

THE CONCEPT OF BEHAVIOURAL ADDITIONALITY OF PUBLIC SUPPORT FOR PRIVATE
R&D AND A METHODOLOGICAL PROPOSAL FOR AN EVALUATION FRAMEWORK IN
TURKEY

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ABSTRACT

THE CONCEPT OF BEHAVIOURAL ADDITIONALITY OF PUBLIC SUPPORT FOR PRIVATE R&D AND A METHODOLOGICAL PROPOSAL FOR AN EVALUATION FRAMEWORK IN TURKEY

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The changes in the behaviour of the innovating firm that would not have been the case in the absence of the public support, behavioural additionality, is investigated in this thesis. The theoretical foundations of the concept along with the existing evaluation attempts worldwide are analysed. The need for evaluation in Turkey is established. The design of the TÜBİTAK-TEYDEB programme in question along with the related policy context is described to form a basis for the evaluation of the behavioural additionality. It is revealed that the need for an evaluation of behavioural additionality for the legitimacy of the programme from the data analysis. Finally, given such inputs, the thesis develops a methodological proposal for a framework to evaluate the behavioural additionality of the public support to private R&D in Turkey.

Keywords: Science and Technology Policy Evaluation, R&D Grants, Additionality, Behavioural Additionality

ÖZ

TİCARİ AR-GE'YE KAMU DESTEĞİNİN DAVRANIŞSAL ARTIMLILIĞI KAVRAMI VE TÜRKİYE İÇİN BİR DEĞERLENDİRME ÇERÇEVESİ YÖNTEMBİLİMSEL ÖNERİSİ

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Yüksek Lisans, Bilim ve Teknoloji Politikaları Çalışmaları

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Yenilikçi firmanın kamu desteğinin yokluğunda oluşmayacak davranış değişiklikleri, davranışsal artımlılık, bu tez çerçevesinde incelenmektedir. Bu kavramın kuramsal çerçevesi ile dünya çapında değerlendirme girişimleri çözümlenmekte, Türkiye için değerlendirme ihtiyacı belirlenmektedir. Davranışsal artımlılığının değerlendirilebilmesi için seçilen TÜBİTAK-TEYDEB programının tasarımı ilgili politika bağlamı ile beraber betimlenmiştir. Daha sonra, programın meşruiyeti için davranışsal artımlılığın değerlendirilmesi ihtiyacı veri analizi yolu ile tesis edildi. Son olarak, bu girdiler ışığında tez, Türkiye’de TÜBİTAK-TEYDEB programı eliyle özel sektöre verilen Ar-Ge desteklerinin davranışsal artımlılığını değerlendirmek için yöntembilimsel bir değerlendirme çerçevesi geliştirmektedir.

Anahtar Kelimeler: Bilim ve Teknoloji Politikası Değerlendirmesi, Ar-Ge Destekleri, Artımlılık, Davranışsal Artımlılık

To Yeliz, for her love...

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CHAPTER 1

INTRODUCTION

As a newly emerged concept, the behavioural additionality of the public supports to private R&D is one of the focal points of the recent evaluation studies across Europe. Besides the input and the output that would not be the case in the absence of the support, the change in the behaviour of the firms that is solely created because of the public intervention is being investigated.

As the recent shift of Turkish science, technology and innovation policy and the connected drastic increase in the resources devoted to the domain is evident, an emerging and urgent need for evaluation of the Turkish support from the aspect of behavioural additionality is existent parallel to the current trend across the Europe.

Therefore, consisting of the main research topics, this seeks answer to three questions. The first question is ‘why evaluating behavioural additionality is important in Turkey’? Logically, the questions ‘how can we evaluate it?’ and “what kind of a framework should we build to evaluate the behavioural additionality?” follows the first question.

Seeking answer to these questions, this thesis introduces the concept of science, technology and innovation evaluation in Chapter 2. The current trend of evaluation in the world along with the need is explained.

After this brief introduction to the science, technology and innovation policy, the concept of additionality is explained in the next Chapter. The input and output additionalities are defined and the limitations of these is tried to be investigated. Then, the concept of behavioural additionality is introduced.

Chapter 4 is devoted to the theoretical foundations of the behavioural additionality. The resource based view theory and the value innovation perspective are explained in the context of the behavioural additionality. Also, the levels of the behavioural additionality are mentioned.

As final phase of the literature survey, the evaluation attempts of the behavioural additionality undertaken worldwide are investigated. The corollaries derived from these efforts are explained. This represented one of the pillars of the methodology followed in this research: investigating the existing attempts and deriving corollaries to be used in building a new framework.

Chapter 6 is the part that the main research questions of the thesis are tried to be answered. To understand the need for an evaluation and to be able to develop a framework to evaluate the behavioural additionality of the Turkish TÜBİTAK-TEYDEB support, the recent policy shift in Turkish science, technology and innovation policy is explained. As the second pillar of the methodology, then, the policy context and the programme design are investigated to form an input to the framework of evaluation. Connected with the existing measurement attempts, this represented the second pillar of the methodology employed in this research: analysing the history and conditions of the programme under investigation and re-shaping the corollaries derived from the other efforts in this regard.

Finally, having these inputs, this Chapter finally proposes an evaluation framework for the behavioural additionality effects of the TÜBİTAK-TEYDEB programme.

CHAPTER 2

SCIENCE AND TECHNOLOGY POLICY EVALUATION

As “most of the OECD countries recognise that innovation makes an increasingly important contribution to sustainable economic growth” (OECD, 2001), the investment for science, technology and innovation is growing in a remarkable pace. Gross Domestic Expenditure on R&D (GERD) has increased more than 50% between 1995 and 2003, raising the intensity of R&D in GDP¹ from 2.08% in 1995 to 2.26% in 2003 as depicted in Figure 2.1.

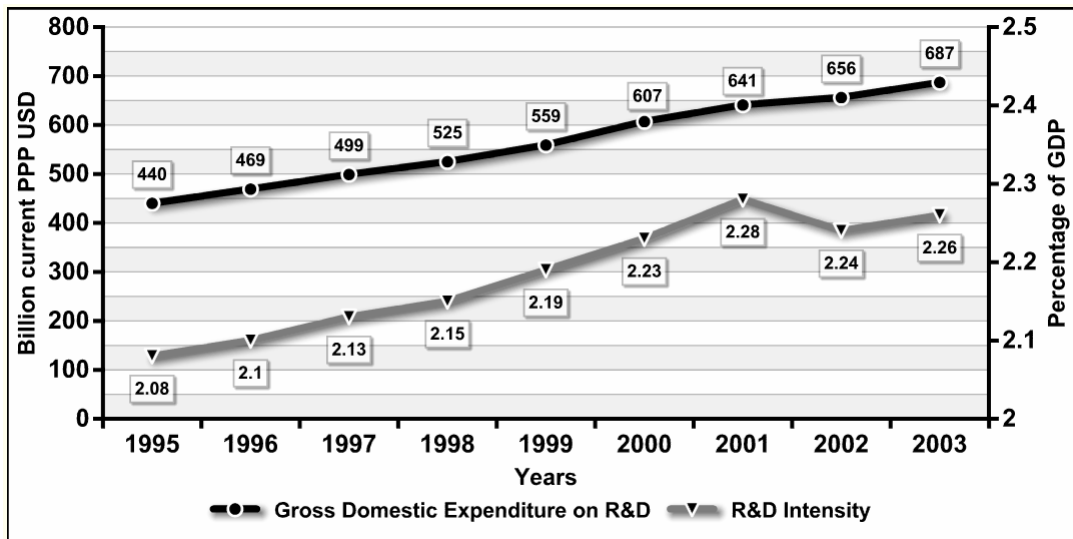


Figure 2.1: Gross Domestic Expenditure on R&D (GERD) and R&D Intensity in OECD Region² (Source: OECD Main Science and Technology Indicators (MSTI) Database, 2005-2.)

Similarly, in 2002, European Union has decided to increase the R&D intensity to 3% of the GDP by 2010 in accordance with the Lisbon strategy of “becoming the most competitive and dynamic knowledge-based economy in the world, capable

¹ R&D intensity can be defined in national context as the share of the R&D expenditures in GDP.

² The last known value for GERD belongs to year 2003 or 2002 for OECD countries.

of sustainable economic growth with more and better jobs and greater social cohesion" (Commission of the European Communities, 2002:5).

In line with this trend, there is an extensive amount of public expenditure for funding business enterprise R&D. In 2003, OECD countries provided the total funding of more than USD 32 Billion representing 7.4% of the total business enterprise R&D expenditure. This means a 12% increase in the public resources devoted to private R&D in 2003 (OECD, 2005).

These numbers along with the phenomenon of "shrinking government budgets and intensified international competition in the field of technology, increasing the efficiency of innovation policies has become crucial" (OECD, 2004:80).

To ensure this efficiency, therefore, policy evaluation plays the central role. OECD (2004:80) reports that "the government programmes need to be evaluated periodically to ensure their effectiveness and to improve their design".

In this framework, science, technology and innovation policy can be thought as closed loop consisting of policy determination, implementation monitoring and evaluation as pictured at Figure 2.2.

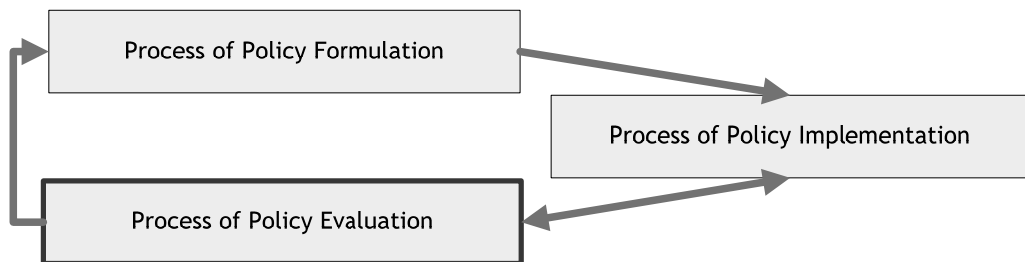


Figure 2.2: Process of Science, Technology and Innovation Policy-Making (Source: Own drawing.)

The process of science, technology and innovation policy begins with the process of policy formulation. The process of policy implementation follows this formulation. In accordance with the aims and fundamentals that the policy-maker determined using various tools including foresight, implementer tries to

fulfil this duty either using the existing tools and mechanisms or developing new ones.

Then, the process of policy evaluation both fine-tunes the implementation with a close feedback and constitutes an invaluable input for the policy formulated at the very beginning.

Therefore, an evaluation not only provides a sound basis for strategic change, assists the decision support in resource allocation and constitutes a source of enhanced accountability as product benefits as OECD (1999) points out, but also it enables all parties to crystallize their perception about the policy and share their knowledge and experience as process benefits as echoed by Fahrenkrog et al. (2002). Figure 2.3 pictures these process and product benefits of policy evaluation.

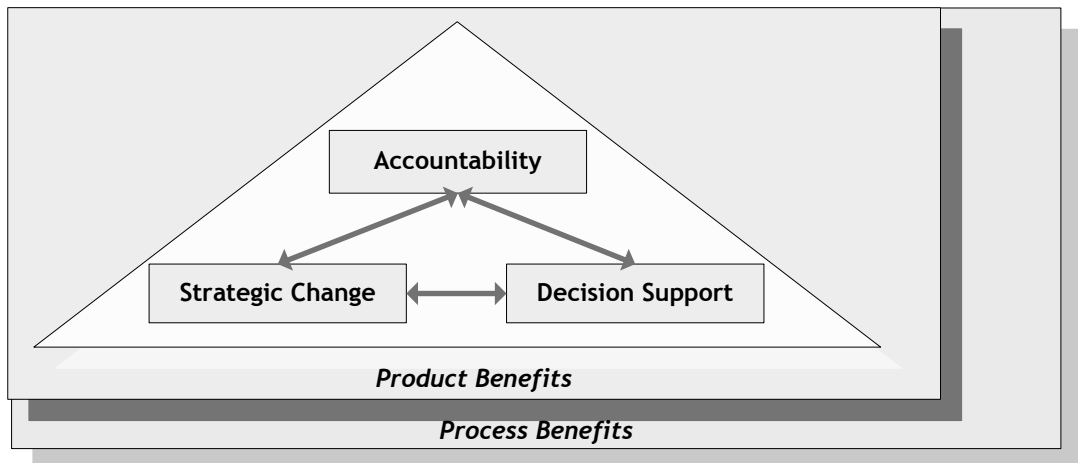


Figure 2.3: Product and Process Benefits of Science, Technology and Innovation Policy Evaluation (Source: Own drawing.)

Within the above explained framework, evaluation that is defined as “a systematic and objective process that assesses the relevance, efficiency and effectiveness of policies, programmes and projects in attaining their originally stated objectives” by Fahrenkrog et al. (2002:IX), can be thought as depicted in Figure 2.4. This process includes the ex-ante evaluation that measure the strategic objectives along with the framework of implementation, evaluation and

selection, monitoring and finally ex-post evaluation. The scope of this thesis is limited to ex-post evaluation that tries to measure the impact from various perspectives.

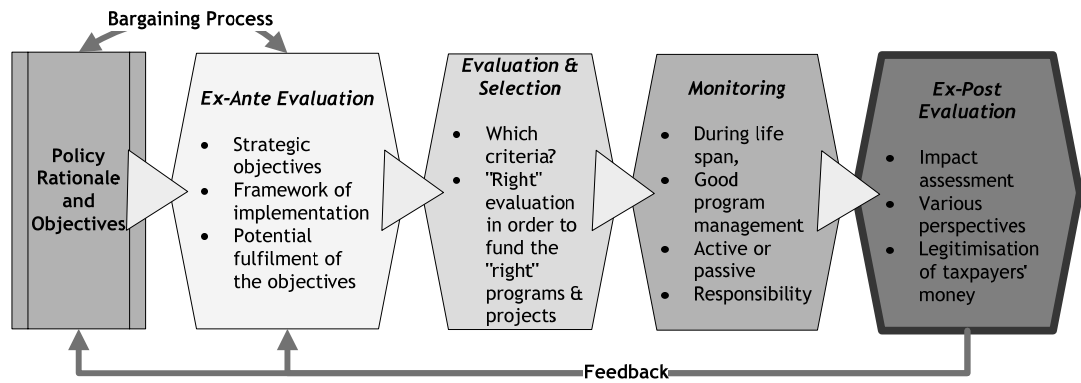


Figure 2.4: Process of Evaluation (Source: Fahrenkrog et al. (2002:IX).)

Finally, an evaluation should be distinguished from relevant activities as warned by OECD (1999). First of all, an evaluation is very different from traditional audits. Audit is used to ensure financial regularity and accountability for resources while evaluation aims to promote economy, efficiency and effectiveness. Secondly, as shown in Figure 2.4, monitoring is not the evaluation itself but it is rather a part of a well structured evaluation mechanism. Thirdly and most importantly, performance evaluation and evaluation are very different concepts. While performance evaluation investigates the change of pre-determined performance indicators and tries to derive an overall conclusion on that ground, evaluation “tries to find explanations for observed outcomes and impacts and understand the logic of public intervention” (OECD, 1999:11). In other words, performance evaluation focuses on indicators while the mechanism that changes them is more important for evaluation.

Similarly, OECD (2006b) defines the relationship between indicators, benchmark and evaluation by claiming

the first represents an input to the other two, the second is an exercise to find and implement good practice through comparing the performance of an organisation with that of others, while the third seeks to ascertain

the value or worth of activity according to criteria which usually derive from the line of accountability or a need for legitimisation.

Given this definition, process and position with regard to the related activities of the evaluation, OECD Science, Technology and Industry (STI) Outlook (OECD, 2004) summarizes the current trends in evaluation practices across the OECD geography. The first trend in this context, is conducting broad evaluations. OECD (2004) reports that Australia, Canada, Czech Republic, Belgium, Finland, Ireland, Luxembourg and Spain “have recently completed or announced plans for broad evaluations covering almost all innovation policies”. Secondly, OECD (2004:80-90) details that some OECD member countries such as New Zealand, Sweden, Switzerland and United Kingdom made evaluation of innovation system legally compulsory.

In the same token, OECD (2006b) investigates the four major trends on the evaluation of science, technology and innovation policies. The first trend is the ‘tighter public governance’. OECD (2006b: 3) argues that the change in the approach of public governance affected the science, technology and innovation domain in a way that the relationship between researchers and those to whom they are accountable “more conditional upon performance against specified targets”. Secondly, OECD (2006b: 3) claims that the nature of competition is gained more importance by the recent “competitive pressures such as international ratings and rankings of research groups and institutions”. Thirdly, OECD (2006b) claims that interfaces between research fields and between research and economy/society are being focused increasingly. Finally, it is argued that the evaluation tools and techniques reached a certain maturity and therefore the confidence of the policy-makers sustained (OECD, 2006b).

Closely connected to those trends as an issue in science, technology and innovation, OECD (2006b: 15) argues that

the concept of additionality has drawn more attention of the OECD countries for addressing the issue of whether public support is resulting in new activity rather than substituting for private support that would have occurred even in the absence of the government’s intervention.

The next Chapter, therefore, will deal with that concept and sub-branches of it.

CHAPTER 3

THE CONCEPT OF ADDITIONALITY

While the previous chapter is devoted to the need for and the characteristics of the science, technology and innovation policy evaluation, this chapter is on a specific concept within it.

Georghiou (2004:58) claims that

it is tempting for the policymaker to compile dossiers replete with “success stories” which may be used to justify continuation or expansion of the policy measure in question. Even better if some proxy for rate of return or economic activity generated can be integrated. However, it has long been realized that the critical question that an evaluation needs to ask must go beyond the level of effects achieved by the beneficiaries of a policy and pursue the issue of the contribution to those effects made by the existence of the public intervention.

Therefore, evaluation of additionality is simply testing the null-hypothesis asserting a particular effect would be the case in the absence of the support also. In other words, as Buisseret et al. (1995) echo measuring additionality is trying to understand ‘what difference is made by the policy’.

Bach and Matt (2002) argue that the question of additionality, ‘what difference does State intervention make?’, is directly linked with another question: ‘Does this difference justify State intervention?’. However this question brings together two problems according to them. The first problem is that the policy can create some differences on the targeted objectives. Secondly,

these unexpected differences can be coherent with the framework that gave birth to the objectives or not; if they are not, it is required to adopt the theoretical view of the other framework to identify them and if possible to evaluate them (Bach and Matt, 2002:105).

Additionality, then, can be analyzed at 3 main categories: input additionality, output additionality and behavioural additionality. However, as Bach and Matt (2002:106) argues, each of these types “shed some light on the global problem of additionality, but none of them can alone address this global problem, and the sum up of the four types³ is not equal to the global additionality”.

Table 3.1 summarizes the questions raised by these three approaches; also the consecutive 3 sub-sections will investigate them:

Table 3.1: Types of Additionalities and Associated Questions (Source: Own compilation.)

Type of Additionality	Associated question
Input Additionality	Does the firm spend at least an additional Euro on the target activity for every Euro provided in subsidy?
Output Additionality	What proportion of outputs result from a particular intervention? What is the proportion of outputs which would not have been achieved without public support?
Behavioural Additionality	Does the public intervention result in a change that would not have been the case in the absence of the support in the behaviour of the firm?

3.1. Input Additionality

Input additionality is defined by Georghiou (2004) as the concern with whether resources provided to a firm are additional, that is to say whether for every Euro provided in subsidy or other assistance, the firm spends at least an additional Euro on the target activity. It is also called the leverage effect.

Therefore, from the input additionality perspective, a government subsidy not only may or may not create input additionality, but also can crowd out the private resources. According to the literature survey of David et al. (2000), the

³ Bach and Matt (2002) also use a new type of additionality definition called as “cognitive capacity additionality” other than the input, output and behavioural additionality. However, the scope of this thesis is not includes this special terminology, rather the additionality is thought to be consisted of input, output and behavioural additionalities.

relationship between public and private R&D turned out to be in most cases substitute at the firm level studies, and complementary at the aggregate level studies. In other words, David et al. (2000) summarizes that the econometric studies conducted with aggregate data found that the R&D input allocated by the government also increases the private allocation of the resources while the econometric studies conducted with the micro data claim that the increasing government resources for R&D not increases the private resources but decreases them.

Within this definition of input additionality, the 'principle of additionality' is also the core of the European Union's Structural funds: funds of the European Community should not replace, but be an addition to national regional policy funds.

Some scholars, however, point out the limitations of input additionality approach. Bach and Matt (2002) argue that the concept of input additionality more or less explicitly requires the following assumptions:

- there is a clear link between input and output of the innovation activities
- divisibility and constant return to scale of the innovative activity;
- no differences in the nature of the output generated by public funds and private funds.

Although input additionality relies on some certain assumptions, almost all scholars agree on the idea that neither input additionality is a perfect indicator that would be used alone nor it should be neglected. Rather, input additionality should be the part of a broad analysis in an evaluation study in line with other types of additionalities and yet other approaches than additionality.

3.2. Output Additionality

Georghiou (2004) defines the output additionality as the proportion of outputs which would not have been achieved without public support. The term output covers all kinds of outputs such as patent, licence, revenue, export, etc.

Bach and Matt (2002:106) raise several questions about the output additionality. First of all, they claim that the term output is somewhat neo-classical and is not enough to measure some outputs such as capacities. Secondly, they claim that “the account for outputs does not express as such the ‘differences’ the output made possible” but the output additionality merely focuses on outputs without the consequences of them.

Similarly, Georghiou (2002) claims that since the term of output is not clear enough, output additionality is very simplistic to understand the effect of government funding and should rely on some certain assumptions on the nature of the term output.

3.3. Behavioural Additionality

Upon the limitations of the input and output additionality explained in previous Parts, Prof. Luke Georghiou, Hugh Cameron and Tim Buisseret of PREST, Manchester University proposed a new type of additionality called ‘behavioural additionality’ at their highly-cited article in 1995 (Buisseret et al., 1995). The term is defined as the change in the firm behaviour that would not have been the case in the absence of the intervention.

The concept of behavioural additionality, after its appearance, has become one of the focal points of the current evaluation effort. Some OECD countries form an alliance under the coordination of the Secretariat to undertake evaluations measuring behavioural additionality in their respective countries as summarized in Chapter 5.

Within this intuitive introduction to the concept of behavioural additionality, the theoretical background and the dimensions of the concept is the subject of the next Chapter.

CHAPTER 4

THEORETICAL FOUNDATIONS OF BEHAVIOURAL ADDITIONALITY

As explained in previous chapter the concept of behavioural additionality is first introduced by Luke Georghiou and some other scholars to explain the effects that input and output additionality are not capable of explaining the real and whole contribution of the public intervention to private R&D (Buisseret et al., 1995).

Until 2003, the concept was defined intuitively. Recently, the OECD-TIP study which is summarized at Chapter 5 has been initiated after which some theoretical explanations began to be introduced. The only established effort to investigate the theoretical background of the concept is by Georghiou and Clarysse (2006).

Therefore, this chapter is devoted to summarize the above mentioned effort (Georghiou and Clarysse, 2006) to employ the resource based view and dynamic capabilities model for behavioural additionality. Then, the last section of this Chapter will analyse the dimensions of the behavioural additionality.

4.1. Resource Based View Theory

Barney (1991) exposes the resource-based view theory by arguing that firms possess resources, while a subset of those resources enables them to achieve competitive advantage. Still another subset of those leads to superior long-term performance. The competitive advantage can be created with the use of the resources that are valuable and rare. As long as firm protects these resources from imitation, transfer and substitution, the competitive advantage endures.

Figure 4.1 summarizes this mechanism. According to Wade and Hulland (2004), productive use of the firm resources which are valuable, rare and appropriable

leads to short term competitive advantage. This competitive advantage can be sustained over time due to resource imitability, substitutability and mobility.

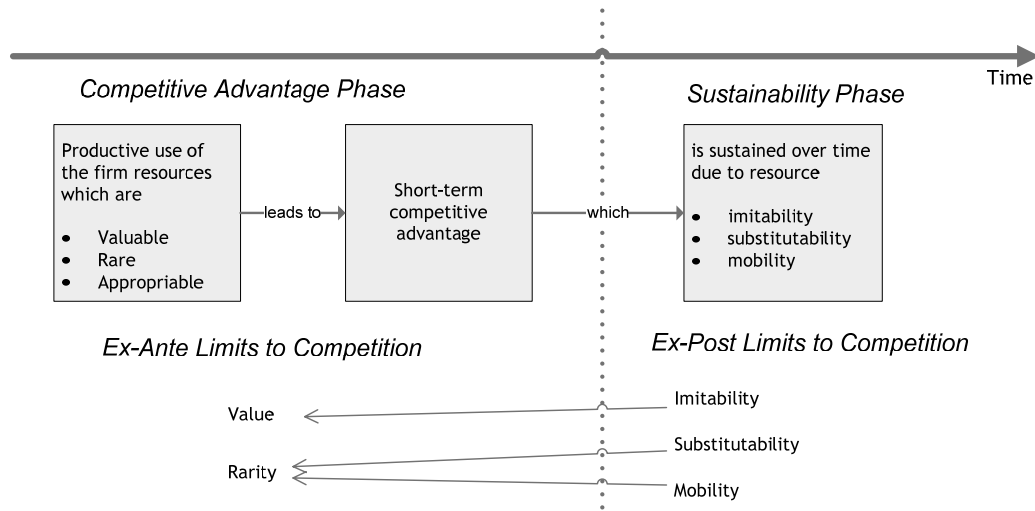


Figure 4.1: The Resource Based View over Time (Source: Wade and Hulland (2004).)

The resource based view theory asserts that mainly the intangible resources are the determinants of performance heterogeneity among firms and thus are the likely sources of competitive advantage. The resources that the theory focuses on may be the tangible ones such as capital and labour, there may be also intangible resources such as technological knowledge and competencies.

Georghiou and Clarysse (2006:13) employ the theory exactly at this point on behavioural additionality. They argue that an R&D funding creating additionality “should allow an increase in the company’s resources in such a way that it results in a competitive advantage”. Furthermore, they exemplify this by arguing that “enabling a company to attract a unique skill which it would otherwise not be able to recruit or access may be more important than recruiting five relatively easy-to-find engineers because of funding provided by an R&D grant”. This represents the behavioural additionality.

Carrying out further the argument, Georghiou and Clarysse employs the dynamic capabilities model, a complement to the resource based view theory. Dynamic capabilities model is defined as the ability to integrate, build, and reconfigure internal and external competencies to address rapidly-changing environments. In

Georghiou and Clarysse's (2006:13) words it refers to "the firm's ability to assemble, integrate and deploy valued resources to accomplish its target". Also, it is argued that the source of the innovation is mainly these dynamic capabilities. Therefore, Georghiou and Clarysse (2006) claims that "changes in the management of innovation processes in companies that receive R&D subsidies can be considered an aspect of behavioural additionality".

Similarly, both Georghiou and Clarysse (2006) and Clarysse et al. (2006) employ Wheelwright and Clark's (1993) innovation funnel concept. As depicted in Figure 4.2, Wheelwright and Clark argue that there exists an innovation funnel for which "each development of a new product is managed through milestones on which 'go/no-go' decisions have to be made by a certain committee based on a write-out or a presentation of progress" (Clarysse et al., 2006:102). In other words, Georghiou and Clarysse (2006:14) argue that "in order to smoothen the innovation process, most companies have developed some sort of milestone or gate process, through which they push their innovation".

Georghiou and Clarysse (2006:14) argues that the key success factors of resource based view theory such as heavyweight team managers, cross-functional teams, team tenure and the use of partnerships "are optimised along the innovation funnel". They argue that the behavioural additionality is the change in decisions in these gates. Clarysse et al. (2006) argues that the firm applies for subsidy after a go/no-go decision this would represent the behavioural additionality.

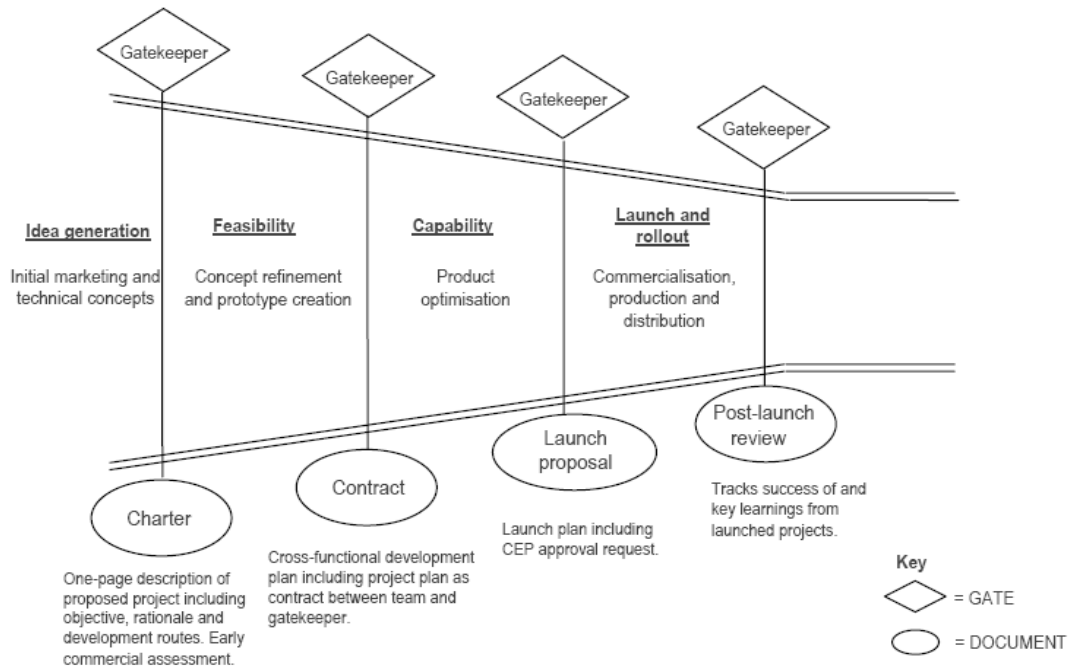


Figure 4.2: Innovation Funnel (Source: Wheelwright and Clark (1993).)

Also, Georghiou and Clarysse (2006) summarize the literature of the resource based view theory. According to them there are two distinct resource classifications and the effect of government subsidy in the use of these resource categories to for a competitive power represents the behavioural additionality. Especially, intangible resources in the first classification and the organisational capital in the second one consists the potential areas for the behavioural additionality.

- Classification 1:
 - Tangible resources: financial capital and the physical assets of the firm such as plants, equipment and stocks of raw materials
 - Intangible Resources: assets such as reputation, brand image and product quality
 - Personnel-based resources: technical know-how and other knowledge resources including organisational culture, employee training, loyalty, etc.
- Classification 2:

- Physical capital: the physical technology used in the firm, a firm's plant and equipment, its geography and its access to raw materials
- Human capital: the training, experience, judgment, intelligence, relationships, and insights of individual managers and workers in the firm
- Organisational capital: a firm's formal reporting structure, its formal and informal planning, controlling and co-ordinating systems, as well as informal relationships among groups within a firm and between a firm and those in its environment

Also, they group the resource based view theory literature for the factors that contribute to successful new product development processes in such categories:

- team tenure
- cross-functional teams
- heavyweight project leader
- partnerships

4.2. Value Innovation Theory

As a second effort, Georghiou and Clarysse (2006) try to employ value innovation to form a basis for the theoretical foundation of the concept of behavioural additionality. They argue that the value innovation, strategies to pursue new markets and/or build up new competencies that can result in an entirely new business, is the source of quantum leap of the firms. Georghiou and Clarysse (2006:14) cite some scholars claiming that

most companies that are among the top in their industry did not obtain this position through outperforming the others, but because they had entered a new market segment that tended to be a growing one.

Also, Georghiou and Clarysse (2006:14) claim that unlike the resource based view theory, "value innovation points to the long-term need to change an industry or industry segment regularly". Therefore, a support can create behavioural additionality by "changing a firm's strategy and encouraging it to enter a new market".

4.3. Layers of the Behavioural Additionality

As explained at the beginning of this chapter, behavioural additionality is a very decent concept. The above summarized resource-based view of the firm and value innovation theory forms the only attempt to develop a theoretical background for this concept. Although, in a sense, this attempt is not representing a mature effort and does not cover the all aspects of the concept, the literature is limited to it. The literature on the government's ability to change the routines of the innovative firm and integrated management model can be further deployed to this purpose. However, as the main aim of this thesis is not to build a new theoretical framework to the concept, the analysis is limited to the above explained existing efforts.

Moving forward pragmatically, as these efforts to provide a theoretical foundation to the behavioural additionality are very immature and need improvements, Georghiou (2004) claims that behavioural additionality is a multi-layered concept. Furthermore, Georghiou and Clarysse (2006) develop the following categories to compare the results of the OECD - TIP studies that will be analysed at the next chapter. Therefore, in the broadest sense, these categories can be thought as the layers of the behavioural additionality. Practically, these layers are taken as the main definitions and the scope of the behavioural additionality in effort of developing a methodology to evaluate the issue.

- **Behavioural changes during project implementation:**
 - **Project Additionality** (Decisions regarding project launch): This layer of additionality is related with the decision of launching the project that would not be the case in the absence of the support. Also, this layer is a facet of input additionality.
 - **Acceleration Additionality** (Acceleration of projects): Acceleration additionality refers to the increase in the pace of the project that would not be the case in the absence of the support. In other words, it investigates whether the supports led a faster project completion or not.
 - **Scope and Scale Additionality** (Expanded scale and scope): Scope and scale additionality refers to the scope and scale of the project that

would not be the case in the absence of the support. It is closely linked with the input additionality also.

- **Challenge Additionality** (More challenging research): This layer of additionality raises the question of whether the support enabled the firm to conduct a more challenging project that would not have been undertaken in the absence of the public funding.
- **Behavioural changes after project completion:**
 - **Network Additionality** (More collaboration): Network additionality refers to the collaboration that the public funding created. It asks the question whether the project would be conducted in a less collaborative way in the absence of the supports. Also, it covers the persistence of this collaboration effort after the completion of the project.
 - **Follow-Up Additionality** (Project follow-up): Follow-up additionality is related with the spin-off projects that are created by the funded project and that would not have been the case in the absence of the support. It is particularly important from the aspect of sustainability.
 - **Management Additionality** (Improved management): It is related with the management routines that the firm adopted because of the public funding. “These changes could result in further participation in government programmes, changes in organisational structures for conducting R&D or commercialising results, and different management strategies” (Georghiou and Clarysse, 2006:31).

As the resource based view of the firm and value innovation theory is explained as the recent attempts to deploy a theoretical foundation to the concept of behavioural additionality and as the layers of behavioural additionality introduced by Georghiou and Clarysse (2006) to elaborate the perception on the concept, the next Chapter is devoted to the existing evaluation attempts of behavioural additionality in OECD countries.

CHAPTER 5

EXISTING EVALUATION ATTEMPTS OF BEHAVIOURAL ADDITIONALITY IN OECD COUNTRIES

As the previous Chapters introduces the concept of science, technology and innovation policy as well as the additionality and the theoretical foundations of it, the evaluation of the behavioural additionality of the government support has been the focal point of the some OECD member countries' policies. This chapter, therefore, will try to analyse these efforts and derive corollaries for further efforts.

As explained at OECD (2003:1), "Following a proposal made at the December 2002 meeting of the TIP Working Party⁴, the IWT⁵ (Flanders) and OECD organized a one-day working meeting in Brussels on Tuesday, February 4, 2003 to discuss future activities to evaluate the effects – and effectiveness – of government policies for stimulating business R&D." In this meeting, OECD (2003:1) reports that "TIP delegates suggested that future work attempt to investigate how governments can improve the effectiveness of individual instruments and the mix of policies used to support business R&D and innovation."

To this aim, the concept of behavioural additionality is perceived as crucial and OECD TIP members agreed to undertake a pilot project on the evaluation of behavioural additionality. Among the countries that declared interest on this issue such as Australia, Austria, Belgium, Finland, Germany, Japan, Korea, Norway, United Kingdom, United States and EU a workgroup was formed.

⁴ One of the most influential working party's of OECD is Technology and Innovation Policy (TIP) Working Party formed by the experts of the OECD member countries.

⁵ IWT is defined at its website as: "IWT is the Institute for the Promotion of Innovation by Science and Technology in Flanders. The organisation is the only Flemish organisation stimulating and supporting innovation."

After this kick-off, the workgroup concentrated their efforts to develop a methodology to measure the behavioural additionality effects of their respective supports and compare the preliminary findings. The workgroup had two formal meetings during the project lifespan.

The first workshop co-organised by the OECD and the Institute for Policy Research in Engineering, Science and Technology (PREST) in the University of Manchester took place on 10-11 May 2004 at PREST. After the conceptual debates following this meeting, the workgroup gathered again in Vienna at 31 January -1 February 2005.

During the project lifespan milestone by these workshops, the participating countries firstly tried to develop a conceptual framework to behavioural additionality. This phase is especially led by Prof. Luke Georghiou of PREST, University of Manchester as he is the originator of the concept and the creator of the majority of the relevant literature.

Then, within the objectives of the project, each participating country tried to develop a specific evaluation framework and implemented pilot studies. Following these evaluations, the results were compared within the workgroup.

Finalizing the project, OECD (2006a) published a book consisting of an introduction and synthesis chapter written by Luke Georghiou and Bart Clarysse and 12 following chapters for each evaluation effort.

The workgroup members, the programmes addressed and the methodology they used are summarized in Table 5.1. The respective studies are conducted by Australia, Austria (two separate programmes evaluated, FFF and Kplus), Belgium, Finland, Germany, Japan, Korea, Norway, United Kingdom, United States and EU⁶.

The programmes in focus and the methodologies used to measure behavioural additionality will be explained in the following parts. Final section will be

⁶ Ireland was also in the workgroup. However, as there is no report on the results and the methodology they used, Ireland is excluded in this analysis.

devoted to the consolidation of methodologies and comparison of the findings of these studies.

Table 5.1: Programmes addressed and methodology (Source: Taken from Georghiou and Clarysse (2006:21))

Country	Programme	Methodology
Australia	R&D Start programme	100 firms interviewed by telephone or in-person
Austria (Case 1)	Austrian federal R&D support scheme (FFF)	Compares survey responses about hypothetical scenarios (1 000 firms) to actual consequences documented in administrative records (420 firms)
Austria (Case 2)	Kplus funding initiative	Compares questionnaire-based survey of 118 firms (75% of those surveyed) with responses to the 3rd Community Innovation Survey
Belgium	IWT support programme	Telephone interviews plus additional in-take interviews for large R&D-intensive firms
Finland	Tekes funding programme	Questionnaire-based survey (193 respondents)
Germany	Public R&D project funding	Data from CIS Germany: 659 firms were surveyed by telephone interview; 203 responded (39% response rate)
Japan	R&D projects of NEDO	Interviews and questionnaires (501 firms and other institutions responded)
Korea	General R&D funding	Econometric analysis based on public and private sector R&D data
Norway	Loans and grants from Innovation Norway	Interviews (807 firms responded, 67% response rate)
United Kingdom	SMART and LINK initiatives	10 in-depth case studies of firms looking at grant histories
United States	Advanced Technology Program	Online survey with follow-up by telephone interview (81% response rate)
EU	5th Framework Programme for Research and Technology Development (FP5)	Questionnaire survey: 1 700 responses. Also survey to rejected applicants.

5.1. Australia R&D Start Programme

The Australian R&D Start Programme comprises both competitive grants programmes and an entitlement-based R&D tax concession “aimed to improve industry competitiveness, enhance productivity and ensure the introduction of innovative new products, processes and services to the market”. “The R&D Start programme was established in 1996 and closed on September 2004. During this period, it provided USD 1.01 billion in grants to 1 134 companies” (ITR, 2006:39).

The study (ITR, 2006:39) interpreted behavioural additionality as “persistent changes in firm attitude, culture or behaviour that resulted from participation in a grant process”. To this aim, they (ITR, 2006:41) argue that “a survey approach that combines quantitative and qualitative aspects to enable changes to be measured and to investigate the reasons for these changes” is sought to be necessary.

The survey is implemented in face-to-face or telephone interviews with senior executives from a sample of 100 firms representing 9% of the total programme population.

The Australian study (ITR, 2006) used a short survey⁷ to measure the effects of government grants by asking firms whether they would have a project and if they had, whether it would be

- with a smaller budget,
- more slowly,
- with less external collaboration,
- with less ambitious outcomes and
- with a smaller range of potential applications

in the absence of the support on a 5 phase Likert scale.

Furthermore,

the subsequent group of questions sought to determine the degree of behavioural additionality at company level induced by the grants, focusing on cultural attitudes, project and business management, and the development of external collaborative relationships (ITR, 2006:42).

⁷ A total of 2 pages that are annexed to ITR (2006).

5.2. Austrian Federal R&D-Support Scheme (FFF)

Falk (2006) reports that the behavioural additionality of the Austrian Federal R&D-Support Scheme (FFF) is tried to be measured through the existing survey conducted in 2003 to understand the customer's appraisal of the working of the Austrian Industrial Research Promotion Fund (FFF). According to Falk (2006:60), this survey includes the questions geared to the following two groups of firms:

- “successful applications that received funding from the FFF and who were asked hypothetical questions about what would have happened if they had not received FFF funding; and
- failed applications who did not receive FFF funding and were asked questions about what actually happened to their proposed projects.”

This kind of a modality enabled the evaluators to compare these two groups by “detecting biases in the answers of successful firms (which might answer the questionnaire strategically to highlight the importance of the FFF funds)” (Falk, 2006:60).

The study (Falk, 2006), by comparing these two groups, therefore, aims to explore project additionality, scale additionality and scope additionality in terms of collaboration and in terms of research topics. This analysis relies on a descriptive statistics.

Finally, the study (Falk, 2006:62) tries to estimate the effect of FFF subsidies on the stock of R&D personnel econometrically, by arguing “it represents important element of firms' ability to change its R&D behaviour”.

5.3. Austrian Kplus Funding Initiative

The third evaluation attempt in relation with OECD-TIP project is Austria's Kplus programme. In Georghiou and Clarysse's (2006:23) words, Kplus competence centres “are platforms for science-industry co-operation that focus on changing research culture by using public funding to help bring together researchers from the public and private sectors”. Firms and universities form a Kplus centre, a

legal firm to conduct R&D projects, whose up to 60% of total costs are funded by the programme during a maximum of 7 years.

The evaluation for behavioural additionality is reported by Steyer (2006) through a survey conducted with 158 partnering firms affiliated to the 12 Kplus competence centres.

Georghiou and Clarysse's (2006:23) calls the methodology employed by the evaluator as "before-and after-methodology: participating firms were asked to give information on the situation before the Kplus centre had started and on the situation four years later". Also they used EU's Community Innovation Survey (CIS) results to compare the findings.

5.4. Belgium IWT Support Programme

Belgium study (Clarysse et al., 2006) tries to measure the behavioural additionality effects of the IWT-Flanders' R&D support programme, the main support for the Flanders region of Belgium.

Clarysee et al. (2006:93) criticise the assumption made by econometric studies on the firm size. They argue that in practice there should be "a clear distinction between different groups of companies in terms of their type". Therefore they categorize the firms into these 4 distinct groups to measure the behavioural additionality:

- Large R&D-based firms (Group I)
- Large non-R&D based firms (Group II)
- SMEs without permanent R&D (Group III)
- High-tech R&D (Group IV)

Belgium study, then conducted an interview with large R&D based firms

to better understand their innovation processes, decision processes for R&D projects, and management of government grants. These talks were seen as an essential part of the interview process and helped better target questions to the different respondents within each firm (Georghiou and Clarysse, 2006:24).

After this interview, the pilot study designed a modular survey consisting of different parts for different firm types. This survey was then performed via telephone interviews to a small number of firms for each category. This structure of the questionnaire is summarized in Table 5.2.

Table 5.2: Belgium Study Questionnaire Structure⁸ (Source: Clarysee et al. (2006))

Modules	No permanent R&D activities		Permanent R&D activities		
	SMEs	Large	High-tech start-ups	Large firms	
				In-take interview	Project interview
Group	I	II	IV	III	
1. General information about the firm	=	=	=	=	=
2. Competitive market position	=	=	=	=	=
3. R&D budget, grants and personnel	=	=	=	=	=
4. Description of the project	=	=	=	=	=
5. Project development process and organisation	=	=	=	Innovation portfolio	=
6. Project output, results and impact	=	=	=	Innovation output	=

5.5. Finland Tekes Funding Programme

Tekes, the national body responsible for the R&D supports to Finnish industry, is the subject of Finnish study. The study is not itself bringing a new evaluation effort but in Georghiou and Clarysee's (2006:24) words "drawing on a number of previous studies that used a combination of interviews and surveys".

After introducing a series of evaluation studies funded by Tekes on input additionality and other effects, the Finnish study (Hyvärinen, 2006) summarizes a research conducted by Pekkanen et al. (2004). The study reported by Hyvärinen (2006:119) "to be aimed to evaluate business manager's attitudes about the additional effects of Tekes R&D funding". He explains that upon the random

⁸ The equal sign means that the corresponding part is same for all groups.

sample of 1 000 manufacturing and services firms from a database of Statistics Finland, a questionnaire that is designed on Likert scale was sent to managers of 645 firms in order to inquire about their perceptions of the impact of public R&D funding.

5.6. Germany Public R&D Project Funding

Georghiou and Clarysse (2006:25) report that

the German study that is based both on results of the German Community Innovation Survey data from 2000 and 2003 (659 firms) and a telephone survey of firms that received public R&D funding for projects that were completed between July 2002 and August 2004 evaluates the behavioural additionality effects of public R&D funding provided via direct project grants from the federal government.

With this data, then, Fier et al. (2006) undertake a descriptive analysis and an accompanying multivariate econometric analysis.

The study (Fier et al., 2006:132) mainly relies on the collaboration aspect of the behavioural additionality and tests these two hypotheses:

- “public R&D funding stimulates firms to seek new R&D partners, i.e. different from the partners they usually co-operate with.”
- “business or science collaborations newly initiated within a publicly funded R&D project are lasting.”

5.7. Japan R&D Projects of NEDO

The Japanese study undertaken by Suzuki and Yumitori (2006) follows a way similar to Finnish study. They are trying to review already completed two studies to explore the behavioural additionality and contribute the project.

The first study reported at Suzuki and Yumitori (2006) is Japanese New Energy and Industrial Technology Development Organization’s (NEDO) follow-up monitoring activity. They are trying to compare the before, during and after the project conditions of the monitoring survey filled by 501 entities from 56 R&D projects between 2001 and 2002. This survey consists of 90 questions from the main parts of details of business, utilisation of intellectual property, spill-over effects and NEDO’s management.

Second source of data is Sakakibara's survey on NEDO projects which in Georghiou and Clarysse's (2006:26) words

aimed at collecting data related to participation in national programmes and focused on several topics, such the as objectives of participation, indirect effects of the programmes and the degree of networking and co-operation with other organisations.

Suzuki and Yumitori (2006) reveals that as this study is not fully appropriate to understand the behavioural additionality of NEDO programme, as it is not isolating the effect of the intervention but comparing the situation before and after the funding, they advise to the government to build behavioural additionality methodologies and promote undertaking such practices.

5.8. Korea General R&D Funding

Korean study conducted by Shin (2006) is not an evaluation attempt for behavioural additionality but an input additionality tried to be derived by employing econometric analysis on simple investment function with aggregate data. The study employs a time-lag to the model and tries to measure the time-lag effect of public funding of R&D on private funding of R&D. This lag effect is then labelled as behavioural additionality.

This methodology, however, is very hard to be classified as a methodology to evaluate the behavioural additionality. This approach is very similar to one used for measuring input additionality.

5.9. Norway Loans/Grants From Innovation Norway

Norwegian study conducted by Madsen and Brastad (2006:182) of Nordland Research Institute examines the supports given by Innovation Norway (IN), Norway's institution for industrial R&D support, at 2000. The study tries to answer the questions: "How does IN contribute to the realisation of projects?" and "How does IN's involvement affect important objectives and processes of change in a company?"

To this aim, the study analyses a preliminary survey conducted just after the support, at 2001. Then Madsen and Brastad (2006) reports that they conducted an interview from January to March 2004 with the firms that responded to this survey and are still operating. From this data set, then, the Norwegian study tries to derive implications by employing econometrics.

5.10. UK SMART and LINK Initiatives

The UK study conducted by Malik et al. (2006) investigate the behavioural additionality effects of two R&D support programmes, LINK and SMART by interviewing with the senior managers of 10 firms selected from the support database.

The evaluators (Malik et al., 2006:210) underline three strategic questions used in these interviews as

- “Whether the support helps to overcome a lock-in failure by introducing a firm to a new or extended technology or market area?”
- “Whether the support is building new networks or co-ordinating systematic innovations such as those requiring establishment of standards, either between firms or between firms and the research base?”
- “Whether the support has provided the firm with incentives to acquire new competencies, ranging from project management skills, through various acquired technological and market capabilities, and possibly encompassing innovation and commercialisation capabilities (for example securing intellectual property or raising venture capital investment)?”

To this aim, it is reported by Malik et al. (2006:211) that an interview guide “was designed focus on the areas of the firm’s strategy and formulation process, its current strategy profile, experience of public supported R&D initiatives, details about the SMART or LINK project and additionality effect” and tested on a small local firm.

5.11. US Advanced Technology Programme

The study representing United States of America investigates US Department of Commerce National Institute of Standards and Technology sponsored Advanced Technology Programme (ATP). Georghiou and Clarysse (2006) report that the main aim of the study is to see programme's success on forming joint R&D ventures.

ATP, to measure this, signed a contract with Westat, a private research firm specialized at survey design. Shipp et al. (2006) report that Westat developed the survey with two versions, one for companies and one for non-profit organisations. This survey was then conducted via Internet and "for those that did not respond to the online survey a follow-up phone interview phase (was) undertaken" (Shipp et al., 2006:222).

With this data, the study undertakes an econometric analysis where ATP effect is the dependent variable on forming joint ventures.

5.12. EU 5th Framework Programme for Research and Technology Development (FP5)

The final study performed in relation with OECD-TIP workgroup on behavioural additionality tries to identify the behavioural additionality effects of European Union's 5th Framework Programme (FP5). Georghiou and Clarysse (2006) report that Polt and Psarra (2006) re-examines the results of the Five-Year Assessment of FP5, a large study conducted by a wide range of evaluators and included a survey distributed to 12 000 participants of FP5 during 2004.

Within this data set, the authors conduct a descriptive analysis on behavioural additionality elements. One interesting thing about this study is that it includes the concept of negative behavioural additionality on which Georghiou and Clarysse (2006) stress the importance.

5.13. Consolidation of Evaluation Attempts

The 12 studies summarized in above parts are all unique. Although there were several meetings and workshops to align the studies in a common shape, the results of the studies are not comparable with all aspects. However, Georghiou and Clarysse (2006) try to build a comparison by excluding the deviant ones, the Belgium, Japan, Korea and UK studies. This effort is summarized in Table 5.3 and 5.4. However, it should be noted that Georghiou and Clarysse (2006:30) indicate that “as many of the country studies were designed before the OECD project, the methodologies are not sufficiently consistent to allow a direct combination of data”. In any case, however, this effort provides a quick snapshot of the results of whole study.

Returning to the focus of this thesis, these studies derive significant corollaries from the methodological perspective for a study on a prospective framework in Turkey.

The first corollary is about the data collection mechanism, as spotted by Georghiou and Clarysse (2006:30) and most of the studies, “given the economics of performing such studies: many companies can be surveyed at little cost”. However, some studies employ an interview stage either before the survey to improve its design as was the case of Belgium or after the survey to increase its respond rate as in US case. This approach is also very useful for the integrity of the data by giving more insight to the evaluator about whether the firm answers to a question psychologically in a way not reflecting the bare truth.

Another benefit that can be derived from a methodology that is reinforcing the survey approach with interview can be associated with the nature of behavioural additionality that can not be revealed by simply collecting cold data via surveys. Georghiou and Clarysse (2006:30) argue that “surveys can be more productive if linked to more in-depth interviews”.

Secondly, some countries like Belgium used a control group approach as echoed by Georghiou and Clarysse (2006). This approach also can be very helpful to see the additionality by comparing and contrasting the firms that were funded by the

government and the firms that were not funded. However, to employ this kind of an approach, the firms that were not funded by the program should have been rejected on strategic grounds such as the technology area priorities or the budget constraints. In contrast, if the project is rejected for it is not an R&D project, the data derived cannot be used for comparison purposes.

Thirdly, Georghiou and Clarysse (2006:30) expose that the surveys accompanied by interviews “allow the surveys to allow to be tailored to different populations of firms that use government R&D support in different ways”. Therefore, there can be a modular design for the survey that each firm type is separately treated in its own characteristics and healthier data is collected as in the case of Belgium study.

Final lesson is about the treatment of the collected data. Some studies uses econometric approaches, some studies rely on descriptive analysis and yet other studies employ both approach. It is very clear that as Georghiou and Clarysse (2006:30) put forward “not all aspects of behavioural additionality are amenable to being modelled in a way suitable for such approaches”. Therefore, it is best in most of the cases trying to accompany the econometric models with qualitative judgements.

Table 5.3: Behavioural Additionality During The Project: Summary and Findings (Source: Taken from Georghiou and Clarysse (2006:32))

Country	Type of behavioural additionality (Anticipated effect of failure to receive government funding)			
	Project Additionality (Project launch)	Acceleration Additionality (Accelerated schedule)	Scale and Scope Additionality (Expanded scale & scope)	Challenge Additionality (More challenging research)
Australia	37% would have cancelled.	100% would have taken longer.	92% would have scaled down.	78% would have been less challenging. 64% would have reduced range of applications.
Austria (FFF)	28% would have cancelled (31% did cancel). 61% would have sought alternative funds (25% did seek alternative funds).	32% would have postponed (43% did postpone). 51% would have taken longer (61% did take longer).	74% would have scaled down (60% did scale down).	49% would have been less challenging (40% were less challenging).
Austria (Kplus)	33% would have cancelled.	Firms would have slowed down implementation.	67% would have carried out project with limitations.	Firms would have reduced the technical challenge.
Finland	20% would have cancelled.	—	46% would have scaled down.	48% of projects were too risky to carry out alone. 73% would have reduced technical ambition.
Germany	—	With government funding, 53% sped up project launch; 28% sped up project implementation.	With government funding, 55% extended project size.	With government funding, 60% pursued more technically challenging projects.
Norway	53% would have cancelled.	16% would have slowed the R&D.	—	—
United States	93% would have cancelled.	—	—	82% of funded projects were more ambitious than firms' typical R&D projects, and 70% were more technically challenging.
EU	57% would have cancelled.	33% would have taken longer.	76% would have scaled down.	43% would have been less challenging.

Table 5.4: Behavioural Additionality After The Project: Summary and Findings (Source: Taken from Georghiou and Clarysse (2006:33))

Country	Type of behavioural additionality (Reported impact of participating in the government programme)		
	Network Additionality (More collaboration)	Follow-up Additionality (Project follow-up)	Management Additionality (Improved management)
Australia	67% formed new collaboration with another company. 48% formed new collaboration with universities or research institutes.	87% participated in subsequent government programmes.	70% introduced entrenched changes in R&D management. 60% enhanced their commitment to R&D. 56% improved their understanding of benefits of R&D. 50% changed commercial strategy.
Austria (FFF)	51%/55% collaborated with public research organisations/other firms.	43% resulted in subsequent activities. 63% extended R&D into new areas.	—
Austria (Kplus)	Firms recognised collaboration more important.	50% resulted in subsequent activities.	78% sell on international market. Share of R&D funding spent externally doubled in four-year period. Larger share of participants engaged in EU-funded programmes.
Finland	53% strengthened collaborative networks. 50% collaborated with research institutes. 35% increased subcontracting.	—	44% affected long-term business strategies. 53% doing R&D not connected to short-term business strategy.
Germany	78%/74% intensified collaboration with research institutes/industry. 42%/58% formed new collaboration with research institutes/industry.	... but new networks do not necessarily last long after funding has ended.	66% changed R&D management as a result of public funding procedures
Japan	—	63% resulted in subsequent activities. 29% established related projects. 21% of projects reached the stage of commercial application.	32% expanded R&D department.
Norway	60% increased collaboration.	—	67% increased competence, usually in product development.
United States	More than 90% of joint ventures would not have formed without ATP support. 64% indicated that programme fostered increased trust and cooperation among partners.	—	—
EU	70% reported increased collaboration.	—	—

CHAPTER 6

THE TURKISH CASE: TÜBİTAK-TEYDEB SUPPORT

This chapter of the thesis represents the main research section of the whole study. On the back of the insights of the literature survey and classification efforts of the previous 4 chapters dealing with the conceptual framework of evaluation, additionality - behavioural additionality in particular- and the existing evaluation attempts in OECD countries, this chapter will try to develop a methodological framework to measure the behavioural additionality effects of TÜBİTAK - TÜBİTAK-TEYDEB R&D support programme.

Section 6.1, to this aim, will explain the overall shift of Turkish science, technology and innovation policy observed after 2004 and the connected and increased need for an evaluation framework.

Section 6.2, then, will analyse older developments, policy context of Turkish industrial R&D support till 1995 to be able to propose a methodology to measure the behavioural additionality. After this crucial perception of policy, the design of the TÜBİTAK-TEYDEB programme will be investigated in Section 6.3.

Then, the data analysis will be investigated in Section 6.4 to unveil the necessary points in focus during an evaluation exercise of TÜBİTAK - TÜBİTAK-TEYDEB programme's behavioural additionality effects.

Finally, Section 6.5 will attempt to propose a methodology to measure the behavioural additionality effects in the light of above mentioned structure as the central and most important part. This will be the most important output of the thesis.

6.1. Shift of Turkish Science, Technology and Innovation Policy and the Need for an Evaluation Framework

Following the environment created by the process benefits of the first Turkish foresight study, *Vision 2023*, Turkish science, technology and innovation domain faced a turning point on September 8th, 2004. The Supreme Council for Science and Technology (SCST), highest body for determining science and technology policy, had its 10th meeting with the participation of most of the ministers and other high-level officers under the chairmanship of the Prime Minister.

At this meeting, a new approach of linking the process of wealth creation and science and technology was explicitly announced. Within the resolution 2004/1 (SCST, 2004), four main aims of the 'Science and Technology Policies Action Plan: 2005 - 2010', i.e. the focus of science and technology policy, are defined as "increasing the quality of life of the nation, answering to social problems, increasing the competitive power of the country and disseminating the science and technology culture in society".

Also, at this meeting every stakeholder was convinced that the comparative position of Turkey regarding science and technology is very weak and the investment in research and development should be increased to "carry the country to a better place it deserves". Therefore, SCST decided to have an official target of increasing the R&D intensity, the share of the R&D expenditures in Gross Domestic Product (GDP), to 2% in 2010 from the latest known value of 0.66% in 2002 (SCST, 2004:Res 2004/1). Moreover, another official target of gradually increasing the number of full time equivalent R&D personnel to 40 000 at 2010 from the latest known value of 23 000 at 2002 was adopted.

In line with these targets, government has dramatically increased the R&D Turkish Research Area. Similarly, The Scientific and Technological Research Council of Turkey's (TÜBİTAK), the public organization responsible for R&D grant-making and science and technology policy advising, budget for R&D grants rose in 2005. The government also reiterated its commitment in 2006. Figure 6.1 shows the overall R&D expenditure of the government between 2000 and 2006.

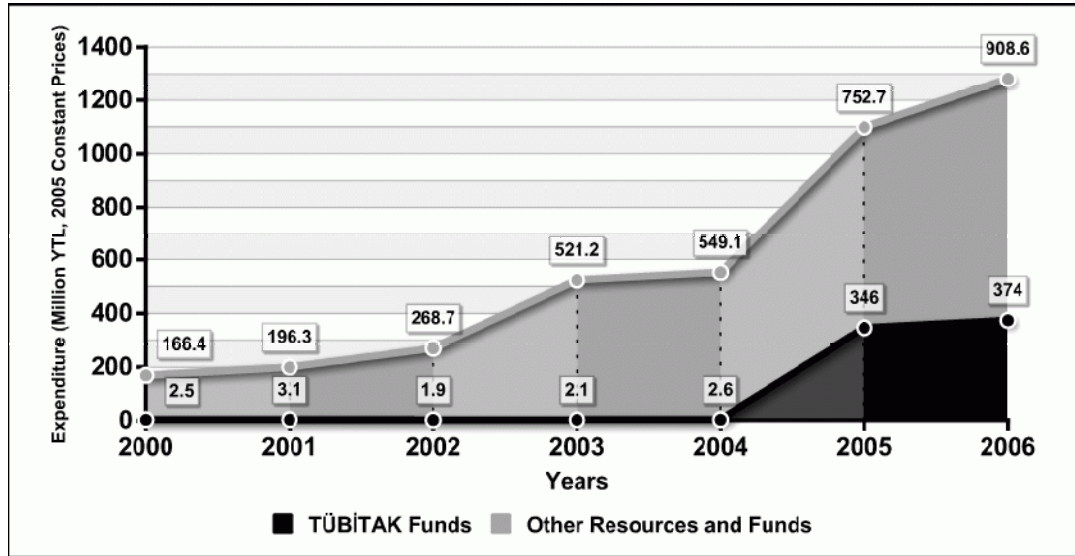


Figure 6.1: Government Resources for R&D (Source: SCST, 2006)

Consequently, SCST set some rules and established a policy framework at its 11th meeting (SCST, 2005a). For the use of the huge resource allocated for R&D, for instance, SCST has decided that the Frascati, Oslo and Canberra Manuals will be used as references to determine the borders of R&D and extent of the R&D support. Also, Council repeated its determination to support result-oriented researches.

More specifically, the support for private R&D was also in the focus of SCST decisions on various aspects. Not having a slope as sharp as the curve in Figure 6.1, government support for private R&D has also faced a dramatic increase. This enabled TÜBİTAK to support all the projects that is considered as R&D regardless of the priorities and other policy objectives.

Although 14 technology activity areas and 8 strategic technology fields derived from the Turkish Foresight Study, Vision 2023, is officially amended in 11th SCST as the priorities, as Saritaş et al. (2006: 22) argues “after two years of its completion the findings and recommendations of the Vision 2023 Program have not been fully incorporated into the actual S&T policy making of Turkey”.

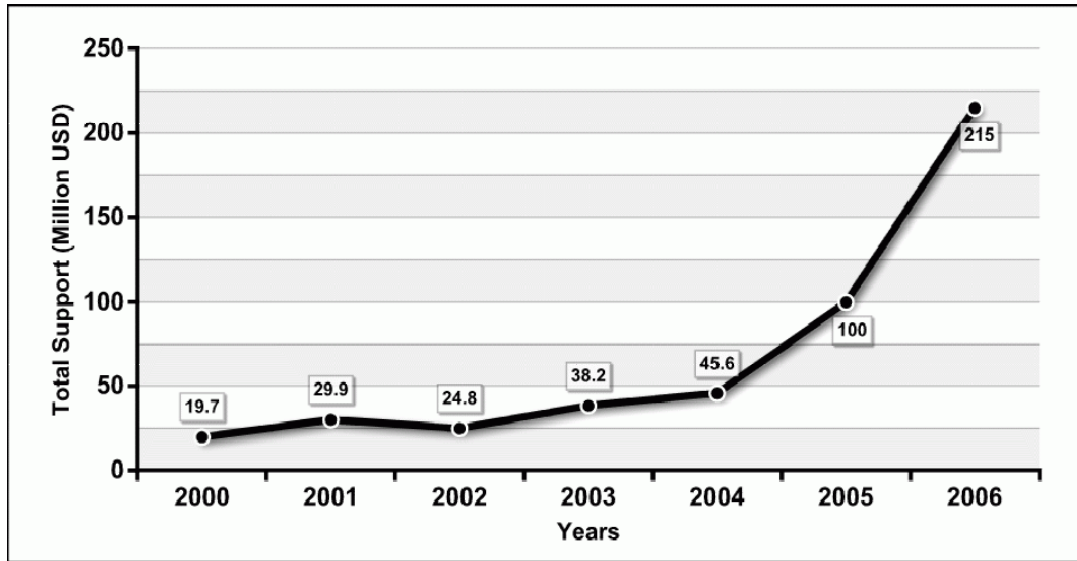


Figure 6.2: Government Support to Private R&D (Source: SCST, 2006)

Similarly, although it was not stated explicitly, the 2% target intrinsically assumed that there will also be a structural change in the expenditure framework during the targeted period, 2005 - 2010. It was assumed that the private sector will contribute to the Gross Domestic Expenditure on R&D (GERD) in the same magnitude and degree as the government expenditures for R&D is increasing. In other words, it was assumed that government support for R&D will definitely create input additionality.

Within this framework, this kind of a shift in science, technology and innovation policy and the dramatic increase in the resources devoted should add to the requirement of a solid ex-ante and ex-post evaluation mechanisms along with the in process monitoring system more than anything.

As drawn in Chapter 2, an evaluation can be carried out for accountability, strategic change and decision support purposes on ex-post or ex-ante basis. In other words, the evaluation mechanism is supposed to reinforce this kind of a policy shift to manage the strategic change and decisions and ensure the accountability of such a great increase in resources requires.

6.2. Policy Context

Argued as crucial by Fahrenkrog et al. (2002) to perceive the policy characteristics for the design of an evaluation study, understanding the policy context plays a central role in this thesis as well. The chronological flow of events is summarized at Figure 6.3.

Detailing the chronological flow depicted at Figure 6.3, as the initial motion, relying on the Supreme Planning Committee's report dated 27.12.1994, Council of Ministers approved the 'Decision of Government Support Regarding to the Export' at the same day (Council of Ministers Decision, 1995:5). This decision announced a series of government supports

to abrogate economic and social disadvantages arising from regional differences, to improve employment by providing new training opportunities, to foster undertaking of R&D projects especially in the sectors using new products, production systems and technologies, to help organization of SMEs operating in the same production domain, to comfort the reorganisation of the industry for avoiding environmental problems, to support agricultural products in relation with GATT agreements and to help marketing of the products in international arena.

Therefore, this decision draws the border of government support on the following topics within the above mentioned framework:

- R&D
- Environmental Protection
- National and International Export Fairs
- Market Research
- Overseas Offices-Stores
- Training
- Export refund on agricultural products

Furthermore, Council of Ministers commissioned the Undersecretariat for Foreign Trade (UTF) for the implementation of those supports and spared Support and Price Stability Fund (DFIF), a fund under UTF control and consisting of various import and export taxes and other fees, for this purpose.

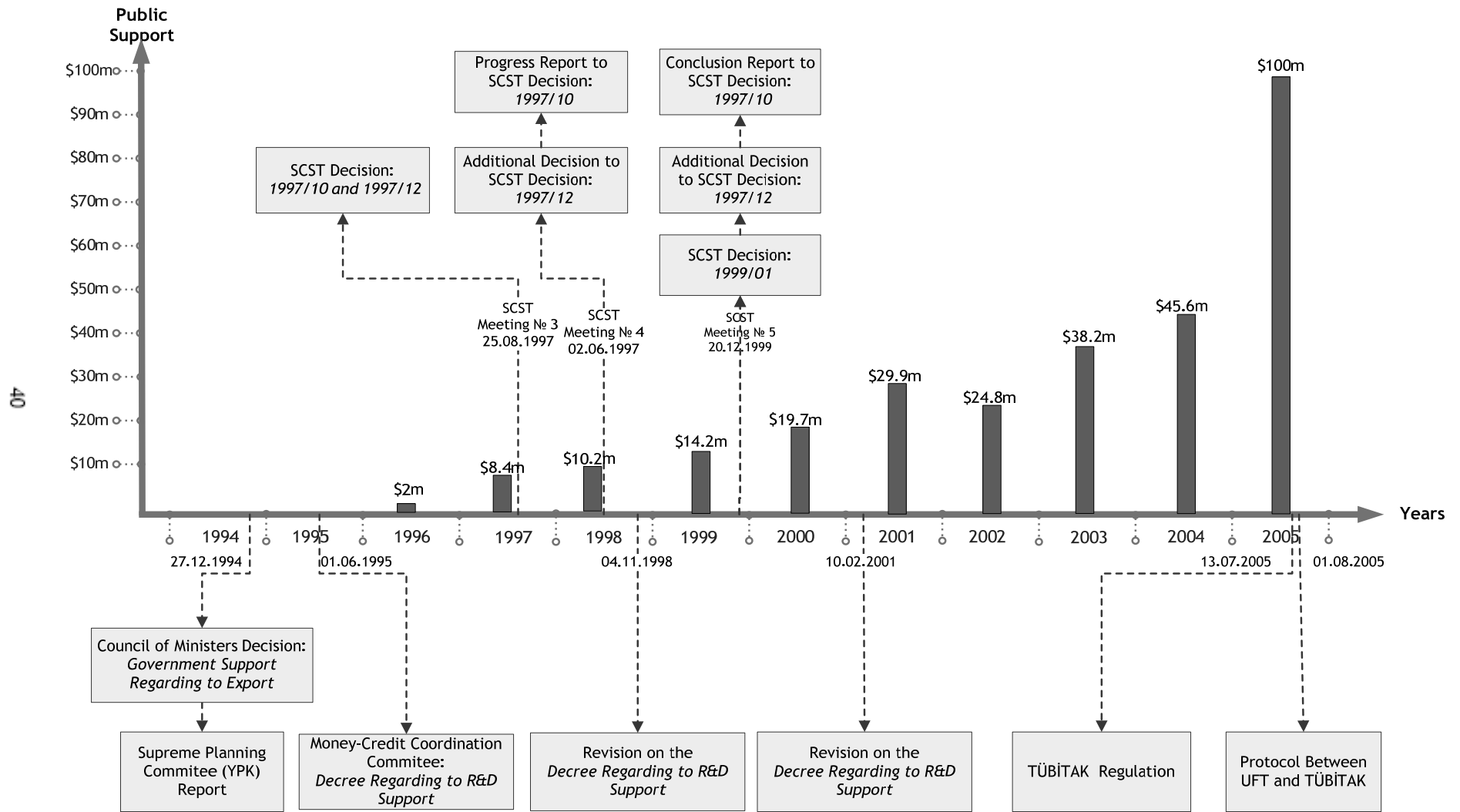


Figure 6.3: Chronological Milestones Related to Policy Context of and Design of TÜBİTAK-TEYDEB Grant Programme (Source: Own Drawing)

Following this framework drawn by Council of Ministers, secondary regulation, Decree Regarding to R&D Support, was published by Money-Credit Coordination Committee at 01.06.1995 (Money-Credit Coordination Committee, 1995).

This decree was defining two policy tools for industrial R&D supports:

- A grant programme that will be conducted by TUBITAK was established. This led to the foundation of TÜBİTAK - Technology Assessment and Monitoring Board (TİDEB)⁹. The support given by TEYDEB was on purely grant basis, i.e. without repayment or any other responsibility. Also, the scope of this thesis is limited to this support mechanism.
- The contract programme that was being conducted by Turkish Technology Development Foundation (TTGV) was also covered with this decree. The support given by TTGV is not on grant basis but on contract basis, i.e. with repayment or other kind of financial responsibility such as share option. The scope of this thesis does not include TTGV contracts.

Some aspects of the policy drawn by this Decree numbered 1995/1, therefore, are as following:

- **Target Audience:**
 - Targeted firms were all the firms engaging in industrial and software development activities
- **The Definition of R&D and Innovation:**
 - The framework of R&D projects was defined in a manner more close to the experimental development in Frascati terminology.
 - Also, the framework for the innovation was defined in accordance with 2nd Edition of Oslo Manual (OECD/Eurostat, 1997). Therefore, it included solely product and process innovation and excluded newly defined marketing and organizational innovation.
 - Thus activities to be supported were enumerated as:
 - Conceptual development
 - Technological / technical and economical feasibility studies

⁹ The body is renamed as Technology and Innovation Support Programmes Directorate (TEYDEB) in 2006.

- Laboratory studies to be conducted in the process of transition from conceptual development to design
 - Design and drawing studies
 - Prototype production
 - Establishment of pilot plant
 - Trial production
 - Patent and licence studies
 - After-sales support

- **Support Type:**
 - The support for R&D was on grant basis. The maximum amount that could be supported by the public resources was the 50% of project budget.
 - Support ratio could be increased in such cases:
 - 10% increase in support could be applied for the projects that have patent outputs. It means that the total support ratio was 55% at maximum for such projects.
 - Up to 20% increase in support could be applied for the firms that acquired more than half of its revenue from previous R&D studies. It means that the total support ratio was 60% at maximum for such projects.
 - 20% increase in support could be applied for the projects that was being conducted in the following priority areas:
 - Informatics
 - Flexible production
 - Advanced material technologies
 - Biotechnology / genetic engineering
 - Aerospace and aviation technologies

- **Support Duration:**
 - Projects up to 3 year span could be supported.

- **Expenditure Types to Be Supported:**
 - Personnel Expenditures could be supported. However, it is worth notable that although Frascati Manual (OECD, 2002) enumerates the

categories of R&D Personnel as researchers, technicians and equivalent staff and other supporting staff, the decree indicates that only the costs incurred by researchers and technicians and equivalent staff would be considered as R&D personnel expenditure.

- Expenditures for instruments, equipment, computer software that would be used for R&D purposes could be supported.
- Expenditures for consultancy services and other services that would be used for R&D purposes could be supported.
- Expenditures for extramural R&D that was conducted by universities, public research organizations (TÜBİTAK institutes) and other private undertakings could be supported.
- Patent application expenditures could be supported.
- Direct expenditures for materials etc. to be used at R&D activities could be supported.

Apart from this Newton motion to the policy for supporting private R&D, there were other steps undertaken by various governments within the second half of 90s and the first half of the current decade. Some other important turning points for the policy which is summarized at Figure 6.3 are, therefore, as following:

- **1997**

- **SCST Decision 1997/10**

Council recommended increasing the maximum ratio of support from 50% to 60%, the maximum level of GATT agreement.

- **SCST Decision 1997/12**

Council emphasized the importance of supporting SMEs in relation with the R&D support policy. Also, the need for the reorganization of Small and Medium Industry Development Organization (KOSGEB) was pointed out.

- **1998**

- **Progress Report to SCST Decision 1997/10**

Council announced its approval on TÜBİTAK recommendation for a change in the Decree. The proposal included:

- increasing the maximum ratio of support from 50% to 60%, the maximum level of GATT agreement

- a new mechanism to compensate the inflation effect for the payments
 - a new regulation to encourage applying to Turkish Patent Institute for patent
 - increasing the support ratio for R&D personnel expenditures
 - a new regulation to support shared R&D centres and joint R&D projects and to encourage university - industry partnership
 - a new regulation to support firms and universities undertaking joint international projects
 - including 'environmentally sensitive technologies' to the prioritized support areas
- **Additional Decision to SCST Decision 1997/12**

Council decided to discuss a report for the reorganization of KOSGEB at its next meeting.

- **Revision of the Decree Regarding to R&D Support**

Decree was renewed on 04.11.1998 (Money-Credit Coordination Committee, 1998). This new form of the Decree numbered as 1998/10 included the recommendations on above mentioned 'Progress Report to SCST Decisions 1997/10'. This new form of the Decree represented the backbone of the implementation over the life span of the programme. Although the details of the regulation that are related with the programme design will be explained in Chapter 6.2, the main points of this regulation related to the policy context can be enlisted as:

- Regardless of the total support, 60%, 75% and 90% of the personnel expenditures of the large-sized enterprises, SMEs and firms residing in a technopark can be supported respectively. Also, all of the costs incurred by the employment of PhD level researchers can be supported.
- An additional 30% increase in support is introduced if the R&D is contracted to a TÜBİTAK Institute or is conducted at a technopark.
- Technologies sensitive to the environment are added to the priority technologies list.
- Firms are enabled to cooperate for R&D projects.

- **1999**

- **Conclusion Report to SCST Decision 1997/10**

Council announced its appreciation for the release of the renewed Decree including the recommendations SCST pointed out.

- **Additional Decision to SCST Decision 1997/12**

Council announced its disappointment on the termination of the regulation enabling additional KOSGEB support to projects that are supported as SME projects in the framework of R&D support programme

- **SCST Decision 1999/01**

Council pointed out that the support was only covering the industrial firms. However, it explained that especially the firms in agricultural sector should have been thought in the framework of the grant programme because of their importance. Therefore, Council Decision recommended expanding the firm definition from 'industrial firms undertaking R&D' to 'all firms undertaking R&D'.

- **2001**

- **Revision of the Decree Regarding to the R&D Support**

The decree was renewed for the second time on 10.02.2001 (Money-Credit Coordination Committee, 1998). The changes introduced in this renewal were as following:

- The definition of the target audience is expanded to firms engaging in industrial and software development activities and firms creating value added regardless of their sector and size.
 - The maximum duration of the project was increased to 3.5 years by introducing final renewal of 6 months to 3 years of maximum project duration.

- **2005**

- **TÜBİTAK Regulation**

The Regulation Regarding to TÜBİTAK Industrial R&D Support Programme (Prime Ministry, 2005) published on 13.07.2005 regulates programme

design. Regarding to the overall policy, there are two main changes: the concept of contract is introduced and the opportunity of advance payment is made possible. Chapter 6.3 of this thesis will deal with this regulation while investigating for the programme design.

- **Protocol Between UFT and TÜBİTAK**

While originally all the resources used for this support is financed by the DFIF under UTF control as explained before in this chapter, a protocol was signed by TÜBİTAK and UFT mandating the review of the sources of the support every year. For 2005, it was also concluded that as TÜBİTAK has sufficient amount of budget to cover the support by its own resources, 75% of the support budget would remitted by TÜBİTAK while the rest would be liquidated by using DFIF.

6.3. Design of the Programme

In relation to above explained policy context and history, it is also crucial to perceive the programme design of the support to be able to propose a methodology to evaluate its behavioural additionality effects. Thus, this section is devoted to this kind of an analysis.

As detailed above, the Decree numbered 1995/1 drawing the general policy framework designated TÜBİTAK - TİDEB as the implementation body for the industrial R&D grant programme. Since 1995, therefore, TÜBİTAK-TEYDEB served as the most dominant apparatus to support R&D. During the last 10 years, it has been operating the programme granted almost USD 300 million of which one third was spent in 2005 (SCST, 2006). Also, the programme is reported to the source of a R&D volume of more than USD 750 million after the year 2000 (SCST, 2006).

In addition to the above mentioned monetary values, the programme supported 2 641 projects out of 3 666 total applications while this represents a total of 1 594 firms supported during 10 years. Figure 6.4 shows the historical trend in the project applications and supports and new firms supported.

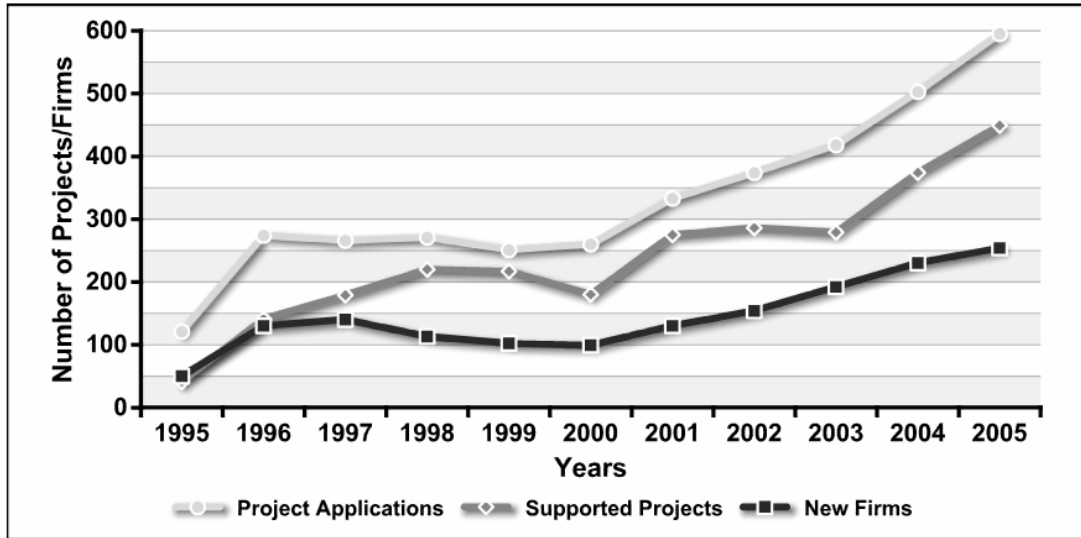


Figure 6.4: Number of Projects Applied and Supported and Number of New Firms Applied to TIDEB Programme Since 1995 (Source: SCST, 2006)

Mandated with the allocation of this huge resource, TÜBİTAK-TEYDEB was formed as a semi-independent body at the initial years following the foundation. The budget (for personnel expenditures and other current expenditures) of the TÜBİTAK-TEYDEB was also sourced by DFİF, the fund used for the grant flow. Independence from TÜBİTAK in terms of financing (although it administratively reported to TÜBİTAK) left TÜBİTAK-TEYDEB room for independent decision making.

The technology objectives of the programme are enlisted as:

- to share the risk doing the R&D project
- to increase the in-house capability in design of new products and processes
- to increase the percentage of industrial R&D expenditure in Turkey
- to deepen and widen R&D culture in industry
- to promote industry-university cooperation
- to promote the employment of qualified people (especially with PhD)
- to maximize the use of advanced technologies in traditional manufacturing
- to assist SMEs in managing projects effectively,
- to promote R&D in the priority technological fields listed above

- to bring together the separate but related knowledge bases (networking) in generating technology specific competences
- to open up new scopes to industry in becoming competitive

It is a bottom-up program. Firms themselves decide on the subject of the project and there is no time limitation or other restriction for the application to the program. It is an open call program. Project applications can be done anytime considering that the expenses covering at most the preceding 3 months can be supported.

TEYDEB was governed by a Director accompanied by the Vice-Directors. Recently, the Director of TÜBİTAK-TEYDEB is also the Vice-President of TÜBİTAK as it was the case for some period during the life-span of the programme. Besides, this structure of top management of TÜBİTAK-TEYDEB is organized on thematic basis. The judgement of expert is valued in those thematic groups. The function of the programme is to provide R&D funding as a grant. However, during the assessment and monitoring of the project by technical experts, an indirect consultancy is usually given to the firm.

The criteria used in assessment/evaluation of the projects are listed as the following:

- clearly defined objectives
- R&D approach achieving defined objectives
- clear added value at firm/national level
- innovation level
- technological complexity level
- potential impact at national/international level
- commercialization possibility
- project management structuring
- dissemination plans

The supported projects are monitored and examined through site visits by the selected external technical experts and through financial audits. The results of the projects are monitored by a formatted 'Project Result Report' that an

analysis of the data derived from this report is the subject of the next section, section 6.4.

The process of TÜBİTAK-TEYDEB project application and selection is depicted in Figure 6.5. Similarly, Figure 6.6 represents TÜBİTAK-TEYDEB project monitoring and implementation process. Apart from the details provided in these figures, some points about the programme design are worth to mention.

First of all, it is a distinctive characteristic of the programme that the payments are made on a term basis. In other words, firm spends the money for R&D in advance and send a technical and financial report regarding to this activity in every 6 months (every term, a year is considered as two terms), and only after this report is approved, the firm can reimburse the money it spent. This term system leads many complaints that it is argued that it is not a R&D support but a reimbursement programme.

Neo-classical argument postulates that the technology policy and apparatus of technology policy like TÜBİTAK-TEYDEB programme are existent because of a failure in financial markets for R&D (Arrow, 1962). However, because financial institutions do not tend to lend the necessary resource to firms as R&D is too risky, this 'reimbursement structure' of the programme does not serve as a mechanism for enabling firms to undertake R&D that would be otherwise not undertaken because of financial difficulties. In contrast, it functions as a reward mechanism for the firms that have already undertaken R&D.

This structure was more influential in years that high level of inflation is evident in Turkey¹⁰. Taking into consideration that time consumed for filling the red-tape could reach to 6 months on some projects, the firm could get the money it disposed almost one year ago. Therefore, the firm in some cases reimbursed the half of the money in real terms agreed on the contract. This structure, therefore, can be considered as not a R&D grant programme but a non-steady implementation of a R&D reimbursement programme.

¹⁰ The annual rate of change of "Producer Price Index" was higher than 75% for the years 1995, 1998 and 1999 and higher than 50% for the years 1996, 1997 and 2001.

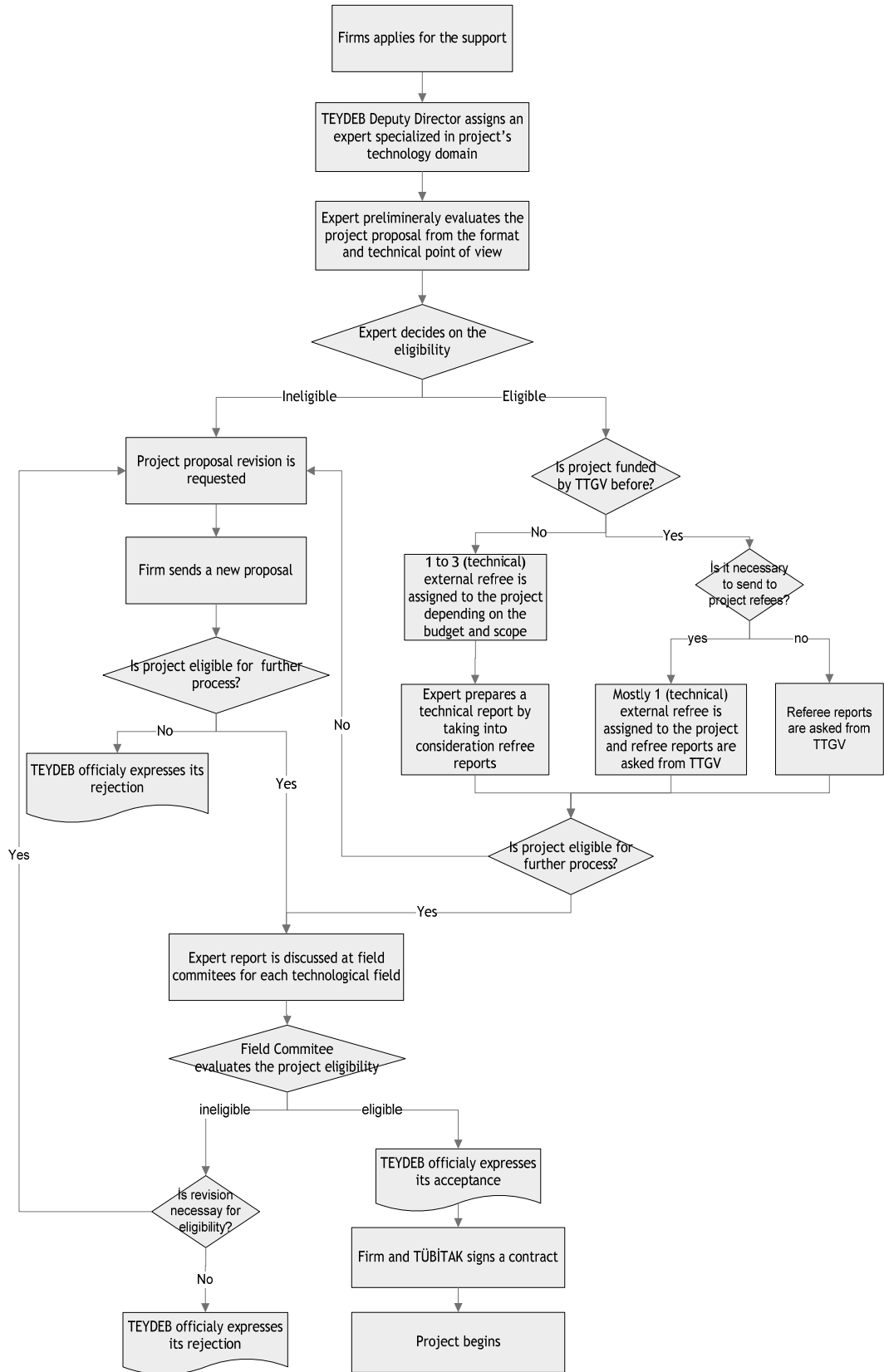


Figure 6.5: Flowchart of TÜBİTAK-TEYDEB Project Application and Selection Process
(Source: Own Drawing.)

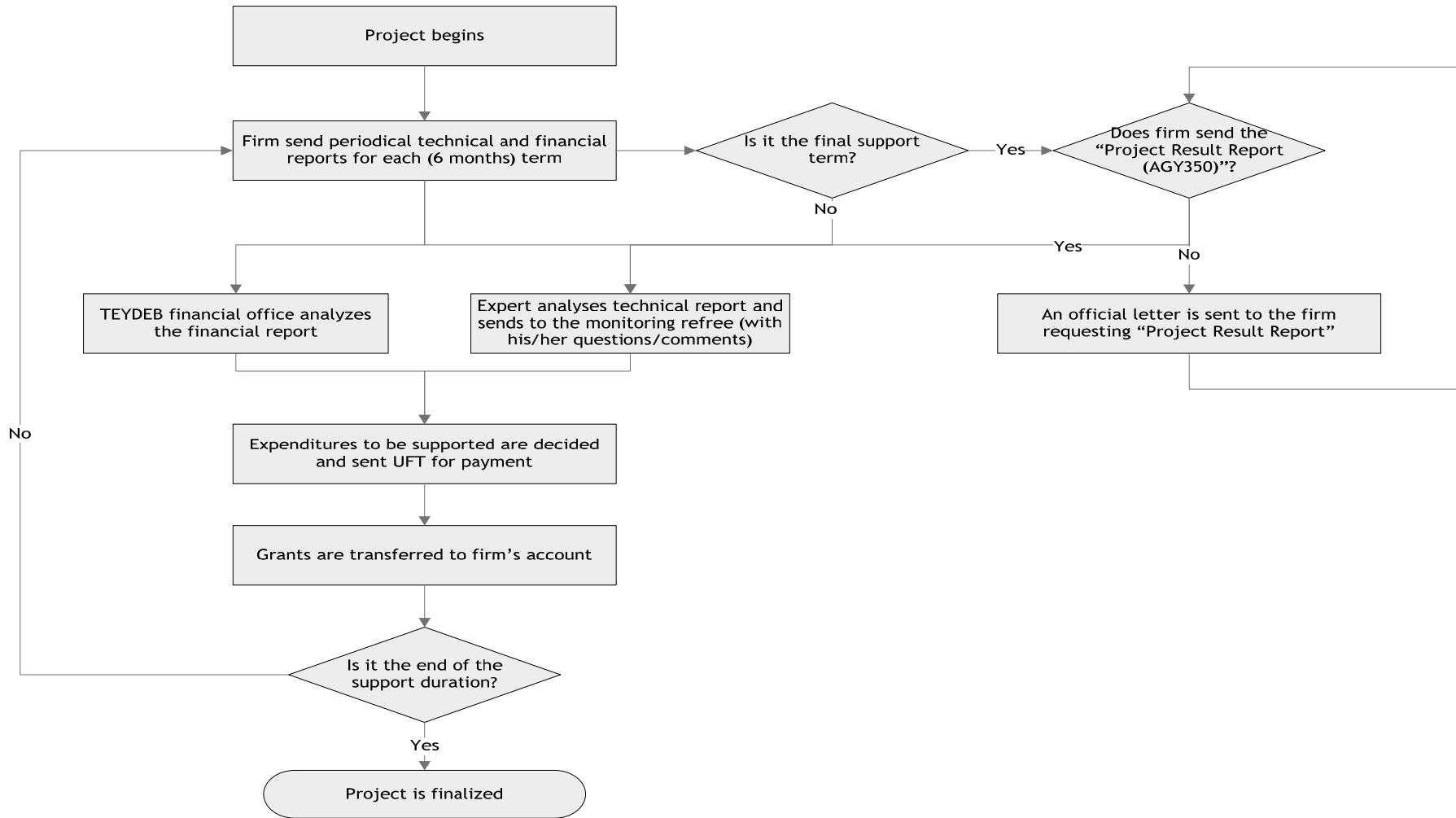


Figure 6.6: Flowchart of TÜBİTAK-TEYDEB Project Monitoring and Implementation Process (Source: Own Drawing.)

6.4. Data Analysis

As explained in Chapter 6.3, before beginning the final period, i.e. last 6 month, every firm should answer a survey called 'Project Result Report' and coded AGY350. This survey, then, is subject to the examination of TÜBİTAK-TEYDEB expert. If there are any missing or mishandled parts in the filled surveys, expert requests a correction in the 'Project Result Report' to be able to pay the sum of the relevant support term. Therefore, as AGY350 is directly connected to a financial mean, the filling rate of the surveys is extremely high, almost 100%.

The full version of the AGY350 is translated to English and presented in Appendix A. It sums to 8 pages and includes following main parts:

- A. Firm Information
- B. Project Information
- C. Project Assessment
 - C.1. Summary Assessment
 - C.2. Project Duration Assessment
 - C.3. Cost Assessment
 - C.4. Funding Assessment
 - C.5. Commercial Assessment
 - C.6. Other Economic Effects
 - C.7. In-Firm Effects
 - C.8. Out of Firm Effects
- D. R&D Support Programme Assessment

From the point of view of its high response rate and broad coverage, AGY350 is an excellent resource for an evaluation of TÜBİTAK-TEYDEB support. Therefore, when it was decided to investigate TÜBİTAK-TEYDEB support from the aspect of behavioural additionality, the first potential resource for this kind of an evaluation was AGY350. However, later it is understood that deriving a broad implication from this resource for behavioural additionality is not possible.

This survey was designed in 1998 for measuring neither the behavioural additionality nor any type additionality. In fact, this survey is designed by taking

the project as the focal point. Every effect inquired by the survey is related to the project not the firm.

Furthermore, the attribution problem¹¹ was not taken into consideration while designing the survey. Every question seeking an answer to the existence of a particular effect is questioning the project's role, not the firm's own role or the government intervention's role. Therefore, although it can be derived that whether there is a change in firm behaviour after the project or not, for instance, it is impossible to attribute a possible effect to the firm or to the intervention. It is evident that the survey is not designed for this purpose or need.

Finally, the survey's approach is not the modern evaluation approach. AGY350 is not following a logical framework of input, output and behaviour. Rather, it focuses on the financial (monetary) measures and questions that have implications for output and behaviour effects are scattered within this basis.

Therefore, when it was clearly understood that deriving a reasonably broad and sense implication for behavioural additionality from AGY350 is impossible, the main research question of this thesis appeared for the reasons explained in Section 6.1: How can we measure the behavioural additionality of TÜBİTAK-TEYDEB support? However, still there was a room for the use of AGY350 for this purpose. It could serve for the design of a new and complete methodology for the evaluation of behavioural additionality.

A design for a methodology of an evaluation should require clues about the domain apart from the policy context and programme design. The design should spot the potential for the effect it is intended to measure, behavioural

¹¹ OECD (2006) argues that 4 kinds of problems may arise in the evaluations: timing, appropriability, inequality and attribution. The timing problem refers to the fact that the timing of the evaluation may not be appropriate to perceive the evaluated phenomenon. Appropriability refers to the situation that "the beneficiaries of research may not be the same people or organisations who performed it so it may not be obvious where to look for effects" (OECD, 2006:4). Inequality problem means that within the portfolio of the projects evaluated some projects may distort the general average and affect the evaluation conclusion. Finally, attribution problem refers to the fact that the particular effect may not be accounted for the government intervention or the firm's own dynamics.

additionality in this case and should improve the design taking into consideration these potentials and clues.

Within the above explained rationale, thus, AGY350 reports of the projects finalized at 2002, 2003 and 2004 were investigated to be able to understand the most recent situation. A total of 528 projects finalized by 310 unique firms during these 3 years are thought as a good proxy to explain the dynamics of the programme of 1413 finalized projects in 10 years from 1996 to 2005. This sample of surveys represents 37% of the population. Also, as the main intention is not investigating the change in time, i.e. a time series analysis, the last 3 years' available data (taking into consideration that the formalities for the projects finalized at 2005 still continue, it is impossible to compile the data for 2005) is compiled to be able to include the effects of the recent changes in the policy and programme design.

As this data was not digitized before, from this dataset consisting of 528 'Project Result Report', all and every survey is physically searched in TÜBİTAK-TEYDEB Archive. The TÜBİTAK-TEYDEB Archive is arranged according to the project, therefore AGY350 surveys is not in the same row or in the same shelf or in the same room, in contrast every project has a folder which also includes AGY350. Therefore, the compilation of the data was lengthy.

As the TÜBİTAK-TEYDEB Archive has some pitfalls, on the other hand, some AGY350 surveys could not be found. They are either missing or misplaced. Therefore, out of 528 surveys, 433 surveys that represent 82% could be reached. As it is not efficient to digitize all 3464 pages, 105 variables representing approximately 25% of each survey are selected according to their potential relevancy.

From these digitized data of a matrix sized 433x105, after a preliminary analysis, a brief and possible version of the logic that Georghiou and Clarysse (2006) used to summarize and compare the OECD-TIP projects data that is explained at Chapter 5 was tried to be employed. This logic is consisting of following sub-sections for behavioural additionality:

- Behavioural changes during project implementation:
 - **Project Additionality:** whether or not the government intervention affected the launch of the projects that would not have been undertaken in the absence of the support. In other words, did the government support direct to the projects that would have been undertaken in any case or did it support projects undertaken because of the government support?
 - **Scale Additionality:** whether or not the government intervention affected the scale of the project in a way that would not be the case in the absence of the government intervention. In other words, did the firm undertake the project on a larger scale that would not be the case in the absence of the government support?
- Behavioural changes after project completion:
 - **Management Additionality:** whether or not the management routines of the firm improved as a result of using government funds. According to Georghiou and Clarysse (2006:31), “These changes could result in further participation in government programmes, changes in organisational structures for conducting R&D or commercialising results, and different management strategies”.
 - **Follow-up Additionality:** whether the firm engaged in another project because of undertaking the government-sponsored project. In Georghiou and Clarysse’s (2006) words, “(whether) the government-funded programme enabled firms to develop a capability that it exploits in further R&D.”
 - **Network Additionality:** whether or not the government intervention resulted in more and deeper collaboration that would not be the case in the absence of the support among firms.

Among these five types of additionality and with the existing data, only project and scale additionality was possible to measure. However, there were also some implications for management, follow-up and network additionality although the attribution problem was the case for them. In other words, it was possible to determine whether these type of effects was the case or not but it was not

possible to determine whether these type of effects could be attributed to the government intervention or not.

Therefore, the data analysis has the following sub-sections:

- Project Additionality
- Scale Additionality
- Un-attributed Management Effects
- Un-attributed Follow-up Effects
- Un-attributed Network Effects

In this regard, for each sub-section an analysis has been conducted. For each of the above sub-items a detailed and unique approach is carried out. The following sub-sections will deal with the details of this analysis. Finally, the Section 6.4.6. will consolidate the findings of the data analysis.

6.4.1. Project Additionality

Project additionality was amongst the most important questions of the AGY350 survey analysis for getting clues on how to measure the behavioural additionality effects of the programme. As depicted in Appendix A and as explained in the previous section, the AGY350 survey has a direct question on project additionality. In part D titled “R&D Support Evaluation” question 3 is “Would you carry out the project in the absence of the R&D Support?”. Taking this question further, thus, the degree of the project additionality is derived. Moreover, the topology of the project additionality is tried to be shown by cross-tabulating this question. Therefore, the analysis is summarized below:

6.4.1.1. Degree of Project Additionality:

Resulting from the frequency analysis of the data to the question “Would you carry out the project in the absence of the R&D Support?” shown in Table A2.1 in Appendix B, only 12.9% of the projects is claimed that they would not have been undertaken in the absence of the support. In other words, the support made it possible to undertake R&D for 12.9% of the projects that would not have been conducted in the absence of the support. It is also reasonable to say that 87.1%

of the projects supported would have been undertaken regardless of the support from the government.

This 12.9% of TÜBİTAK-TEYDEB project additionality is very low compared to the 20% of Finland, 28% of Austria (FFF programme), 33% Austria (Kplus programme), 37% of Australia, 53% of Norway, 57% of EU FP5 and 93% of USA as depicted in Table 5.1 of the Chapter 5 devoted to the summary of the national studies conducted in relation with OECD-TIP project on behavioural additionality (OECD, 2006a). Simply taking arithmetic average yields 45.9% which is more than three times of the TÜBİTAK-TEYDEB value.

This low value means that TÜBİTAK-TEYDEB support is not creating as new projects that would not have been undertaken in the absence of the support as its equivalent programmes do across the Europe. In contrast, it can be argued that TÜBİTAK-TEYDEB programme was supporting projects that would have been undertaken in any case. Therefore, the programme was not serving to its mandate to “to foster undertaking of R&D programmes of firms”, nor is it “increasing the percentage of industrial R&D expenditure in Turkey” as explained in prior parts of this thesis.

Thus, as the programme is not as successful as its equivalents in OECD geography to create new projects, it loses its legitimacy ground to use public resource. However, it is still arguable that although it is not successful to create new projects, it may have been changing the behaviour of the firms it supported, i.e. creating behavioural additionality. In this framework, as the only potential source of legitimacy of the programme is behavioural additionality, the need for an evaluation turns out to be more vital and this creates the main ground for an attempt to develop a methodology to measure, the main question of this thesis.

A reason for such low project additionality can be about the perception of the programme explained in the previous section devoted to the programme design. Firms may perceive the programme as not a mechanism of government to support firms to undertake R&D that would not otherwise have been able to conduct but they probably think this as an award mechanism of government to reward firms conducting R&D.

6.4.1.2. Topology of the Project Additionality

As the degree of the project additionality is evident, the analysis shifted to get clues about the topology of the support. In this respect, firm characteristics, project characteristics and the reason to apply for the support are cross-tabulated with the project additionality question.

Firm Characteristics

General Characteristics: “Total number of employees”, “R&D intensity”, “Location”, “Is it your first R&D project?” and “How many R&D projects you have undertaken before?” questions of the AGY350 survey are cross-tabulated with project additionality to be able to see how the project additionality changes with these general characteristics of the firms.

Project additionality decreases with total number of employees as shown in Table A2.2 of Appendix B. Therefore, Project additionality tends to be higher at SMEs. While the project additionality of firms with less than 10 employees is 22.5%, the ratio is 8.9% for the firms with more than 250 employees.

Project additionality decreases with R&D intensity as shown in Table A2.3. Project additionality tends to be lower at low R&D spending firms. An important thing when analysing the relevant table is that some values are excluded because they have either insufficient or no observations to make an analysis. This principle is also applied for the rest of the study.

Project additionality is higher at firms located at Small Industrial Zone than firms located at Technoparks, Organized Industrial Zones and Technology Centres as shown in Table A2.4.

Project additionality is higher in firms performing R&D for the first time. Firms which has not conducted an R&D project before has 20.6% project additionality, while others has 10.5% as depicted in Table A2.5.

Also, the more the firm conducted R&D projects before, the less the project additionality as shown in Table A2.6.

Propensity to be Awarded a Grant: “Is it your first TÜBİTAK-TEYDEB project?” and “How many project supports have you been granted by TÜBİTAK-TEYDEB before?” questions of the AGY350 survey are cross-tabulated with project additionality.

- Project additionality is higher at firms awarded for the first time as shown in Table A2.7.
- Project additionality decreases with number of grants awarded as shown in Table A2.8.

Project Characteristics:

Accomplishments: Project accomplishments cross-tabulated with project additionality. It is found that project additionality

- decreases with the level of technical accomplishments and commercial accomplishments
- increases with the level of structural effects and other effects

as shown at tables A2.9, A2.10, A2.11 and A2.12.

Financial Resources: Financial resources for the project cross-tabulated with project additionality. Naturally, it is lowest at projects

- with own resources ratio higher than 90%,
- with external private resources ratio lower than 10% and
- with public resources ratio lower than 10%

as shown at tables A2.13, A2.14 and A2.15. Also, it is worth to note that

- more than 70% of the firms has own resources ratio of 90% - 100%,
- approximately 90% of the firms has external private resources ratio of 0% - 10% and
- approximately 80% of the firms has external public resources ratio of 0% - 10%.

Reasons to apply to R&D support and project additionality are cross-tabulated. project additionality is found to be

- Higher at projects applied to the R&D support since it was the necessary financial source to realise the project,
- Lower at projects applied to the R&D support since it provides prestige and
- Lower at projects applied to the R&D support to institutionalize the R&D management and to validate the quality of the R&D

as shown at tables A2.16, A2.17, A2.18 and A2.19.

The summary of the topology of project additionality is shown in Table 6.1.

Table 6.1: The summary of the topology of the Project Additionality

Level of Topology	Relation with Project Additionality
Firm Characteristics	
General Characteristics	
Total number of employees	Decreases with total number of employees
R&D intensity	Decreases with R&D intensity
Location	Highest at "Small Industrial Zone"
Experience in R&D before	Higher at firms performing R&D for the first time
Number of R&D projects conducted before	Decreases with number of R&D projects performed before
Propensity to be awarded a grant	
Experience in TÜBİTAK-TEYDEB support before	Higher at firms awarded for the first time
Number of TÜBİTAK-TEYDEB supports awarded before	Decreases with number of grants awarded
Project Characteristics	
Accomplishments	
Technical accomplishment	Decreases with the level of technical accomplishments
Commercial accomplishment	Decreases with the level of commercial accomplishments
Structural effects	Increases with the level of structural effects
Other effects	Increases with the level of other effects
Financial Resources	
Own resources spent for the project ratio	Lowest at projects with own resources ratio higher than 90%. More than 70% of the firms has own resources ratio of 90% - 100%.
External private resources spent for the project ratio	Lowest at projects with external private resources ratio lower than 10%. Approximately 90% of the firms has external private resources ratio of 0% - 10%
Public resources spent for the project ratio	Lowest at projects with public resources ratio lower than 10%. Approximately 80% of the firms has external private resources ratio of 0% - 10%
Reasons	
It was the necessary financial source to realise the project	Higher at projects applied to the R&D support since it was the necessary financial source to realise the project
It provides prestige	Lower at projects applied to the R&D support since it provides prestige
It institutionalizes the R&D management	Lower at projects applied to the R&D support to institutionalize the R&D management
It validates the quality of the R&D	Lower at projects applied to the R&D support to validate the quality of the R&D

6.4.2. Scale Additionality

Scale Additionality is another component in Georghiou and Clarysse's (2006) terminology of analysis of behavioural additionality. Although Georghiou and Clarysse (2006) takes the concept as to cover both scale and scope additionality of the public intervention, this thesis is bounded by the scale additionality only because of the lack of data to get evidence about scope additionality. Connected to the question in AGY 350 survey used in the analysis of project additionality, there is a direct question related to scale additionality like "What would be the size of the project in the absence of the support?". Therefore, the degree of scale additionality is straightforward to measure. The topology of the scale additionality is also tried to be shown by cross-tabulating this question. Therefore, the analysis is summarized below and also briefed in Table 6.2:

6.4.2.1. Degree of Scale Additionality:

35.5% of the projects would have been conducted on a smaller scale as shown in Table A2.20. Also, 63.7% of the projects would have been conducted in same scale in the absence of the TÜBİTAK-TEYDEB support. In other words, the government support enabled 35.5% of the firms to conduct larger scale R&D project that would not have been able to undertake in the absence of the support.

This scale additionality of 35.5% is very low compared to the 46% of Finland, 55% of Germany, 67% of Austria (Kplus), 74% of Austria (FFF), 76% of EU FP5 and 92% of Australia.

Moving forward, approximately 85% of the projects that would be conducted on a smaller scale would be scaled down within grant range, between 20% and 60% as detailed in Table A2.21. Moreover, they would have been scaled down the project by 25% on weighted average.

6.4.2.2. Topology of the Scale Additionality

Firm Characteristics

General Characteristics: Although it is not consisting of a perfect pattern, projects that are undertaken by firms that has smaller number of employees would have been tended to scale down their projects in the absence of the support as shown in Table A2.22.

Similarly, firms performing R&D for the first time would have been tended to scale down the project more in the absence of support as detailed in Table A2.23.

Propensity to be Awarded a Grant: Firms awarded the TÜBİTAK-TEYDEB grant for the first time would have been tended to scale down the project more in the absence of support as shown in Table A2.24.

It is observed that the more the number of TÜBİTAK-TEYDEB grants awarded, the more tendency they would have been scaled down the project in the absence of support as shown in Table A2.25.

Project Characteristics:

Accomplishments: It is observed that the higher the level of structural accomplishments of the firms, the more tendency they would have scaled down the project in the absence of support as detailed in Table A2.26.

Financial Resources: As shown in Table A2.27, scale additionality is Lowest at projects with own resources ratio higher than 90%. Also note that more than 70% of the firms has own resources ratio of 90% - 100%

Labour Force: The change in different labour types are cross-tabulated with scale additionality and found to be::

- Higher at projects with change in employees in production as shown in Table A2.28.
- Higher at projects with change in employees in R&D as shown in Table A2.29.
- Higher at projects with change in employees in management in Table A2.30.
- Higher at projects with change in employees with graduate education in Table A2.31.
- Higher at projects with change in total employees in Table A2.32.

Reasons to apply to R&D support and scale additionality are cross-tabulated. Scale additionality is observed to be

- Higher at projects applied to the R&D support since it was the necessary financial source to realise the project as explained in Table A2.33.
- Higher at projects applied to the R&D support since it provides collaboration with R&D institutions as explained in Table A2.34.

Table 6.2: The summary of the topology of the scale additionality

Level of Topology	Relation with Scale Additionality
Degree	
<i>What would the size of the project in the absence of the R&D support?</i>	35.5% of the projects would be conducted on a smaller scale.
<i>The proportion the size would be decreased</i>	Approximately 90% of the projects that would be conducted on a smaller scale would be scaled down within grant range, between 20% and 60%. Also they would be scaled down by 25% on weighted average.
Topology	
Firm Characteristics	
General Characteristics	
<i>Total number of employees</i>	Projects that are undertaken by firms that has smaller number of employees would tend to scale down their projects in the absence of the support.
<i>Experience in R&D before</i>	Companies performing R&D for the first time would tend to scale down the project more in the absence of support
Propensity to be awarded a grant	
<i>Experience in TÜBİTAK-TEYDEB support before</i>	Companies awarded for the first time would tend to scale down the project more in the absence of support
<i>Number of TÜBİTAK-TEYDEB supports awarded before</i>	The more the number of grants awarded, the more tendency they would scale down the project in the absence of support
Project Characteristics	
Accomplishments	
<i>Structural effects</i>	The higher the level of structural accomplishments of the companies, the more tendency they would scale down the project in the absence of support
Financial Resources	
<i>Own resources spent for the project ratio</i>	Lowest at projects with own resources ratio higher than 90%. More than 70% of the firms has own resources ratio of 90% - 100%
Labour Force	
<i>Employees in production</i>	Higher at projects with change in employees in production
<i>Employees in R&D</i>	Higher at projects with change in employees in R&D
<i>Employees in Management</i>	Higher at projects with change in employees in management
<i>Employees with Graduate Education</i>	Higher at projects with change in employees with graduate education
<i>Total Employees</i>	Higher at projects with change in total employees
Reasons	
<i>It was the necessary financial source to realise the project</i>	Higher at projects applied to the R&D support since it was the necessary financial source to realise the project
<i>It provides collaboration with R&D institutions</i>	Higher at projects applied to the R&D support since it provides collaboration with R&D institutions

6.4.3. Management Effects

Having analysed project additionality and scale additionality in previous two parts, another source of behavioural additionality, management additionality, will be considered in this section. However as explained at the very beginning of this Chapter it is not possible to measure this component from the existing data.

However, related to the reason of conducting this data analysis, it is still possible to derive some implications on management additionality. These implications can be thought in two groups in general.

For the first group, it is possible to measure the management effects of the project without isolating whether the source of this change is the government intervention or the own dynamics of the firm. Similarly, it is not possible to comment whether the effects of government intervention and the firm's own dynamics are reinforcing each other or they are working in opposite direction. Therefore, the first group of the analysis is on the un-attributed management effects of the project upon the firm.

For the second group, by the virtue of the project additionality question, the question asking 'Would you carry out the project in the absence of the R&D Support?', it is possible to divide the firms into two distinct groups: the firms that would have been conducted R&D in any case and the firms that undertook R&D because of the TÜBİTAK-TEYDEB support. In this respect, the management effects of the project upon the firms that would have been conducted R&D in any case is the effects that we cannot isolate the result of the government intervention as explained above. However, the management effects upon the firms that undertook R&D because of TÜBİTAK-TEYDEB support are solely additionality because in the absence of the support these effects would not be the case. Therefore, comparing the management effects of these groups, the group on which additionality is in effect and the group on which combined effects of the government and the firm dynamics are in effect on would give a reasonable implication on the behavioural additionality to support our analysis to develop a methodology to measure.

Thus, these two groups of analysis on management additionality are compared according to their answers to the Part C7 of the AGY350 Survey titled 'Inside-Company Other Effects'. The firms are expected to select one or more effects that they think the firm gained because of the project. The comparison which is detailed in Tables A2.35 to A2.45 is summarized in Table 6.3 presented below.

To this aim, it is possible to say that, there is a potential that the management component of behavioural additionality exists in the following fields:

- Technology Monitoring Competency
- Using of Consulting Services
- R&D Infrastructure
- Permanence (Know-How) of the Knowledge Created During R&D Activities

Table 6.3: The comparison of management effects in two firm types

Level of Additionality	The Ratio of the Firms that would not have been conducted R&D in the absence of the support	The Ratio of the Firms that would have been conducted R&D in any case	Result
Technology Monitoring Competency Gained	89.10%	70.4%	Firms carried out the project because of R&D support would tend to gain technology monitoring competency <i>more</i> .
Using of Consulting Services Systemised	50.90%	29.1%	Firms carried out the project because of R&D support would tend to systemise the use of consultancy services <i>more</i> .
Use of a New a Technology in Product and Process Development Gained	45.5%	52.50%	Firms carried out the project because of R&D support would tend to use of a new a technology in product and process development <i>less</i> .
R&D Infrastructure Began to be Built	30.9%	20.50%	Firms carried out the project because of R&D support would tend to begin to build an R&D infrastructure <i>more</i> .
R&D Infrastructure was Improved	67.3%	63.80%	Indefinite
Production Infrastructure was Improved	50.9%	47.30%	Indefinite
Had Effect on Identification of Technological Capabilities and Deficiencies	52.7%	60.70%	Firms carried out the project because of R&D support would tend to identify technological capabilities and deficiencies <i>less</i> .
Contributed to the Permanence (Know-How) of the Knowledge Created During R&D Activities	72.7%	63.60%	Firms carried out the project because of R&D support would tend to endure the knowledge created during R&D activities <i>more</i> .
Gained Decrease in the Cost of New R&D Activities	25.50%	24.90%	Indefinite
Gained Decrease in Production Cost	47.3%	31.30%	Firms carried out the project because of R&D support would tend to gain advantage in production cost <i>more</i> .
Gained Profit via Sale of Patent, Licence, Know-How	10.9%	7.80%	Indefinite

6.4.4. Follow-up Effects

Like the logic employed at management effects, it is possible to compare the follow-up effects of the project on the firms that would not have been conducted R&D in the absence of the support and the firms that would have conducted R&D in any case.

For this purpose the question of ‘Outputs of This Project Created a New R&D Project’ is cross-tabulated with the project additionality question of ‘Would you carry out the project in the absence of the R&D Support?’. From this analysis detailed in Table A2.46, it is clear that the follow-up additionality is not showing a promising potential to be existent.

6.4.5. Network Effects

Following the same reasoning employed in the previous two parts by cross-tabulating the questions ‘An institution was contacted for the first time to realise the project’ and ‘Would you carry out the project in the absence of the R&D Support?’, it can be claimed that the TÜBİTAK-TEYDEB support lacks showing a potential to have network additionality. The Table A2.47 details the claim.

6.4.6. Data Analysis Consolidation

The results of the data analysis can be consolidated as following:

- **Project Additionality:**
 - It is evident that the project additionality is very low compared to the existing evaluation attempts analysed in Chapter 5.
 - However, project additionality would tend to be higher at such firms
 - Small sized
 - Low R&D intensity
 - Located at ‘Small Industrial Zone’
 - Performing R&D and awarded TÜBİTAK-TEYDEB support for the first time

- Achieved low technical and commercial and high structural accomplishments at the end of the project
 - Conducted R&D less on its own resources but more on the public resources than other firms
 - Applied to the support because thinks that it was the necessary financial source to realise the project

- **Scale Additionality:**
 - Scale additionality is also found to be too low.
 - Scale additionality would tend to be higher at such firms:
 - Small sized
 - Performing R&D and awarded TÜBİTAK-TEYDEB support for the first time
 - Achieved high structural accomplishments at the end of the project
 - Conducted R&D less on its own resources than other firms
 - Changed the number of employees in all fields because of the project
 - Applied to the support because it was the necessary financial source to realise the project and it provides collaboration with R&D institutions

- **Management Effects:**
 - There is a potential of existence of management component of behavioural additionality in those fields:
 - Technology Monitoring Competency
 - Using of Consulting Services
 - R&D Infrastructure
 - Permanence (Know-How) of the Knowledge Created During R&D Activities

- **Follow-up Effects:**
 - Follow-up additionality is not showing a promising potential to be existent.

- **Network Effects:**
 - TEYDEB support is lack of showing a potential to have network additionality.

These results directly lead to the fact that there exists a topology of firms that are small sized, low R&D performing, located at ‘Small Industrial Zone’, performing R&D and awarded TÜBİTAK-TEYDEB support for the first time, achieved low technical and commercial and high structural accomplishments at the end of the project, conducted R&D less on its own resources but more on the public resources than other firms and applied to the support because thinks that it was the necessary financial source to realise the project along with low project and scale additionality. This topology is an expected result, however, as it implies that high probability of behavioural additionality in small and immature firms. These firms as explained at Chapter 3 are the firms that need improvement in their behaviours regarding to the innovative activities than the firms large institutionalized firms. Therefore as this need is clear, expecting more behavioural additionality in this topology would also be reasonable.

Furthermore, the data can be investigated and commented further. However, as the main aim of the data analysis is not deriving results about behavioural additionality but to reveal some implications to use in the evaluation design, the analysis is limited to certain point.

6.5. Framework for Evaluation

As the previous parts of this chapter expose the recent policy shift in technology policy, the 10 years history of the policy framework of the TÜBİTAK-TEYDEB support and the programme design, the main aim was to provide a basis for an evaluation framework for the behavioural additionality of the support. Apart from the detailed analyses depicted in those chapters, it is revealed that the recent policy shift in science, technology and innovation is strengthening the need for evaluation, the policy framework has not included such a study within the programme lifespan and the programme design is very open to an improvement that can be derived from a behavioural additionality study.

Furthermore, moving forward to the final basis for this framework, the data analysis detailed at previous section also depicts the need for an evaluation. As explained in Section 6.4, the project additionality, the ratio of the firms that would not have been undertaken the R&D project in the absence of the support, is found to be 12.9% that is very low comparing with the other studies in OECD countries averaging 45.9%. This implies that the support is not functioning as it mandated in the Decrees numbered 1995/1 and 1998/10 (Money-Credit Coordination Committee, 1995 and 1998) as 'to foster undertaking of R&D projects'. Rather it supports the projects that would have also been conducted in the absence of the support. Therefore, this bare truth points out the need for evaluation for behavioural additionality as it is the only potential legitimacy ground for the support. Although the support most probably was not successful in creating new projects, it can be potentially legitimized with the argument that it created a behavioural additionality amongst the firms that would have been undertaken R&D projects independent from TÜBİTAK-TEYDEB support.

The same logic can be applied to the scale additionality, the degree in which the firms would have scaled down their project in the absence of the public support. Again as the value for scale additionality is very low compared to the average of studies undertaken in OECD countries, the need for an evaluation of behavioural additionality gains more importance.

As another indicator for the need, the results of the preparation study of the TÜBİTAK-TEYDEB evaluation practice are worth noting. In January 2006, TÜBİTAK decided to undertake an evaluation exercise in all the programmes it was operating. As a first step of this effort, TÜBİTAK-TEYDEB support was selected to be the pilot programme. In this regard a workshop was organized with the participation of the TÜBİTAK-TEYDEB experts and some employees of TÜBİTAK Science and Technology Policy Department totalling 16 participants. This workshop is organized and coordinated by the author of this thesis and deliberately designed to form an input to this thesis as well as a by-product. Using brain-storming technique, the participants determined the questions that will be sought answer during an evaluation project to be able to determine the

areas that a prospective evaluation should answer. These questions are explained as the basis and the objective of a prospective evaluation study.

99 questions were created in 4 categories such as appropriateness, effectiveness, additionality and negative and displacement effects which can be found in Appendix C. Amongst these categories, additionality was also sub-branched as input, output and behavioural additionality. Of 99 questions, thus, 29 questions representing about 30% of the total was related with behavioural additionality as depicted in Table 6.4. Similarly, detailed descriptive statistics are also presented at Appendix C.

Table 6.4: The composition questions to be sought answer in a future evaluation study

	Number of Questions	Mean	Standard Deviation
1. Appropriateness	6	3.46	1.06
2. Effectiveness	35	3.56	0.99
3. Additionality	51	3.90	0.89
3.1. Input Additionality	7	4.12	0.75
3.2. Output Additionality	15	3.87	0.96
3.3. Behavioural Additionality	29	3.87	0.89
4. Negative and Displacement Effects	7	3.54	1.14
Total / Weighted Average	99	3.73	0.95

These questions, then, were requested to be given points to prioritize some questions as seeking answer to all the questions would not be efficient and reasonable. It is intended that in line with budgetary conditions and the approach of the decision-maker some questions out of these 99 can be selected to form a basis in evaluation exercise. 16 participants, as the next phase of the workshop, prioritized them on a Likert scale while points 5 to 1 mean ‘answer should definitely be sought’, ‘answer should be sought’, ‘answer should be sought only if it is possible’, ‘seeking answer is unnecessary’ and ‘answer should definitely not to be sought’, respectively. As a result of this prioritization, behavioural additionality was ranked as the second most important aspect of an

evaluation with an average point of 3.87. Also, the standard deviation of the points given to behavioural additionality resulted as the lowest, implying that the part which its aspects largely compromised by the participants were the behavioural additionality as depicted in Table 6.4. Therefore, this study that will form an input in the following sections of this thesis also represents an indicator for the need for an evaluation framework of behavioural additionality of TÜBİTAK-TEYDEB support.

Ascertaining the need for evaluation, the evaluation itself should exhibit some certain characteristics. Within the above framework, a spontaneous and provisional evaluation of the behavioural additionality of the support would add nothing to the overall system in the long-run. Therefore, as OECD (1999) proposes a systemic and institutionalized evaluation framework is needed to gain the maximum utility and to satisfy the need fully. This kind of a systemization and institutionalization necessitates an official set-up. An SCST decision regarding to the periodic and systematic evaluation and reporting of the behavioural additionality effects of the TÜBİTAK-TEYDEB support would immunize the general approach from the political and administrative fluctuations that the country periodically tends to come across. Also, the Decree can be amended in such a way that it boldly mandates the relevant institutions for such an evaluation.

Another aspect of the institutionalization of evaluation is allocating a proportion of budget for evaluations. As evaluation efforts is mostly expensive and time-consuming, allocating a proportion from the budget in certain intervals would add to the persistency of the evaluation.

As the next aspect in institutionalization of the evaluation of behavioural additionality, it should be linked with other levels of evaluation. As Georghiou (2004) and Clarysse et al. (2004) state that behavioural additionality is not a substitute to other evaluation efforts (such as input and output additionality or yet other kinds of evaluation) but it should be perceived as complement. It shows only one facet of reality, yet the reality has countless facets from a post-positivist perspective. However, as the history of policy evaluation in Turkey is

limited to the studies of some few scholars¹², the behavioural additionality study to be undertaken probably would be a pioneer in the field. Nevertheless, this kind of a study would only be meaningful when it complements the findings of other studies and when build upon them. Therefore, as an aspect of institutionalization, the behavioural additionality study should be accompanied with other studies in evaluation.

Finally, such an institutionalization needs to be clear and transparent. Sharing the results and all details of study would not only add to the credibility of the exercise but also form a basis for accountability. There is no need to repeat how the concept of accountability is important for a public organization using tax payers' money to subsidize private entities. Similarly, as a part of this transparency, TÜBİTAK should participate in international studies. This would also represent a part of the knowledge sharing and learning process.

Therefore, linked with the need for institutionalization as explained above, a proposal for an evaluation framework of behavioural additionality should not propose a one-time effort but offer a system that would work permanently. The intention of this thesis, thus, is compatible with this claim.

Apart from the above mentioned need for evaluation of behavioural additionality of TÜBİTAK-TEYDEB support and the necessity for associated institutionalization this evaluation, an integrated approach with other similar supports in this respect is worth to mention. TTGV is the other apparatus of the same policy mandating TÜBİTAK-TEYDEB by Decrees 1995/1 and 1998/10 (Money-Credit Coordination Committee, 1995 and 1998). Therefore, an opportunity to compare the results of the behavioural additionality studies with a similar study in TTGV would add a great potential to the exercise. Knowing that TTGV is more active in evaluating the programme as it is a credit system, a similar study to this thesis adapting the system to TTGV would be complementary.

Moving forward to the practical issues from the above argued basic principles, the proposed evaluation framework of the TÜBİTAK-TEYDEB support can be pictured as depicted in Figure 6.6. Furthermore, the Figure 6.7 depicts the

¹² Taymaz (2001) provides a single known example to this.

timeline of the evaluation. The first thing in this is about the need for a two-pillar design. As explained in section 5.13 and as Georghiou and Clarysse (2006) exhibits, one of the corollaries derived from the existing evaluation attempts in OECD countries is that one should not solely rely on a quantitative evaluation framework but also extend the scope to a balanced approach by employing a qualitative phase. Therefore, the proposal for Turkish study includes a quantitative phase of evaluation as well as a qualitative phase to balance the approach and to be able to perceive better the overall dynamics of the system.

Within this framework of evaluation, treatment of the collected data is not the focal problem. Once the data is collected, there can be descriptive studies as well as econometric modelling efforts. In fact, a preliminary analysis on collected data may determine this. In any case, keeping options open is the main principle. Thus, the design represents a more generic approach that covers all the possible options in that sense.

Therefore, the next two sub-sections will analyse the quantitative and qualitative phases of the evaluation.

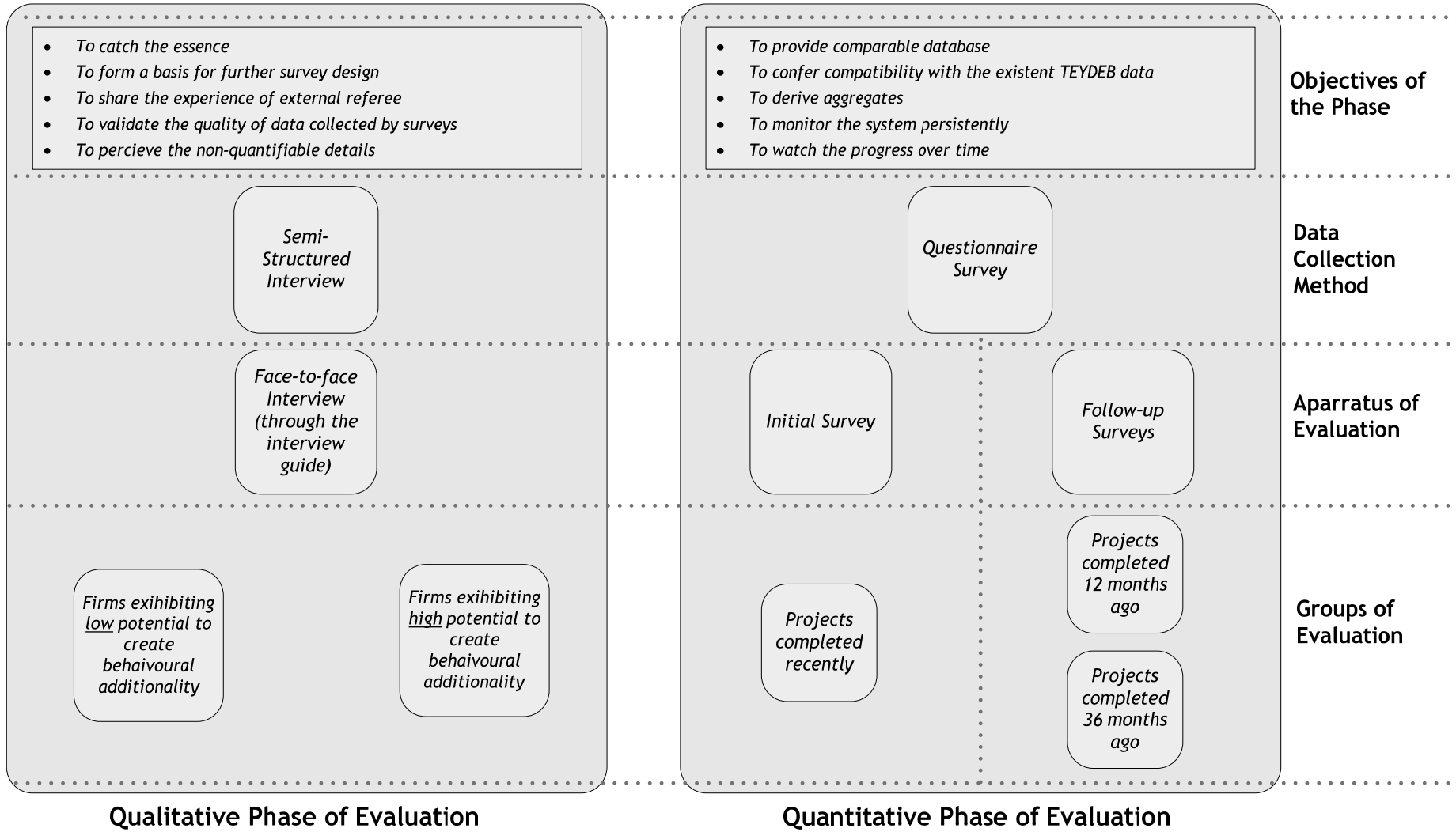


Figure 6.6: The Proposed Structure of the Evaluation Design of Behavioural Additionality

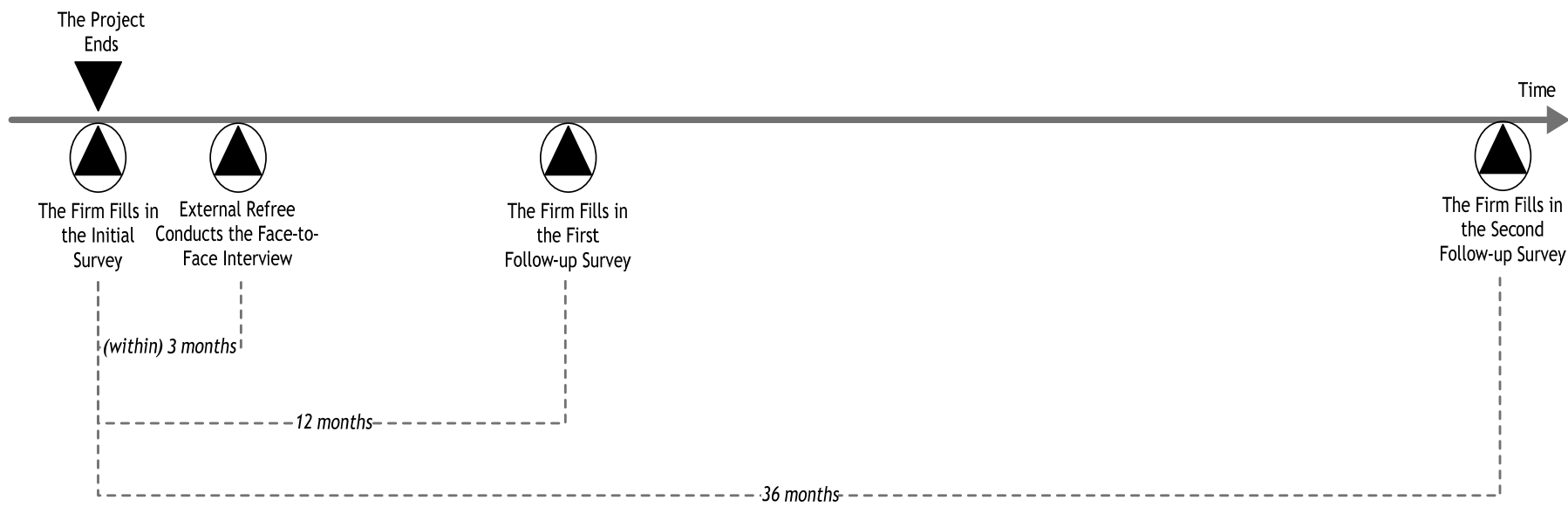


Figure 6.7: The Proposed Timeline of the Evaluation Design of Behavioural Additionality

6.5.1. Quantitative Phase of Evaluation

As the first pillar of above depicted evaluation framework for behavioural additionality, a quantitative phase of evaluation is vital. As the first corollary derived from the other studies undertaken in OECD countries and summarized in section 5.13, using a survey has some certain advantages.

First of all, as noted by Georghiou and Clarysse (2006:30) and most of the other studies, “given the economics of performing such studies: many companies can be surveyed at little cost”.

Secondly, this kind of quantitative data collected would provide a comparable dataset to enable the evaluators to undertake various kinds of studies to perceive the behavioural additionality effects of the TÜBİTAK-TEYDEB support.

Also, as explained in Section 6.3 titled programme design, there already exists a data collection attempt in the programme, despite no effort to evaluate it has been attempted before. Although not suitable for measuring behavioural additionality in its original form, the project result report (AGY350) presented in Appendix A has been conducted since the beginning of the programme. Therefore, to keep collecting quantitative data would confer to the compatibility of the existing rich stock.

As a next objective of the quantitative phase of evaluation, to derive aggregates from this database is another aspect. By the virtue of such a quantitative approach, by definition, the measured aspects would be additive and the aggregate would be derived without a further effort.

As the final aspect, engaging in a quantitative evaluation effort would provide a basis to monitor the system persistently and to watch the progress over time as this approach would be more continuous than the discrete nature of a qualitative framework.

Before moving forward the apparatuses of this quantitative phase of evaluation, one final point is worth to be noted. To enjoy the benefits of quantitative

evaluation explained above, the data should definitely be collected digitally. Collecting any data only in paper would create an extra burden of digitization. So, any survey conducted should be filled in on-line and if a written proof is necessary a signed print-out should be kept. The existing stock of data also is not digitized, rather is on paper. Therefore, an immediate effort to design a database in relation with the framework drawn in this thesis along with to enter the current stock of data to this database is vital.

Ascertaining the objectives and advantages of the quantitative phase of evaluation, the apparatuses of evaluation should be determined. The proposal in this thesis is to use an initial survey combined with follow-up surveys for two reasons.

The first argument for this kind of a design can be derived from Georghiou's (2002:4 and 2004:48) stress on the '*persistence*' of behavioural additionality effects. He argues that "while input and output additionality operate at a point in time, behavioural additionality effects may be expected to endure beyond the period of R&D". Thus, as behavioural additionality is not operating at a point in time but endure, collecting time-series data for each observation rather than simply panelling a point is more reasonable. The approach of conducting an initial survey, in this context, can be considered as a tool to catch the short-run effects while performing follow-up surveys to the same observation would provide a basis to perceive the medium and long-run effects.

Secondly, employing such an approach would be the only feasible option, as the alternative method of using a control-group approach is not reasonable in this case. As explained in the section devoted to the programme design, neither a project has been rejected because of prioritization in technology fields or in another basis, nor has been rejected on budgetary limitations. On the contrary, the only criterion of rejection was the R&D quality, i.e. if a project was considered as R&D it was supported. Therefore, the rejected projects are not comparable with the accepted ones as the former does not have the necessary quality to be considered as R&D. In that ground, employing a control-group approach by surveying the rejected projects is not feasible.

The following two sub-sections are devoted to proposal of the modalities of the above argued initial survey and accompanying follow-up surveys.

6.5.1.1. Initial Survey

As explained above, the short-run effects of public intervention on firm behaviour should be captured in the design of the evaluation apparatus of the behavioural additionality.

To this aim, in fact, there are two options: designing a completely new survey or adjusting the current tools for the need. The latter option may be realized by the redesign of the current Project Result Survey (AGY350) of TÜBİTAK-TEYDEB. Pursuing on this survey may exhibit some advantages.

First of all, as explained in section 6.4, the firm has to fill in and submit this survey to be able to reimburse the last 6 months' expenditures. Moreover, the expert of TÜBİTAK-TEYDEB checks the consistency of the survey and ensures the accuracy. Therefore, as the response rate is practically 100%, the mechanism is very solid to collect data. In this respect, to keep using this tool will provide a high response rate.

Secondly, AGY350, apart from the attribution problem that it is facing, is fully reflecting the apprehension of the TÜBİTAK-TEYDEB. As the main aim of an evaluation study is to answer the questions of the policy-maker, policy-implementer and other stakeholders, the use of this kind of a tool that will be reinforced would satisfy the needs of those parties more than a completely new survey.

Thirdly, as the current AGY350 that has been filled by the portfolio of 2641 projects completed up to now¹³, it represents an enormous amount of data for comparison. Using a revised version of this source would enable the evaluator to benefit from this treasure in comparative studies or in time-series analyses at least partially.

¹³ Source: SCST, 2006

As the advantages of to keep using AGY350 is clear, the survey needs some improvements to be able to function as an apparatus of quantitative phase of evaluation of behavioural additionality of TÜBİTAK-TEYDEB support. There exist two problem areas that a redesign should address: attribution problem and deficiency to cover some aspects.

The first problem about AGY350 is that, as demonstrated in section 6.4, the current design does not allow attributing any effect to the government intervention. The current design makes the project focal and asks whether the project affected the firm for particular effect. However, as the question of whether it would also have been the case in the absence of the public support, isolating the impact of intervention from the firms' own dynamics is impossible.

The second problem of using AGY350 to measure the behavioural additionality is that it does not cover some aspects of the concept. As explained in section 6.5, the survey is not capable of measuring certain levels of behavioural additionality. As explained previously, behavioural additionality is a multi-dimensional concept and the current design of AGY350 reflects a small part of these dimensions.

Therefore, if AGY350 will be used with a redesign effort, these two problems should be solved. Figure 6.8 depicts this situation. Left-hand side pictures the current situation referring to above mentioned two problems while the right-hand side pictures the ultimate situation that the improvement will attain.

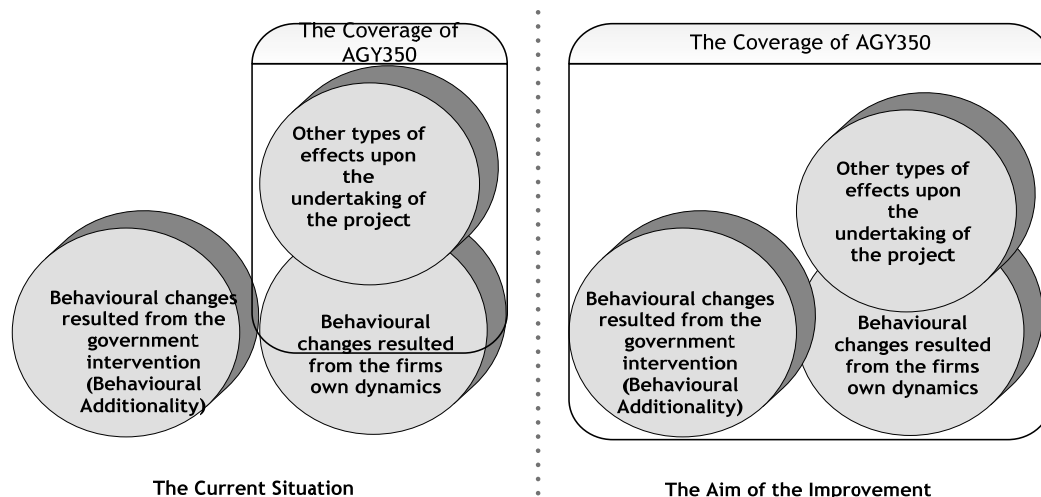


Figure 6.8: The Current Situation of AGY350 in Satisfying the Requirements and the Aimed Coverage during the Improvement

Trying to solve these problems, reminding the structure of AGY350 would be helpful. The survey (AGY350) as explained in section 6.4 has the following 4 sections:

- A. Firm Information
- B. Project Information
- C. Project Assessment
 - C.1. Summary Assessment
 - C.2. Project Duration Assessment
 - C.3. Cost Assessment
 - C.4. Funding Assessment
 - C.5. Commercial Assessment
 - C.6. Other Economic Effects
 - C.7. In-Firm Effects
 - C.8. Out of Firm Effects
- D. R&D Support Programme Assessment

This design of the survey partly investigates the project additionality dimension of the behavioural additionality, also has some implication for scale additionality. However, some dimensions that are defined in Chapter 4 are missing. These dimensions that are valid and that are introduced by Georghiou and Clarysse (2006) and the current intersections with AGY350 are as following:

- **Project Additionality** (Decisions regarding project launch): The question 3 of section D asking as “Would you carry out the project in the absence of the R&D Support?” captures the project additionality
- **Acceleration Additionality** (Acceleration of projects): There is no question on the AGY350 whether the firm would have been conducted R&D slower or faster in the absence of the support.
- **Scope and Scale Additionality** (Expanded scale and scope): The firm is asked as “What would the size of the project in the absence of the R&D support?” if it answers positively to the project additionality question.
- **Challenge Additionality** (More challenging research): There is no question on AGY350 whether the firm would have been conducted a more challenging R&D in the absence of the support.
- **Network Additionality** (More collaboration): Section C8 titled as “Out of Firm Effects” investigates the collaboration and dissemination effects of the projects. However, attribution problem is valid.
- **Follow-Up Additionality** (Project follow-up): Although there are some questions asking whether the firm plans to undertake new R&D projects in the following three years, this question is not linked with the benefits of the R&D project. Moreover, it would better this dimension is dealt with in the follow-up survey that will be explained later in this Chapter.
- **Management Additionality** (Improved management): The section C7 is completely about the management additionality. However, the attribution problem exists.

To solve all these problems revised survey design is presented at Appendix D. In this Annex the changed or newly added parts are marked with italic and highlighted. The following arguments and discussions would explain this proposal.

The first improvement that can be done in AGY350 is to shift the section titled as ‘R&D Support Programme Assessment’, the section that the project additionality and scale and scope additionality are included, just after the section asking basic information about the firm and project, parts A and B. This would make the project additionality focal at the survey. Furthermore, in the following section (and in its sub-sections) other dimensions of the behavioural additionality would

be tried to attributed by asking a question like ‘Would you undertake ... behaviour in the absence of the support?’. However, if the firm thinks that it would not undertake the project itself in the absence of the support, i.e. answers the project additionality question negatively, there is no need to ask a further dimension as they would automatically be qualified as ‘not applicable’. In this context, the new flow would be as following:

- A. Firm Information
- B. Project Information
- C. R&D Support Programme Assessment
- D. Project Assessment
 - D.1. Summary Assessment
 - D.2. Project Duration Assessment
 - D.3. Cost Assessment
 - D.4. Funding Assessment
 - D.5. Commercial Assessment
 - D.6. Other Economic Effects
 - D.7. In-Firm Effects
 - D.8. Out of Firm Effects

The second iteration can be improving this shifted section, ‘R&D Support Programme Assessment’. It is said before that this section includes the project additionality question and scale and scope additionality questions already. The only improvement about them can be a small change on scale and scope additionality question.

Similarly, the questions of acceleration and challenge additionalities would also be included here, right after asking project additionality question. This new structure is included in Appendix D. The modality used for scale and scope additionality, asking the question only if the firm answered positively to the question of project additionality, can also be used for these dimensions.

Solving the problem about project, scale and scope, acceleration and challenge additionalities and moving forward to the section titled ‘Project Assessment’, the remaining problems are to solve the attribution problems of management and network additionalities. The sub-section D7 titled as ‘In-Firm Effects’, in fact,

exactly the questions asking the management effects. There can be different improvements in each branch of this subsection to solve the attribution problem.

In the first branch of this section, the original AGY350 is asking whether a change was exhibited in employment by detailing the types of employment as employees in production, R&D, management and with graduate education. Moreover, the rate and the absolute level of change are being asked. To solve the attribution problem, a new question asking whether the number of employees would have been decreased, remained unchanged or increased in the absence of public funding in each category can be asked. This would give a good insight to measure the employment aspect of management additionality by solving the attribution problem.

The second branch of this sub-section is asking whether the listed 12 competencies gained after undertaking the project. The firm is requested to mark all the applicable competencies. These competencies may also be meaningful to get implication for behavioural additionality. However, this category is also facing the attribution problem. To solve this problem, a new column can be added asking if this competency would have been gained in the absence of the support also.

The third and the last branch of this sub-section instructs the firm as ‘Indicate the effects of the project in organization and management of your company and the ones existing before the project, separately’ and request to mark either ‘existing’ or ‘realized’ for each of the 12 category reflecting a change in management or organization. This section is perfectly matching with the management effects that are described in Georghiou and Clarysse (2006), although the attribution problem is also valid for it. To solve this problem again, the logic applied at the second branch can be employed. A new column asking whether these effects would have been the case in the absence of the support would solve the attribution problem. In this case, as was before the firm should mark either existing or realised options and if realised is selected, then it should answer to the additionality column.

The final problem to be solved is the network additionality. To this aim subsection titled 'Out of Firm Effects' seems to be useful. In this part, the firm is asked as 'Are there any institutions you have had an initial contact for undertaking the project?' and as usual there exists the attribution problem. To overcome this problem, again the same logic can be applied, a new question can be asked whether the firm have been contacted any other firm in the absence of the project.

Therefore, this concludes the first apparatus of the quantitative phase of the evaluation framework. The new AGY350 survey reflecting above proposed changes can be found in Appendix D.

6.5.1.2. Follow-Up Survey

As the second apparatus of the quantitative phase of the evaluation framework of behavioural additionality of TÜBİTAK-TEYDEB support, follow-up surveys are included in the design pictured in Figure 6.6 mainly because of two reasons.

First of all, this kind of an apparatus would fill the blanks that the initial survey left empty. Follow-up additionality, for instance, in the previous section is argued as not to be able to be measured by initial survey. Therefore, a follow-up survey approach would be valuable.

Secondly, this kind of an apparatus would enable the evaluator to perceive the medium and long-run effects. Given the nature of the initial survey that is proposed to be conducted immediately after the completion of project, it would only be capable of measuring the short-run behavioural additionality. As Georghiou (2002:4 and 2004:48) argues that "behavioural additionality effects may be expected to endure beyond the period of R&D", such a follow-up survey or series of follow-up surveys would make it possible to measure the medium-run and long-run effects.

Ascertaining the need for a follow-up survey, the proposed survey should exhibit some characteristics. First of all, it should be as similar as possible to the initial survey to enable the evaluator perceiving the progress. The same logic is

employed while proposing that AGY350 should be pursued to be used with some redesign rather than designing a completely new survey. However, there will be some points arising from the nature of the behavioural additionality that the follow-up survey should address in a completely different fashion than the initial survey. Therefore, the first principle is to design the follow-up survey compatible with the initial survey where possible.

Secondly, employing the same arguments of the initial survey, this survey should also collect data digitally.

Thirdly, as the follow-up survey will be asked to be filled by the firm after a lag, the firm may answer the question inconsistently. Therefore, to ensure the consistency the firm should be supplied with its answers while asking about the follow-up survey. If data is collected digitally as proposed above, this would not be so difficult technically and would add very much to the consistency. This approach, in a way, may also be legitimized with the advantages of the use of multi-round survey techniques (Delphi method) in the foresight exercises.

Finally, this survey should not be conducted only once. Connected with the first argument for the need for a follow-up approach, the need for perceiving both medium and long-run effects cannot be satisfied with a single follow-up survey. A single follow-up survey would only be considered as an effort to medium-run and would not give the long-run effects. Therefore, at least two follow-up surveys should be undertaken; the first one may be conducted 12 months after the completion of the project to perceive the medium-run behavioural additionality while the second one should be conducted 36 months after completion of projects to measure the long-run behavioural additionality. This approach would be justified with the examples of 'Continuous and Systematic Monitoring in the EUREKA programme' or Advanced Technology Programme Evaluation of the US. OECD (2006b) reports that both programmes use an evaluation apparatus at 2, 4 and 6 years after the funding ends for the same reason proposed for TEYDEB.

Moving forward to the practicality, the follow-up surveys may include network additionality, follow-up additionality and management additionality as these dimensions of behavioural additionality are defined by Georghiou and Clarysse

(2006) as ‘the behavioural additionality effects exhibited after the project completion’. Project additionality, scale and scope additionality, acceleration additionality and challenge additionality, however, are classified as the dimensions of behavioural additionality faced while undertaking the project. Therefore, logically it is not reasonable to include them in follow-up surveys.

In this context, the proposed follow-up survey that will be conducted in the 1st and the 3rd year is depicted in Appendix E. The first part of this survey is management additionality. Exactly the same structure with the initial survey is used for this section. The only change is to remove the column titled ‘existing’ in sub-section 2, as it is irrelevant.

The second section of this survey is about the network additionality. Again, in this section employing the same logic and arguments, exactly the same question used in the initial survey is kept.

As the final section, follow-up additionality should be enquired. Unlike the previous two sections, this question is completely new. By this question, whether a spin-off project is undertaken because of the public intervention will be investigated.

The above mentioned framework is applicable for the projects completed in the near past and the projects that will be completed from now on, the approach of conducting the survey as soon as the evaluation begins for the rest of the projects completed within the 10 years of history of the support could be reasonable. The above mentioned time-frames, 12 months and 36 months after the project, that is proposed for the follow-up survey are reflecting the system-building effort. However to melt down the cumulated mass to this day, an exception can be considered and all the projects completed can be investigated for once.

6.5.2. Qualitative Phase of Evaluation

Figured out the first pillar of the evaluation framework of behavioural additionality of TÜBİTAK-TEYDEB support, the next task is to design the second

pillar of the framework, - the qualitative phase of evaluation as depicted at Figure 6.6.

As based on previously given evidence, there are several reasons to undertake such a phase in the evaluation. First of all, as Georghiou and Clarysse (2006) argues and as explained in section 5.14, while discussing the lessons learned from other evaluation attempts in OECD countries, the survey approach is not always fully capable to perceive the essence of the dynamics. A face-to-face semi-structured interview should reinforce it to see what is really happening as implemented at Belgium, Japan and United States studies. Similarly, Georghiou (2004:48) reports that “a first IWT project in 1999, using econometric techniques to evaluate the additionality on R&D expenditures pointed out that these quantitative results are not conclusive without some qualitative research by means of interviews”.

Secondly, this kind of an approach would also be valuable for the continuous improvement of the evaluation framework in general, and the quantitative phase in specific. It is possible to neglect or misrepresent some details because of the design of the surveys and a qualitative effort would give the opportunity to detect such a deficiency. Therefore, the qualitative phase will add to the accuracy of the quantitative one.

Thirdly, connected with the previous one, such a qualitative pillar of the evaluation framework would also reinforce the consistency of the data collected at quantitative design. As firms may tend to misrepresent their situation psychologically, the results of the survey may be in need of a check. The qualitative phase of the evaluation framework, therefore, can be act as an insurance mechanism against an inconsistency of the data collected at the other phase. Similarly, such an effort of semi-structured interview may prevent multidimensionality bias in the survey apparatuses of the quantitative phase.

Fourthly, such a pillar of evaluation would enable the evaluator to share the experience, perception and knowledge of the conductor of this phase. Especially in TÜBİTAK-TEYDEB case, as explained in Section 6.3 an external referee is commissioned at the preliminary assessment of the project to determine whether

it is worth to support or not. This referee visits the firm and assesses the project. Therefore, an important experience accumulated in this way can be extracted with such a qualitative phase of evaluation that includes such people.

Finally, Fahrenkrog et al. (2002) argue that for the evaluation of the science, technology and innovation policy, some aspects of the information to be collected is not quantifiable. Therefore, this kind of a semi-structured interview would allow the evaluator to perceive these details.

Ascertaining the need for such a qualitative pillar of evaluation as depicted in Figure 6.6, the apparatus of such evaluation should be discussed. The proposal is to use semi-structured interview method. As explained in section 5.14, the lessons learned from the other evaluation attempts are in that direction also.

This interview, on the other hand, should have some characteristics. First of all, it is proposed to be conducted by the external referee used in the assessment of the project because of above explained reasons. An alternative to this would be to employ the TÜBİTAK-TEYDEB expert for such an activity. However, this would not be a better choice as the expert does not visit the firm contrary to the external referee, so utilizing this experience would not be the case. Moreover, the current heavy workload of the expert would make this alternative infeasible.

One other thing important about using the external referee as the interviewer is that he or she should be trained well about the concept. As the interview is a hard process requiring a thorough knowledge on the issue that is being interviewed about, the training of the interviewers requires a special effort.

As a final advantage of using the external referee as interviewer, engagement of such a 3rd party would also add to the credibility of the evaluation and minimizes the risk of organizational bias.

Apart from the considerations of this thesis, commissioning external referees who are mainly from academia would add to the university-industry partnership indirectly.

Timing of the interview is another characteristic that needs attention. This interview can be take place within 3 months after the project completion by linking this process to the last payment in the project schedule. This approach would benefit more from the external referee's experience and knowledge on the firm accumulated at the beginning of the project. Also, the interview should also be linked with the payment as is in the case of AGY350. Firms can be urged to conduct interview to be awarded for the last payment. Secondly, as the majority of the firms that benefit from the TÜBİTAK-TEYDEB support are SMEs¹⁴, it will be very likely after a certain time that some of the firms supported by TÜBİTAK-TEYDEB will be shut down. Therefore, having interviews after a long time would not be a good idea.

Another issue is the content of the interview, first of all the basic dimensions of behavioural additionality that Georghiou and Clarysse (2006) used for comparison of efforts in OECD countries should be included. The questions of the TÜBİTAK-TEYDEB prioritization study presented in Appendix C would also be valuable for this purpose. Most of the questions produced in this study are not suitable to be asked in the survey but to be used in such a face-to-face apparatus.

The mean of conducting the interview is another issue. As the external referee visits the firm for the last term's assessment, utilizing this opportunity would be wiser. Moreover, as the issue of additionality can be perceived as too complex by the firm, a good introduction of the concept is necessary. These would be accomplished by a face-to-face interview.

Finally, interview is a good apparatus only if it is reported correctly. Designing a web-based system integrated to the data collected through quantitative phase and requesting the referee to fill in the implications gained from the interview is vital. Furthermore, the TÜBİTAK-TEYDEB expert should approve the report of the interview to ensure the accuracy as is the case at the apparatuses of the quantitative phase.

¹⁴ According to the statistics announced at SCST 13th meeting (SCST, 2006), 58% of the project proposals during 10 years of history of programme is submitted by SMEs. Similarly, at 2005 78% of the firms in TÜBİTAK-TEYDEB pool were SMEs.

Moving forward to the structural characteristics of this semi-structured telephone interview, the implications of the data analysis can be employed. Data analysis signposted that the firms in TÜBİTAK-TEYDEB portfolio can be categorized into two groups as high and low potential from the perspective of behavioural additionality. Summarizing, the firms that are small-sized, performing R&D and awarded TÜBİTAK-TEYDEB support for the first time or fewer, spending low for R&D, located at 'Small Industrial Zone', relied on the support for the project more than other firms and applied to the support since it was the necessary financial source to realise the project are expected to be the source of behavioural additionality than the rest.

Therefore, within these modalities, the interview should distinguish the firms that have more potential for behavioural additionality than the others. For high potential firms, for example the interviewers may have more attention.

In this perspective, an interview guide can be useful as Malik et al. (2006) propose. A proposal for this survey is presented in Appendix E of this thesis. This proposal includes the questions of the basic dimensions of the additionality as well as TÜBİTAK-TEYDEB's considerations presented in Appendix C. From the latter category only the top 5 questions are selected, as the first category would also take some time and as an interview should take 1 or 2 hours at most.

Therefore, for above explained reasons a qualitative phase to accompany the quantitative one is introduced as the concluding and final phase of the proposed evaluation framework to evaluate the behavioural additionality effects in Turkey.

CHAPTER 7

CONCLUSION

As the starting point of this thesis, evaluation of the behavioural additionality effects of the Turkish TÜBİTAK-TEYDEB support is considered as crucial. After it is revealed that it is not possible that an evaluation can be undertaken with current set of data. The main research questions of this thesis appeared: How can we measure the behavioural additionality of the support and what kind of a framework should be implemented for an evaluation of behavioural additionality?

To this aim, firstly, this thesis introduced the science, technology and innovation policy analysis along with its additionality dimension to be able to discuss the behavioural additionality concept. The theoretical foundations of the concept discussed by briefly explaining the attempts to employ the resource based view of firm and value innovation theory.

Afterwards, the related evaluation attempts in OECD countries are summarized in relevant Chapters. It is observed that almost all studies uses questionnaire survey accompanied by a semi-structured interview, as this approach proved to be economical, quick and fail-safe. Connected with this corollary it is revealed that most of the studies uses not only econometric models but also reinforces them with qualitative / descriptive judgments. Moreover, a control group approach along with a modular design is widespread used approaches in previous studies.

Then, an evaluation framework for TÜBİTAK-TEYDEB support of Turkey is attempted to build. For this purpose, it is claimed that the recent shift in science, technology and innovation policy has underlined the need for such a framework to measure the behavioural additionality. Similarly, the policy context does not include such a mandate and the programme design is very open to the improvement that would be undertaken as a result of a behavioural additionality evaluation.

Although, the existing data is not capable of measuring additionality, it is decided that an analysis would contribute to the evaluation framework design by giving clues. The analysis of the data revealed that the project additionality and the scale additionality are very low compared to the other evaluation efforts in OECD countries. This contributed to the claims of the need for the evaluation. Furthermore, by the virtue of the data a firm topology that has more potential to create the behavioural additionality is figured out.

Having these inputs, an evaluation framework consisting of a qualitative and quantitative phase is proposed. The quantitative phase is proposed to provide comparable database, to confer compatibility with the existent TEYDEB data, to derive aggregates, to monitor the system persistently and to watch the progress over time. This phase is proposed to use a questionnaire survey approach by using an initial survey and a follow-up survey as apparatus of evaluation.

Secondly a qualitative phase is also proposed to catch the essence, to form a basis for further survey design, to share the experience of external referee, to validate the quality of data collected by surveys and to perceive the non-quantifiable details. This phase uses semi-structured interview as apparatus. The design of these apparatuses is provided at Appendices separately.

Given these efforts summarized above, the approach used throughout the thesis has some limitations. Although the ‘resource-based view theory’ and ‘the value innovation perspective’ that are summarized at Chapter 4 are strong attempts to deploy a theoretical foundation to the concept, there is still another problem that should be focused.

All of the studies that are undertaken in relation to this newly emerging concept are either conducted by Georghiou and a few other scholars to introduce the idea or some of the members of the OECD TIP to ‘measure’ such effects in their respective countries. However, these studies are mainly relying on a typical assumption that we are dealing with a ‘developed country’.

The question here can be that whether the nature of the behavioural additionality differs according to the country we are working on. Is the nature of the behaviour of the innovative firm in a developed country different from the one in a developing country? And also, does the mechanism to change this behaviour, i.e. the public intervention, work in completely the same way? If these questions are valid, are the theories to deploy a theoretical background to the concept enough to explain the case in the developing countries as well?

In fact, against this challenge, Oslo Manual includes some clues. It says not only the “size and structure of markets and firms” are different in the developing countries but also the factors of the innovation landscape such as instability, informality, particular economic and innovation environments, reduced innovation decision-making powers, weak innovation systems and characteristics of innovation differ from the ones in a developing country. This argument can be carried out further in the light of the other Schumpeterian arguments such as national innovation systems.

Within this framework, this thesis also assumes that conditions of Turkey are not different from the countries that an evaluation attempt undertaken. In fact, as it is not possible to undertake a research that reveals the nature of the behavioural additionality in developing and developed countries in the context of this thesis, the study should have been relied on such an assumption. Therefore, undertaking such a research to investigate the difference in the nature of behavioural additionality would be a further research topic.

As the final remark, it is worth to underline again the urgent need for an evaluation in Turkey. This thesis would only be valuable if an evaluation attempt is considered to be undertaken. Otherwise, it would be nothing more than an intellectual exercise.

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APPENDICES

APPENDIX A

CURRENT TÜBİTAK-TEYDEB PROJECT RESULT REPORT SURVEY (AGY350)¹⁵

PROJECT RESULT REPORT

AGY350-01

Project Number:

Date:/..../....

Accuracy and completeness of this report at the end of each project will help to improve our decisions about R&D support and our effort to measure the impacts of the programme from the aspect of **TEYDEB**. On the other hand from the aspect of **your undertaking**, it would help to look into future by enabling you to reveal the technical, technological and commercial real gains of the project.

A. FIRM INFORMATION

Firm Name			
Authorized Firm Representative		Title/Position	
Project Leader		Title/Position	
Firm Address			
Phone:	Fax:	E-mail:	Web:

- EquityUSD
Net of land and building; as is in the balance sheet.
- Parent Firm/Holding
Shareholders whose shares exceed 25%.
- Total Number of Employees:
<10 11-50 51-150 151-200 200-250 >250
- Last Year R&D Expenditure / Net Sales %.....
- Last Year Export / Net Sales %.....
- Location of Firm
Industrial zone, small industrial site, technopark, technology center, etc.
- Main Line of Business
- Accreditations.....
ISO 9000, 14000, etc.

¹⁵ The original Turkish form can be accessed through the web address http://www.tideb.tubitak.gov.tr/formlar/AGY350_2005.12.31.doc

B. PROJECT INFORMATION

- TEYDEB PROJECT NUMBER :
- PROJECT NAME :
- PROJECT SUMMARY :
Explain the subject and main targets of the project along with the applied methods therein compared with the forecasted targets, taking into consideration the completeness of the project *(maximum 2 pages)*.
- TECHNICAL ASPECTS OF PROJECT OUTPUT :
Explain the technical features of the product compared with the similar products, if possible *(maximum 2 pages)*.
- DOCUMENTATION :
Enclose any document in the form of photograph, booklet, CD, etc. that displays the project output.
- EVALUATION OF PROJECT COLLABORATIONS :
Evaluate the collaborations with universities, R&D institutions and other institutions at the end of the project with pros-cons.

C. PROJECT EVALUATION

1. Is it your first R&D project?
Yes 1 No 2 (if)
 - How many R&D projects you have undertaken before? Mark.
1-5 1 6-10 2 >10 3

2. Is it your first TEYDEB project?
Yes 1 No 2 (if)
 - How many project supports have you been granted by TIDEB before? Mark.
1-5 1 6-10 2 >10 3

CI. SUMMARY EVALUATION

1. Indicate the points arrived as you evaluate the project in general with the following criteria.

	<i>Mostly</i> 1	<i>Partially</i> 2	<i>Very Little</i> 3	<i>None</i> 4
1. Technical accomplishment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Commercial accomplishment (Considering the targets of product introduction, market acceptance, sales and market share; indicating if the product has not been introduced yet.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Employment effect (Employment effects of the project in firm as well as other sectors and institutions.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Structural effects (Especially considering the effects on R&D structure and corporate structure)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Other effects (Considering the effects on efficiency, quality, changes in employees' qualifications and other sectors.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Evaluate the initial targets of the project and realization of these targets through marking the following items. (Mark all applicable alternatives.)

	<i>Initial target</i> 1	<i>Realized</i> 2	<i>To be realized in three years</i> 3
Technical/Commercial targets			
1. Development of new product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Improvement of current products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Development of new processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Improvement of current processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Establishment of prototype or pilot plant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Solvency of technical/operational problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. New licence application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. New licence application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Extension in new markets			
9.1 In Turkey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2 In Europe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3 In other countries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other aims			
10. Scientific publications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Creating new knowledge and competencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Increasing the quality of management and business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Developing strategic industrial collaborations with other institutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Developing new networks and improving the existing ones with universities and research institutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Other (indicate)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. What are the difficulties encountered while undertaking the project? (Mark all applicable alternatives.)

Technical difficulties	<input type="checkbox"/>	1
Inadequacy of self-financing resources	<input type="checkbox"/>	2
Inadequacy of external resources	<input type="checkbox"/>	3
Weakness in production capability	<input type="checkbox"/>	4
Shift in user/market preferences	<input type="checkbox"/>	5
Change in establishment strategy	<input type="checkbox"/>	6
Insufficient support from top management	<input type="checkbox"/>	7
Firm-inside bureaucratic model	<input type="checkbox"/>	8
Failure in establishment of necessary infrastructure	<input type="checkbox"/>	9
Failure in setting a proper business plan of project	<input type="checkbox"/>	10
Changes in targets	<input type="checkbox"/>	11
Problems in R&D process	<input type="checkbox"/>	12
Other (indicate)	<input type="checkbox"/>	13

C2. EVALUATION OF PROJECT PERIOD

1. Indicate the beginning and ending dates of the project.

	Beginning Date	Ending Date	Project Period (month)
Anticipated			
Realized			

4. If anticipated and realized project duration are different, mark the appropriate causes.

- Delay in providing equipment, hardware, etc. 1
- Change in project targets 2
- Deviation from forecasted time frame 3
- Financial difficulties 4
- Scarcity of qualified workforce 5
- Inadequacy in infrastructure 6
- Delays in services provided 7
- Delays in R&D support process 8
- Other (indicate) 9

C3. COST EVALUATION

1. Indicate the anticipated cost for support, realized total cost and the difference on cost type basis.

Cost Items	Anticipated (USD)	Realized (USD)	Difference	
			USD	%
1. Personnel				
2. Travel				
3. Machine/Equipment/Software/ Publication				
4. Domestic R&D Service				
5. Consultancy/ Service Provision				
6. Equipment				
7. TOTAL				

(Costs Subject to Support will be considered while filling the table.)

2. Indicate the sources of differences in costs.

- Absence of project cost plan 1
- Extension in project period 2
- Change in project targets 3
- Occurrence of unforeseen expenditures 4
- Miscalculation of expenditure forecasts 5
- Other (indicate) 6

C4. PROJECT FINANCE

	<i>Anticipated (USD)</i>	<i>Realized (USD)</i>	<i>Share of Source (%)</i>
1. Own Resources			
2. External Private Resources (bank loans, venture capital, special borrowing, etc.)			
3. Public Resources(grant, loan,etc.)			

(Project Costs Subject to Support will be considered while filling the table.)

C5. COMMERCIAL EVALUATION

Answer this part considering your forecasts in case commercialization of the product has not been realized yet.

1. Compare the post-project commercial success with the pre-project forecasted one (regarding the criteria such as sales, sales amount and market share)

Higher 1 Lower 2 Same 3

2. Indicate the sources of differences.

Absence of forecasts 1
 Changes in the economic environment 2
 Faster introduction of competitive products 3
 Technical failure of product 4
 Difficulties during the introduction of product 5
 Absence of necessary financing for commercialization 6

3. Indicate the differences in terms of sales and market share due to the commercialization of project.

- 3.1. Increase in sales

Domestic..... USD / %.....
 International..... USD / %.....

- 3.2. Increase in market share

Domestic %.....
 International %.....

C6. OTHER ECONOMICAL EFFECTS

Mark the other economical gains produced with the project.

1. Efficiency HIGH INCREASE 1 INCREASED 2 UNCHANGED 3 DECLINED 4
2. Cost HIGH INCREASE 1 INCREASED 2 UNCHANGED 3 DECLINED 4
3. Licence/Know-How Sale EXISTENT 1 MAYBE EXISTENT 2 NON-EXISTENT 3

C7. IN-FIRM EFFECTS

1. Indicate the effect of the project to the firm-inside employment.

	Increased		Unchanged <i>Mark</i>	Decreased	
	Increase Rate %	Absolute Increase		Decrease Rate %	Absolute Decrease
1. Number of employees in production					
2. Number of employees in R&D					
3. Number of employees in management					
4. Number of employees with graduate education					
5. TOTAL					

2. Which of the following effects were observed in your firm after the project?
(Mark all applicable alternatives.)

- Technology Monitoring Competency Gained 1
- Using of Consulting Services Systemised 2
- Use of a New a Technology in Product and Process Development Gained 3
- R&D Infrastructure Began to be Built 4
- R&D Infrastructure was Improved 5
- Production Infrastructure was Improved 6
- Had Effect on Identification of Technological Capabilities and Deficiencies 7
- Contributed to the Permanence (Know-How) of the Knowledge Created During R&D Activities 8
- Outputs of This Projects Created a New R&D Project 9
- Gained Decrease in the Cost of New R&D Activities 10
- Gained Decrease in Production Cost 11
- Gained Profit via Sale of Patent, Licence, Know-How 12

3. Indicate the effects of the project in organization and management of your firm and the ones existing before the project, separately.

- | | <i>Existing</i> | <i>Realized</i> |
|---|--------------------------|--------------------------|
| | 1 | 2 |
| 1. An R&D Department was Established | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Existing R&D Department was Restructured | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. The Approach of Conducting R&D Projects on Project Basis was Adopted | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. Team Culture was Gained in the Implementation Process of R&D Projects (in all the related departments) | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. R&D Awareness was Diffused in All Layers of the Firm Including Top Management | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. New Management Techniques was Implemented (simultaneous engineering , etc.) | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. Separate R&D Budget was Established | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Need for Market Research in R&D was Understood | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Support to and Share of R&D (new idea generation) Studies in the Institution was Gained | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Use of the Internet was Increased | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. Training Activities was Increased | <input type="checkbox"/> | <input type="checkbox"/> |
| 12. Participation to Congresses, Conferences and Fairs was Increased | <input type="checkbox"/> | <input type="checkbox"/> |

C8. OUT OF FIRME EFFECTS

1. Fields in which project output is utilized

Entirely firm-inside	<input type="checkbox"/>	1
Entirely firm-outside	<input type="checkbox"/>	2
Firm-inside and outside	<input type="checkbox"/>	3

2. Indicate the effects of the project to other sectors or institutions.

	Yes	No	Maybe
	1	2	3
Employment effects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Efficiency effects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality effects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Are there any institutions you have had an initial contact for the undertaking of the project?

If Yes 1; how many institutions

1 1 2-5 2 6-10 3 >10 4

No 2

D. R & D SUPPORT EVALUATION

1. Indicate the reasons for applying for a R&D support.

Applied to the R&D support since it was the necessary financial source to realise the project	<input type="checkbox"/> 1
Applied to the R&D support since it provides prestige	<input type="checkbox"/> 2
Applied to the R&D support to reach other inner and outer financial sources	<input type="checkbox"/> 3
Applied to the R&D support since it provides collaboration with R&D institutions	<input type="checkbox"/> 4
Applied to the R&D support to institutionalize the R&D management	<input type="checkbox"/> 5
Applied to the R&D support to validate the quality of the R&D	<input type="checkbox"/> 6
Applied to the R&D support because of another reason	<input type="checkbox"/> 7

2. Indicate the difficulties experienced during the R&D support process.

No difficulty at all	<input type="checkbox"/> 1
Lack of communication with arbitrager	<input type="checkbox"/> 2
Difficulty in preparation of project documents	<input type="checkbox"/> 3
Lingering evaluation and follow-up period	<input type="checkbox"/> 4
Inadequacy of evaluation	<input type="checkbox"/> 5
Business stance of TUBITAK	<input type="checkbox"/> 6
Delays in payments	<input type="checkbox"/> 7
Other (indicate)	<input type="checkbox"/> 8

3. Would you carry out the project in the absence of the R&D Support?

If Yes 1; What would the size of the project in the absence of the R&D support?

1. Same	<input type="checkbox"/>
2. Lower	<input type="checkbox"/> %.....
3. Higher	<input type="checkbox"/> %.....

No 2

4. Do you plan to undertake new R&D projects in the following three years?

Yes 1..... number of projects

If No 2; Why don't you consider new R&D projects?

- Absence of new product/technique to develop 1
- Inadequate financial resources 2
- Uncertainty prevailing in the economy 3
- Failure in capturing the expected benefits from R&D projects 4
- Other (indicate) 5

5. If you plan to undertake new R&D projects in the following three years, do you consider applying for a R&D support for these projects?

Yes 1

If No 2; mark the reasons.

- Inadequacy of support 1
- Delays in support 2
- Unwilling to reveal commercial information 3
- Other (indicate) 4

APPENDIX B

DATA TABLES

Table A2.1: Would you carry out the project in the absence of the R&D Support?

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Yes	371	85.7	87.1	87.1
Valid No	55	12.7	12.9	100.0
Valid Total	426	98.4	100.0	
Missing System	7	1.6		
Total	433	100.0		

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Table A2.2: Would you carry out the project in the absence of the R&D Support? * Total number of employees Crosstabulation

		Total number of employees						Total	
		<10	11-50	51-100	101-200	201-250	>250		
Would you carry out the project in the absence of the R&D Support?	Yes	Count	31	79	80	18	6	153	367
		% within Total number of employees	77.5%	83.2%	86.0%	94.7%	85.7%	91.1%	87.0%
		% of Total	7.3%	18.7%	19.0%	4.3%	1.4%	36.3%	87.0%
	No	Count	9	16	13	1	1	15	55
		% within Total number of employees	22.5%	16.8%	14.0%	5.3%	14.3%	8.9%	13.0%
		% of Total	2.1%	3.8%	3.1%	.2%	.2%	3.6%	13.0%
Total	Count	40	95	93	19	7	168	422	
	% within Total number of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	9.5%	22.5%	22.0%	4.5%	1.7%	39.8%	100.0%	

Table A2.3: Would you carry out the project in the absence of the R&D Support? * R&D intensity Crosstabulation

		R&D intensity											Total	
		less than 1%	1% - 9.99%	10% - 19.99%	20% - 29.99%	30% - 39.99%	40% - 49.99%	50% - 59.99%	60% - 69.99%	70% - 79.99%	80% - 89.99%	more than 90%		
Would you carry out the project in the absence of the R&D Support?	Yes	Count	127	141	25	21	8	6	6	3	1	1	2	341
		% within R&D intensity	83.0%	89.8%	89.3%	100.0%	88.9%	100.0%	100.0%	75.0%	50.0%	33.3%	66.7%	87.0%
		% of Total	32.4%	36.0%	6.4%	5.4%	2.0%	1.5%	1.5%	.8%	.3%	.3%	.5%	87.0%
	No	Count	26	16	3	0	1	0	0	1	1	2	1	51
		% within R&D intensity	17.0%	10.2%	10.7%	.0%	11.1%	.0%	.0%	25.0%	50.0%	66.7%	33.3%	13.0%
		% of Total	6.6%	4.1%	.8%	.0%	.3%	.0%	.0%	.3%	.3%	.5%	.3%	13.0%
Total	Count	153	157	28	21	9	6	6	4	2	3	3	392	
	% within R&D intensity	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	39.0%	40.1%	7.1%	5.4%	2.3%	1.5%	1.5%	1.0%	.5%	.8%	.8%	100.0%	

Table A2.4: Would you carry out the project in the absence of the R&D Support? * Location Crosstabulation

		Location					Total	
		Other	Small Industrial Zone	Organized Industrial Zone	Technology Centre	Technopark		
Would you carry out the project in the absence of the R&D Support?	Yes	Count	171	21	139	2	38	371
		% within Location	90.0%	77.8%	85.3%	100.0%	86.4%	87.1%
		% of Total	40.1%	4.9%	32.6%	.5%	8.9%	87.1%
	No	Count	19	6	24	0	6	55
		% within Location	10.0%	22.2%	14.7%	.0%	13.6%	12.9%
		% of Total	4.5%	1.4%	5.6%	.0%	1.4%	12.9%
Total	Count	190	27	163	2	44	426	
	% within Location	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	44.6%	6.3%	38.3%	.5%	10.3%	100.0%	

**Table A2.5: Would you carry out the project in the absence of the R&D Support? *
Is it your first R&D project? Crosstabulation**

			Is it your first R&D project?		
			Yes	No	Total
Would you carry out the project in the absence of the R&D Support?	Yes	Count	77	291	368
		% within Is it your first R&D project?	79.4%	89.5%	87.2%
		% of Total	18.2%	69.0%	87.2%
	No	Count	20	34	54
		% within Is it your first R&D project?	20.6%	10.5%	12.8%
		% of Total	4.7%	8.1%	12.8%
Total	Count	97	325	422	
	% within Is it your first R&D project?	100.0%	100.0%	100.0%	
	% of Total	23.0%	77.0%	100.0%	

Table A2.6: Would you carry out the project in the absence of the R&D Support? * How many R&D projects you have undertaken before? Crosstabulation

			How many R&D projects you have undertaken before?			Total
			1-5	6-10	>10	
Would you carry out the project in the absence of the R&D Support?	Yes	Count	119	42	128	289
		% within How many R&D projects you have undertaken before?	83.8%	91.3%	95.5%	89.8%
		% of Total	37.0%	13.0%	39.8%	89.8%
	No	Count	23	4	6	33
		% within How many R&D projects you have undertaken before?	16.2%	8.7%	4.5%	10.2%
		% of Total	7.1%	1.2%	1.9%	10.2%
Total	Count	142	46	134	322	
	% within How many R&D projects you have undertaken before?	100.0%	100.0%	100.0%	100.0%	
	% of Total	44.1%	14.3%	41.6%	100.0%	

Table A2.7: Would you carry out the project in the absence of the R&D Support? * Is it your first TEYDEB project? Crosstabulation

			Is it your first TEYDEB project?		Total
			Yes	No	
Would you carry out the project in the absence of the R&D Support?	Yes	Count	125	242	367
		% within Is it your first TEYDEB project?	80.1%	91.3%	87.2%
		% of Total	29.7%	57.5%	87.2%
	No	Count	31	23	54
		% within Is it your first TEYDEB project?	19.9%	8.7%	12.8%
		% of Total	7.4%	5.5%	12.8%
Total	Count	156	265	421	
	% within Is it your first TEYDEB project?	100.0%	100.0%	100.0%	
	% of Total	37.1%	62.9%	100.0%	

Table A2.8: Would you carry out the project in the absence of the R&D Support? * How many project supports have you been granted by TIDEB before? Crosstabulation

			How many project supports have you been granted by TIDEB before?			Total
			1-5	6-10	>10	
Would you carry out the project in the absence of the R&D Support?	Yes	Count	138	38	63	239
		% within How many project supports have you been granted by TIDEB before?	87.9%	90.5%	100.0%	91.2%
		% of Total	52.7%	14.5%	24.0%	91.2%
	No	Count	19	4	0	23
		% within How many project supports have you been granted by TIDEB before?	12.1%	9.5%	.0%	8.8%
		% of Total	7.3%	1.5%	.0%	8.8%
Total	Count	157	42	63	262	
	% within How many project supports have you been granted by TIDEB before?	100.0%	100.0%	100.0%	100.0%	
	% of Total	59.9%	16.0%	24.0%	100.0%	

Table A2.9: Would you carry out the project in the absence of the R&D Support? *
Technical accomplishment Crosstabulation

		Technical accomplishment					Total
		Substantially	Partially	Barely	None		
Would you carry out the project in the absence of the R&D Support?	Yes	Count	337	26	2	1	366
		% within Technical accomplishment	87.8%	81.3%	66.7%	100.0%	87.1%
		% of Total	80.2%	6.2%	.5%	.2%	87.1%
	No	Count	47	6	1	0	54
		% within Technical accomplishment	12.2%	18.8%	33.3%	.0%	12.9%
		% of Total	11.2%	1.4%	.2%	.0%	12.9%
Total	Count	384	32	3	1	420	
	% within Technical accomplishment	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	91.4%	7.6%	.7%	.2%	100.0%	

Table A2.10. Would you carry out the project in the absence of the R&D Support? *
Commercial accomplishment Crosstabulation

		Commercial accomplishment					Total
		Substantially	Partially	Barely	None		
Would you carry out the project in the absence of the R&D Support?	Yes	Count	155	92	21	19	287
		% within Commercial accomplishment	86.6%	88.5%	77.8%	76.0%	85.7%
		% of Total	46.3%	27.5%	6.3%	5.7%	85.7%
	No	Count	24	12	6	6	48
		% within Commercial accomplishment	13.4%	11.5%	22.2%	24.0%	14.3%
		% of Total	7.2%	3.6%	1.8%	1.8%	14.3%
Total	Count	179	104	27	25	335	
	% within Commercial accomplishment	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	53.4%	31.0%	8.1%	7.5%	100.0%	

Table A2.11. Would you carry out the project in the absence of the R&D Support? *
Structural effects Crosstabulation

		Structural effects					Total
		Substantially	Partially	Barely	None		
Would you carry out the project in the absence of the R&D Support?	Yes	Count	143	143	42	27	355
		% within Structural effects	84.1%	86.7%	89.4%	100.0%	86.8%
		% of Total	35.0%	35.0%	10.3%	6.6%	86.8%
	No	Count	27	22	5	0	54
		% within Structural effects	15.9%	13.3%	10.6%	.0%	13.2%
		% of Total	6.6%	5.4%	1.2%	.0%	13.2%
Total	Count	170	165	47	27	409	
	% within Structural effects	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	41.6%	40.3%	11.5%	6.6%	100.0%	

Table A2.12. Would you carry out the project in the absence of the R&D Support? *
Other effects Crosstabulation

			Other effects				
			Substantially	Partially	Barely	None	Total
Would you carry out the project in the absence of the R&D Support?	Yes	Count	199	118	25	9	351
		% within Other effects	87.3%	85.5%	83.3%	100.0%	86.7%
		% of Total	49.1%	29.1%	6.2%	2.2%	86.7%
	No	Count	29	20	5	0	54
		% within Other effects	12.7%	14.5%	16.7%	.0%	13.3%
		% of Total	7.2%	4.9%	1.2%	.0%	13.3%
Total	Count	228	138	30	9	405	
	% within Other effects	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	56.3%	34.1%	7.4%	2.2%	100.0%	

Table A2.13. Would you carry out the project in the absence of the R&D Support? * Own resources grouped ratio Crosstabulation

		Own resources grouped ratio										Total	
		0% - 9. 99%	10% - 19. 99%	20% - 29. 99%	30% - 39. 99%	40% - 49. 99%	50% - 59. 99%	60% - 69. 99%	70% - 79. 99%	80% - 89. 99%	more than 90%		
Would you carry out the project in the absence of the R&D Support?	Yes	Count	2	1	3	5	10	28	19	3	5	266	342
		% within Own resources grouped ratio	66.7%	50.0%	100.0%	62.5%	58.8%	73.7%	76.0%	60.0%	83.3%	93.0%	87.0%
		% of Total	.5%	.3%	.8%	1.3%	2.5%	7.1%	4.8%	.8%	1.3%	67.7%	87.0%
	No	Count	1	1	0	3	7	10	6	2	1	20	51
		% within Own resources grouped ratio	33.3%	50.0%	.0%	37.5%	41.2%	26.3%	24.0%	40.0%	16.7%	7.0%	13.0%
		% of Total	.3%	.3%	.0%	.8%	1.8%	2.5%	1.5%	.5%	.3%	5.1%	13.0%
Total	Count	3	2	3	8	17	38	25	5	6	286	393	
	% within Own resources grouped ratio	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	.8%	.5%	.8%	2.0%	4.3%	9.7%	6.4%	1.3%	1.5%	72.8%	100.0%	

Table A2.14. Would you carry out the project in the absence of the R&D Support? * External private resources grouped ratio Crosstabulation

			External private resources grouped ratio										
			0% - 9. 99%	10% - 19. 99%	20% - 29. 99%	30% - 39. 99%	40% - 49. 99%	50% - 59. 99%	60% - 69. 99%	70% - 79. 99%	80% - 89. 99%	more than 90%	Total
Would you carry out the project in the absence of the R&D Support?	Yes	Count	323	0	5	2	4	6	1	1	0	0	342
		% within External private resources grouped ratio	91.5%	.0%	83.3%	25.0%	50.0%	60.0%	33.3%	100.0%	.0%	.0%	87.0%
		% of Total	82.2%	.0%	1.3%	.5%	1.0%	1.5%	.3%	.3%	.0%	.0%	87.0%
	No	Count	30	2	1	6	4	4	2	0	1	1	51
		% within External private resources grouped ratio	8.5%	100.0%	16.7%	75.0%	50.0%	40.0%	66.7%	.0%	100.0%	100.0%	13.0%
		% of Total	7.6%	.5%	.3%	1.5%	1.0%	1.0%	.5%	.0%	.3%	.3%	13.0%
Total	Count	353	2	6	8	8	10	3	1	1	1	393	
	% within External private resources grouped ratio	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	89.8%	.5%	1.5%	2.0%	2.0%	2.5%	.8%	.3%	.3%	.3%	100.0%	

Table A2.15. Would you carry out the project in the absence of the R&D Support? * Public resources grouped ratio Crosstabulation

		Public resources grouped ratio								Total	
		0% - 9. 99%	10% - 19. 99%	20% - 29. 99%	30% - 39. 99%	40% - 49. 99%	50% - 59. 99%	60% - 69. 99%	more than 90%		
Would you carry out the project in the absence of the R&D Support?	Yes	Count	280	6	4	14	11	21	4	2	342
		% within Public resources grouped ratio	88.3%	75.0%	57.1%	100.0%	84.6%	77.8%	80.0%	100.0%	87.0%
		% of Total	71.2%	1.5%	1.0%	3.6%	2.8%	5.3%	1.0%	.5%	87.0%
	No	Count	37	2	3	0	2	6	1	0	51
		% within Public resources grouped ratio	11.7%	25.0%	42.9%	.0%	15.4%	22.2%	20.0%	.0%	13.0%
		% of Total	9.4%	.5%	.8%	.0%	.5%	1.5%	.3%	.0%	13.0%
Total	Count	317	8	7	14	13	27	5	2	393	
	% within Public resources grouped ratio	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	% of Total	80.7%	2.0%	1.8%	3.6%	3.3%	6.9%	1.3%	.5%	100.0%	

Table A2.16: Would you carry out the project in the absence of the R&D Support? * Applied to the R&D support since it was the necessary financial source to realise the project Crosstabulation

		Applied to the R&D support since it was the necessary financial source to realise the project			
		No	Yes	Total	
Would you carry out the project in the absence of the R&D Support?	Yes	Count	72	297	369
		% within Applied to the R&D support since it was the necessary financial source to realise the project	96.0%	85.1%	87.0%
		% of Total	17.0%	70.0%	87.0%
	No	Count	3	52	55
		% within Applied to the R&D support since it was the necessary financial source to realise the project	4.0%	14.9%	13.0%
		% of Total	.7%	12.3%	13.0%
Total	Count	75	349	424	
	% within Applied to the R&D support since it was the necessary financial source to realise the project	100.0%	100.0%	100.0%	
	% of Total	17.7%	82.3%	100.0%	

Table A2.17: Would you carry out the project in the absence of the R&D Support? * Applied to the R&D support since it provides prestige Crosstabulation

		Applied to the R&D support since it provides prestige			
		No	Yes	Total	
Would you carry out the project in the absence of the R&D Support?	Yes	Count	149	220	369
		% within Applied to the R&D support since it provides prestige	83.7%	89.4%	87.0%
		% of Total	35.1%	51.9%	87.0%
	No	Count	29	26	55
		% within Applied to the R&D support since it provides prestige	16.3%	10.6%	13.0%
		% of Total	6.8%	6.1%	13.0%
Total	Count	178	246	424	
	% within Applied to the R&D support since it provides prestige	100.0%	100.0%	100.0%	
	% of Total	42.0%	58.0%	100.0%	

**Table A2.18. Would you carry out the project in the absence of the R&D Support? *
Applied to the R&D support to institutionalize the R&D management Crosstabulation**

			Applied to the R&D support to institutionalize the R&D management		
			No	Yes	Total
Would you carry out the project in the absence of the R&D Support?	Yes	Count	196	173	369
		% within Applied to the R&D support to institutionalize the R&D management	84.5%	90.1%	87.0%
		% of Total	46.2%	40.8%	87.0%
	No	Count	36	19	55
		% within Applied to the R&D support to institutionalize the R&D management	15.5%	9.9%	13.0%
		% of Total	8.5%	4.5%	13.0%
Total	Count	232	192	424	
	% within Applied to the R&D support to institutionalize the R&D management	100.0%	100.0%	100.0%	
	% of Total	54.7%	45.3%	100.0%	

**Table A2.19. Would you carry out the project in the absence of the R&D Support? * Applied
to the R&D support to validate the quality of the R&D Crosstabulation**

			Applied to the R&D support to validate the quality of the R&D		
			No	Yes	Total
Would you carry out the project in the absence of the R&D Support?	Yes	Count	193	176	369
		% within Applied to the R&D support to validate the quality of the R&D	83.5%	91.7%	87.2%
		% of Total	45.6%	41.6%	87.2%
	No	Count	38	16	54
		% within Applied to the R&D support to validate the quality of the R&D	16.5%	8.3%	12.8%
		% of Total	9.0%	3.8%	12.8%
Total	Count	231	192	423	
	% within Applied to the R&D support to validate the quality of the R&D	100.0%	100.0%	100.0%	
	% of Total	54.6%	45.4%	100.0%	

**Table A2.20: What would the size of the project in the absence of the R&D
support?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Same	233	53.8	63.7	63.7
	Smaller	130	30.0	35.5	99.2
	Larger	3	.7	.8	100.0
	Total	366	84.5	100.0	
Missing	System	67	15.5		
Total		433	100.0		

Table A2.21: The proportion the size would be decreased

	Frequency	Percent	Valid Percent	Cumulative Percent
	1% - 19.99%	9	2.1	7.4
	20% - 39.99%	57	13.2	46.7
Valid	40% - 59.99%	48	11.1	39.3
	60% - 79.99%	8	1.8	6.6
	Total	122	28.2	100.0
Missing	System	311	71.8	
Total		433	100.0	

Table A2.22: What would the size of the project in the absence of the R&D support? *
Total number of employees Crosstabulation

		Total number of employees							
		<10	11-50	51-100	101-200	201-250	>250	Total	
What would the size of the project in the absence of the R&D support?	Same	Count	18	31	45	12	5	120	231
		% within Total number of employees	58.1%	40.8%	57.0%	66.7%	83.3%	78.9%	63.8%
		% of Total	5.0%	8.6%	12.4%	3.3%	1.4%	33.1%	63.8%
	Smaller	Count	13	43	34	6	1	31	128
		% within Total number of employees	41.9%	56.6%	43.0%	33.3%	16.7%	20.4%	35.4%
		% of Total	3.6%	11.9%	9.4%	1.7%	.3%	8.6%	35.4%
	Larger	Count	0	2	0	0	0	1	3
		% within Total number of employees	.0%	2.6%	.0%	.0%	.0%	.7%	.8%
		% of Total	.0%	.6%	.0%	.0%	.0%	.3%	.8%
	Total	Count	31	76	79	18	6	152	362
		% within Total number of employees	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	8.6%	21.0%	21.8%	5.0%	1.7%	42.0%	100.0%

Table A2.23: What would the size of the project in the absence of the R&D support? * Is it your first R&D project? Crosstabulation

		Is it your first R&D project?			
		Yes	No	Total	
What would the size of the project in the absence of the R&D support?	Same	Count	35	197	232
		% within Is it your first R&D project?	46.7%	68.4%	63.9%
		% of Total	9.6%	54.3%	63.9%
	Smaller	Count	40	88	128
		% within Is it your first R&D project?	53.3%	30.6%	35.3%
		% of Total	11.0%	24.2%	35.3%
	Larger	Count	0	3	3
		% within Is it your first R&D project?	.0%	1.0%	.8%
		% of Total	.0%	.8%	.8%
Total	Count	75	288	363	
	% within Is it your first R&D project?	100.0%	100.0%	100.0%	
	% of Total	20.7%	79.3%	100.0%	

Table A2.24: What would the size of the project in the absence of the R&D support? * Is it your first TEYDEB project? Crosstabulation

		Is it your first TEYDEB project?			
		Yes	No	Total	
What would the size of the project in the absence of the R&D support?	Same	Count	63	168	231
		% within Is it your first TEYDEB project?	51.6%	70.0%	63.8%
		% of Total	17.4%	46.4%	63.8%
	Smaller	Count	58	70	128
		% within Is it your first TEYDEB project?	47.5%	29.2%	35.4%
		% of Total	16.0%	19.3%	35.4%
	Larger	Count	1	2	3
		% within Is it your first TEYDEB project?	.8%	.8%	.8%
		% of Total	.3%	.6%	.8%
Total	Count	122	240	362	
	% within Is it your first TEYDEB project?	100.0%	100.0%	100.0%	
	% of Total	33.7%	66.3%	100.0%	

**Table A2.25: What would the size of the project in the absence of the R&D support? *
How many project supports have you been granted by TIDEB before? Crosstabulation**

		How many project supports have you been granted by TIDEB before?			Total	
		1-5	6-10	>10		
What would the size of the project in the absence of the R&D support?	Same	Count	85	25	55	165
		% within How many project supports have you been granted by TIDEB before?	63.0%	65.8%	85.9%	69.6%
		% of Total	35.9%	10.5%	23.2%	69.6%
	Smaller	Count	48	13	9	70
		% within How many project supports have you been granted by TIDEB before?	35.6%	34.2%	14.1%	29.5%
		% of Total	20.3%	5.5%	3.8%	29.5%
	Larger	Count	2	0	0	2
		% within How many project supports have you been granted by TIDEB before?	1.5%	.0%	.0%	.8%
		% of Total	.8%	.0%	.0%	.8%
	Total	Count	135	38	64	237
		% within How many project supports have you been granted by TIDEB before?	100.0%	100.0%	100.0%	100.0%
		% of Total	57.0%	16.0%	27.0%	100.0%

**Table A2.26: What would the size of the project in the absence of the R&D support? *
Structural effects Crosstabulation**

		Structural effects				Total	
		Substantially	Partially	Barely	None		
What would the size of the project in the absence of the R&D support?	Same	Count	78	88	30	25	221
		% within Structural Effects	55.7%	62.4%	71.4%	92.6%	63.1%
		% of Total	22.3%	25.1%	8.6%	7.1%	63.1%
	Smaller	Count	62	51	11	2	126
		% within Structural Effects	44.3%	36.2%	26.2%	7.4%	36.0%
		% of Total	17.7%	14.6%	3.1%	.6%	36.0%
	Larger	Count	0	2	1	0	3
		% within Structural Effects	.0%	1.4%	2.4%	.0%	.9%
		% of Total	.0%	.6%	.3%	.0%	.9%
	Total	Count	140	141	42	27	350
		% within Structural Effects	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	40.0%	40.3%	12.0%	7.7%	100.0%

Table A2.27: What would the size of the project in the absence of the R&D support? * Own resources grouped ratio Crosstabulation

		Own resources grouped ratio											
		0% - 9.99%	10% - 19.99%	20% - 29.99%	30% - 39.99%	40% - 49.99%	50% - 59.99%	60% - 69.99%	70% - 79.99%	80% - 89.99%	more than 90%	Total	
What would the size of the project in the absence of the R&D support?	Count	2	1	2	2	5	13	8	1	2	181	217	
	Same	% within Own resources grouped ratio	100.0%	100.0%	66.7%	40.0%	50.0%	46.4%	44.4%	50.0%	40.0%	68.0%	63.8%
		% of Total	.6%	.3%	.6%	.6%	1.5%	3.8%	2.4%	.3%	.6%	53.2%	63.8%
		Count	0	0	1	3	4	15	10	1	3	83	120
	Smaller	% within Own resources grouped ratio	.0%	.0%	33.3%	60.0%	40.0%	53.6%	55.6%	50.0%	60.0%	31.2%	35.3%
		% of Total	.0%	.0%	.3%	.9%	1.2%	4.4%	2.9%	.3%	.9%	24.4%	35.3%
		Count	0	0	0	0	1	0	0	0	0	2	3
	Larger	% within Own resources grouped ratio	.0%	.0%	.0%	.0%	10.0%	.0%	.0%	.0%	.0%	.8%	.9%
		% of Total	.0%	.0%	.0%	.0%	.3%	.0%	.0%	.0%	.0%	.6%	.9%
Total	Count	2	1	3	5	10	28	18	2	5	266	340	
		% within Own resources grouped ratio	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	.6%	.3%	.9%	1.5%	2.9%	8.2%	5.3%	.6%	1.5%	78.2%	100.0%

Table A2.28: What would the size of the project in the absence of the R&D support? *
Employees in production Crosstabulation

		Employees in production			
		Changed	Not Changed	Total	
What would the size of the project in the absence of the R&D support?		Count	66	167	233
	Same	% within Employees in production	55.5%	67.6%	63.7%
		% of Total	18.0%	45.6%	63.7%
		Count	53	77	130
	Smaller	% within Employees in production	44.5%	31.2%	35.5%
		% of Total	14.5%	21.0%	35.5%
		Count	0	3	3
	Larger	% within Employees in production	.0%	1.2%	.8%
		% of Total	.0%	.8%	.8%
Total	Count	119	247	366	
	% within Employees in production	100.0%	100.0%	100.0%	
	% of Total	32.5%	67.5%	100.0%	

Table A2.29: What would the size of the project in the absence of the R&D support? *
*** Employees in R&D Crosstabulation**

		Employees in R&D			
		Changed	Not Changed	Total	
What would the size of the project in the absence of the R&D support?		Count	84	148	232
	Same	% within Employees in R&D	56.4%	68.5%	63.6%
		% of Total	23.0%	40.5%	63.6%
		Count	65	65	130
	Smaller	% within Employees in R&D	43.6%	30.1%	35.6%
		% of Total	17.8%	17.8%	35.6%
		Count	0	3	3
	Larger	% within Employees in R&D	.0%	1.4%	.8%
		% of Total	.0%	.8%	.8%
Total	Count	149	216	365	
	% within Employees in R&D	100.0%	100.0%	100.0%	
	% of Total	40.8%	59.2%	100.0%	

**Table A2.30: What would the size of the project in the absence of the R&D support? *
Employees in Management Crosstabulation**

		Employees in Management			
		Changed	Not Changed	Total	
What would the size of the project in the absence of the R&D support?	Same	Count	50	182	232
		% within Employees in Management	51.5%	67.9%	63.6%
		% of Total	13.7%	49.9%	63.6%
	Smaller	Count	46	84	130
		% within Employees in Management	47.4%	31.3%	35.6%
		% of Total	12.6%	23.0%	35.6%
	Larger	Count	1	2	3
		% within Employees in Management	1.0%	.7%	.8%
		% of Total	.3%	.5%	.8%
Total	Count	97	268	365	
	% within Employees in Management	100.0%	100.0%	100.0%	
	% of Total	26.6%	73.4%	100.0%	

Table A2.31: What would the size of the project in the absence of the R&D support? * Employees with Graduate Education Crosstabulation

		Employees with Graduate Education			
		Changed	Not Changed	Total	
What would the size of the project in the absence of the R&D support?	Same	Count	59	174	233
		% within Employees with Graduate Education	56.2%	66.7%	63.7%
		% of Total	16.1%	47.5%	63.7%
	Smaller	Count	46	84	130
		% within Employees with Graduate Education	43.8%	32.2%	35.5%
		% of Total	12.6%	23.0%	35.5%
	Larger	Count	0	3	3
		% within Employees with Graduate Education	.0%	1.1%	.8%
		% of Total	.0%	.8%	.8%
Total	Count	105	261	366	
	% within Employees with Graduate Education	100.0%	100.0%	100.0%	
	% of Total	28.7%	71.3%	100.0%	

Table A2.32: What would the size of the project in the absence of the R&D support? * Total Employees Crosstabulation

		Total Employees		Total	
		Changed	Not Changed		
What would the size of the project in the absence of the R&D support?	Same	Count	132	100	232
		% within Total Employees	59.7%	69.4%	63.6%
		% of Total	36.2%	27.4%	63.6%
	Smaller	Count	89	41	130
		% within Total Employees	40.3%	28.5%	35.6%
		% of Total	24.4%	11.2%	35.6%
	Larger	Count	0	3	3
		% within Total Employees	.0%	2.1%	.8%
		% of Total	.0%	.8%	.8%
	Total	Count	221	144	365
		% within Total Employees	100.0%	100.0%	100.0%
		% of Total	60.5%	39.5%	100.0%

Table A2.33: What would the size of the project in the absence of the R&D support? * Applied to the R&D support since it was the necessary financial source to realise the project Crosstabulation

		Applied to the R&D support since it was the necessary financial source to realise the project			Total
		No	Yes		
What would the size of the project in the absence of the R&D support?	Same	Count	62	169	231
		% within Applied to the R&D support since it was the necessary financial source to realise the project	87.3%	57.7%	63.5%
		% of Total	17.0%	46.4%	63.5%
	Smaller	Count	9	121	130
		% within Applied to the R&D support since it was the necessary financial source to realise the project	12.7%	41.3%	35.7%
		% of Total	2.5%	33.2%	35.7%
	Larger	Count	0	3	3
		% within Applied to the R&D support since it was the necessary financial source to realise the project	.0%	1.0%	.8%
		% of Total	.0%	.8%	.8%
Total	Count	71	293	364	
	% within Applied to the R&D support since it was the necessary financial source to realise the project	100.0%	100.0%	100.0%	
	% of Total	19.5%	80.5%	100.0%	

Table A2.34: What would the size of the project in the absence of the R&D support? * Applied to the R&D support since it provides collaboration with R&D institutions Crosstabulation

		Applied to the R&D support since it provides collaboration with R&D institutions			
		No	Yes	Total	
What would the size of the project in the absence of the R&D support?	Same	Count	148	83	231
		% within Applied to the R&D support since it provides collaboration with R&D institutions	68.8%	55.7%	63.5%
		% of Total	40.7%	22.8%	63.5%
	Smaller	Count	67	63	130
		% within Applied to the R&D support since it provides collaboration with R&D institutions	31.2%	42.3%	35.7%
		% of Total	18.4%	17.3%	35.7%
	Larger	Count	0	3	3
		% within Applied to the R&D support since it provides collaboration with R&D institutions	.0%	2.0%	.8%
		% of Total	.0%	.8%	.8%
Total	Count	215	149	364	
	% within Applied to the R&D support since it provides collaboration with R&D institutions	100.0%	100.0%	100.0%	
	% of Total	59.1%	40.9%	100.0%	

**Table A2.35: Would you carry out the project in the absence of the R&D Support? *
Technology Monitoring Competency Gained Crosstabulation**

		Technology Monitoring Competency Gained			
		No	Yes	Total	
Would you carry out the project in the absence of the R&D Support?	Yes	Count	110	261	371
		% within Would you carry out the project in the absence of the R&D Support?	29.6%	70.4%	100.0%
		% within Technology Monitoring Competency Gained	94.8%	84.2%	87.1%
		% of Total	25.8%	61.3%	87.1%
	No	Count	6	49	55
		% within Would you carry out the project in the absence of the R&D Support?	10.9%	89.1%	100.0%
		% within Technology Monitoring Competency Gained	5.2%	15.8%	12.9%
		% of Total	1.4%	11.5%	12.9%
Total	Count	116	310	426	
	% within Would you carry out the project in the absence of the R&D Support?	27.2%	72.8%	100.0%	
	% within Technology Monitoring Competency Gained	100.0%	100.0%	100.0%	
	% of Total	27.2%	72.8%	100.0%	

**Table A2.36: Would you carry out the project in the absence of the R&D Support? *
Using of Consulting Services Systemised Crosstabulation**

		Using of Consulting Services Systemised			
		No	Yes	Total	
Would you carry out the project in the absence of the R&D Support?	Yes	Count	263	108	371
		% within Would you carry out the project in the absence of the R&D Support?	70.9%	29.1%	100.0%
		% within Using of Consulting Services Systemised	90.7%	79.4%	87.1%
		% of Total	61.7%	25.4%	87.1%
	No	Count	27	28	55
		% within Would you carry out the project in the absence of the R&D Support?	49.1%	50.9%	100.0%
		% within Using of Consulting Services Systemised	9.3%	20.6%	12.9%
		% of Total	6.3%	6.6%	12.9%
Total	Count	290	136	426	
	% within Would you carry out the project in the absence of the R&D Support?	68.1%	31.9%	100.0%	
	% within Using of Consulting Services Systemised	100.0%	100.0%	100.0%	
	% of Total	68.1%	31.9%	100.0%	

**Table A2.37: Would you carry out the project in the absence of the R&D Support? *
Production Infrastructure was Improved Crosstabulation**

		Production Infrastructure was Improved		Total
		No	Yes	
Would you carry out the project in the absence of the R&D Support?	Count	195	175	370
	Yes			
	% within Would you carry out the project in the absence of the R&D Support?	52.7%	47.3%	100.0%
	% within Production Infrastructure was Improved	87.8%	86.2%	87.1%
	% of Total	45.9%	41.2%	87.1%
	No			
	Count	27	28	55
	% within Would you carry out the project in the absence of the R&D Support?	49.1%	50.9%	100.0%
	% within Production Infrastructure was Improved	12.2%	13.8%	12.9%
% of Total	6.4%	6.6%	12.9%	
Total	Count	222	203	425
	% within Would you carry out the project in the absence of the R&D Support?	52.2%	47.8%	100.0%
	% within Production Infrastructure was Improved	100.0%	100.0%	100.0%
	% of Total	52.2%	47.8%	100.0%

Table A2.38: Would you carry out the project in the absence of the R&D Support? * Use of a New a Technology in Product and Process Development Gained Crosstabulation

		Use of a New a Technology in Product and Process Development Gained		
		No	Yes	Total
Would you carry out the project in the absence of the R&D Support?	Count	176	194	370
	% within Would you carry out the project in the absence of the R&D Support?	47.6%	52.4%	100.0%
	Yes			
	% within Use of a New a Technology in Product and Process Development Gained	85.4%	88.6%	87.1%
	% of Total	41.4%	45.6%	87.1%
	Count	30	25	55
	% within Would you carry out the project in the absence of the R&D Support?	54.5%	45.5%	100.0%
	No			
	% within Use of a New a Technology in Product and Process Development Gained	14.6%	11.4%	12.9%
	% of Total	7.1%	5.9%	12.9%
Total	Count	206	219	425
	% within Would you carry out the project in the absence of the R&D Support?	48.5%	51.5%	100.0%
	% within Use of a New a Technology in Product and Process Development Gained	100.0%	100.0%	100.0%
	% of Total	48.5%	51.5%	100.0%

Table A2.39: Would you carry out the project in the absence of the R&D Support? *
R&D Infrastructure Began to be Built Crosstabulation

		R&D Infrastructure Began to be Built			
		No	Yes	Total	
Would you carry out the project in the absence of the R&D Support?	Yes	Count	295	76	371
		% within Would you carry out the project in the absence of the R&D Support?	79.5%	20.5%	100.0%
		% within R&D Infrastructure Began to be Built	88.6%	81.7%	87.1%
		% of Total	69.2%	17.8%	87.1%
		Count	38	17	55
	No	% within Would you carry out the project in the absence of the R&D Support?	69.1%	30.9%	100.0%
		% within R&D Infrastructure Began to be Built	11.4%	18.3%	12.9%
		% of Total	8.9%	4.0%	12.9%
		Count	333	93	426
		% within Would you carry out the project in the absence of the R&D Support?	78.2%	21.8%	100.0%
Total	% within R&D Infrastructure Began to be Built	100.0%	100.0%	100.0%	
	% of Total	78.2%	21.8%	100.0%	

Table A2.40: Would you carry out the project in the absence of the R&D Support? * R&D Infrastructure was Improved Crosstabulation

		R&D Infrastructure was Improved		Total
		No	Yes	
Would you carry out the project in the absence of the R&D Support?	Count	134	236	370
	Yes			
	% within Would you carry out the project in the absence of the R&D Support?	36.2%	63.8%	100.0%
	% within R&D Infrastructure was Improved	88.2%	86.4%	87.1%
	% of Total	31.5%	55.5%	87.1%
	No			
	Count	18	37	55
	% within Would you carry out the project in the absence of the R&D Support?	32.7%	67.3%	100.0%
% within R&D Infrastructure was Improved	11.8%	13.6%	12.9%	
% of Total	4.2%	8.7%	12.9%	
Total	Count	152	273	425
	% within Would you carry out the project in the absence of the R&D Support?	35.8%	64.2%	100.0%
	% within R&D Infrastructure was Improved	100.0%	100.0%	100.0%
	% of Total	35.8%	64.2%	100.0%

Table A2.41: Would you carry out the project in the absence of the R&D Support? * Had Effect on Identification of Technological Capabilities and Deficiencies Crosstabulation

		Had Effect on Identification of Technological Capabilities and Deficiencies		Total
		No	Yes	
Would you carry out the project in the absence of the R&D Support?	Count	145	224	369
	% within Would you carry out the project in the absence of the R&D Support?	39.3%	60.7%	100.0%
	Yes			
	% within Had Effect on Identification of Technological Capabilities and Deficiencies	84.8%	88.5%	87.0%
	% of Total	34.2%	52.8%	87.0%
	Count	26	29	55
	% within Would you carry out the project in the absence of the R&D Support?	47.3%	52.7%	100.0%
	No			
	% within Had Effect on Identification of Technological Capabilities and Deficiencies	15.2%	11.5%	13.0%
	% of Total	6.1%	6.8%	13.0%
Total	Count	171	253	424
	% within Would you carry out the project in the absence of the R&D Support?	40.3%	59.7%	100.0%
	% within Had Effect on Identification of Technological Capabilities and Deficiencies	100.0%	100.0%	100.0%
	% of Total	40.3%	59.7%	100.0%

**Table A2.42: Would you carry out the project in the absence of the R&D Support? *
Contributed to the Permanence (Know-How) of the Knowledge Created During R&D
Activities Crosstabulation**

		Contributed to the Permanence (Know-How) of the Knowledge Created During R&D Activities		Total
		No	Yes	
Would you carry out the project in the absence of the R&D Support?	Count	135	236	371
	% within Would you carry out the project in the absence of the R&D Support?	36.4%	63.6%	100.0%
	Yes			
	% within Contributed to the Permanence (Know-How) of the Knowledge Created During R&D Activities	90.0%	85.5%	87.1%
	% of Total	31.7%	55.4%	87.1%
	Count	15	40	55
	% within Would you carry out the project in the absence of the R&D Support?	27.3%	72.7%	100.0%
	No			
	% within Contributed to the Permanence (Know-How) of the Knowledge Created During R&D Activities	10.0%	14.5%	12.9%
	% of Total	3.5%	9.4%	12.9%
Total	Count	150	276	426
	% within Would you carry out the project in the absence of the R&D Support?	35.2%	64.8%	100.0%
	% within Contributed to the Permanence (Know-How) of the Knowledge Created During R&D Activities	100.0%	100.0%	100.0%
	% of Total	35.2%	64.8%	100.0%

**Table A2.43: Would you carry out the project in the absence of the R&D Support? *
Gained Decrease in the Cost of New R&D Activities Crosstabulation**

		Gained Decrease in the Cost of New R&D Activities			
		No	Yes	Total	
Would you carry out the project in the absence of the R&D Support?	Yes	Count	277	92	369
		% within Would you carry out the project in the absence of the R&D Support?	75.1%	24.9%	100.0%
		% within Gained Decrease in the Cost of New R&D Activities	87.1%	86.8%	87.0%
		% of Total	65.3%	21.7%	87.0%
		Count	41	14	55
	No	% within Would you carry out the project in the absence of the R&D Support?	74.5%	25.5%	100.0%
		% within Gained Decrease in the Cost of New R&D Activities	12.9%	13.2%	13.0%
		% of Total	9.7%	3.3%	13.0%
		Count	318	106	424
		% within Would you carry out the project in the absence of the R&D Support?	75.0%	25.0%	100.0%
Total	% within Gained Decrease in the Cost of New R&D Activities	100.0%	100.0%	100.0%	
	% of Total	75.0%	25.0%	100.0%	

**Table A2.44: Would you carry out the project in the absence of the R&D Support?
* Gained Decrease in Production Cost Crosstabulation**

		Gained Decrease in Production Cost		Total
		No	Yes	
Would you carry out the project in the absence of the R&D Support?	Count	255	116	371
	% within Would you carry out the project in the absence of the R&D Support?	68.7%	31.3%	100.0%
	Yes			
	% within Gained Decrease in Production Cost	89.8%	81.7%	87.1%
	% of Total	59.9%	27.2%	87.1%
	Count	29	26	55
	% within Would you carry out the project in the absence of the R&D Support?	52.7%	47.3%	100.0%
	No			
	% within Gained Decrease in Production Cost	10.2%	18.3%	12.9%
	% of Total	6.8%	6.1%	12.9%
Total	Count	284	142	426
	% within Would you carry out the project in the absence of the R&D Support?	66.7%	33.3%	100.0%
	% within Gained Decrease in Production Cost	100.0%	100.0%	100.0%
	% of Total	66.7%	33.3%	100.0%

Table A2.45: Would you carry out the project in the absence of the R&D Support?

* Gained Profit via Sale of Patent, Licence, Know-How Crosstabulation

		Gained Profit via Sale of Patent, Licence, Know-How		Total
		No	Yes	
Would you carry out the project in the absence of the R&D Support?	Count	342	29	371
	% within Would you carry out the project in the absence of the R&D Support?	92.2%	7.8%	100.0%
	Yes			
	% within Gained Profit via Sale of Patent, Licence, Know-How	87.5%	82.9%	87.1%
	% of Total	80.3%	6.8%	87.1%
	Count	49	6	55
	% within Would you carry out the project in the absence of the R&D Support?	89.1%	10.9%	100.0%
	No			
	% within Gained Profit via Sale of Patent, Licence, Know-How	12.5%	17.1%	12.9%
	% of Total	11.5%	1.4%	12.9%
Total	Count	391	35	426
	% within Would you carry out the project in the absence of the R&D Support?	91.8%	8.2%	100.0%
	% within Gained Profit via Sale of Patent, Licence, Know-How	100.0%	100.0%	100.0%
	% of Total	91.8%	8.2%	100.0%

**Table A2.46: Would you carry out the project in the absence of the R&D Support? *
Outputs of This Projects Created a New R&D Project Crosstabulation**

		Outputs of This Projects Created a New R&D Project		
		No	Yes	Total
Would you carry out the project in the absence of the R&D Support?	Count	203	167	370
	% within Would you carry out the project in the absence of the R&D Support?	54.9%	45.1%	100.0%
	Yes			
	% within Outputs of This Projects Created a New R&D Project	84.2%	90.8%	87.1%
	% of Total	47.8%	39.3%	87.1%
	Count	38	17	55
	% within Would you carry out the project in the absence of the R&D Support?	69.1%	30.9%	100.0%
	No			
	% within Outputs of This Projects Created a New R&D Project	15.8%	9.2%	12.9%
	% of Total	8.9%	4.0%	12.9%
Total	Count	241	184	425
	% within Would you carry out the project in the absence of the R&D Support?	56.7%	43.3%	100.0%
	% within Outputs of This Projects Created a New R&D Project	100.0%	100.0%	100.0%
	% of Total	56.7%	43.3%	100.0%

Table A2.47: Would you carry out the project in the absence of the R&D Support? * An institution was contacted for the first time to realise the project Crosstabulation

		An institution was contacted for the first time to realise the project		
		Yes	No	Total
Would you carry out the project in the absence of the R&D Support?	Count	268	95	363
	Yes			
	% within Would you carry out the project in the absence of the R&D Support?	73.8%	26.2%	100.0%
	% within An institution was contacted for the first time to realise the project	85.1%	92.2%	86.8%
	% of Total	64.1%	22.7%	86.8%
	No			
	Count	47	8	55
	% within Would you carry out the project in the absence of the R&D Support?	85.5%	14.5%	100.0%
	% within An institution was contacted for the first time to realise the project	14.9%	7.8%	13.2%
	% of Total	11.2%	1.9%	13.2%
Total	Count	315	103	418
	% within Would you carry out the project in the absence of the R&D Support?	75.4%	24.6%	100.0%
	% within An institution was contacted for the first time to realise the project	100.0%	100.0%	100.0%
	% of Total	75.4%	24.6%	100.0%

APPENDIX C

QUESTIONS TO BE ANSWERED AT SCIENCE AND TECHNOLOGY POLICY EVALUATION PROJECT INDUSTRIAL R&D FUNDING EVALUATION MODULE AND THEIR RANKINGS

5	<i>Answer should definitely be sought</i>
4	<i>Answer should be sought</i>
3	<i>Answer should be sought only if it is possible</i>
2	<i>Seeking answer is unnecessary</i>
1	<i>Answer should definitely not to be sought</i>

1. Appropriateness

- 1.1. Is it more appropriate to use indirect support (tax concession) rather than direct support?
- 1.2. Is it appropriate to use the same mechanism for all kinds of projects?
- 1.3. Is it appropriate to use the same mechanism for all firm sizes?
- 1.4. Is the system used compatible with all firm's technological level?
- 1.5. Is it appropriate to use the same mechanism for all sectors?
- 1.6. Is it compatible with international regulations and obligations?

2. Effectiveness

- 2.1. Are all the firms that have R&D potential contacted?
- 2.2. Does the financial support mechanism assist the firms to progress forward?
- 2.3. Is there an established trust by firms to funding mechanisms?
- 2.4. Does the increase in the amount of projects meet the expectations?
- 2.5. Are the volume and number of projects compatible with general economic situation?

- 2.6. Is the increase in the number of firms enough?
- 2.7. Is it contributing technological development at prioritized fields
- 2.8. Is there any change in the diversity in the supported firm types?
- 2.9. Is there any change in the diversity in the sectors supported?
- 2.10. Is there any change in the diversity in the regions supported?
- 2.11. Does it change the policy making actors' point of view to R&D?
- 2.12. Does it meet the firm's expectations?
- 2.13. Does it lead to a change in the number of firms producing technology?
- 2.14. Does it contribute to reverse brain drain?
- 2.15. Does it lead to change in regional development?
- 2.16. Does it contribute to the forming of new R&D firms?
- 2.17. What are the sector-different impacts it creating?
- 2.18. How does it affect the sectors that are important for the country?
- 2.19. How does it affect the forming of supplier industry?
- 2.20. Are the new business fields and new interfaces (like consultants and chartered accountants) created by the support?
- 2.21. Which benefits it provides in acquired technologies?
- 2.22. Does it change the national innovativeness and competitiveness power?
- 2.23. Does it improve the technological independency?
- 2.24. Does it change the comparative position of turkey in R&D indicators?
- 2.25. Does it change the SMEs' technology development?
- 2.26. Does it created awareness in public?
- 2.27. Does it contribute the increase of the public support funds allocated for R&D?
- 2.28. Does it create additional support mechanisms?
- 2.29. Does it create new support mechanisms?
- 2.30. Does it contribute to the participation to international R&D networks?
- 2.31. Does it contribute to EU accession process?

- 2.32. Does it contribute to the quantity and quality of firms located at Technoparks?
- 2.33. Does the support help to overcome a lock-in failure by introducing a firm to a new or extended technology or market area?
- 2.34. Does it lead to focusing in certain sectors?
- 2.35. Does it create new networks?

3. Additionality

3.1. Input Additionality

- 3.1.1. Do the firms undertake expenditures that would not have been spent in the absence of the public funding for the project?
- 3.1.2. Do the firms allocate human resources that would not have been allocated in the absence of the public funding for the project?
- 3.1.3. Do the firms designate physical infrastructure that would not have been designated in the absence of the public funding for the project?
- 3.1.4. Do the firms allocate human resources in a certain quantity that would not have been the case in the absence of the public funding for the project?
- 3.1.5. Do the firms allocate human resources in a certain quality that would not have been the case in the absence of the public funding for the project?
- 3.1.6. Do the firms use the consultancy services in a quality and quantity that would not have been the case in the absence of the public funding for the project?
- 3.1.7. Do the firms use a new technology in product and process development that would not have been the case in the absence of the public funding for the project?

3.2. Output Additionality

- 3.2.1. Are new outcomes attained with public support?
- 3.2.2. Is increase in productivity attained with public support?
- 3.2.3. Is advantage in costs attained with public support?

- 3.2.4. Is new patent or licence attained with public support?
- 3.2.5. Is change in exports attained with public support?
- 3.2.6. Is change in imports attained with public support?
- 3.2.7. Is there any spin-off created because of public support?
- 3.2.8. Is there any improvement in R&D infrastructure with public support?
- 3.2.9. Is there any improvement in advanced production technology infrastructure that would not be the case in the absence of the project?
- 3.2.10. Is there any new product development that would not be the case in the absence of the project?
- 3.2.11. Is there any improvement on the existing products that would not be the case in the absence of the project?
- 3.2.12. Is there any new process development that would not be the case in the absence of the project?
- 3.2.13. Is there any improvement on the existing processes that would not be the case in the absence of the project?
- 3.2.14. Does the support contribute to the solution of technical/operational problems that would not be the case in the absence of the project?
- 3.2.15. Is there any expansion to new markets that would not be the case in the absence of the project?

3.3. Behavioural Additionality

- 3.3.1. Is the support building new networks or
- 3.3.2. Is the support coordinating systemic innovations such as those requiring establishment of standards?
- 3.3.3. Do the support incentivise the firm to acquire project management skills?
- 3.3.4. Does the public support lead to the firm to create intellectual property rights?

- 3.3.5. Does the public support lead to the creation and diffusion of the venture capital formations?
- 3.3.6. Does the public support lead to the establishment of a permanent R&D department?
- 3.3.7. Does the public support lead to the establishment of a permanent employment of researchers?
- 3.3.8. Does the public support lead to the behaviour of taking and managing risk?
- 3.3.9. Does the public support help to establish institutional R&D infrastructure?
- 3.3.10. Does the public support develop international partnerships?
- 3.3.11. Does the public support help to form inter-firm partnerships?
- 3.3.12. Does the firm help to undertake multidisciplinary projects?
- 3.3.13. Does the number of researchers holding doctorate increase with public support?
- 3.3.14. How does the support affect the university - industry partnership?
- 3.3.15. How does the support contribute to industry - university R&D?
- 3.3.16. Does the support affect the design and design improvement competency?
- 3.3.17. Does the technological capacity level that firms have change with the support?
- 3.3.18. Does the support lead to focus in certain technologies?
- 3.3.19. Does the support encourage the development of technology management competencies in SMEs?
- 3.3.20. Does the support lead to a technological continuity?
- 3.3.21. Does the support lead to competency focus in firms?
- 3.3.22. Is there any increase in the number of firms that follow the technology and produce innovative outputs?
- 3.3.23. Does the support lead to restructuring in firms' existing R&D departments?

- 3.3.24. Does the support lead to the creation of a team culture in the implementation process of R&D projects (in all the related departments)
- 3.3.25. Does support lead to R&D awareness in all layers of the firm including top management?
- 3.3.26. Does support lead to the implementation of new management techniques?
- 3.3.27. Does support lead to the establishment of separate R&D budget?
- 3.3.28. Does support lead to the understanding of the need for market research in R&D?
- 3.3.29. Does support lead to the gain of support to and share of R&D (new idea generation) studies in the institution?

4. Displacement and Adverse Effects

- 4.1. Does it have disruptive effects for competition?
- 4.2. Is there any firm that give-up R&D because of public support?
- 4.3. What is not realised positive that would be realised in the absence of the support?
- 4.4. Do the firms develop the behaviour of having risk that they should not because of the public support?
- 4.5. Do the firms form idle R&D infrastructure that they will not utilize fully because of the public support?
- 4.6. Do the firms employ that will not utilize fully because of the public support?
- 4.7. Does the public support harm the trust to the public organizations?

Table A4.1: Descriptive Statistics for Appropriateness Questions

	Mean	Std. Deviation
Is the system used compatible with all firm's technological level?	4.00	.966
Is it appropriate to use the same mechanism for all sectors?	3.75	1.125
Is it appropriate to use the same mechanism for all kinds of projects?	3.69	.873
Is it appropriate to use the same mechanism for all firm sizes?	3.63	1.088
Is it more appropriate to use indirect support (tax concession) rather than direct support?	2.88	1.408
Is it compatible with international regulations and obligations?	2.81	.911

Table A4.2: Descriptive Statistics for Effectiveness Questions

	Mean	Std. Deviation
Does it change the national innovativeness and competitiveness power?	4.31	1.078
Does it lead to a change in the number of firms producing technology?	4.19	.834
Does it contribute to the forming of new R&D firms?	4.13	.806
Does it change the policy making actors' point of view to R&D?	4.13	1.258
How does it affect the forming of supplier industry?	4.06	.772
Does it meet the firm's expectations?	4.00	.730
Are all the firms that have R&D potential contacted?	3.88	1.088
Does it create new networks?	3.88	.719
Does it change the SMEs' technology development?	3.88	.806
Does it contribute to the participation to international R&D networks?	3.81	.655
Does it improve the technological independency?	3.81	1.109
Does it create new support mechanisms?	3.75	.775
Does it contribute the increase of the public support funds allocated for R&D?	3.69	.793
How does it affect the sectors that are important for the country?	3.69	.793
Does it create additional support mechanisms?	3.63	.885
Is it contributing technological development at prioritized fields	3.63	1.310
Does the increase in the amount of projects meet the expectations?	3.56	1.263
Is there an established trust by firms to funding mechanisms?	3.56	.964
Is the increase in the number of firms enough?	3.50	1.155
Which benefits it provides in acquired technologies?	3.50	.966
Are the new business fields and new interfaces (like consultants and chartered accountants) created by the support?	3.44	1.031
Does it lead to change in regional development?	3.44	1.094
Does it change the comparative position of turkey in R&D indicators?	3.44	1.094
Does it contribute to reverse brain drain?	3.38	1.147
Does it lead to focusing in certain sectors?	3.31	1.014
What are the sector-different impacts it creating?	3.31	.479
Is there any change in the diversity in the sectors supported?	3.25	1.238
Does it contribute to the quantity and quality of firms located at Technoparks?	3.13	1.025
Does it created awareness in public?	3.13	.957
Is there any change in the diversity in the supported firm types?	3.13	1.310
Is there any change in the diversity in the regions supported?	3.06	1.124
Are the volume and number of projects compatible with general economic situation?	3.06	.929
Does the financial support mechanism assist the firms to progress forward?	3.06	1.340
Does it contribute to EU accession process?	3.00	1.033
Does the support help to overcome a lock-in failure by introducing a firm to a new or extended technology or market area?	2.88	1.147

Table A4.3: Descriptive Statistics for Input Additionality Questions

	Mean	Std. Deviation
Do the firms allocate human resources in a certain quality that would not have been the case in the absence of the public funding for the project?	4.44	.512
Do the firms undertake expenditures that would not have been spent in the absence of the public funding for the project?	4.44	.814
Do the firms allocate human resources that would not have been allocated in the absence of the public funding for the project?	4.19	.911
Do the firms use a new technology in product and process development that would not have been the case in the absence of the public funding for the project?	4.13	.885
Do the firms allocate human resources in a certain quantity that would not have been the case in the absence of the public funding for the project?	3.88	.806
Do the firms use the consultancy services in a quality and quantity that would not have been the case in the absence of the public funding for the project?	3.88	.719
Do the firms designate physical infrastructure that would not have been designated in the absence of the public funding for the project?	3.88	.619

Table A4.4: Descriptive Statistics for Output Additionality Questions

	Mean	Std. Deviation
Are new outcomes attained with public support?	4.38	.719
Is there any new product development that would not be the case in the absence of the project?	4.38	.885
Is there any new process development that would not be the case in the absence of the project?	4.25	.856
Is there any improvement in R&D infrastructure with public support?	4.13	.806
Is there any improvement on the existing products that would not be the case in the absence of the project?	4.06	.998
Is increase in productivity attained with public support?	4.00	.894
Is new patent or licence attained with public support?	3.94	.772
Is there any improvement on the existing processes that would not be the case in the absence of the project?	3.88	1.088
Is there any expansion to new markets that would not be the case in the absence of the project?	3.88	.719
Is there any spin-off created because of public support?	3.81	.750
Is change in exports attained with public support?	3.69	1.250
Is there any improvement in advanced production technology infrastructure that would not be the case in the absence of the project?	3.69	1.302
Is advantage in costs attained with public support?	3.63	.957
Is change in imports attained with public support?	3.31	1.138
Does the support contribute to the solution of technical/operational problems that would not be the case in the absence of the project?	3.06	1.237

Table A4.5: Descriptive Statistics for Behavioural Additionality Questions

	Mean	Std. Deviation
Does the public support lead to the establishment of a permanent employment of researchers?	4.63	.619
Does the public support lead to the establishment of a permanent R&D department?	4.50	.516
How does the support affect the university - industry partnership?	4.50	.632
Does the public support help to form inter-firm partnerships?	4.44	.727
Does the technological capacity level that firms have change with the support?	4.31	.793
How does the support contribute to industry - university R&D?	4.25	.683
Does the support encourage the development of technology management competencies in SMEs?	4.19	.750
Does the public support help to establish institutional R&D infrastructure?	4.13	.957
Does the public support lead to the behaviour of taking and managing risk?	4.06	.680
Do the support incentivise the firm to acquire project management skills?	4.06	.574
Does the support lead to a technological continuity?	4.06	1.181
Does the support lead to restructuring in firms' existing R&D departments?	4.00	.894
Is there any increase in the number of firms that follow the technology and produce innovative outputs?	3.94	1.237
Does to support affect the design and design improvement competency?	3.94	1.340
Is the support building new networks or	3.88	1.025
Does the public support develop international partnerships?	3.88	.957
Does support lead to the establishment of separate R&D budget?	3.75	.931
Does the firm help to undertake multidisciplinary projects?	3.75	1.000
Does the support lead to competency focus in firms?	3.69	.704
Does the number of researchers holding doctorate increase with public support?	3.69	1.195
Does the public support lead to the creation and diffusion of the venture capital formations?	3.63	.957
Does the support lead to focus in certain technologies?	3.63	1.147
Does support lead to R&D awareness in all layers of the firm including top management?	3.56	.892
Does the public support lead to the firm to create intellectual property rights?	3.56	.629
Is the support coordinating systemic innovations such as those requiring establishment of standards?	3.50	.894
Does the support lead to the creation of a team culture in the implementation process of R&D projects (in all the related departments)	3.44	.727
Does support lead to the gain of support to and share of R&D (new idea generation) studies in the institution?	3.13	1.310
Does support lead to the understanding of the need for market research in R&D?	3.06	.772
Does support lead to the implementation of new management techniques?	3.06	.998

Table A4.6: Descriptive Statistics for Displacement/Adverse Effects Questions

	Mean	Std. Deviation
Do the firms form idle R&D infrastructure that they will not utilize fully because of the public support?	3.88	.885
Does the public support harm the trust to the public organizations?	3.75	1.065
Do the firms employ that will not utilize fully because of the public support?	3.63	1.147
Do the firms develop the behaviour of having risk that they should not because of the public support?	3.50	.816
Does it have disruptive effects for competition?	3.50	1.414
What is not realised positive that would be realised in the absence of the support?	3.25	1.342
Is there any firm that give-up R&D because of public support?	3.25	1.291

APPENDIX D

**PROPOSED VERSION OF TÜBİTAK - TÜBİTAK-TEYDEBPROJECT RESULT REPORT
SURVEY (AGY350)¹⁶**

PROJECT RESULT REPORT

AGY350-01

Project Number:

Date:/..../....

Accuracy and completeness of this report at the end of each project will help to improve our decisions about R&D support and our effort to measure the impacts of the programme from the aspect of **TEYDEB**. On the other hand from the aspect of **your undertaking**, it would help to look into future by enabling you to reveal the technical, technological and commercial real gains of the project.

<i>A. FIRM INFORMATION</i>

Firm Name			
Authorized Firm Representative		Title/Position	
Project Leader		Title/Position	
Firm Address			
Phone:	Fax:	E-mail:	Web:

1. EquityUSD
Net of land and building; as is in the balance sheet.
2. Parent Firm/Holding
Shareholders whose shares exceed 25%.
3. Total Number of Employees:

<10	<input type="checkbox"/>	11-50	<input type="checkbox"/>	51-150	<input type="checkbox"/>	151-200	<input type="checkbox"/>	200-250	<input type="checkbox"/>	>250	<input type="checkbox"/>
-----	--------------------------	-------	--------------------------	--------	--------------------------	---------	--------------------------	---------	--------------------------	------	--------------------------
4. Last Year R&D Expenditure / Net Sales %.....
5. Last Year Export / Net Sales %.....
6. Location of Firm
Industrial zone, small industrial site, technopark, technology center, etc.
7. Main Line of Business
8. Accreditations.....
ISO 9000, 14000, etc.

¹⁶ Different parts from the original one are italicized and highlighted.

B. PROJECT INFORMATION

- TEYDEB PROJECT NUMBER :
- PROJECT NAME :
- PROJECT SUMMARY :
Explain the subject and main targets of the project along with the applied methods therein compared with the forecasted targets, taking into consideration the completeness of the project (*maximum 2 pages*).
- TECHNICAL ASPECTS OF PROJECT OUTPUT :
Explain the technical features of the product compared with the similar products, if possible (*maximum 2 pages*).
- DOCUMENTATION :
Enclose any document in the form of photograph, booklet, CD, etc. that displays the project output.
- EVALUATION OF PROJECT COLLABORATIONS :
Evaluate the collaborations with universities, R&D institutions and other institutions at the end of the project with pros-cons.

C. R & D SUPPORT EVALUATION

1. Indicate the reasons for applying for a R&D support.

- Applied to the R&D support since it was the necessary financial source to realise the project 1
- Applied to the R&D support since it provides prestige 2
- Applied to the R&D support to reach other inner and outer financial sources 3
- Applied to the R&D support since it provides collaboration with R&D institutions 4
- Applied to the R&D support to institutionalize the R&D management 5
- Applied to the R&D support to validate the quality of the R&D 6
- Applied to the R&D support because of another reason 7

2. Indicate the difficulties experienced during the R&D support process.

- No difficulty at all 1
- Lack of communication with arbitrager 2
- Difficulty in preparation of project documents 3
- Lingering evaluation and follow-up period 4
- Inadequacy of evaluation 5
- Business stance of TUBITAK 6
- Delays in payments 7
- Other (indicate) 8

3. Would you carry out the project in the absence of the R&D Support?

If Yes 1;

What would the size of the project in the absence of the R&D support?

1. Same
2. Lower %.....
3. Higher %.....

What would the speed of the project in the absence of the R&D support?

1. Same
2. Slower
3. Faster

What would the challenge of the project in the absence of the R&D support?

1. Same
2. Less Challenging
3. More Challenging

No 2

4. Do you plan to undertake new R&D projects in the following three years?

Yes 1..... number of projects

If No 2; Why don't you consider new R&D projects?

- Absence of new product/technique to develop 1
- Inadequate financial resources 2
- Uncertainty prevailing in the economy 3
- Failure in capturing the expected benefits from R&D projects 4
- Other (indicate) 5

5. If you plan to undertake new R&D projects in the following three years, do you consider applying for a R&D support for these projects?

Yes 1

If No 2; mark the reasons.

- Inadequacy of support 1
- Delays in support 2
- Unwilling to reveal commercial information 3
- Other (indicate) 4

D. PROJECT EVALUATION

1. Is it your first R&D project?

Yes 1 No 2 (if)

- How many R&D projects you have undertaken before? Mark.
1-5 1 6-10 2 >10 3

2. Is it your first TEYDEB project?

Yes 1 No 2 (if)

- How many project supports have you been granted by TIDEB before? Mark.
1-5 1 6-10 2 >10 3

DI. SUMMARY EVALUATION

1. Indicate the points arrived as you evaluate the project in general with the following criteria.

	<i>Mostly</i>	<i>Partially</i>	<i>Very Little</i>	<i>None</i>
	1	2	3	4
1. Technical accomplishment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Commercial accomplishment (Considering the targets of product introduction, market acceptance, sales and market share; indicating if the product has not been introduced yet.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Employment effect (Employment effects of the project in firm as well as other sectors and institutions.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Structural effects (Especially considering the effects on R&D structure and corporate structure)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Other effects (Considering the effects on efficiency, quality, changes in employees' qualifications and other sectors.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. Evaluate the initial targets of the project and realization of these targets through marking the following items. (Mark all applicable alternatives.)

	<i>Initial target</i>	<i>Realized</i>	<i>To be realized in three years</i>
	1	2	3
Technical/Commercial targets			
1. Development of new product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Improvement of current products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Development of new processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Improvement of current processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Establishment of prototype or pilot plant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Solvency of technical/operational problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. New licence application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. New licence application	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Extension in new markets			
9.1 In Turkey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2 In Europe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3 In other countries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other aims			
10. Scientific publications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Creating new knowledge and competencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Increasing the quality of management and business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Developing strategic industrial collaborations with other institutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Developing new networks and improving the existing ones with universities and research institutions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Other (indicate)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. What are the difficulties encountered while undertaking the project? (Mark all applicable alternatives.)

Technical difficulties	<input type="checkbox"/>	1
Inadequacy of self-financing resources	<input type="checkbox"/>	2
Inadequacy of external resources	<input type="checkbox"/>	3
Weakness in production capability	<input type="checkbox"/>	4
Shift in user/market preferences	<input type="checkbox"/>	5
Change in establishment strategy	<input type="checkbox"/>	6
Insufficient support from top management	<input type="checkbox"/>	7
Firm-inside bureaucratic model	<input type="checkbox"/>	8
Failure in establishment of necessary infrastructure	<input type="checkbox"/>	9
Failure in setting a proper business plan of project	<input type="checkbox"/>	10
Changes in targets	<input type="checkbox"/>	11
Problems in R&D process	<input type="checkbox"/>	12
Other (indicate)	<input type="checkbox"/>	13

D2. EVALUATION OF PROJECT PERIOD

1. Indicate the beginning and ending dates of the project.

	Beginning Date	Ending Date	Project Period (month)
Anticipated			
Realized			

4. If anticipated and realized project duration are different, mark the appropriate causes.

- Delay in providing equipment, hardware, etc. 1
- Change in project targets 2
- Deviation from forecasted time frame 3
- Financial difficulties 4
- Scarcity of qualified workforce 5
- Inadequacy in infrastructure 6
- Delays in services provided 7
- Delays in R&D support process 8
- Other (indicate) 9

D3. COST EVALUATION

1. Indicate the anticipated cost for support, realized total cost and the difference on cost type basis.

Cost Items	Anticipated (USD)	Realized (USD)	Difference	
			USD	%
1. Personnel				
2. Travel				
3. Machine/Equipment/Software/ Publication				
4. Domestic R&D Service				
5. Consultancy/ Service Provision				
6. Equipment				
7. TOTAL				

(Costs Subject to Support will be considered while filling the table.)

2. Indicate the sources of differences in costs.

- Absence of project cost plan 1
- Extension in project period 2
- Change in project targets 3
- Occurrence of unforeseen expenditures 4
- Miscalculation of expenditure forecasts 5
- Other (indicate) 6

D4. PROJECT FINANCE

	<i>Anticipated (USD)</i>	<i>Realized (USD)</i>	<i>Share of Source (%)</i>
1. Own Resources			
2. External Private Resources (bank loans, venture capital, special borrowing, etc.)			
3. Public Resources(grant, loan,etc.)			

(Project Costs Subject to Support will be considered while filling the table.)

D5. COMMERCIAL EVALUATION

Answer this part considering your forecasts in case commercialization of the product has not been realized yet.

1. Compare the post-project commercial success with the pre-project forecasted one (regarding the criteria such as sales, sales amount and market share)

Higher 1 Lower 2 Same 3

2. Indicate the sources of differences.

Absence of forecasts 1
 Changes in the economic environment 2
 Faster introduction of competitive products 3
 Technical failure of product 4
 Difficulties during the introduction of product 5
 Absence of necessary financing for commercialization 6

3. Indicate the differences in terms of sales and market share due to the commercialization of project.

- 3.1. Increase in sales

Domestic..... USD / %.....
 International..... USD / %.....

- 3.2. Increase in market share

Domestic %.....
 International %.....

D6. OTHER ECONOMICAL EFFECTS

Mark the other economical gains produced with the project.

1. Efficiency HIGH INCREASE 1 INCREASED 2 UNCHANGED 3 DECLINED 4
2. Cost HIGH INCREASE 1 INCREASED 2 UNCHANGED 3 DECLINED 4
3. Licence/Know-How Sale EXISTENT 1 MAYBE EXISTENT 2 NON-EXISTENT 3

D7. IN-FIRM EFFECTS

1. **a.** Indicate the effect of the project to the firm-inside employment.

	Increased		Unchanged <i>Mark</i>	Decreased	
	Increase Rate %	Absolute Increase		Decrease Rate %	Absolute Decrease
1. Number of employees in production					
2. Number of employees in R&D					
3. Number of employees in management					
4. Number of employees with graduate education					
5. TOTAL					

b. If you were not funded by TEYDEB and if you conducted the project

- | | | | |
|--|----------------------------------|-----------------------------------|------------------------------------|
| 1. Number of employees in production | 1. Same <input type="checkbox"/> | 2. Lower <input type="checkbox"/> | 3. Higher <input type="checkbox"/> |
| 2. Number of employees in R&D | 1. Same <input type="checkbox"/> | 2. Lower <input type="checkbox"/> | 3. Higher <input type="checkbox"/> |
| 3. Number of employees in management | 1. Same <input type="checkbox"/> | 2. Lower <input type="checkbox"/> | 3. Higher <input type="checkbox"/> |
| 4. Number of employees with graduate education | 1. Same <input type="checkbox"/> | 2. Lower <input type="checkbox"/> | 3. Higher <input type="checkbox"/> |

2. Which of the following effects were observed in your firm after the project *and which of the following effects would also have been observed if you were not funded?*
(Mark all applicable alternatives.)

	Observed	<i>Would also have been observed if we were not funded</i>
Technology Monitoring Competency Gained	<input type="checkbox"/> 1a	<input type="checkbox"/> 1b
Using of Consulting Services Systemised	<input type="checkbox"/> 2a	<input type="checkbox"/> 2b
Use of a New a Technology in Product and Process Development Gained	<input type="checkbox"/> 3a	<input type="checkbox"/> 3b
R&D Infrastructure Began to be Built	<input type="checkbox"/> 4a	<input type="checkbox"/> 4b
R&D Infrastructure was Improved	<input type="checkbox"/> 5a	<input type="checkbox"/> 5b
Production Infrastructure was Improved	<input type="checkbox"/> 6a	<input type="checkbox"/> 6b
Had Effect on Identification of Technological Capabilities and Deficiencies	<input type="checkbox"/> 7a	<input type="checkbox"/> 7b
Contributed to the Permanence (Know-How) of the Knowledge Created During R&D Activities	<input type="checkbox"/> 8a	<input type="checkbox"/> 8b
Outputs of This Projects Created a New R&D Project	<input type="checkbox"/> 9a	<input type="checkbox"/> 9b
Gained Decrease in the Cost of New R&D Activities	<input type="checkbox"/> 10a	<input type="checkbox"/> 10b
Gained Decrease in Production Cost	<input type="checkbox"/> 11a	<input type="checkbox"/> 11b
Gained Profit via Sale of Patent, Licence, Know-How	<input type="checkbox"/> 12a	<input type="checkbox"/> 12b

3. Indicate the effects of the project in organization and management of your firm and the ones existing before the project, separately. *If you mark realized, also consider that would it have been realized in the absence of the funding.*

	Existing 1	Realized 2	Would also have been realized in the absence of the funding 3
1. An R&D Department was Established	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Existing R&D Department was Restructured	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. The Approach of Conducting R&D Projects on Project Basis was Adopted	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Team Culture was Gained in the Implementation Process of R&D Projects (in all the related departments)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. R&D Awareness was Diffused in All Layers of the Firm Including Top Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. New Management Techniques was Implemented (simultaneous engineering, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Separate R&D Budget was Established	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Need for Market Research in R&D was Understood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Support to and Share of R&D (new idea generation) Studies in the Institution was Gained	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Use of the Internet was Increased	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Training Activities was Increased	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Participation to Congresses, Conferences and Fairs was Increased	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

D8. OUT OF FIRM EFFECTS

1. Fields in which project output is utilized

Entirely firm-inside 1
 Entirely firm-outside 2
 Firm-inside and outside 3

2. Indicate the effects of the project to other sectors or institutions.

	Yes	No	Maybe
	1	2	3
Employment effects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Efficiency effects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality effects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Are there any institutions you have had an initial contact for the undertaking of the project?

If Yes 1a;

how many institutions 1 1 2-5 2 6-10 3 >10 4

if you were not funded, would you also have been contacted? Yes 1b-1 No 1b-2

No 2

APPENDIX E

PROPOSED FOLLOW-UP SURVEY FOR MEASURING BEHAVIOURAL ADDITIONALITY

A. Management Additionality of the Support

1. Which of the following effects were observed in your firm after the completion of project and which of the following effects would also have been observed if you were not funded?
(Mark all applicable alternatives.)

	Observed	Would also have been observed if we were not funded
Technology Monitoring Competency Gained	<input type="checkbox"/> 1a	<input type="checkbox"/> 1b
Using of Consulting Services Systemised	<input type="checkbox"/> 2a	<input type="checkbox"/> 2b
Use of a New a Technology in Product and Process Development Gained	<input type="checkbox"/> 3a	<input type="checkbox"/> 3b
R&D Infrastructure Began to be Built	<input type="checkbox"/> 4a	<input type="checkbox"/> 4b
R&D Infrastructure was Improved	<input type="checkbox"/> 5a	<input type="checkbox"/> 5b
Production Infrastructure was Improved	<input type="checkbox"/> 6a	<input type="checkbox"/> 6b
Had Effect on Identification of Technological Capabilities and Deficiencies	<input type="checkbox"/> 7a	<input type="checkbox"/> 7b
Contributed to the Permanence (Know-How) of the Knowledge Created During R&D Activities	<input type="checkbox"/> 8a	<input type="checkbox"/> 8b
Outputs of This Projects Created a New R&D Project	<input type="checkbox"/> 9a	<input type="checkbox"/> 9b
Gained Decrease in the Cost of New R&D Activities	<input type="checkbox"/> 10a	<input type="checkbox"/> 10b
Gained Decrease in Production Cost	<input type="checkbox"/> 11a	<input type="checkbox"/> 11b
Gained Profit via Sale of Patent, Licence, Know-How	<input type="checkbox"/> 12a	<input type="checkbox"/> 12b

2. Indicate the effects of the project in organization and management of your firm after the completion of the project. If you mark realized, also consider that would it have been realized in the absence of the funding.

	Realized 1	Would also have been realized in the absence of the funding 1
1. An R&D Department was Established	<input type="checkbox"/>	<input type="checkbox"/>
2. Existing R&D Department was Restructured	<input type="checkbox"/>	<input type="checkbox"/>
3. The Approach of Conducting R&D Projects on Project Basis was Adopted	<input type="checkbox"/>	<input type="checkbox"/>
4. Team Culture was Gained in the Implementation Process of R&D Projects (in all the related departments)	<input type="checkbox"/>	<input type="checkbox"/>
5. R&D Awareness was Diffused in All Layers of the Firm Including Top Management	<input type="checkbox"/>	<input type="checkbox"/>
6. New Management Techniques was Implemented (simultaneous engineering, etc.)	<input type="checkbox"/>	<input type="checkbox"/>
7. Separate R&D Budget was Established	<input type="checkbox"/>	<input type="checkbox"/>
8. Need for Market Research in R&D was Understood	<input type="checkbox"/>	<input type="checkbox"/>
9. Support to and Share of R&D (new idea generation) Studies in the Institution was Gained	<input type="checkbox"/>	<input type="checkbox"/>
10. Use of the Internet was Increased	<input type="checkbox"/>	<input type="checkbox"/>
11. Training Activities was Increased	<input type="checkbox"/>	<input type="checkbox"/>
12. Participation to Congresses, Conferences and Fairs was Increased	<input type="checkbox"/>	<input type="checkbox"/>

B. Network Additionality of the Support

1. Are there any institutions you have had an initial contact after the undertaking of the project?

If Yes 1a;

how many institutions

1 1 2-5 2 6-10 3 >10 4

if you were not funded, would you also have been contacted?

Yes 1b-1 No 1b-2

No 2

C. Follow-up Additionality of the Support

1. Are there any spin-off projects that you have been conducted as a result of your original project?

If Yes 1a;

how many projects

1 1 2-5 2 6-10 3 >10 4

if you were not funded, would you also have been

undertaken?

Yes 1b-1 No 1b-2

No 2

APPENDIX F

PROPOSED INTERVIEW GUIDE FOR MEASURING BEHAVIOURAL ADDITIONALITY

Important points to be considered during the interview:

- This interview is expected to last within 1 hour.
- The data obtained during other phases of evaluation of behavioural additionality should be scanned before the interview.

Part 1: Basic Dimensions of the Behavioural Additionality

Project Additionality:

Q1: Would have you been undertaken the project in the absence of the TÜBİTAK-TEYDEB Support?

Scale and Scope Additionality:

Q2. What would the size of the project in the absence of the R&D support?

Acceleration Additionality:

Q3. What would the speed of the project in the absence of the R&D support?

Challenge Additionality

Q4. What would the challenge of the project in the absence of the R&D support?

Management Additionality

Q5. What management and organizational changes have you been faced because for TÜBİTAK-TEYDEB funding?

Network Additionality

Q5. Did you contacted an organization (especially university) in the process of R&D because you funded by TÜBİTAK-TEYDEB? State explicitly the collaboration you maintained? Would have you been also collaborate with them if you were not funded by TÜBİTAK-TEYDEB?

Follow-up Additionality

Q6. Have you undertaken spin-off projects after the project you were funded. Would have it also been the case if you were not funded? Also, have you devised the results of the project for other applications that you did not originally intend? Would have it also been the case if you were not funded?

Part 2: Other Dimensions of the Behavioural Additionality

Q7. Did you employ a permanent researcher for the project that you would not have been employed in the absence of the TÜBİTAK-TEYDEB support?

Q8. Did you establish a permanent R&D department that you would not have been employed in the absence of the TÜBİTAK-TEYDEB support?

Q9. Did the support help you to form inter-firm partnerships? Would have it also been the case if you were not funded?

Q10. Did the support help you to change the technological capacity level of your firm? Would have it also been the case if you were not funded?