any, can they to some extent be attributed to the ERC?*

Interview guide: European funding landscape

Aims and strategy of the ERC

1. How do you perceive the overall aims of the ERC?
2. How likely is it that the ERC will achieve its aims? What do you think ought to be changed if the ERC is to achieve its aims?
3. How do you see the place of the ERC in ERA in general

The ERC in the European and national-level funding landscape

4. Are there overlaps between the ERC and your own organization?
   a) in terms of strategy and goals
   b) in terms of funding instruments
   c) in terms of procedures
5. Are there overlaps between the ERC and other European or member state level funding organizations in terms of strategy, funding instruments and procedures?
6. Do you consider the ERC to be a competitor for your organisation? Are there any complementarities? Is the ERC a competitor to other organisations?
7. What are the changes in your organisation (strategy, governance, instruments, processes) in recent years (since the last study on the matter)?

   a. What are the major divers for change?

   b. Has the establishment of the ERC affected your own organization (strategy, instruments, procedures, prestige, funding opportunities, other)? Do you expect it to influence it in the long run?

Position of the ERC

8. In your estimation, will the ERC become an important European funding organization? What are the major factors affecting the development of its position?
9. What is the prestige of the ERC? How can it maintain it (achieve if it does not yet have it)?
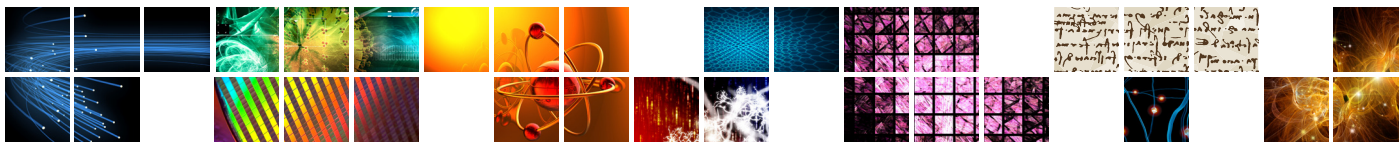
European Research Council President, Prof Helga Nowotny on the ERC's mission and excellence:

"*Excellence in science is the ultimate goal that every researcher aspires to obtain. Excellence is multidimensional. It fosters innovative new thinking, experimentation and the discovery of new solutions. It encourages variety and often flourishes at the interface of established disciplines and practices.*"

"*The ERC's mission is to find and fund the best researchers, through competition at the global level, who will conduct their frontier research projects in Europe.*"

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