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SMALL COUNTRY PARTICIPATION IN THE EU RESEARCH PROGRAMMES

*Anthea Fabri**

Abstract. Research, innovation and education constitute the Knowledge Triangle and are the three central and strongly interdependent drivers of the knowledge economy (European Commission, ERA, 2012). The EU's Framework Programme is the main instrument for funding research and for implementing the EU's research and innovation policy agenda. This paper examines Malta's participation in the EU's 7th Framework Programme for Research and Technological Development and compares the performance with other small Member States, namely Cyprus, Estonia, Luxembourg and Slovenia, within the context of previous Framework Programmes. The performance of Small States has also been benchmarked with the performance of larger Member States to identify success factors and any barriers which could hinder successful participation of Small States.

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Introduction

The aim of this paper is to analyse Small States' participation in the EU's Seventh Framework Programme (FP7) and to benchmark the performance of small states with the performance of the large Member States. The EU's Framework Programme is the main instrument for funding research and for implementing the EU's research and innovation policy agenda. The programme plays a crucial role in achieving the goals of growth, competitiveness and employment in the EU.

A small state is not defined by one single criterion. There are numerous factors that could determine this such as population size, land and sea area, availability of natural resources and gross domestic product (GDP). But despite these factors, in today's knowledge society, education, research and innovation have become the three most important drivers of economy. However small countries (with the exception of more affluent small countries like Luxembourg) find it more difficult to garner and to justify resources for research and development (R&D) expenditure. It is inappropriate for small countries to copy systems and structures of larger and successful countries since they do not share similar context and conditions which can be transferred from one country to another. Small countries need to adapt smart specialisation measures to help them revisit policy problems of resource allocation and budget prioritisation (Foray, 2009).

This paper also provides a factual analysis of small Member States' participation in funded FP7 projects and funding received. This has been complemented by a questionnaire-based survey with FP7 coordinators in order to obtain a more in-depth view of particular difficult encountered in preparing and running an FP7 project.

Background

Public research policy in Europe remains fragmented and nationally based and this weighs down the formation of world-class centres. This fragmentation has prevented the natural development of hubs whose growth should have been unrestrictedly nurtured by the sources of the knowledge economy. Additionally, such a fragmented system makes European R&D uncompetitive against its major competitors as it leads to inefficiency given that economies of scale potentials are not fully realised (Foray, 2009).

This concept applies entirely to research and innovation systems in small countries. Small countries find it more difficult to justify resources for research and development expenditure. It is also inappropriate for small countries to copy systems and structures of larger and successful countries since they do not share similarities which can be transferred from one country to another. Small countries are unable to benefit from economies of scale and as a result they face higher production costs and unfavourable competition. Moreover, small countries have other limitations such as lack of natural resources, lack of financial resources and limited manpower.

These constraints require small countries to plan their R&I programmes strategically and following thorough consultations (ALLEA Working Group, 2002).

R&I systems in small countries should therefore rely on existing strengths and potential, and concentrate resources on priority areas. This is particularly crucial for small countries which are not leaders in any particular field of science and technology. This initiated the basis for ‘smart specialisation’.

In view of the need to reinvigorate the Lisbon Agenda, in 2005, the EU Research Commissioner, Dr Janez Potočnik commissioned a group of prominent economists in the field of Knowledge for Growth to provide high-level advice on how knowledge can contribute to sustainable growth and prosperity, optimisation of policies to promote creation, dissemination and the use of knowledge and the role that the various actors can play in stimulating a knowledge-based society (European Commission, 2008). The Expert Group, which became known as the K4G Group, drew up a number of policy briefs and reports and proposed the idea of “smart specialisation”.

In one of the Policy Briefs delivered by the K4G Expert Group, Foray, David and Hall (2009) argue that the idea of smart specialisation does not call for imposing specialisation through some form of top-down industrial policy or involve a foresight exercise, but suggest an entrepreneurial process of discovery that can expose what a country does best in terms of science and technology. This can be achieved through a learning process which aims at discovering the research and innovation domains in which a country can excel (Foray, David, & Hall, Smart Specialisation — The Concept, June 2009).

Governmental policies should also play a role in smart specialisation however the role is not that of selecting areas of specialisation and encouraging the advancement of these few winners. Foray, David and Hall argue that governments have three main responsibilities in this process:

- Introducing incentives to encourage entrepreneurs and other organisations to become involved in the discovery of the right specialisations of that particular region/country;
- Evaluating and assessing the effectiveness of the specialisations;
- Identifying complementary investments which can be associated with the emerging specialisations (Foray, David, & Hall, Smart Specialisation — The Concept, June 2009).

The ‘Smart Specialisation’ concept has now become a key factor in the EU 2020 Innovation Strategy. Indeed, in June 2011, the European Commission launched a “Smart Specialisation Platform” to support regions and Member States in better defining their research and innovation strategies. This was launched as part of the Europe 2020 strategy and was initiated through the realisation that each Member State is different from another and there is no “one-size-fits-all” policy solution for all countries.

In a Policy Analysis paper published on the 14th of June 2012, Professor Dominique Foray continues his argument on smart specialisation by stating that “Regions and Small Countries need a Smart Specialisation Strategy.” The concept is also more valid during such times of financial crisis and budget prioritisation and therefore small states should “bring a fresh perspective to the problem of resources allocation”. It is thus crucial, Foray argues, to prioritise,

concentrating resources in specially-selected domains to get economies of scale and build critical mass. As a result, smart specialisation entails “strategic and specialised diversification” and such initiatives must also be supported by the governments to ensure the activities to grow.

What Constitutes Critical Mass?

Evaluation of the EU’s research programmes as a stand-alone programme is not enough. The creation of the ERA has integrated the national programmes with the EU programmes and therefore a clearer common understanding of what constitutes quality and excellence in each country is necessary (Georghiou, 2003).

One aspect of collaborative research projects at European level is the thought of pooling of resources including knowledge and funding to attain the necessary “critical mass” to achieve innovation. Research projects at European level are funded on the concept that no single Member State can achieve the required results on their own and therefore collaboration with other Member States and international partners is necessary. This has also served as the basis for the changes in the scale of projects which has increased throughout the years.

Critical mass relates to the minimum amount of resources required to render an investment viable in the longer term (ERA-PRISM Project, 2010-2011). Existing literature on critical mass focus mostly on the minimum size of a research group required to carry out a particular research project, however assuming that the country in question already has the required infrastructures to carry out the research (ERA-PRISM Project, 2010-2011). This is however not the case for small countries which may already face difficulties in the setting up of research infrastructure of a certain critical mass (ERA-PRISM Project, 2010-2011).

The ERA Expert Group describes critical mass as the “*threshold size as which working becomes effective,*” and “*below a certain size... research performance is reduced*” (ERA Expert Group, 2008). For small countries to achieve the required critical mass, it is required that they attract top researchers from outside the country through attractive working and living conditions, competitive salaries, access to top research infrastructures, top international networks and sustainability of research funding over time (ERA-PRISM Project, 2010-2011).

Research and Innovation Systems in Small Countries

Examining existing Research and Innovation systems in the five smallest EU Member States: Malta, Cyprus, Estonia, Luxembourg and Slovenia helps us to achieve a better and deeper understanding of the main objectives behind R&I policies and identify the challenges faced by these countries. These are essential to understand the factors constraining the progress of small countries in the EU and to assess whether small states are at a disadvantage in research in development.

Research and innovation are becoming the main driving force for increasing a country's competitiveness and for this reason, research and innovation are at the core of the knowledge-based society.

Innovation Performance

The Innovation Union Scoreboard (European Commission, 2012, Innovation Union Scoreboard), is a yearly comparative assessment of the research and innovation performance of all EU-27 Member States. The Scoreboard also aims to identify the strengths and weaknesses of the R&I systems in each country by using a set of indicators and innovation dimensions to track progress over time. The Scoreboard groups the EU Member States into four performance groups as follows:

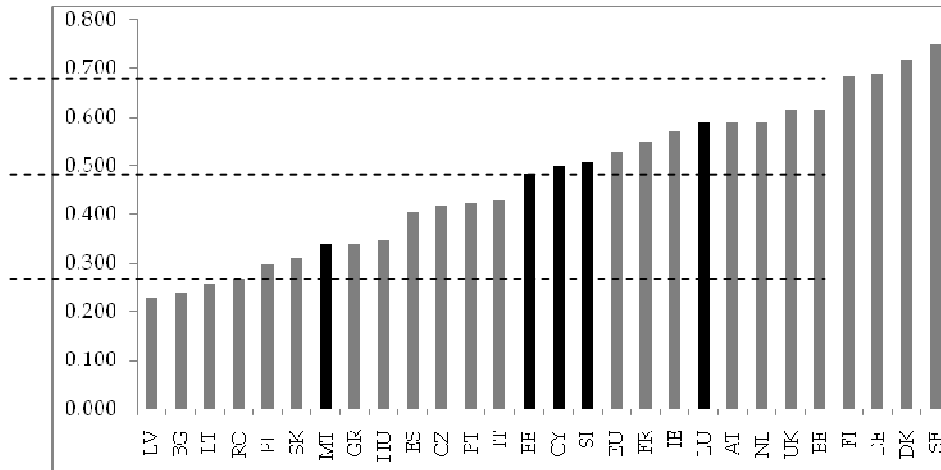
- Innovation Leaders: countries having performance well above EU-27 average.
- Innovation Followers: countries having performance close to EU-27 average.
- Moderate Innovators: countries having performance below EU-27 average.
- Modest Innovators: countries having performance way below EU-27 average.

In the 2011 Scoreboard, Estonia, Cyprus, Slovenia and Luxemburg fall within the Innovation Followers group while Malta falls within the Moderate Innovators group (See Figure 1).

Additionally, as shown in Figure 2, Cyprus, Estonia and Slovenia have been identified as growth leaders of the Innovation Followers while Malta (together with Portugal) has been identified a growth leader of the Moderate Innovators group (European Commission, 2012).

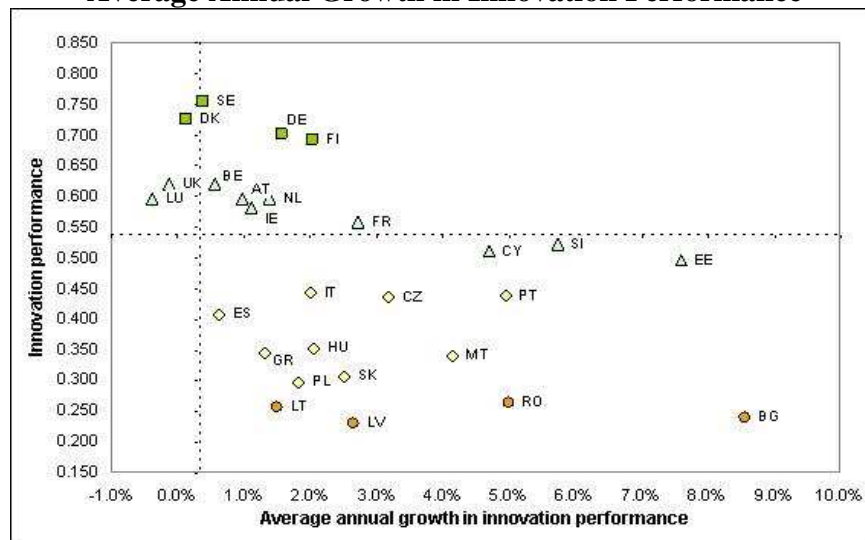
The performance and average annual growth of each country also varies within each group. The less innovative countries tend to grow at a faster rate than the more innovative countries. In fact, Estonia has registered the highest average annual growth in innovation performance (approximate 7.5% growth compared to the 2.4% average of the Innovation Followers group).

Figure 1
Member States Performance and Classification



Source: European Commission (2012). Note: the small Member States are marked in black.

Figure 2
Average Annual Growth in Innovation Performance



Source: European Commission (2012).

The average annual growth rates in Figure 2 are calculated over a five-year period. On the other hand, even though Luxembourg falls within the same group (Innovation Followers), it has registered a negative growth in its performance.

Challenges of R&D Systems in Small Countries

Due to the limitations faced by small states, such as limited land and limited resources including human and financial resources, small countries face critical challenges in their R&D systems. Small states have small R&D systems and are often characterised by low capacity and inability to take advantage of economies of scale.

The complexity of R&D systems requires that researchers should have an advanced level of expertise however some small states may lack the ability to train their researchers adequately to keep up with the continuous changes required by R&D. R&D systems are not resourced to cover the range and depth of challenges/themes covered in large countries – this can create considerable gaps in terms of policies, research and business opportunities (ERA-PRISM Project, 2010-2011).

However, although small states share similar characteristics, their diversity in their R&D systems such as capacity, investment, funding and sources of funding, and research priorities, also makes them unique amongst themselves and the challenges they face (ERA-PRISM Project, 2010-2011).

As one of the main deliverables, the ERA-Prism Project coordinated by the Malta Council for Science and Technology and funded under the FP7 Programme, published a report on “The Challenges faced by R&D Public Funding Systems in small (and transition) countries.” The report provided an in-depth focus on the research funding frameworks of small countries with a view to identifying the critical challenges in designing an effective and efficient R&D funding framework. The challenges identified relate to:

- Priority-setting;
- Human capital;
- Stimulating private sector R&D investment.

Priority Setting

The formulation of a national R&D system requires clear and focused priority-setting and a good strategic vision within the global landscape. Such a system should also be embodied within a national strategy that would serve as the basis of the proposed system. Within this framework, throughout the discussions undertaken within the context of the ERA-Prism project, prioritisation has emerged as a highly significant topic with the growing emphasis on smart specialisation. Priority-setting and the identification of niche areas in which they can excel, is of significant importance for small states. This is necessary in order to create a sustainable research system and to achieve critical mass in the selected areas.

National R&D systems in small states should therefore identify and focus their research activities on to a limited number of research areas in which they already have strengths and potential. This will also be essential in tackling fragmentation and in making more rational strategic and resource-allocation decisions including financial resources especially if these are limited.

In June 2011, the European Commission launched the “smart specialisation platform”. The aim of this platform is mainly to support regions and Member States in better defining their research and innovation strategies. The platform was launched taking into

consideration that in policy there is no “one-size-fits-all” solution and therefore this platform will help the regions to assess their specific R&I strengths and weaknesses and build on their competitive advantage. This initiative encourages member states to identify their best assets and R&I potential in order to concentrate their efforts and resources on a limited number of priorities where they can develop excellence and compete in the global economy (European Commission—Press Release, 2011).

Human Capital

Educational investment is another priority-setting for R&D systems as this will eventually result in trained researchers in technical and scientific fields. This is even more so essential due to the fact that human resources are limited in small countries, and therefore researchers from small countries should be well-qualified and in possession of a broad range of skills which make it easier for them to adapt to the different needs required by the R&D system.

Excellent human capital and working conditions are a necessity to attract human capital both on a national and international level. However, typical small states, due to their limited ability to exploit economies of scale in research infrastructure, focus on building human capital rather than physical capital. This however comes at a risk as investment in human capital not backed by physical capital in research infrastructures may result in brain drain (ERA-Prism Report, 2011).

Policies addressing human capital vary from one small state to another. While for example Estonia and Slovenia allocate significant resources towards the training of researchers, Cyprus encourages its students to seek studying abroad but to eventually return and carry out research within the country (ERA-Prism Report, 2011).

Stimulating Private Sector R&D investment

Differences in salaries can also be observed between the public sector, the private sector and academia. While in some countries there is a wide gap in researchers’ salaries from the public sector to the private sector to academia, in some other countries, the differences are minimal.

Table 1
Small Country Total Yearly Salary Average of Researchers by Sector *

| | Business Enterprise Sector (€) | Government (€) | Higher Education (€) |
|-------------------|---------------------------------------|-----------------------|-----------------------------|
| Malta | 69,480 | 27,559 | 40,965 |
| Cyprus | 56,096 | 50,687 | 56,579 |
| Estonia | - | 13,856 | 22,657 |
| Luxembourg | 52,344 | 52,803 | 63,995 |
| Slovenia | 34,335 | 34,420 | 41,501 |

* Country Total Yearly Salary Average of Researchers per sector (2006, all currencies in PPS)

Source: European Commission Research Directorate (2007)

Remuneration of Researchers in the Public and Private Sectors

Performance of Member States in FP7

This Section will analyse the performance of Member States in FP7 based on available statistics which focus on number of funded projects and the total funding secured from the European Commission. The Section will analyse in particular the participation of small Member States—Malta, Cyprus, Estonia, Luxembourg and Slovenia. The statistics cover the implementation of the programme from 2007 to 2010. This Section also looks at the results obtained from a questionnaire which was sent to a number of FP7 coordinators from entities from the five countries being analysed in this paper.

FP7 calls for proposals are published on a yearly basis. The Commission publishes a yearly Work Programme which defines the priorities for the calls for proposals to be launched during that period. The priorities chosen reflect the priorities of the European Union and also take into consideration the input received from each Member State through the Programme Committee Members and Advisory Groups. The funding is allocated on a competitive basis and the proposals are evaluated on the criteria of European relevance, scientific quality and potential impact. Those achieving the highest scores above threshold are selected for funding, depending on the funding available. Proposals must also demonstrate a European added value to complement national research programmes.

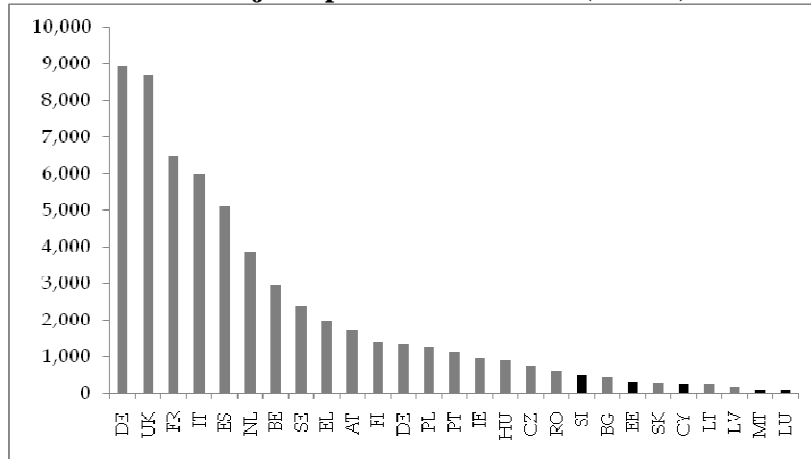
Statistics of Small Country Participation vs. Large Country Participation

The data in this section is taken from the Commission's Fourth FP7 Monitoring Report published in August 2011.

There are two main methods as to how the participation of small Member States can be compared with the participation of larger Member States:

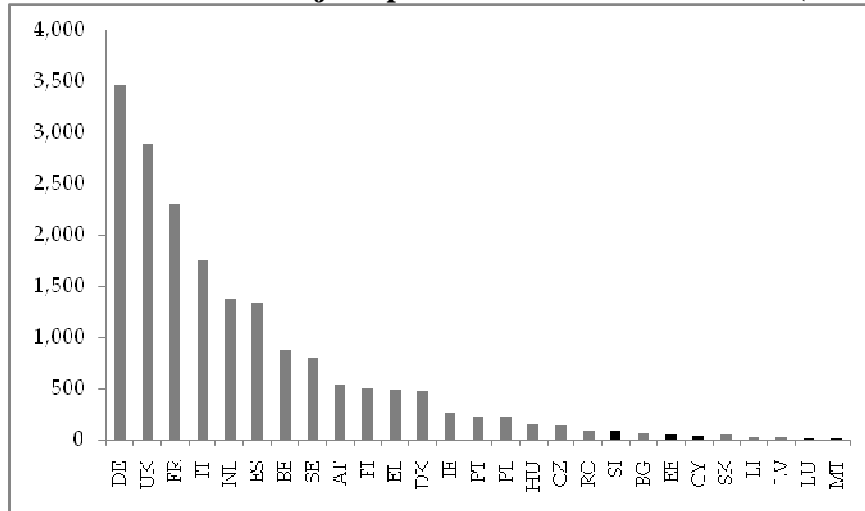
- Number of projects involving the participation of the country in question (shown in Figure 3);
- Total amount of EC funding allocated to that country (shown in Figure 4).

Figure 3
Number of FP7 Projects per Member State (EU-27): 2007-2010



Note: The small Member States are marked in black

Figure 4
EC Contribution to FP7 Projects per Member State €millions: (2007-2010)



Note: The small Member States are marked in black

Framework Programme funding is allocated on a competitive basis which indicates that statistics on the participation of each country in the Framework Programme are good indicators on the country's successes as these can easily be compared with other countries.

The Fourth FP7 Monitoring Report reports on the number of beneficiaries in funded proposals by Member State. According to this table, the largest EU Member States (Germany, UK and France) have the highest number of FP7 projects.

The same picture is depicted when we consider the EC funding received by each country in million Euros. Again, the largest three EU countries (Germany, France and UK) are ranking as the top three countries receiving the highest EC contribution from FP7.

If we however look at the same figures per country and compare them on a per capita basis, the graph differs significantly.

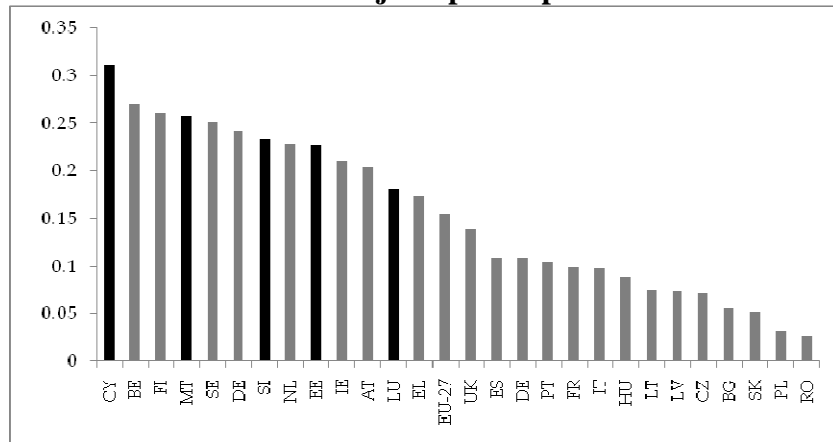
From Figure 5 we can notice that although the number of projects in the small countries is significantly low, when expressed on a per capita basis, the smallest EU Member States perform quite well with Cyprus ranking first, Malta ranking fourth, Slovenia seventh, Estonia ranked ninth and Luxembourg twelfth. This is highly encouraging for small countries with a limited pool and critical mass of researchers.

However when considering the EC contribution for FP7 projects per capita, the picture is not quite as appealing as only Cyprus ranks above the EU-27 average. Slovenia, Estonia, Luxembourg and Malta are all ranked below EU-27 average.

These differences may be due to a number of factors including:

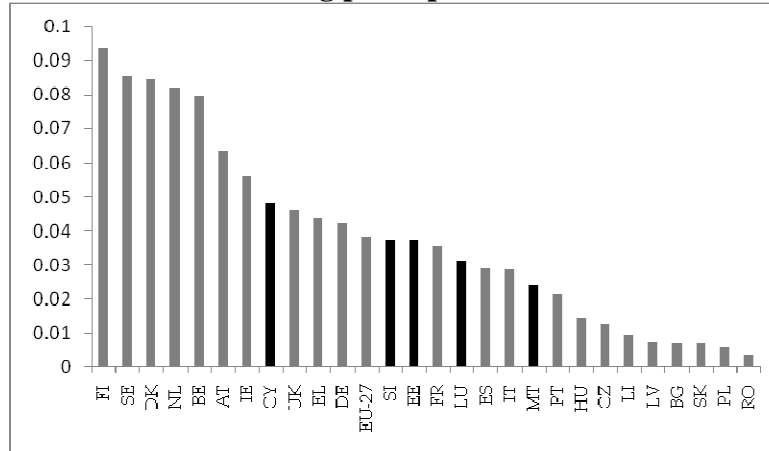
- The differences in salaries from one country to another. As we can notice from the Figure 6 the top three countries receiving the highest FP7 funding per capita (Finland, Sweden and Denmark) are Scandinavian countries which have higher salary rates when compared to Southern and Eastern European countries;

Figure 5
Number of FP7 Projects per Capita for EU-27



Note: The small Member States are marked in black

Figure 6
EC Funding per capita for EU-27



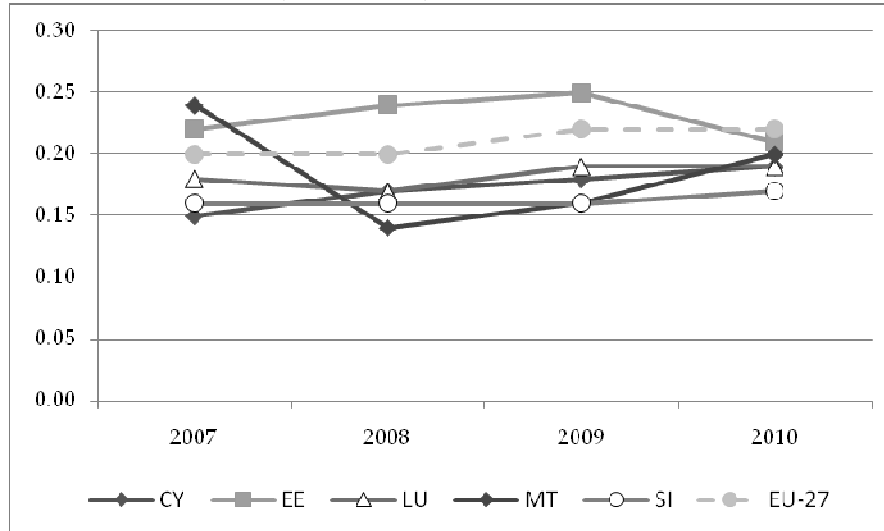
Note: The small Member States are marked in black

- *The difference in roles taken in FP7 projects.* Given the considerable burden of running a project or leading a work package, it is often the case that small countries opt not to take a leading role in FP7 projects. This may be due not only to lack of experience but also lack of human resources that can assist during the project preparation and implementation. Such organisation would therefore opt for less demanding roles;
- *Lack of human resources.* Because of their size, small countries have a limited number of human resources including full time researchers and administrative support. This may also limit the roles they take up in projects. Preparing an FP7 proposal is very time consuming and therefore the lack of human resources also restricts smaller organisations from dedicating the necessary time to prepare such projects.
- *Types of projects.* FP7 collaborative projects (research projects) require a significant amount of funding in co-financing from the participating institution. On the other hand, coordination and support actions (networking and policy support projects) are most of the time 100% funded. However this, the non-research projects are much smaller than the research projects both in terms of funding and number of partners. Organisations from small countries tend to participate more actively in smaller projects. In terms of coordination of projects, entities from small countries tend to coordinate coordination and support actions rather than larger research projects;
- *Difficulties in co-financing.* Since most research projects require a substantial amount of co-financing, small countries may lack the financial capacities to participate in these projects.

Success Rates

If we consider the success rate of the small countries and the EU-27 average, it is evident that the majority of the small countries are faring worse than the EU-27 success rate. In 2007, only Malta performed better than the EU-27 average. In 2008 and 2009, only Estonia achieved a higher success rate while in 2010, the performance of all of the five smallest EU countries was below the performance of the EU-27 average.

Figure 7
Success Rate (2007-2010) for EU-27 and Small States



*Data source: European Commission, DG Research. (2011),
 Fourth FP7 Monitoring Report: Monitoring Report (2010).*

Main Results of Questionnaire to Coordinators

The aim of the questionnaire-based survey was to explore whether coordinators from organisations from Small States face any particular difficulties when it comes to participation in FP7 projects.

The data collected set insight on whether small countries are at a disadvantage in research and development when compared to larger countries by identifying the factors constraining the progress of small countries in the EU.

Representativeness of Sample Replying to Questionnaire

The questionnaire was designed using an online survey tool and was sent to a sample of 40 FP7 Coordinators out of a total of 52 coordinating entities from the five countries being analysed in this paper. The aim was to send the questionnaire to all FP7 coordinators from these five countries but as explained below, this was not possible.

Marie Curie Host-driven Action (Individual Fellowships and Career Re-Integration Grants) were not included since normally the coordinator preparing the proposal is the individual researcher who may be of any nationality. In the event that a coordinating entity coordinated more than one FP7 project, that entity was sent just one questionnaire, specifying that their responses should apply to all the projects they are involved in.

It should be noted that in many instances it was difficult to obtain the contact details of the coordinating entity. While project information is available on the Commission’s website—

CORDIS—and some FP7 projects also have their own project website, due to data protection, the Commission does not provide the contact details of the project coordinators. Moreover the survey was carried out during July 2012 and it was difficult to contact some of the individual entities who had already been on holiday.

Of the 40 entities to whom the questionnaire was sent, 24 responded, 60 percent, representing a high level of response. The highest percentage (83.3%) came from Malta but this is also mainly due to the fact that a good contact is established with the entities.

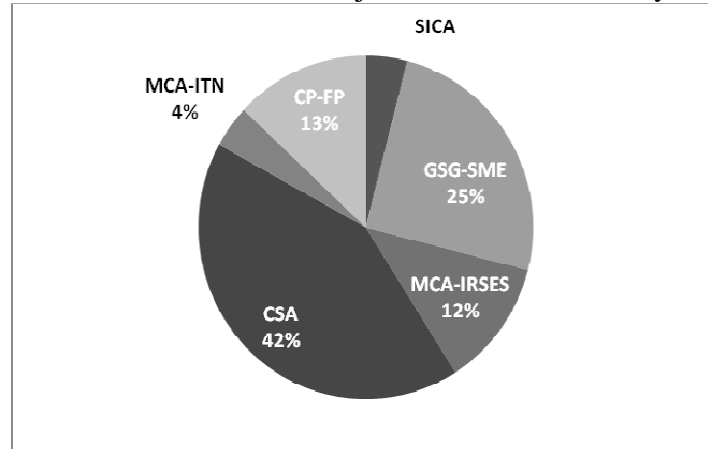
In terms of Project Areas, the 24 entities responding to this questionnaire also represented a fairly balanced sample in terms of FP7 thematic area. It should be noted however that there is a lack of coordination from small countries in the majority of the thematic areas under the Cooperation Specific Programme. It can therefore be assumed that a very high majority of projects funded under the Cooperation Specific Programme are being coordinated by entities in the larger countries.

With regards to the FP7 funding instruments, the majority of the organisations that responded to the questionnaire (42%) were participating in a Coordination and Support Action (CSA). These types of projects are non-research projects but provide support to coordinating activities or supporting policies such as networking exchanges and studies.

Table 2
Coordinating Entities Replying the Questionnaire

| | Malta | Cyprus | Estonia | Luxembourg | Slovenia |
|--------------------------------------------------------------------|-------|--------|---------|------------|----------|
| Number of Coordinators receiving questionnaire. | 6 | 10 | 12 | 5 | 7 |
| Number of Coordinators replying to questionnaire. | 5 | 6 | 6 | 3 | 4 |
| Percentage of Coordinators replying to questionnaire | 83.3% | 60% | 50% | 60% | 57% |
| Total percentage of Coordinators replying to questionnaire. | 60% | | | | |

Figure 8
FP7 Instruments of Projects Involved in Survey



The second largest group was the funding instrument used in the Research for the benefit of SMEs area – BSG-SME – with 25% of the respondents.

These results show that entities from small countries which embarked on the task to coordinate an FP7 project chose small manageable projects. No entity from a small country was coordinating a Collaborative Integrated Project (CP-IP). These are the largest types of FP7 instruments where funding may go up to around €15 million and the number of partners varies between 10-30 partners.

Project Relevance to Small Country Issue

Of the 24 respondents, only one coordinator replied that their project was directly linked to a small country issue. The aim of this project was in fact to bring together a number of small countries and other larger member states with which the small countries have a historical or geographical link to. The project addresses a range of small country concerns including scale effects and lack of critical mass in designing effective research and innovation policies within the European Research Area.

Motivation for Developing the Project

When asked whether the idea to develop the project was their own initiative or whether they had been approached by the entity they work for to prepare the project proposal, 70% of the respondents replied that the idea to develop the project was their own initiative. Of these however, 57% replied that they had approached their superiors with this idea and that the entity fully supported their initiative. The remaining 30% replied that they had initially been approached by their management at their organisation to develop the project proposal. Four of the SMEs also added that their organisation's business focus was moving towards this direction and that they were also in touch with other SMEs abroad who shared the same interests. The project concept therefore formed therefore part of the entity's general development approach. Two other public entities

added that they had worked with the same consortium in a previous project and this project aimed to take the results of the previously funded project to another level by continuing to build on the previously obtained results.

Difficulties Encountered during Project Preparation Stage

It was surprising that 33.3% of the respondents stated that they did not encounter any particular difficulties during the proposal preparation stage. However some of these respondents also added that they had experience in preparing such projects and this was therefore not a new venture for them. Others also added that they relied mostly on the experience of their colleagues and also of their foreign partners who were more experienced in the field.

The main difficulties encountered by the remaining 66.7% were mostly related to:

- Understanding complex documentation which requires a steep learning curve especially when experience is lacking;
- Preparing the proposal itself which imposes additional work especially on SMEs;
- Finding partners with the same research interests;
- Devoting time;
- Building up the project budget;
- No assistance from colleagues or administrative assistance.

One SME added that it was very difficult to assign a member of staff to devote time to prepare the proposal since there were less than twenty employees employed at the company (including administrative staff). This was also more difficult when considering that the success rate of such projects being funded is most of the time very low, in some areas, the success rate is less than 10%.

Difficulties encountered during project implementation stage

With regards to what difficulties were/are being encountered (if any) during the project implementation stage, approximately 21% of the respondents replied that they faced no problems whatsoever and the project ran smoothly. One of the respondents added that since they had already worked with the same consortium in a previous project they were aware that the partners they were working with were reliable.

On the other hand, the main difficulties encountered by the remaining 79% of the respondents were related to:

- Working with difficult partners—getting them to respect deadlines and not completing the required work;
- Underestimating the role of coordinating a project and a number of partners and management of all the consortium including dealing with all administrative and budgetary requirements;
- Legal changes in partners' institutions;
- Long negotiations;
- Management of intellectual property rights;

- Concerns about which costs are eligible and which are not;
- Insufficient funding;
- Keeping partners' enthusiasm up.

One University added that they found inadequate support in terms of understanding the programme and financial guidelines, "the resources were not enough to manage the project and so my administrative role was bigger than anticipated." Another coordinator from a public entity added that s/he had to deal with most issues including administration and budget issues and also assist the partners to complete their own financial reporting. The same coordinator added that coming from a public entity did not help at all as since the project duration was short it was impossible to recruit employees to assist in the project.

Another coordinator, also from a public entity added that learning how to use the Commission's IT programmes was not easy especially since the system was changed for a number of times during the project stage. The coordinator added that s/he had to learn very quickly to be a leader and to manage the partners successfully.

Relationship between Problems and Size of Country

Asked whether such problems are related to the size of the country they are coming from, 29% replied that such problems are independent of the size of the country and are normally faced by every coordinator from any country.

In contrast to this, the remaining 71% replied that such difficulties are more common in small countries mainly due to their lack of resources, lack of expertise and limited number of researchers. Some respondents also pointed out that small countries have very limited national research funds which they can tap into. Therefore should entities from small countries want to participate in research projects, they have to tap into European funding.

Required Action to Overcome such Difficulties

Of the respondents, 16.7% replied that they do not foresee any action that can be taken to overcome such problems. The majority of the remaining 83.3% replied that action would be required at the proposal preparation stage by allowing more time to prepare a better competitive proposal and making a more thorough choice when selecting partners. One of the SMEs however admitted that this is "easier said than done" since many times coordinators (especially from very small entities) have to prepare a project proposal over and above their normal work. Another two coordinators from public entities highlighted the importance of including experienced partners in the consortium as these can assist the coordinators whenever s/he faces such difficulties.

Other suggestions that were made by the project coordinators are:

- The Commission should implement a two-stage proposal submission system whenever possible as this would save time from preparing a full proposal until necessary. The coordinator added that this would be highly beneficial to SMEs especially those from small countries;
- Increasing national funds for research; and
- Reducing time to contract as the current long wait disheartens participation from the private sector.

Differences in Participation Patterns between Small and Larger Member States

When asked whether they think that small Member States participate in the Framework Programme on an equal basis with larger Member States, approximately 40% of the respondents replied that they do not see any differences in the participation patterns of the differently-sized countries and that competition is the same for all partners.

On the other hand the remaining 60% replied that organisations from small member states are at a disadvantage when it comes to participation in FP7. Three of the respondents replied that unfortunately there is no developed network and culture to support research efforts in small countries. Two respondents from academia replied that small countries do not have expertise in all the research areas and therefore they will surely be disadvantaged when competing with larger institutions from larger countries. Another coordinator from a public entity added that unless the coordinating institution is big or known in the sector, it will have difficulties to be accepted as a coordinator. Two SMEs suggested that SME participation should be further encouraged and the Commission should add a quota on the minimum number of SMEs that can participate in a given project.

Preparing for Horizon 2020

Some useful suggestions were made by the respondents in relation to ensuring that small countries are fully prepared for effective participation in the upcoming research programme – Horizon 2020. Two academics highlighted the need for action to be taken at national level by developing a culture of research in small countries and increasing the national research and innovation budget.

A coordinator from a public entity suggested that the needs of small countries need to be given more prominence and addressed by opening up dedicated opportunities for small states. Projects dealing with policies for small countries need to be developed to provide a much needed platform to support policy design.

Moreover two coordinators from two different SMEs in different countries added that more lobbying by the National Contact Points and the Programme Committee Members would be very useful to push the interests of their countries.

Conclusions and Recommendations

In general, as shown in Table 3, it should be noted that small countries mainly participate in FP7 proposals as partners rather than as coordinators.

Table 3
Small Country Total Number of FP7 Projects and Coordinators

| Country | Total number of projects involved in (2007-2010) | Total number of Coordinators* | Percentage of Coordinators |
|------------|--------------------------------------------------|-------------------------------|----------------------------|
| Malta | 126 | 13 | 10% |
| Cyprus | 300 | 54 | 18% |
| Estonia | 345 | 38 | 11% |
| Luxembourg | 135 | 16 | 11.8% |
| Slovenia | 590 | 32 | 5.4% |

*Total number of Coordinators include Marie Curie host Actions where the lead scientist may not be of the same country as the host institution

Moreover the majority of the projects being coordinated from institutions from small countries are Coordination and Support Actions which are smaller non-research projects and which involve a smaller number of beneficiaries than larger research projects. This is mainly due to a number of reasons such as the lack of experience in managing transnational projects, lack of R&D culture and facilities and limited number of researchers.

In addition, coordinating an FP project may be quite daunting and overwhelming for small organisations from small countries. This has been noted from the replies of the questionnaire carried out with FP7 Coordinators from small countries. The main difficulties noted by these coordinators at proposal preparation stage were the following:

- Understanding complex documentation which requires a steep learning curve especially when experience is lacking;
- Preparing the proposal itself which imposes additional work especially on SMEs;
- Finding partners with the same research interests and competent partners;
- Devoting time especially considering the very low success rate;
- Building up the project budget;
- No assistance from colleagues or administrative assistance.

Moreover other problems were also encountered during proposal implementation stage and these mainly relate to:

- Working with difficult partners – getting them to respect deadlines and not completing the required work;
- Underestimating the role of coordinating a project and a number of partners and management of all the consortium including dealing with all administrative and budgetary requirements;
- Legal changes in partners' institutions;
- Long negotiations;
- Management of intellectual property rights;

- Concerns about which costs are eligible and which are not;
- Insufficient funding;
- Keeping partners' enthusiasm up.

However, it can be claimed that because of the participation in the Framework Programmes, the R&D capacity of all Member States has increased significantly. This is especially true for countries such as Malta where the National R&I budget is very trivial compared to the budget available at European level and the Framework Programme participation is seen as a crucial support to R&D. Transnational cooperation has led to increased networking, sharing of expertise and knowledge and gaining more confidence through international collaboration. Awareness towards research, development and innovation has also been increased while a cultural shift towards innovation is starting to grow.

Enhancing Small States' participation in the EU Research Programme

Some suggestions and opportunities for improvement for the next budgetary period and new Framework Programme (Horizon 2020, 2014-2020), have been identified from both the questionnaire replies and from personal experience as a National Contact Point, Programme Committee Member and National Coordinator of FP7.

National level

- *Better alignment of national strategies with EU and FP priorities*

National research and innovation strategies need to be better aligned with the priorities of the EU to enhance the research and innovation capacity and competitiveness of individual countries and the EU as a whole. Moreover the framework programme needs to address European and global challenges.

- *Increasing national budgets for research*

National RTDI budgets need to be increased and in some countries like Malta the increase needs to be substantial. Despite the current financial crisis in the EU, some countries have recognised the importance of research and though they made drastic cuts in their budget expenditures, their research budgets have remained untouched. Such countries include the Scandinavian countries which are also faring better than most of the EU countries when it comes to research and innovation.

- *Shifting organisational culture towards RTDI*

Research, Technological Development and Innovation are a source of creating a competitive advantage in organisations. This has become a top priority for a number of large organisations and such a culture should thus also be adopted by small countries which want to grow their innovation potential. The importance of innovation is now also globally accepted and organisations need to start investing in employees' development and enable continuous learning, and at the same time encourage innovation which is critical for the organisation's success.

- *Increasing awareness, dissemination and training*

Such a cultural shift needs to be marketed thoroughly to encourage its implementation. Educational campaigns could also be used to encourage creativity and innovation at all stages. Moreover the EU's research programme needs to be more widely disseminated. The FP7 Unit within the Malta Council for Science and Technology has only in the past year and a half increased its capacity of National Contact Points and Programme Committee Members but this has been considered as a positive step in the right direction. While the National Contact Points at the Council do their utmost to disseminate all information about the programme and reach out to potential participants, better coordination between other organisations implementing similar programmes and incentives such as Malta Enterprise is necessary. Rather than fostering a competitive environment between such organisations, better cooperation is necessary which would be beneficial for all entities.

Moreover, showcasing of excellent local success stories could also help send the right messages to other potential participants.

European/FP level

- *Retaining small research projects*

Smaller research projects with a limited number of partners (less than ten partners) should be encouraged rather than just focusing on large scale research projects with over twenty partners. Such projects allow more room for flexibility, can be rapidly implemented and encourage the participation of smaller entities from smaller countries. Such projects would also be less disheartening for coordinators from these entities. Smaller projects would also improve the attractiveness and participation of Small and Medium-Sized Entities (SMEs) which are key drivers of innovation in Europe. Small research projects also contribute to the simplification challenge which the Commission (and Member States) are striving for in the next Horizon 2020 Programme.

- *Simplification*

The sought simplification is not only a challenge which the Commission is seeking to achieve but this achievement would also be greatly welcome by all Member States which have argued with the Commission for more trust-based procedures for a number of years. The framework programme needs to be made more attractive for small institutions and for this reason it needs to be simplified and improved. The required simplification is in administration, application procedures and financial regulations. Given that administration rules vary from country to country, simplification should also allow acceptance of national procedures which have been tried and tested for a number of years.

- *Reducing time to contract*

This recommendation was also suggested by some SMEs which have responded to the questionnaire. The current average time to contract in FP7 is just under one year. This is very disheartening and is seen as a disincentive to participate especially for SMEs which

do not normally plan their activities so well ahead due to the competitive nature of their business.

- *Increasing access to large research infrastructures*

A specific programme under the FP7 Capacities pillar is dedicated to Research Infrastructures. The objective of this programme is to optimise the use and development of the best research infrastructures existing in Europe. It also aims to help to create new research infrastructures which are of European interest in all fields of science and technology to help Europe to remain at the forefront of the advancement of research. However the deployment of current research infrastructures in the EU show that there are disparities between Member States. The current European Strategy Forum on Research Infrastructures (ESFRI) Roadmap which identifies new Research Infrastructures of pan-European interest for the long-term needs of the EU, shows that the current disparities may not be levelled off in the very near future. For this reason, it is necessary that the EU supports countries which are unable to participate in such large projects by facilitating access to these countries at reduced/subsidized cost.

- *Two-stage submission procedure for large scale projects*

A two-stage submission procedure for large scale projects should be further encouraged in the implementation of the Framework Programmes. This procedure is already being implemented in FP7 in some thematic areas including the Health and the Environment programmes. In the first stage of such a procedure, coordinators present a short proposal which is evaluated by independent experts against a set of criteria. Coordinators who receive a positive result at the first stage will then be invited to submit a full proposal. The implementation of such a procedure will save time from preparation of a full proposal from the beginning which is very time consuming and may also help increase the success rate.

- *Giving organisations a voice in priority-setting*

Selecting appropriate research priorities for the next framework programme is of utmost importance as these have to respond to the current global, European and national challenges. In so doing however the Commission needs to engage in a widely spread consultation and also include input from small organisations which should be given the opportunity to voice their priorities and concerns.

Need for further research

The research conducted in this paper has led to some useful results and conclusions on Small Countries participation in FP7. It has reviewed the current trends and patterns in participation and has also looked into the policies and milestones on which the Programme was developed throughout the years. However this paper was carried out in 2012 using available data and statistics up to 2010. This therefore comes before the end of FP7 and collected data and statistics are subject to change by the end of FP7. Further research would thus be necessary once FP7 finishes as this would give a whole picture of participation trends and statistics during the whole programme.

Moreover it would also be useful to examine the collaboration patterns of each small country such as looking at whether there are any common trends and preferences when it comes to choosing collaboration partners in the different countries.

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