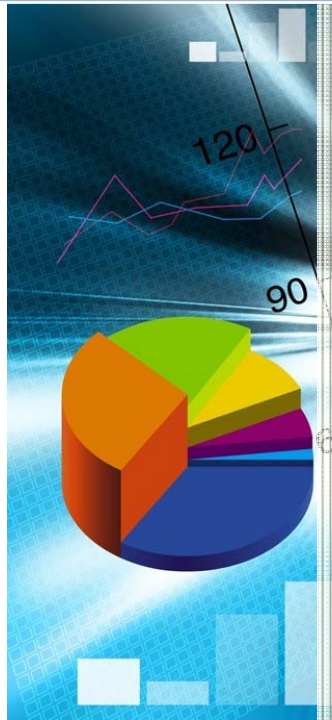


2014

The Microeconomic Effects of Business Environment Reforms



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Preparation of a report on the qualitative and quantitative analysis of the microeconomic effect of reform efforts in light of economic literature and past experiences in other countries to improve the business environment.

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1. Executive summary

Countries that are under a severe fiscal consolidation process like Greece are currently struggling to implement structural reforms in order to achieve significant cost savings by eliminating bureaucracy, reducing administrative burden, ensuring transparency in the public sector, improving the functioning of public procurement, fostering investment and doing business, improving business efficiency, improving competition conditions and facilitating new entry and export activity. Within the context of the economic adjustment programme since May 2010, the Greek authorities are implementing a series of important structural reforms in an effort to rebalance the economy -thus supporting economic growth, productivity and job creation-, especially in the field of business environment.

Given the above, the main objective of this report is to quantify the potential economic effects of the implementation of business environment reforms related to the following areas: public procurement; investment; competition; and exports. In doing so, the quantification analysis utilizes sound econometric techniques to estimate these economic effects. Moreover, the present study attempts to investigate thoroughly the relevant reforms and identify policy failures and potential obstacles to their successful implementation. The analysis takes also into account the economic literature relevant to each examined economic field, and provides past experience in other countries in the corresponding field.

In particular, improving the functioning of **public procurement** is a priority goal on the European agenda given the fact that public procurement entails considerable government expenditures in European Union (EU) accounting for almost 16-20% of EU GDP per year. During the recent economic crisis public procurement has received a great attention as a key mechanism that enables significant cost savings particularly in countries such as Greece where a fiscal adjustment programme is under implementation. Given budgetary constraints in the public sector, policy makers in such countries face a great challenge to improve efficiency and transparency in the public procurement system. Within the context of the third review of the second adjustment programme for Greece (July 2013), improving the efficiency and transparency of public procurement systems is an on-going process and main concern of Greek government. The main barriers to the introduction and development of public procurement reforms in Greece refer to the low degree of transparency and

competition; the existence of time-consuming procedures; the utilization of old-fashioned purchasing techniques and outdated methods for contract award notices; the corruption in the stages of awarding and contracting, the maintenance of disproportionate administrative burdens and expenditures regarding the participation in public tendering process and the submission of tenders, the lack of standardized processes, the shortages in training and specified skills of human capital.

The establishment and organization of the Single Public Procurement Authority (SPPA) in Greece in September 2011 was the main public procurement reform expected to have a measurable economic impact in terms of related public expenditures, even though it is at an early-stage of its operation. The SPPA mainly ensures transparency in public procurement processes. Given that the other reforms (i.e. adoption, development and utilization of e-procurement; centralization of procurement processes; and simplification of the relevant legislative framework) are underway, the only economic impact that can be quantified until now concerns the SPPA reform.

The empirical analysis in the procurement section explores the effect of a major public procurement reform (that is the establishment of the SPPA) on government expenditures using data for 2,218 public supply contracts in Greece over the 2002-2013 period. The results derived from pooled OLS estimates show that improved transparency reduces public procurement cost by about 3.5%. The findings from quantile regressions indicate that the expenditure reduction is greater for medium and high cost projects as compared to projects of lower unit cost.

Investment reforms are also of great importance since they are expected to be a key mechanism for the economic recovery in Greece. Structural reforms in this field are not a panacea to these pressing challenges. However, without deep reform of the business environment, there will not be solid foundations for sustained growth in the future. Given the importance of these reforms, the political decision on reforms and transition to implementation should proceed as quickly as possible. In this context it is imperative that relevant barriers and rigidities that arise from the function of the Greek State should be removed.

More specifically investment reforms include the elimination of excessive regulations, the reduction of administrative burden in the public sector, the facilitation of licensing procedures for investment, and the improvement of the functioning of the judicial system.

In turn these reforms can be essential ingredients towards strengthening the investment climate and domestic competition and, therefore, contributing to economic development. Despite the fact that some progress has been made in improving the business environment, there are still important obstacles that should be eliminated through reforms, in order to enhance investment and growth. In other words, it is necessary that Government actions and plans change the investment climate by delivering rapidly structural reforms, in order to unlock growth and create investment opportunities, since investment appears to be stabilized at a depressed level. These regulatory barriers discourage investment, lead to weak competition, facilitate collusion, and result in high and sticky prices for consumers. Thus, given the significant role that investment will have to play in the recovery of the Greek economy, the investment section attempts, among others, to identify the areas of policy failures related to investment.

The econometric results indicate that benefits in investment climate stem mainly from reductions in the time and the cost required to complete the procedures of getting a construction permit, building the appropriate facility, inspecting it by the urban planning authorities and start using it. Also, this study provides empirical evidence supporting the emergence of benefits after a reduction in the share capital required to start a business. More specifically, using alternative panel data methods the estimates reveal that benefits from reducing administrative barriers in favor of investments, range from EUR 9.2 million to EUR 20.2 million for one percentage point reduction in the explanatory variable under consideration.

With respect to the field of **competition**, it is widely recognized that Greece, over the last few years, has made considerable progress by adopting significant pro-competition reforms. Such reforms, which have been put in place in order to restore weak competition in major product and services markets, are mainly related to the abolishment or amendment of regulations and legislations that impede competition among firms and restrain new entry by protecting incumbents. However, most of the reforms adopted in the past under the justification that they could protect consumers' interest can be characterized as obsolete actions. In addition, the experience from other countries provides strong evidence that the adoption and implementation of pro-competition reforms generates substantial benefits for the economy mainly in terms of productivity, GDP growth and employment.

In this context, Greece is classified among the countries with significant progress in reform policies related to competition. This is reflected, for instance, in the progress the country has

made according to specific indicators, such the Product Market Regulation index compiled by the OECD. However, it should be noted here that the impact of the reforms adopted so far remains weak, mainly due to the deep recession which holds back economic recovery. Under these adverse conditions, it is necessary that the Greek government takes significant steps to further improve the regulatory framework related to competition. The expected outcome of these actions can be expressed in terms of price adjustment acceleration and reallocation of the available resources towards more productive economic sectors.

The basic empirical finding reveals that a unit reduction of the “Barriers in Services” index leads to the decline of the Price Level Index on services by 5.5%. It can be inferred therefore, that if the respective index for Greece converges to the EU average (i.e., a reduction of entry barriers in the tertiary sector) the effect would be a reduction by 4.4% on the price level index on services.

Last but not least, to facilitate **exports**, the Greek state should first simplify the processes (also eliminate steps where possible), change the legal framework and then automate the simplified processes to, finally, integrate the key agencies in an electronic platform. Key ingredient for a successful reform programme is the formation of a system of monitoring and evaluation to ensure that reforms are effective and can be adapted if needed. However, significant challenges remain especially with respect to the lack of skills (retraining of the personnel), incentives (motivation to apply the new working methods), coordination and financial resources to implement the reforms.

Given the challenges faced by the Greek economy, deep structural reforms to facilitate exports are not an easy task, especially given the Greek business mentality and the predominant modes of doing business till recently. However, these reforms are necessary to boost Greek exports and build a solid base for sustained economic growth combined with the reforms in other parts of the economy (on competitiveness, investment, labour and product markets etc). It is worth noting that some inter-linkages may appear among the reforms in various areas of economic activity (for example, in some cases several synergies seem to emerge, while in other cases conflicting forces may exist). Thus, a proper and careful planning of the individual targets in the various policy areas is essential for achieving the desired outcome. Therefore, the government should proceed fast and with decisiveness on the implementation of these deep reforms to gradually and steadily remove the barriers and rigidities that impede economic development.

The main result derived from dynamic panel estimations indicates that under the assumption of *ceteris paribus* a one day reduction (between 2011 and 2012) in the time to export in the Greek custom offices will result in a potential gain in the Greek economy of around EUR 1.9 billion (based on GDP of 2012). However, given that the specific estimated model includes as an export facilitation reform variable only the time to export, the abovementioned strong effect might also include the impact of the other trade facilitation reforms supported by the reduced documents for exports and the reduced costs of exports.

Overall, it is expected that the successful implementation of business environment reforms can improve productivity and employment in Greece, thus being a sustainable channel for the Greek economy to regain its competitiveness and grow in the long-term. In other words, faster implementation of the relevant reforms in the Greek economy could provide significant benefits that could boost business efficiency. Improving doing business in Greece could be a driver for attracting both FDI and local investment as well, thus supporting an investment-led recovery for the Greek economy.

2. Introduction

In the context of the economic adjustment programme since May 2010, the Greek authorities are implementing a series of important reforms in an effort to re-stabilize the economy, thus supporting economic growth and employment, especially in the field of business environment. A number of reforms and relevant legislation have been set in motion in recent years that seek to improve the efficiency of product and service markets in Greece. It is expected that these reforms can improve productivity of the Greek economy and employment by facilitating new entry/investment and competition or eliminating bureaucracy and administrative burdens. However, despite numerous actions, still excessive regulatory burden seems to be present on the business environment, resulting to significant obstacles in the Greek economy and limiting its ability to face external competition and regain competitiveness.

The report tries to look in more detail into some of these reforms and policy measures. It provides a qualitative and quantitative analysis of the microeconomic effect of reform efforts, taking into consideration relevant economic literature, but also past experiences in other countries in the fields that are examined. Four areas are examined: a) **public procurement**, b) **investments**, c) **competition**, and d) **exports**.

In terms of methodology, at the first stage, we identify the policy failures in each one of the four areas. We analyse and specify the effect of the existing state-imposed regulations and administrative procedures on the major stakeholders and participants in the markets affected (including incumbent operators depending on size, possible new entrants/investors, consumers/purchasers, suppliers). The report also includes a description of how the policy failures or regulations affect behaviour and distort market functioning, based on theoretical and empirical research drawing insight from academic papers (literature) and institutional reports (international experience).

At the second stage (**Quantification section**), we try to provide some empirical evidence on the effect that removing (or reducing as much as possible) these policy failures would have on the Greek economy. The analysis is performed separately for the four main categories of reforms and is based on a range of possible impacts (from total elimination to incremental improvements). The analysis utilise econometric techniques to estimate changes in relevant indicators/factors in countries that have reformed in the past, compared with the course of these indicators in a control group of countries, where the regulatory regime has not changed. The description and estimation of impacts are adapted to the form of the policy failure, structure of relevant market affected and types of behaviour observed in Greek market which may affect the impact of the policy failure.

The purpose of the quantitative analysis is to help the Greek authorities to assess current efforts with an economic analysis of the impact of business environment reforms that the Greek authorities have undertaken to implement. The results of this technical assistance will assist the Greek authorities in preparing and designing a renewed policy framework on business strategy.

Concluding, the current report provides for an in-depth micro-economic analysis of the expected outcomes on markets and the economic channels through which these effects will feed through to the wider economy. This contributes to further understanding the impact of the business environment reforms and maybe set a new framework for evaluating the effect of such reforms on growth and employment in Greece.

3. Public procurement

3.1 Core principles and barriers to public procurement

3.1.1 Introduction: definition and importance

In recent years, it has been widely recognized by many policy makers, academics and practitioners that strengthening public procurement systems is a key strategic tool in enhancing efficiency in public organizations. Public procurement is the procedure by which public organizations and authorities (including different levels of government i.e. central government and local authorities) purchase goods and services and order works from the private sector by using large amounts of public funds (Thai, 2001). The overall process of procurement includes several tasks from the identification of needs, selection of sources, preparation and award of contracts, and all the stages from contract administration up to the end of a services' contract.

Without doubt, public procurement process allocates a major part of public expenditures varying from road construction, street lighting, military meals and clothing, to public education and health care equipment. More specifically, public procurement constitutes one of the main expenditures of governments in EU since it accounts almost 16%-20% of EU GDP per year (European Commission, 2012a; Tavares, 2010). Improving public procurement is a priority goal on the European agenda in order to control deficits and to increase economic development in the European Union according to the Single Market paradigm.

Public procurement has attracted a great interest during the recent economic crisis as a crucial tool that promotes value for money mainly in countries implementing a fiscal adjustment program such as Greece. In the view of current budgetary constraints in the public sector, it is a huge challenge for policy makers to develop actions and priorities for the improvement of efficiency and transparency in the public procurement system.

Structural reforms in public procurement may exhibit significant economic and social effects. When public organizations adopt the general procurement principles of open competition and transparency and these principles are combined with operational efficiency and e-procurement, the result is greater value for money. Improving public procurement procedures is expected to increase competition among firms, reduce prices and guarantee

better quality of services for citizens. Public procurement is also a potential key driver for demand-driven innovation (Edler & Georghiou, 2007), and a stimulus for job generation, since public sector constitutes a huge buyer for the products and services of private businesses, and hence it plays a crucial role on the way in which businesses evolve in a national innovation and production system (European Commission, 2013a).

The chapter is structured as follows: first we review the literature related to the core principles that public procurement reforms should take into consideration; second we discuss briefly the main barriers observed to the adoption of fundamental principles in the context of public procurement reforms; afterwards we describe the current procurement reforms in Greece which mainly focus on the stimulation of transparency, the development of centralization and the provision of ICT solutions; then we discuss the expected benefits from the successful implementation of these reforms by providing relevant best practices derived from other countries; after that we provide an empirical analysis in order to investigate and quantify the impact of a main public procurement reform in Greece (that is the establishment of SPPA which ensures transparency in procurement processes) on the cost expenditures of public sector; and finally we summarize the basic benefits of public procurement reforms extracted from the analysis.

3.1.2 Fundamental principles for public procurement reforms

Given the crucial importance of public procurement for various aspects of each economy, strategic priorities for public procurement reforms should be driven by fundamental principles such as value for money, efficiency (cost efficiency and time efficiency), transparency, competition, innovation, sustainability, openness and adoption of ICT solutions (e-procurement). More particularly, the main reasons that the aforementioned principles have to be considered in public procurement reforms by policy makers (especially in the Greek case) are described below:

Achieving **value for money** is usually a key objective of public procurement reforms (Tavares, 2010). In an increasingly tight fiscal environment, the strategic decisions of the public sector should ensure the ability of a public procurement system to achieve cost savings by exploiting economies of scale (European Commission, 2012a). At the same time relevant policy actions it is necessary to ensure that goods, services and works are still provided at the required quality levels. In this context, to ensure that the goal to achieve

cost savings does not cause a sharp drop in quality, one way may be to allow openness in public procurement processes to get feedback from participants.

A further potential effect of public procurement reforms stems from the increase of the intensity of **competition**. By transforming the acquisition process from a bilateral negotiation to an auction increases for the public sector the likelihood to achieve cost savings. The main channel by which a competitive procurement procedure leads to cost savings is demonstrated extensively within the context of auction theory (Krishna, 2009). Also, **openness** concerns the possibility and feasibility of individual stakeholders --e.g. businesses-- to participate in the public procurement procedure --e.g. to submit the bid-- (OECD, 2013). An open public procurement procedure is possible to lead to an efficiency enhancement effect in submitted tenders (Carayannis & Popescu, 2005).

Moreover, the concept of **transparency** is of great significance in public procurement reforms (Schapper et al., 2006; United Nations, 2011). Transparency principally refers to publishing information and conducting procurement processes with clear and fair rules. Evennet and Hoekman (2005) argue that the impact of improved transparency on the procurement procedure is twofold. From the demand side, improved transparency diverts government expenditure away from goods that could foster corruption. Also, from the supply side, it increases the number of firms involved in the bidding process. Ohashi (2009) claims that *“the effect of improved transparency on supply is to force the ring to lower its price”*. This statement is supported by empirical evidence from Japan suggesting that improved transparency reduces public procurement cost by up to 8%.

Apart from the fundamental purpose of procurement to ensure that public funds are spent legally, through open and transparent contracting processes, it is necessary to consider environmental issues as well. In this context, considering **sustainability** in some procurement procedures may be also significant. For example, public procurement calls and contracts should stimulate green procurement (Brammer & Walker, 2011). Furthermore, due to the huge size of the public sector, public procurement could encourage pull **innovation** for the private sector (Aschhoff & Sofka, 2009). However, the probability of innovative output through public procurement increases if innovation is the essential criterion in both the tender specifications and the evaluation of proposals.

Last but not least, the adoption of ICT solutions in public procurement (**“e-procurement”**) is usually justified on account of speeding up processes and enlarging the set of potential

participants. Thus, the adoption of electronic solutions to award public contracts, such as e-auctions, may further increase cost savings (Carayannis & Popescu, 2005; Moon, 2005; Vaidya et al, 2006). In this perspective, e-procurement not only reduces the cost of transactions, it also improves process efficiency and can reduce administrative and other costs. Manual (phone and fax) communications are reduced or eliminated, as are paper invoices and their associated costs. Increasing the use of electronic procurement is of strategic importance for achieving the smart and sustainable growth objective of the EU 2020 Strategy.

3.1.3 Impediments to the adoption of core principles in procurement reforms

It is broadly recognized that enhancing the effectiveness of the use of public funds, requires the existence of an adequate national procurement system that meets international standards (OECD, 2010). However, some general obstacles have been observed in countries that attempt to introduce and implement public procurement reforms, thus eliminating their potential economic effects. According to Hunja (2001) the main factors¹ hindering successful adoption of the aforementioned core principles from countries that implement public procurement reforms are the following:

- **Lack of strategy:** the absence of clear objectives and strategies (e.g. low cost tenders vs. high-quality or innovation-intensive tenders) creates problems related to the mix up of selection and award criteria.
- **Organization of procurement function:** co-ordination, corruption and bureaucracy problems arise due to inefficient organization of procurement processes at the national and regional levels.
- **Complexity of supportive issues:** the complexity of the procurement rules is closely related to various layers of legislation, institutional arrangements and bureaucratic processes. These barriers do not facilitate efficient, innovative and sustainable procurement, but instead add costs to the public and private sectors.
- **Skills shortages:** there exists a lack of technical knowledge on the key components of a well-functioning, modern legal and institutional public procurement framework. Also, there is an observed shortage of operational skills in public procurement practices from administration professionals. These multifaceted obstacles are further strengthened by the lack of managerial skills and knowledge on how to implement reforms through the political and bureaucratic processes and on how to

¹ (Hunja, 2001) provides an extensive discussion and recognizes most of these factors as obstacles to public procurement reforms.

plan, prepare and manage structural changes in an environment that in the past didn't support reforms on procurement fields.

- **Lack of simplicity in e-procurement platforms:** the considerable variation in e-procurement platforms and service models is a major obstacle to the wide adoption of e-Procurement and an important barrier to cross-border and SME participation (Pwc, 2011). Additionally, e-procurement platforms are often not user-friendly and trying to access and learn how to use them is often particularly time-consuming, inefficient and frustrating for participants.
- Excessively **short deadlines** for submission of tenders and **lack of transparency** in evaluation of offers.

Within the context of the third review of the second adjustment programme for Greece (European Commission, 2013b), improving the efficiency and transparency of public procurement systems is an on-going process and main concern of Greek government. Focusing on the Greek case it can be argued that despite the fact that some recent reforms have been introduced, such as the establishment of the Single Public Procurement Authority (SPPA), considerable barriers remain for the successful implementation of public procurement reforms. The formation of a road map in Greece for an efficient public procurement system requires first the identification of the main weaknesses of this system. In particular, the SPPA has already faced the structural pathogenesis characterizing the current public procurement system, even though the SPPA is at an early-stage of its operation. The recent activity report provided by the SPPA (2013) highlights the following barriers to the successful implementation of relevant reforms in Greece:

- **Complexity of regulation framework:** In Greece the current regulatory framework of public procurement is highly complex since it includes a large number of disaggregated rules. These legal and regulatory rules are differentiated among the specific categories of public contracts i.e. goods, services and works. In addition, each category of public contracts is under the jurisdiction and legal initiative of separate public authorities. Therefore, this disaggregation results in an inefficient duplication of operations and causes conflict jurisdictions among public authorities, bodies and organizations. In other words, a complex and multifaceted legislation blocks the development of a single, clear and efficient regulatory framework supporting public procurement.

- **Low degree of transparency and competition:** Lack of simple and clear competition rules in public procurement processes is a factor that hinders transparency and yields significant uncertainty in potential participants about the fair conditions of a public tendering process. This uncertainty along with the contracting authorities' flexibility, mainly in the stages of awarding and contracting, discourages the participation of potential candidates in the participation in tendering processes. Lack of transparency also complements the aforementioned unclear tendering procedures (e.g. a large amount of specific terms in calls for tenders; missing information explaining the awarding choice).
- **Time-consuming procedures:** Time inefficiency in the tendering processes is addressed as a significant limitation in the public procurement procedures in Greece. In particular, a waste of time often appears both in the pre-awarding phase and during the evaluation phase of the candidates, resulting thus to a considerable delay to announce the final winner of the process. Also, it is observed that sometimes authorities do not follow the European and national legal rules, increasing consequently the probability for a tender applicant to submit an objection in order to protect her interests. On the other hand, the submission of groundless objections may lead to significant delays in the procurement processes putting at a great risk the rapid and efficient provision of legal protection services, and, as well as, the successful completion of the public procurement processes.
- **Utilization of old-fashioned purchasing techniques and outdated methods for contract award notices:** The directives 2004/17/EC (European Commission, 2004a) and 2004/18/EC (European Commission, 2004b) have been introduced in Greek legislation through the Presidential Decree 59/2007 and P.D. 60/2007, respectively. According to these directives, new tools for simplification and modernization of contract awards should be introduced such as the use of dynamic purchasing systems, centralized purchasing bodies etc. Nevertheless, in most cases contracting authorities have not yet implemented the relevant legislation. Moreover, the aforementioned directives introduced the adoption of new supportive means in contract notices, such as the use of electronic purchasing systems and electronic auctions. Although these electronic methods aim to reduce the administrative cost, provide a better value-for-money nexus, eliminate the time of tendering processes, increase competition and transparency, the adoption of modern ICT solutions in the procurement processes is yet at an early-stage of development. At the same time,

organizational shortages in the structure of purchasing bodies may further hinder the development of e-procurement.

- **Corruption in the stages of awarding and contracting:** Close interaction between public and private sector and financial interests increase the likelihood for illegal business practices to emerge. Conflict of interests, illegal behavior of candidates and tenderers, such as attempts to influence the decision making process, tacit collusion among participants in order to affect awarding and contracting towards a specific direction break the core principle of transparency and yield important failures in public procurement market.
- **Disproportionate administrative burdens and expenditures regarding the participation in the public tendering process and the submission of tenders:** Administrative burden is a major barrier to the participation of economic bodies and operators in tendering processes, due to the need to submit a large number of documents, papers, certifications etc. Furthermore, many calls for tenders include a huge amount of terms, conditions and requirements that often are difficult to be undertaken during the limited time period of a typical tendering process. The majority of stakeholders highlight the need to simplify the processes and strengthen their flexibility.
- **Lack of standardized processes:** A weakness is often observed to establish objective criteria during the awarding and contracting processes by ensuring and following the principles of transparency and fairness. As a result a great heterogeneity emerges in terms of the conduction of calls, technical standards and the number of documents that are necessary for the supply of similar goods and services. Lack of standardization is a major reason cancelling tender competitions due to the violation of relevant rules, existence of specified conditions, absence of equal, clear and fair terms that offend the competition principles. As a result, the lack of standardized process builds significant impediments in awarding public contracts oriented to the value-for-money principle.
- **Lack of training and specified skills of human capital:** In most cases the staff of contracting authorities has not obtained the appropriate experience and the specific training to address successfully the public procurement process. What is more, mentoring and supporting advice in contracting authorities is not undertaken though efficient and long-run actions.

3.2 Public procurement reforms in Greece: an ongoing process

In the recent past, the large number of contracting authorities and entities in Greece, but also the legal framework about procurement procedures, led to higher bid prices, delays, bureaucracy and in some cases corruption. There was no central public procurement agency for procurement of standardized goods and services or any centralized purchasing body in operation in Greece to facilitate (automated) purchasing by or on behalf of other contracting authorities. To improve these failures, the Greek Government has committed to implement a number of reforms related to the development of a sound public procurement system, characterized by important fiscal savings and higher quality purchases. Given the above, the main current reforms in Greece aim at:

- i) making the Single Public Procurement Authority (SPPA) fully operational and simplifying the public procurement legislative framework
- ii) increasing the share of supplies and services tendered through Central Purchasing Bodies
- iii) applying public procurement processes by electronic means and in this context establishing an e-procurement platform

According to the 3rd Review of the Second Economic Adjustment Program for Greece (European Commission, 2013b) it can be concluded that only the SPPA is already operational while the other reforms have not been implemented yet and remain at a stage of planning and preparation. It should be noted here that the economic impact of these reforms cannot be identified fully yet since the implementation of the majority of them is under an ongoing process (development of e-procurement systems and centralization of processes) or at an early-stage of operation (organization of Single Public Procurement Authority). However, in the field of the health system centralized procurement, the significant effects on cost savings are visible, creating thus a best practice at international level.

3.2.1 Single Public Procurement Authority (SPPA) and legislative framework reforms

The establishment, organization and operation of the Single Public Procurement Authority (SPPA) in Greece have been a fundamental reform introduced in September 2011 (according to the Law no. 4013/2011) within the context of the adjustment programme currently

underway. The principal goal of SPPA is to ensure transparency in procurement processes contributing to cost efficiency in the public sector. Its responsibilities include the conduction of spot checks to monitor if procurement processes follow fair and clear rules, the consideration of objections throughout the relevant procedures, and the interruption of any ongoing tendering process that entails law violation. Thus, the SPPA is expected to be a watchdog of transparency and a supportive mechanism for the efficiency of the public procurement system in Greece. In addition, the SPPA provides guidance for draft laws and other regulatory acts related to public procurement procedures. A further objective of this authority is to contribute to the coordination and to ensure the coherence of the functioning of the Central Purchasing Bodies.

Regarding the reorganization of the legislative framework, the main relevant reforms should be completed by December 2013 and these reforms can be summarized in the following areas:

- simplifying, streamlining and consolidating the body of public procurement legislation
- rationalising and reorganizing the administrative structures and processes in public procurement to desired procurement results in terms of efficiency
- improving national review procedures, eliminating delays caused by the redress system and assessing the role to confer to the SPPA in the area of redress (remedies and judicial protection).

In Section 3.3, we analyze extensively and quantify the impact of transparency reform, through the establishment and organization of the SPPA, on cost expenditures of public sector by employing an advanced econometric method and by collecting data for 2218 project supplies derived from General Secretariat for Commerce. Notably, since other relevant reforms (i.e. wide use of e-procurement; centralization of processes; and simplification of the legislative framework) have not yet been implemented, the only observable economic impact that can be evaluated at the present concerns the SPPA reform.

3.2.2 Centralization of public procurement procedures

Centralized public procurement reforms enable the reduction of the total cost of public purchases, both by lowering purchasing prices and by rationalizing the acquisition processes, thus eliminating transaction costs. The centralization of public procurement processes leads

to cost savings mainly due to the exploitation of scale economies and increased bargaining power of the contracting authority (Albano & Sparro, 2010). In this regard, standardization of products/services will probably offer considerable benefits to the buyer, since suppliers have increased motives to exploit economies of scale, thus operating at lower unit cost.

Nevertheless, lower production average costs may result to smaller purchasing prices only if the buyer increases its bargaining power. This notion is further supported by the fact that the higher the value of procurement contracts the greater the intensity of competition. In particular, when the public sector accounts for a relevant share of the total demand, then centralization and standardization creates a great opportunity for the potential winner of a single competitive tendering to significantly increase its market share. As a consequence, the bargaining power of the public agency awarding the contract could be strengthened, encouraging thus the suppliers to compete more fiercely to provide lower price and better quality. In other words, the centralization of public procurement processes may lead to achieving the value-for-money fundamental principle.

In addition, centralization of public procurement procedures allows scale economies to arise when procurement contracts are to a great extent homogeneous and standardized. In this case, as Albano, G.L., Sparro, (2010) argue *“demand aggregation avoids the duplication of transaction costs that would arise if each purchasing unit were to conduct the procurement process on its own and competing firms were to submit distinct offers for each procurement process”*. Moreover, one of the basic advantages of a centralized procurement system is that it removes the diffusion of accountability for procurement decisions by transferring this within the agency that holds the funds. It also helps capacity to be developed in the user agencies where there is a greater need (Hunja, 2001). In general, a centralized procurement process ensures standardization and accountability of government contracts.²

Given the above, the centralization of public procurement processes, which is currently undertaken by Greek authorities, is expected to result to considerable spending cuts for Greece. In this framework, the Greek Government moves towards more centralized public procurement. The centralization of public procurement especially in the health system has already yielded significant outcomes --as it is in more detail described in Box 3.1--, services and supplies (including civil supplies and services for defence within the context of the Directive 2009/81 (European Union, 2009) on defence and security procurement fields).

² See Dimitri et al. (2006) for an extensive discussion on the main rationales of centralized procurement.

Moreover, the Greek Government adopts decisions leading to the establishment of a Central Purchasing Body at the General Directorate for the procurement of goods and services. In particular, the Central Purchasing Body will provide the following services:

- publishing a detailed list of supplies and services and the requirements of numerous contracting authorities for common supplies and services
- classifying into a limited number of standardized procedures the above multiple requirements
- identifying at least 3 promising groups for procurement through framework contracts
- designing the call for tender and preparing tenders specification
- publishing contract notices for at least 3 framework contracts used in frequently purchased supplies or services at central government level via the Central Purchasing Body
- mandating the relevant administrations to source through the framework contracts submitted to the Commission services
- illustrating framework contracts for the procurement of the aforementioned standardized supplies and services via the Central Purchasing Body
- mandating the purchase of the standardized supplies and services via the Central Purchasing Body with no monetary limits for all central Government authorities following the parallel modification of legislation issues
- tendering at least 3 framework contracts utilized in frequently purchased supplies and services at central Government level via the Central Purchasing Body

During the past years in the Greek health system the basic public procurement process for medical devices and pharmaceuticals of public hospitals was conducted on a basis of hospital tenders and reference price settings. Products were usually invoiced on a patient basis, at the time of use, resulting in elevated administration costs. In an attempt to reduce public procurement expenditures in hospitals, the Greek Government endorsed the Law no. 3580/2007 highlighting the centralization of procurement process through the reestablishment of a Health Procurement Committee, the so-called "EPY". The main purpose of EPY is to monitor and guarantee a suitable level of quality and to control and decrease high costs caused by public hospitals. Hence, EPY aims to ensure and unify the annual tenders conducted by hospitals, and as a consequence to contribute to the decline of procurement costs, the improvement of payment time (which is more than three years on

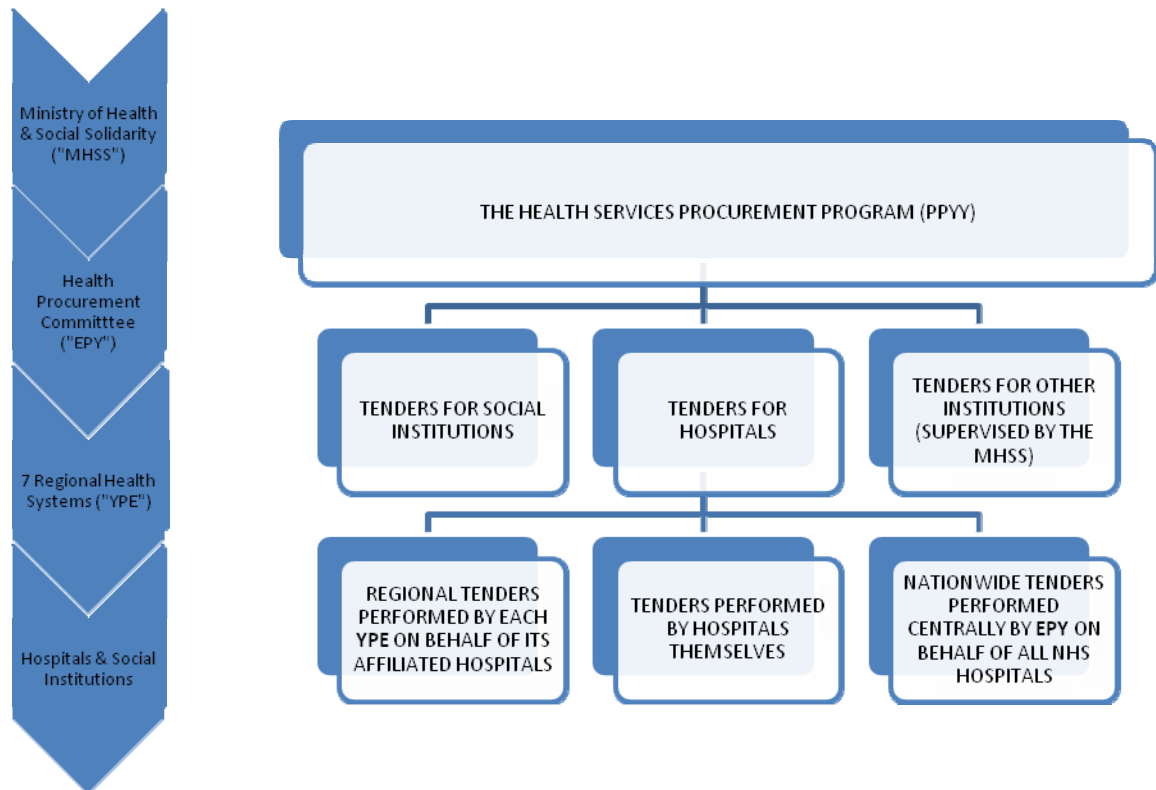
average), the standardization of medical requests, and the efficient mobility of materials among hospitals.

The introduction of centralized reforms in the health care system launched by the Greek Government in 2010 have already yielded considerable results in terms of cost savings, especially in spending on drugs. However, centralized procurement needs to be extended to cover a wider share of hospital purchasing. In this context, the Greek Government aims to increase considerably the share of the expenditures in medicines and medical devices covered by centralized tender procedures through EPY up to 45% by 2014, while this share goes up to 60% in 2015. Under the 2nd adjustment program the Greek Government ensures also the application of the relevant tender procedures. Moreover, EPY will undertake tender procedures for framework contracts for the most expensive medicines sold in EOPPY pharmacies. Also, EPY will publish a detailed report on its activities on an annual basis.

The Health Services Procurement Program in Greece is a centralized procedure in which healthcare suppliers make their procurement request. In the context of the new centralized health procurement system, the hierarchy of Health Services Procurement Program with respect to the involvement of purchasing bodies can be described briefly as follows: a demand begins at the lowest level of hospital management (e.g. a medical department) and then the request is forwarded to the corresponding Regional Health System (that is "YPE"). In turn Regional Health Systems take into account and convey the requests of all hospitals under the inspection of EPY.

EPY controls the tender process (declaration and contract standards, monitoring contract implementation, developing, organizing and promoting e-commerce rules). EPY during the stage of organizing a call for tender, examines first the potential opportunity to standardize similar requests. If this case holds, it returns the requests back to hospitals for appropriate modifications. According to the relevant legislation, in the case that a candidate supplier suspects any distortion in the process, he can take legal actions and in this respect (i.e. if the distortion indeed exists), the process should be cancelled and start all over again.

Figure 3.1: Structure of the health services procurement program in Greece



Source: (Kastanioti et al, 2013)

Despite the significant results that have been already observed in terms of cost savings derived from the centralization of health procurement system (see Box 3.1), more effort is required for the re-organization of the health procurement system on the basis of the relevant commitment of Greek Government under the 2nd adjustment program.

Box 3.1 Cost savings derived from the centralization of health procurement processes

- Within the context of the 2010 Health Services Procurement Program, 90% of tenders --with a total budget of EUR 2 billion -- carried out by public hospitals and their supervising YPE were completed in terms of contract award notices by the end of November 2011. Implementation of the aforementioned procedures resulted in savings around EUR 180 million.
- In May 2010 the Greek Government established the Price List Observatory in health system under the Law no.3846/2010. The main objective of this observatory is to ensure transparency and monitor costs by comparing the prices of similar products and services supplies for tenders among hospitals.
- Since the establishment of the Price List Observatory, EPY has recorded the lowest prices for about 18,000 supplies purchased by hospitals, creating in that way benchmark standards for Greece.
- At the same time, the extensive use of bar codes for pharmaceuticals and medical supplies from the majority of public hospitals (90%-95%) contributes significantly to both the efficient monitoring and cost savings in the last 2 years. From this perspective, relevant estimates (see Kastanioti et al., 2013) demonstrate that there exists a major cut in prices about 30% due to the use of bar-codes.

Source: Kastanioti et al. (2013)

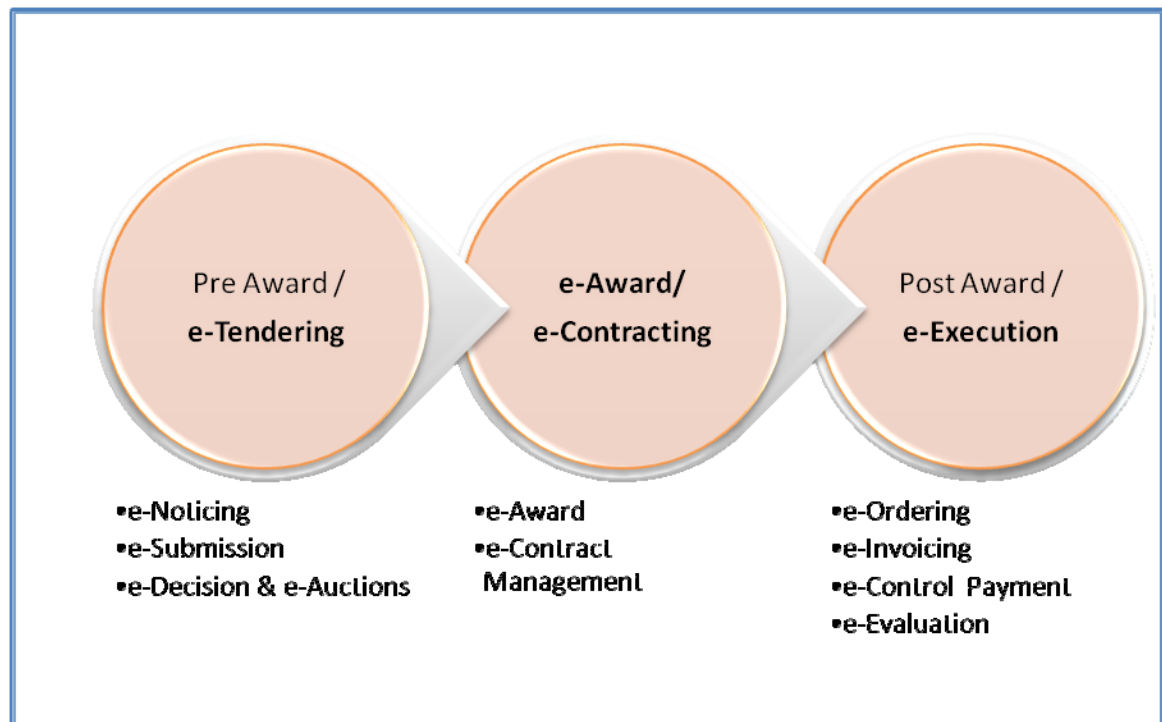
3.2.3 E-procurement

Fast evolution of technology and radical changes and improvements in ICT tools provide a great opportunity to make procurement for goods and services more transparent and efficient. Electronic procurement, particularly in the public domain is a key policy tool to improve efficiency, increase the country's productivity, foster competitiveness and

encourage fiscal savings (Carayannis & Popescu, 2005). A significant way in which the potential benefits of e-government can be realized is through procurement, by which a government purchases goods and services from the private sector, advertises its needs, selects vendors, manages service and fulfillment contracts, and performs payments (Ramanujam, 2012). Therefore, Information and Communication Technologies have helped many government states to solve to a great extent their administrative problems in the public sector. In this context, e-procurement constitutes a driving force to achieve better and cost efficient public procurement systems (Moon, 2005).

E-procurement has been introduced as a comprehensive process in which governments utilize and exploit ICT systems to make agreements for the acquisition of products or services (contracting) or to purchase products or services in exchange for payment (purchasing). In particular, the adoption of e-procurement processes involves several aspects such as electronic ordering, internet bidding, purchasing cards, reverse auctions, and integrated automatic procurement systems. Moreover, information and communication technologies play a crucial role in storing electronically the procurement cases, allowing thus access to information for procurement opportunities in an open market (Carayannis & Popescu, 2005). In this context, the public sector could benefit to a great extent by providing information services, such as standard storage, mechanisms, certification, authentication, electronic communication and electronic exchange of information. From this perspective, the public sector needs to adopt and follow three basic stages in the procurement processes that is electronic tendering, electronic contracting and electronic trading and execution (Tavares, 2010).

Figure 3.2: Basic phases of an e-procurement process



Source: "The 2009 EU e-Government Procurement Benchmark Report"

The adoption and broad use of electronic means to conduct public procurement processes is a basic reform that is currently undertaken by the Greek Government. The ongoing process of e-procurement adoption includes the specific actions described briefly below:

- running supplies, services and public works procurement contracts for the Central Government through the e-procurement platform
- providing the results of the pilot application of the system software/architecture
- providing functional services such as e-notification and e-tendering
- mandating the application of the platform by the central Government, local Governments and other public entities
- providing guidance and training programs for users of the electronic platform
- monitoring mechanisms for the efficient use of e-procurement platform and evaluating the target usage levels
- interacting the electronic procurement platform with the ongoing simplification of procurement legislation
- facilitating access and use of the platform by users
- developing e-signature and e-ID solutions

The Greek Government also creates a system of open data and statistics in the field of public procurement, uses framework contracts and modifies the public procurement legislation that holds about works, supplies and services. In this context the continuous process of the construction of Agora Portal is expected to be a key strategy improving contract transparency, facilitating compliance, providing support to contracting entities and reducing overlap with other reporting obligations. More specifically, the creation of a national public procurement portal for Greece aims to publish:

- a set of standard forms for contract notices
- all contract awards noticing
- data that enable the combination of contract notices regarding supplies, services, works with value exceeding EUR 30,000 with contracting entities that upload information on the portal
- the evaluation results of the portal's functioning, including a review of functionality and results measured by indicators such as contract notices/contract award notices published, types of contracting entities, estimated value of contracts

In recent years a growing number of studies provide empirical evidence demonstrating that e-procurement is a basic strategic mechanism for governments to save money and to provide a more accountable, more effective, and faster way to manage procurement (Moon, 2005). According to Neef (2001), the potential benefits of e-procurement are the following: reducing transaction costs; increasing the speed of ordering; broadening vendor choices; standardizing procurement processes, improving the efficiency of procurement processes; providing greater control over procurement spending (i.e. eliminating "maverick" buying), increasing contract compliance; supporting greater access to Internet alternatives for buyers; reducing paperwork and repetitious administrative procedures; and redirecting procurement workflows (e.g. personnel to strategic value-creation work).

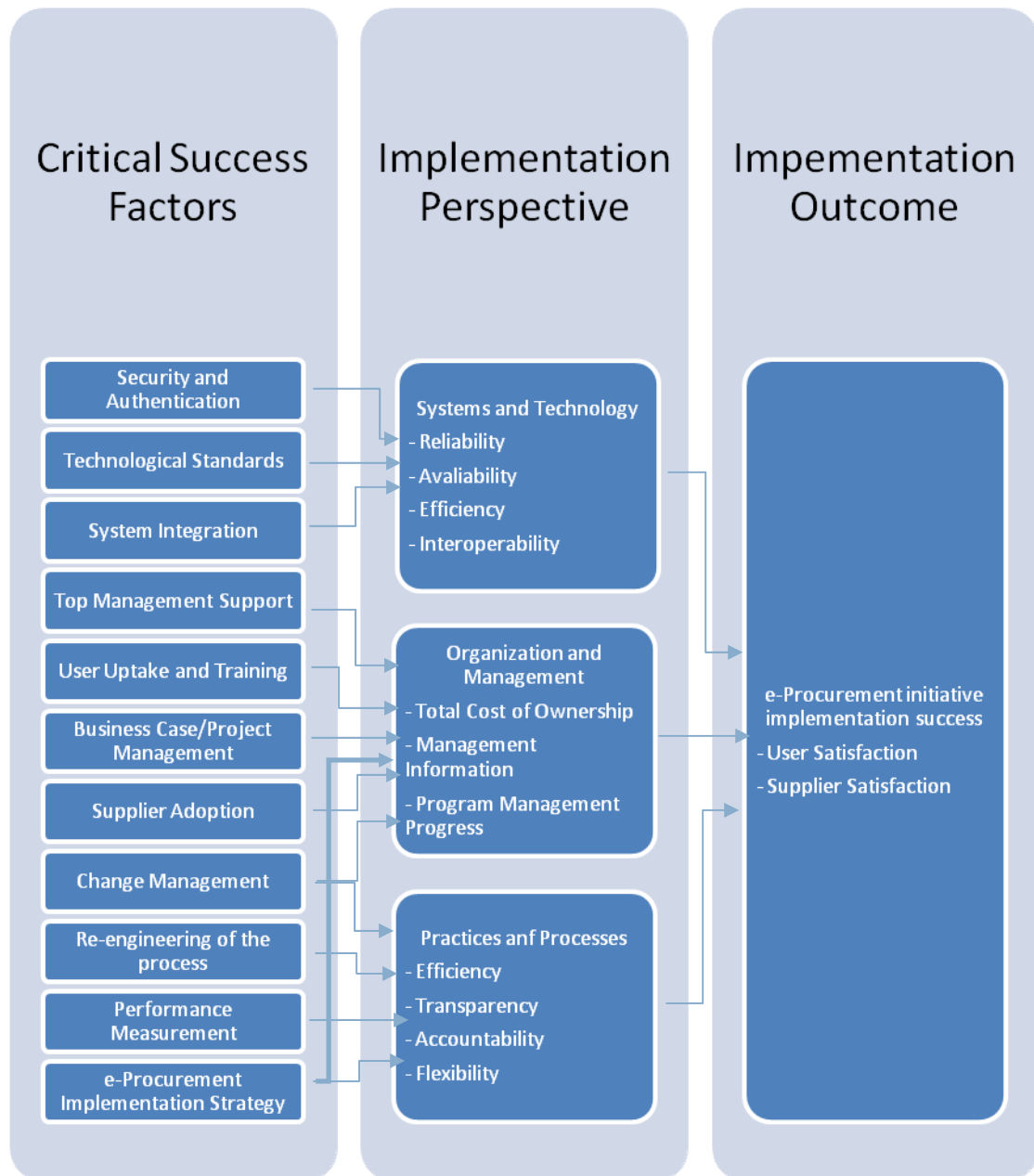
Despite the fact that various governments carry out e-Procurement reforms, its implementation does not appear to have been smooth and the degree of implementation success does not meet fully the original expectations (Steinberg, 2003). In other words, the development and implementation of e-Procurement has not been an easy task and sometimes its anticipated benefits cannot be exploited sufficiently by governments. Vaidya et al. (2006) identify a number of critical factors that best support e-procurement implementation success and initiatives in the public sector:

- **End-user uptake and training:** training staff in procurement practices, supporting users on e-Procurement tools are critical to the success of an e-Procurement initiative (World Bank, 2003). Hence, end-users can realize the immediate benefits of the e-Procurement system once they understand the operational functionalities.
- **Supplier adoption:** As early supplier involvement provides also opportunities for suppliers to offer their feedback, discuss any necessary changes, issues and concerns such as various options in developing and maintaining supplier catalogues (Birks, et al., 2001), it will allow the public procurement department to monitor areas for improvement and adjust practices accordingly. Suppliers, therefore, should be educated on the e-procurement benefits that can be provided to them through a process of consultation as early as possible in the project.
- **Compliance with best practices for business case/project management:** e-procurement initiatives only deliver the planned benefits if the users and buyers make changes to the way they work. E-procurement processes should include identifying drivers, understanding the starting point, benefits, approaches, affordability and relevant risks.
- **Systems integration:** Determining the required level of integration among the e-procurement solution and existing information systems is of crucial importance. For instance, it is important to link the e-procurement system to the financial management system in order to facilitate the process of online payment to suppliers (World Bank, 2003).
- **Security and authentication:** An e-procurement system should develop mechanisms for identifying and authenticating the user who places an order so that the supplier knows it is safe to fulfill the order. Furthermore, security infrastructure is important for the transactions and exchanges among different systems with respect to the identities of the buyers and suppliers (Stenning & Associates Pty Ltd, 2003). Therefore, the engagement of both buyers and suppliers in the e-procurement process requires the existence of complete confidence and trust among the relevant parties.
- **Re-engineering the process:** E-procurement should be viewed as an enabling mechanism to make the process of procurement more efficient in terms of cost, time, and achievement of value for money (ECOM Group, 2002). Where existing procurement practices and procedures may contradict the goals and objectives of the new initiative, the implementation of e-procurement will require the re-

engineering of existing purchasing processes (KPMG Consulting, 2001). Birks et al. (2001) note that roles and responsibilities might change substantially with the new process, which requires staff to adapt according to these. Birks et al. (2001) suggest that the process of reengineering should not only address process but also supplier relationships and all the internal groups affected by procurement.

- **Top management support:** Executive management team should ensure that the procurement reform has been well understood in the agency staff (Stenning & Associates Pty Ltd, 2003). Furthermore, the management leadership is responsible for setting the vision and goals, bringing about collective commitment for change in process and organizational structures, and formulating the policies and strategies necessary to establish an e-procurement initiative (World Bank, 2003).
- **Performance measurement:** Performance measurement drives behavior and is a key to making the change a success (Birks et al., 2001). Establishing goals and baselines is very important. In this regard, it is important to define key performance indicators early in the e-procurement process.
- **Change management:** The World Bank Report (2003) highlights that even though change management related to the speed of adoption of e-procurement may include a high cost, a lack of it can be a main reason of e-procurement project failure.
- **E-procurement implementation strategy:** The design of documented and executable strategies prior to the deployment of an e-Procurement project is a crucial factor for the successful implementation of the relevant initiative (Neef, 2001). A clear planning of e-procurement strategy is needed considering also institutional changes which come from either the procurement process perspective or the organizational perspective (World Bank, 2003).
- **Technological standards:** Technological standardization is a key requirement for the implementation success of an e-procurement reform. Given that there exist various buyer-supplier systems to exchange information and electronic documents, common standards and interoperability should be taken into consideration (Birks et al., 2001; World Bank, 2003).

Figure 3.3: Factors that affect the successful implementation of e-procurement reform



Source: (Vaidya et al., 2006)

According to the strategy for e-procurement of the EU (European Commission, 2012b), there are a lot of best practices (Portugal, Norway, Netherlands, Wales) showing the importance of the electronic procurement mainly in terms of cost savings (see Box 3.2). According to the Aberdeen Group (Aberdeen Group, 2005), the development and utilization of e-procurement may generate a lot of benefits at company level as well.

Box 3.2 Best practices using e-procurement procedures

- **Portugal:** savings of about EUR 650 million in the first year. Could have reached EUR 1.2 billion if all contracting authorities had fully implemented e-procurement (6%-12% of total procurement expenditure). Higher competition / Lower prices / Administrative savings. Price reductions in hospitals of 18% on their procurement contracts.
- **Wales:** benefits of GBP 58 million, three years after it was launched. The investment costs of setting up the programme were recouped in only one year. To date, the programme has saved about 15 million sheets of paper, equivalent to 101 tonnes of CO₂. So far, 56.000 suppliers registered in the system and GBP 18 billion of contracts were advertised electronically.
- **France:** the progressive switch to e-procurement reduced the administrative burden for buyers by 10% and by another 10% for the legal services involved.
- **The Netherlands** (400 local authorities): savings of over EUR 8,500 per tender, through time reduction – per procedure, contracting authorities save on average up to 3 days and bidders up to 1 day; and reduced printing and postage costs (estimated at EUR 2,350 per tender). This is based on using electronic means from the publication of notices through to submission, but does not include automatic evaluation.
- **Norway** (survey): the use of e-procurement increased participation by foreign firms (22% of respondents) and by SMEs (30% of respondents), resulted in a larger number of bids per tender (74% of respondents), reduced purchase costs (70% of respondents) and reduced the time spent on each tender by more than 10% (73% of participants), while none of the managers surveyed would consider returning to manual, paper-based tendering.
- **Korea:** savings of USD 4.5 billion (about 8% of total annual procurement expenditure) annually by 2007
- **Brazil:** 80% of public procurement is carried out electronically.

The special reference to the health sector has been made due to the high share of its expenditures to total public spending in Greece. A main tier of procurement reforms in the health system for the conduction of tendering procedures concerns the establishment and development of a comprehensive and uniform health care information system (e-health system) including the full and integrated system of hospitals' IT systems. The reform of the adoption of e-health system is in compliance with EU procurement rules. Significant cost savings appear in the health system due to the adoption and utilization of e-procurement in Greece as it is described in detail in Box 3.3.



Box 3.3: Cost savings derived from the adoption of e-procurement in the health-care system

- In the year 2011 the Health Services Procurement Program approved by EPY --with a budget over EUR 2.3 billion -- hospitals could submit their requests through the respective YPE by using a specific ICT tool (a digital application). The use of e-auction tenders as regards hospital/EPY requests for products, services and drugs is expected to yield greater cost savings. For example, it should be noted that for six completed national tenders that were implemented, the prices for the products after the e-auction, compared to the respective estimated prices before the implementation of electronic procedures decreased considerably by 30%–75%. As a consequence, the adoption and implementation of web based applications in tenders for health products supplies is expected to yield above EUR 80 million on an annual basis.
- In July 2011 EPY carried out for the first time a tender for hospital drugs by using the e-auction. In particular, the specific e-tendering process concerned 4 active substances for three hospitals, with a total budget of approximately EUR 2 million. It is worth noting that the specific e-procurement process yielded 80% cost savings annually. Moreover, the next (second) e-procurement process for hospital drugs (performed in November 2011) included 23 active substances for all Greek hospitals with a total budget exceeding EUR 80 million, hence this tender performed at a greater scale compared to the previous one. In this case the e-auction process resulted in substantially lower prices which, are estimated at 57%.
- On February 21st 2012, the Greek Ministry for Health and Public Welfare conducted an e-auction. This led to average savings of 54% on previous year's outlays on a range of generic medicines – and an overall saving of EUR 5.5 million for one procedure.

Source: Kastanioti et al., 2012

3.3 Quantifying the impact of the improved transparency due to the SPPA reform on government expenditures

The establishment and organization of SPPA in Greece in September 2011 was the main public procurement reform expected to have a measurable economic impact in terms of related public expenditures, even though it is at an early-stage of its operation. Given that the other reforms (i.e. adoption, development and utilization of e-procurement; centralized aggregation of purchasing for contracting authorities; and simplification of the relevant legislative framework) are underway, the only economic impact that can be quantified until now concerns the SPPA reform. As we have mentioned in more detail in section 3.2.1, the SPPA mainly ensures transparency in public procurement processes.

Thus, the main goal of the present analysis is to explore the effect of improved transparency due to the introduction of the SPPA reform, on public procurement costs in Greece. In doing so it utilizes a novel dataset of 2,218 public supply contracts and applies sound econometric techniques such as quantile regressions. The findings have considerable policy implications for countries that need to reduce government expenditures and undertake structural reforms in their public sector especially in times of crises.

Hence, this work attempts to quantify the effects of improved transparency on public procurement cost in the light of the ongoing structural reforms taking place in Greece. The basic finding indicates that **ensuring transparent practices in public procurement processes reduces government expenditures by about 3.5%**. Moreover, quantile regression estimates show that cost savings are greater for medium and high cost projects as compared to projects of lower unit cost.

For the needs of this work we collected monthly bidding data on 2,218 public supply contracts derived from the General Secretariat for Commerce of Ministry of Development in Greece over a span of 12 years (2002-2013). The study period has been divided into 2 sub-periods, pre and post the establishment of SPPA, by using a time dummy which takes the value of 1 for the period after September 2011, and the value of 0 for the period before September 2011.

To estimate the impact of transparency on average cost of public procurement we use the following model:

where the dependent variable, " $P_{ij,t}$ " stands for the unit price (winning bid) of bidder i , in supply contract, i.e. project j , at time t . Unit prices were converted into real values using a monthly CPI deflator provided by Hellenic Statistical Authority (EL.STAT.) and scaled by natural logarithm. " D_t " denotes the time dummy as explained above. " $Comp$ " corresponds to the number of bidders in project j at time t . This variable measures the intensity of competition in procurement processes, expressed in natural logarithms.

" Loc " is a categorical variable controlling for the location of bidders, taking the value of 3 for winning bidders located in the two largest metropolitan areas of Greece (that is greater Athens, and Thessaloniki), 2 for bidders located abroad and 1 for bidders located in other regions of Greece. " $proced$ " is also a categorical variable capturing the type of awarding procedure, taking the value of 3 when the procurement process is open, 2 when it is negotiated, and 1 when it is restricted. The "GDP" variable, that is the monthly real GDP of Greece expressed in natural logarithms, is included in our model to control for macroeconomic factors that vary over time. The constant term α_{ij} captures the unobserved project specific effects, while the term " $U_{ij,t}$ " is the error term. Finally, parameters β denote the slope coefficients. Note that coefficient β_1 is of primary interest in our study since it captures the effect of improved transparency on public procurement costs per project.

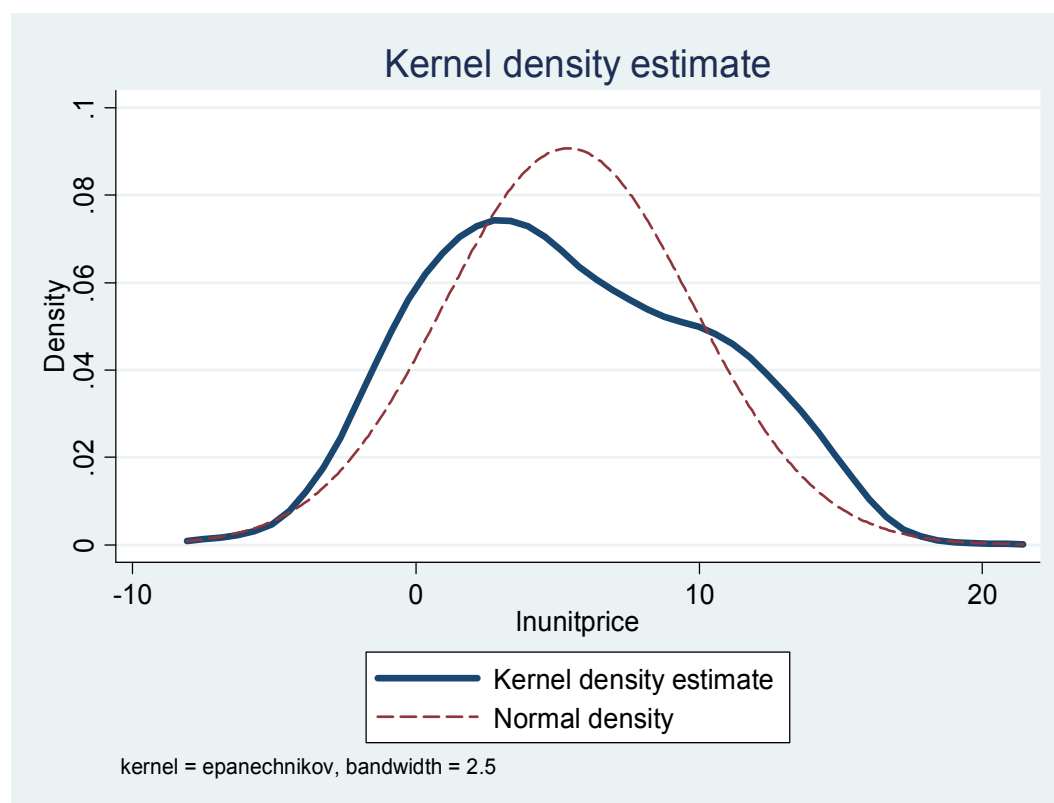
Estimation of our model using Ordinary Least Squares (OLS) techniques requires specific assumptions about the distribution of the error term u . In particular, the OLS methodology requires that $u_{ij,t}$ are independently and identically distributed (i.i.d.) and in addition, for the parameters β to have all the desired properties, a normal distribution is assumed.

However, the above assumptions may not hold when the dependent variable exhibits highly skewed and heavy-tailed distribution. This is very likely in our case, given the great

heterogeneity among the examined projects. Some projects may exhibit higher unit prices than others for reasons that are not captured by the model and are of an idiosyncratic nature. Least squares estimation techniques give estimates that represent the effect from an independent variable on the 'average project'. Therefore, such estimates are not representative of the entire distribution and give an incomplete picture of the impact exercised by the variables of interest.

Figure 3.4 shows the distribution of the projects' unit prices using a kernel smoothing density. In this way, each point of the estimated probability density function is considered as a weighted sum of the data frequencies in the neighborhood around the estimated point. This figure illustrates that the dependent variable of our model does not indeed follow the lognormal distribution, exhibiting a highly skewed distribution. For this reason, the use of a quantile approach may significantly contribute to the consistency of our estimates.

Figure 3.4: Unit price distribution of public procurement projects



One approach to deal with skewed distributions in linear regression models is to apply quantile regression techniques introduced by Koenker and Bassett (1978). One of the great advantages is that the quantile regression estimators are robust to outliers and skewed distributions (Buchinsky, 1994, 1998). A further powerful characteristic of this method is that

it can be used to estimate the slope effects (e.g. the improved transparency effect on unit prices of projects in our case) at various percentage points (quantiles). Hence, this technique enables the exploration of potential differences in the transparency effects among supply contracts with low, medium and high unit costs. As a result, the analysis undoubtedly benefits greatly from quantile regressions. To the best of our knowledge, this is a first attempt to use a quantile regression analysis in the public procurement literature.

The results of the empirical analysis are presented in Table 3.1. The second column reports the estimates for our basic equation using a pooled OLS regression. Columns 3-7 present the results derived from quantile regressions for several percentage points of the entire distribution, that is the low cost procurement projects (i.e. estimates in the 10% and 25% quantiles), the medium cost projects (i.e. for the median, 50%) and the high cost projects (i.e. estimates in the upper quantiles of 75% and 90%).

Table 3.1: Unit cost of public procurement projects in Greece (2002-2013)

Dependent Variable Unit Price (ln)	Pooled OLS	10% quantile	25% quantile	50% quantile	75% quantile	90% quantile
Improved Transparency	-3.47*** (0.54)	-1.79* (0.98)	-3.24*** (0.85)	-5.28*** (1.71)	-3.16*** (0.33)	-3.41*** (1.23)
Competition	-0.97*** (0.12)	-0.03 (0.11)	-0.47*** (0.13)	-0.79*** (0.086)	-0.63*** (0.10)	-0.91*** (0.19)
Location	0.57*** (0.17)	-1.80e-09 (0.09)	0.70*** (0.19)	0.74*** (0.12)	0.30* (0.16)	-0.37 (0.29)
Procedure Type	2.33*** (0.08)	0.33*** (0.12)	1.48*** (0.09)	3.14*** (0.09)	3.58*** (0.11)	3.03*** (0.22)
GDP	-0.55 (0.64)	-1.23** (0.58)	-0.34 (0.81)	0.09 (0.49)	-0.09 (0.50)	-1.67** (0.76)
Constant term	2.65 (2.96)	5.62** (2.77)	0.06 (3.93)	-1.91 (2.39)	0.46 (2.35)	12.58*** 3.26
R ²	0.37					
Adjusted R ²	0.36					
Pseudo R ²		0.01	0.09	0.31	0.40	0.30

Notes: No of observations 2218. *The null hypothesis that each coefficient is equal to zero is rejected at the 10% level of significance. **The null hypothesis that each coefficient is equal to zero is rejected at the 5% level of significance. ***The null hypothesis that each coefficient is equal to zero is rejected at the 1% level of significance.

significance. Standard errors are reported in parentheses. For the quantile regressions we obtained bootstrapped standard errors.

Focusing on the pooled OLS estimates, our basic finding reveals that **improved transparency due to the establishment of SPPA in Greece reduces public procurement unit costs by 3.47 percentage points**. Cost savings have the potential to be even more considerable when the SPPA becomes fully operational. Given that the cost of establishment and operation of SPPA is negligible, the abovementioned benefits can be characterized as net cost savings. It is also worth noting that expected benefits in terms of the improvement of time efficiency in procurement processes have not been considered in our model. The reduction of public procurement cost by 3.47 percentage points is not negligible in terms of GDP, since it corresponds to 0.4 percentage points of GDP. Furthermore, our findings indicate that competition in bidding processes affects negatively the unit price of projects. In other words, the higher the intensity of competition in public procurement processes the lower the unit price of projects. Moreover, the results suggest that location affects positively the unit price of projects. In other words, the winners of bids located in the large urban centres appear to offer higher average prices compared to those located in other Greek regions. This finding may be explained on the grounds of the higher quality ladder of firms operating in the metropolitan areas of Greece that seem to characterize their supply products. Also, we found a strong and positive effect of procedure type on the dependent variable implying unexpectedly that higher average prices are observed mainly in open tenders. However, by looking at the data in more detail (i.e. per public supply contract) we observed that the products under examination in open procedures include very expensive outliers by nature such as equipment for health units. On the other hand, in restricted procedures the products are clearly cheaper per unit since most of them include for example military meals and clothing.

The quantile regressions results provide further insight into the impact of the public procurement reform. In particular, the estimates suggest that improved transparency in procurement processes exercises a negative and significant effect on the unit price of the procurement projects in 25%, 75% and 90% quantiles respectively, ranging from 3.1 p.p. to 3.4 p.p. It is worth noting that this effect becomes stronger for medium cost projects (i.e. 50% quantile) since in this case the cost savings exceed 5.2%. On the other hand, for the lower unit price projects (i.e. 10% quantile), the reduction in public expenditure is found to be smaller, since the corresponding coefficient is less than 2% at the 10% level of significance. Competition appears to have a significant and negative impact in most

quantiles, apart from the lowest quantile (column 3) indicating that the number of bidders does not seem to affect the winning bid in the case of very low cost projects. Finally, the location of bidders and the type of procedure are found to play a significant role as well.

3.4 Summary

Public procurement entails considerable government expenditures in the European Union (EU) since it accounts for almost 16%-20% of EU GDP annually. Improving public procurement is a priority goal on the European agenda. During the recent economic crisis public procurement has received a great attention as a key mechanism that enables significant cost savings particularly in countries where a fiscal adjustment programme is under implementation. Given budgetary constraints in the public sector, policy makers in such countries face a great challenge, namely the implementation of structural reforms, to improve efficiency and transparency in the public procurement system. Improving transparency in public procurement procedure is expected to increase competition among firms, reduce prices and guarantee better quality of public services for citizens. In that context, countries that are under a severe fiscal consolidation process like Greece, are currently struggling to implement public sector reforms in order to achieve cost savings, and improve business efficiency and transparency.

Within the context of the third review of the second adjustment programme for Greece (July 2013), improving the efficiency and transparency of public procurement systems is an on-going process and main concern of the Greek government. The main barriers to the introduction and development of public procurement reforms in Greece, according to the recent report activity of Single Public Procurement Authority (SPPA), refer to the low degree of transparency and competition; the existence of time-consuming procedures; the utilization of old-fashioned purchasing techniques and outdated methods for contract award notices; the corruption in the stages of awarding and contracting, the maintenance of disproportionate administrative burdens and expenditures regarding the participation in public tendering process and the submission of tenders, the lack of standardized processes, the shortages in training and specified skills of human capital.

The establishment and organization of SPPA in Greece in September 2011 was the main public procurement reform expected to have a measurable economic impact in terms of related public expenditures, even though it is at an early-stage of its operation. The SPPA mainly ensures transparency in public procurement processes. Given that the other reforms

(i.e. adoption, development and utilization of e-procurement; centralization of procurement processes; and simplification of the relevant legislative framework) are underway, the only economic impact that can be quantified until now concerns the SPPA reform.

The main objective of the present section is to examine the effect of a major public procurement reform (i.e. the establishment of the SPPA) on government expenditures using data for 2,218 public supply contracts in Greece over the 2002-2013 period. Our results clearly indicate a strong and significant impact of establishing transparent practices in public procurement procedures in terms of cost savings. More particularly, pooled OLS estimates show that **improved transparency reduces procurement cost of the public sector by about 3.5%**. The findings from quantile regressions reveal that the expenditure reduction is greater for medium and high cost projects as compared to projects of lower unit cost. These results indicate that faster implementation of the relevant reforms in the Greek public sector could provide significant benefits that could boost business efficiency. Improving doing business in Greece could be a driver for attracting both FDI and local investments as well, thus supporting an investment-led recovery for the Greek economy.

4. Investment

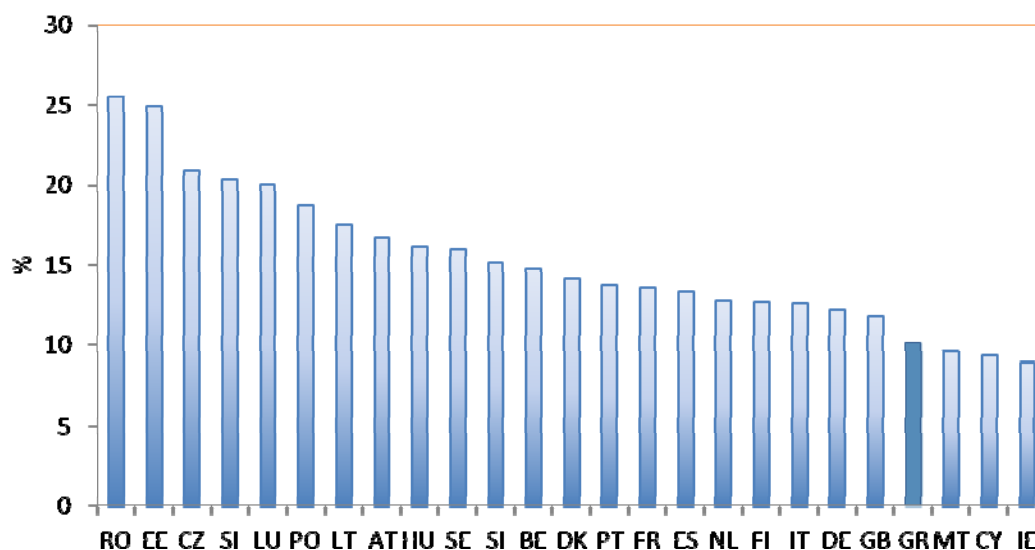
4.1 Regulatory and administrative obstacles to new investment

After 15 years of continuous economic growth (higher almost each year from the European average), since 2008 Greece has been in recession. There now exists a consensus among policy makers that economic recovery is not only a matter of consistent implementation of a fiscal adjustment program but also a matter of systematic and long-standing reform, especially in the area of business environment. Lifting obstacles that prevent entrepreneurial activity in a way that benefits the overall economy must lie at the heart of the reform policy, even if some rent-seeking mechanisms need to be abolished in the process. In this respect, the quality of the investment environment has become an issue of major interest, as it contributes directly to new jobs creation and thus to economic growth.

The economic recovery of Greece is significantly delayed by various structural deficiencies and inadequacies in the functioning of the Greek state. These functional problems are the result of the complex and ineffective structure of central government, the underdeveloped administrative functioning of local governments, as well as of the creation of numerous

public entities. Many reform steps have already been taken in this direction, while others are planned ahead; however, many inadequacies persist.

Figure 4.1 Investments* as %GDP in 2012

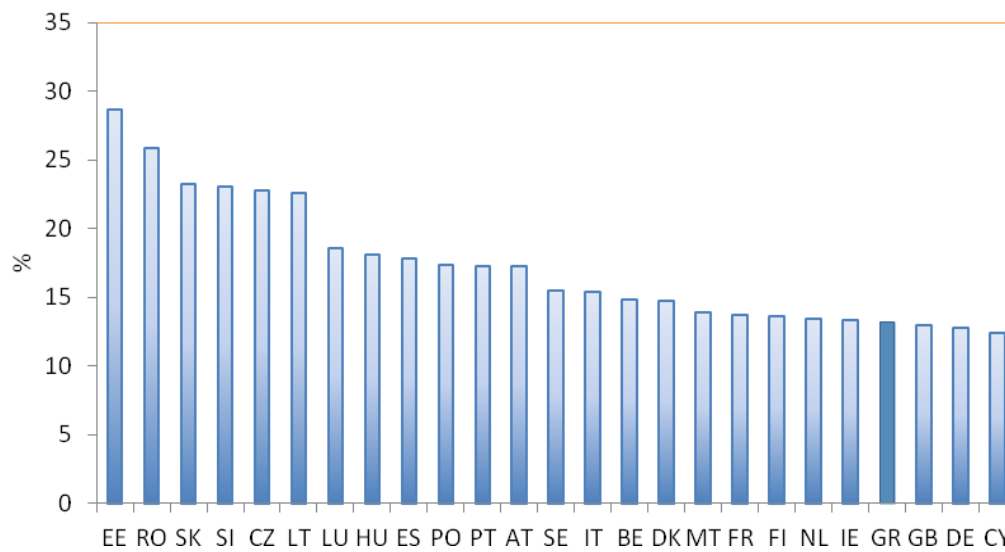


Source: Eurostat, AMECO

*excluding construction of dwellings

The return of the Greek economy to a recovery path after six years of recession necessitates the implementation of all pending structural reforms and the scheduling of all remaining structural changes. As investment, one of the key determinants of the rapid economic growth of the Greek economy prior to the 2010 fiscal crisis, was severely hit by fiscal consolidation and economic recession, emphasis must be laid on the facilitation and support of investment projects, especially those with significant multiplying effects on economic activity and on employment. During 2004-2008 investment (excl. dwellings) in Greece accounted on average for 13% of GDP. It peaked in 2008 (15% of GDP), but due to its steep decline ever since, it has been reduced to 10% of GDP in 2012 (see Figure 4.1 and Figure 4.2).

Figure 4.2 Investments* as %GDP from time period 2004-2008 (average)



Source: Eurostat, AMECO

*excluding construction of dwellings

Taking into account the decisive role that investment can play in restoring economic growth, the Greek Government must take all necessary actions, such as the implementation of structural reform and the revision of the policy framework, with a view of aligning it with international best practices and establishing a business friendly environment.

In each country, non-financial investments are implemented by either domestic enterprises or by foreign investors (Foreign Direct Investment-FDI). The decision to invest is complex as investors take into consideration not only investment-specific criteria (e.g. prospects of the specific sector of activity domestically and on a regional-global scale, intensity of competition, the skills level of the country's labour force, profit margins) but also many other factors that determine the so-called "Investment Environment".

Such factors are:

- a) State activity, such as the provision of core infrastructure (road network, ports-airports, telecommunications, railways, electricity-natural gas network etc.), the appropriateness of the regulatory framework for entrepreneurship (laws, ministerial decisions etc.) and the functioning of public services related to the entrepreneurial activity (tax office, courts, authorities issuing licenses-permits).

- b) Structural characteristics of the economy that are both influenced by state activity and by the activity of the private sector (functioning of the financial system, level of technology absorption, quality of the education system etc.)

While improvements in the second category of factors require long-term planning, improvements in some of the features of the first category, especially on the regulatory framework and on the functioning of public services, can take place relatively quickly, through the implementation of the necessary amendments and restructuring processes. As regards Greece, the factors that affect the investment environment reveal major inadequacies, with existing regulations and procedures creating significant obstacles to investment and entrepreneurial activity more generally. Therefore, the revision of regulations and the implementation of structural reform are of utmost importance in fields such as:

- **Licensing procedures to startup a business**, which are still time consuming and highly costly to investors;
- **Industrial Areas and Business parks**, where many failures and problems are observed in the operation of their facilities;
- **Spatial Planning frameworks**, where major obstacles to investment result from inconsistencies between *Sector* and *Regional Spatial planning frameworks*, as well as from the overlapping of regulations between *Urban Development* and *Land Use*. Also, the full completion of the *National Cadastre* is still pending, which creates significant problems to the implementation of investment projects.

4.2 Impact of reforms in investment

4.2.1 Licensing procedures to start-up a business

Lingering inefficiencies in procedures for starting a business and for acquiring licenses are mainly caused by regulatory rigidities and by the fragmentation of responsibilities among the licensing authorities. Consequently, licensing is both costly and time consuming, deterring investment. In this context, the Greek Government has already amended or abolished such laws and regulations that create barriers to entrepreneurship. However, there are significant delays in the implementation of the relevant legislation, resulting to an inefficient investment climate.

To overcome the investment barriers that arise from multiple and fragmented establishment and operating permits, the Government must adopt a strategy mainly focused on speeding up the investment licensing procedure, introducing, at the same time, more transparency and efficiency in investment licensing. Specifically, to enhance investment the Greek authorities should adopt legislation to comprehensively facilitate the system of investment licenses and permits (operational, environmental, land use and use of public infrastructure licenses) by reducing the number of steps and the time for approval and initiating procedures that are in line with international best practices. In parallel, a tracking system to monitor implementation and ensure accountability of reforms should be established.

A strategic plan has been developed by the Greek Government to create an investment and business friendly environment enhancing economic growth, employment and competitiveness.³ By revising the legal framework related to business procedures as well as amending regulations that impede the licensing to start a business, the authorities planned to achieve the aforementioned desirable results. The plan focused on the facilitation of licensing procedures for new businesses and the abolition of barriers to entrepreneurship. The related actions were implemented in the context of “Fast Track” law, as analyzed below.

In the second quarter of 2010, the Greek authorities set the legal framework for “one-stop-shops”⁴ by reducing the number of steps needed to create a company, which aimed to speed up large investment projects. With the “one stop shop for business start ups” action, the number of steps, days and costs to start a business were reduced significantly. However, so far the “one stop shop” action is relevant only for the establishment of commercial enterprises and not for the manufacturing sector. So, it is imperative to expand this system to all sectors and legal forms of companies.

Complementary to that, the “Fast Track” law⁵ for large investments was adopted in order to accelerate the approval and licensing of strategic investment projects. This law simplifies the procedures for approval of large-scale investment projects and speeds up their licensing. However, an important issue arises from the fact that there is no legislation framework or specific law provisions to facilitate the licensing procedures for smaller scale investments, since very few large investment projects have been implemented in the last years, implying that the contribution of this law to investment activity has been limited.

³ IMF, Greece, Second Review Under the Stand, December 2010

⁴ Law no.3853/2010

⁵ Law no.3894/2010

According to the relevant literature, a reduction of 50% or more in the number of procedures/days/costs leads to an average increase in the number of new firm registrations of 14%, 19% and 30% respectively (Klapper & Love, 2010). These results indicate that only large reforms have a significant effect on new firm registration especially in countries with relatively less favorable business environments. In this context, (Kaplan, Piedra, & Seira, 2011)⁶ found that by reducing the number of administrative procedures and time required to register a firm, new business start-ups increased by about 5% per month in eligible industries, with the biggest part of this effect appearing in the first 15 months after implementation of the reform. Also, according to their estimates the implementation of the reform program resulted in the creation of 4,029 new firms and in a benefit of MXN 35.4 million.

In February 2012, the Greek government adopted a package of reform measures⁷ to improve further the business environment, by adopting "the Business Friendly Greece" law.⁸ It published a plan for a "Business-Friendly Greece" action,⁹ tackling significant restrictions to business activity, investment and innovation not covered elsewhere in previous actions. Particularly, a new legal form of enterprise was introduced, named "Private Company", with minimum initial capital requirement EUR 1. The new type of company has the same characteristics as the "Limited Liability Company", but significantly lower capital is required for its startup. This reform is considered one of the most important up to now for the improvement of the business environment, the facilitation of investment and the boost to employment.

According to the relevant literature, the minimum capital requirement to start a business has proved to significantly impact start-up activity across countries. Several surveys show that minimum capital requirement is one of the major obstacles to entrepreneurship in the so-called "creative industries", implying that it is important for entrepreneurs in these sectors to be able to overcome or avoid bureaucratic burdens in the process of starting a business. However, the minimum capital requirement is an even more significant barrier, because even skilful entrepreneurs cannot overcome it in case they have to get access to

⁶ They estimate the effect on business start-ups of the implementation of a program called "System of Fast Opening of Firms" in Mexican economy

⁷ An amendment of the "Fast Track" law⁷ for large investments was also included in the "Business Friendly Greece" law, creating a more transparent mechanism for the procedures relating to the implementation of strategic investments in Greece. The amended regulations lowered fees, relaxed minimum investment requirements, making thus the framework available to more investment projects.

⁸ Law no.4072/2012

⁹ http://www.mindev.gov.gr/?page_id=6506

assets (Stel, Carree, & Thurik, 2005). Dreher & Gassebner (2007) found that more procedures required starting a business and larger minimal capital requirements are detrimental to entrepreneurship, by robustly reducing the number of entrepreneurs entering the market. Furthermore, the entry rates are significantly lower when stricter administrative regulations are in force, as well as stricter sector specific product market regulations (Scarpetta, Hemmings, Tressel, & Woo, 2002). Fisman & Sarria-Allende, (2004), show that entry regulations reduce significantly the number and growth rate of firms, especially, in Central and Eastern European countries. Moreover, entry barriers and state controls hinder competition amongst incumbents and may reduce opportunities and incentives to catch-up the best-practice technologies in manufacturing industries (Nicoletti & Scarpetta, 2003).

A minimum capital requirement to start a business is in force in all Member states of EA17; however, its level varies across countries and for different types of companies. One major economy outside the Euro area where such a requirement does not exist is that of the United States.

In that context, the Greek government adopted measures to reduce the minimum capital that is required to start a business, as mentioned above, but only for “limited liability” companies. Concerning the role of investment in the Greek economy, it is essential for the authorities to revise the relevant legislation framework with scope to include the remaining types of companies, such as the S.A. companies.

It is also very important that the Greek government pays much more attention to the regulatory framework for entrepreneurship of young people. Stel et al. (2005) suggest that lifting barriers to expansion and the provision of advice and financial support have a much higher positive impact on young businesses than licensing procedures. In that context, EU countries have traditionally favored “support policies”, by providing tax relief to new and small firms.

In the first quarter of 2012, the Greek Government amended legal provisions¹⁰, for companies to publish financial statements and any relevant information electronically, in GEMI. In July 2012, all commercial companies established in Greece were able to publish all relevant company data through GEMI and by the end of 2013 they were supposed to cease to publish their financial statements in newspapers. The publication of financial statements

¹⁰ Consistent with the Law no.4072/2012

through GEMI reduces costs and increases transparency, as these are available to anyone interested. However, the cease of publication in newspapers has not yet been enforced. In addition, the relevant legislation should be extended in order to cover not only “limited liability companies” but also S.A. companies.

Regarding recent developments, the Point of Single Contact (PSC) is fully operational in all sectors and distinguishes between procedures applicable to service providers established in Greece and those applicable to cross-border providers (in particular for the regulated professions), while there is adequate connection between the PSC and other relevant authorities (including one-stop shops, professional associations and the recognition of professional qualifications). However, there are some procedures missing in areas such as the technical professions, for which the legislative framework is currently being revised. The completion of all procedures needed for the recognition of professional qualifications is expected to be completed before the end of the year.

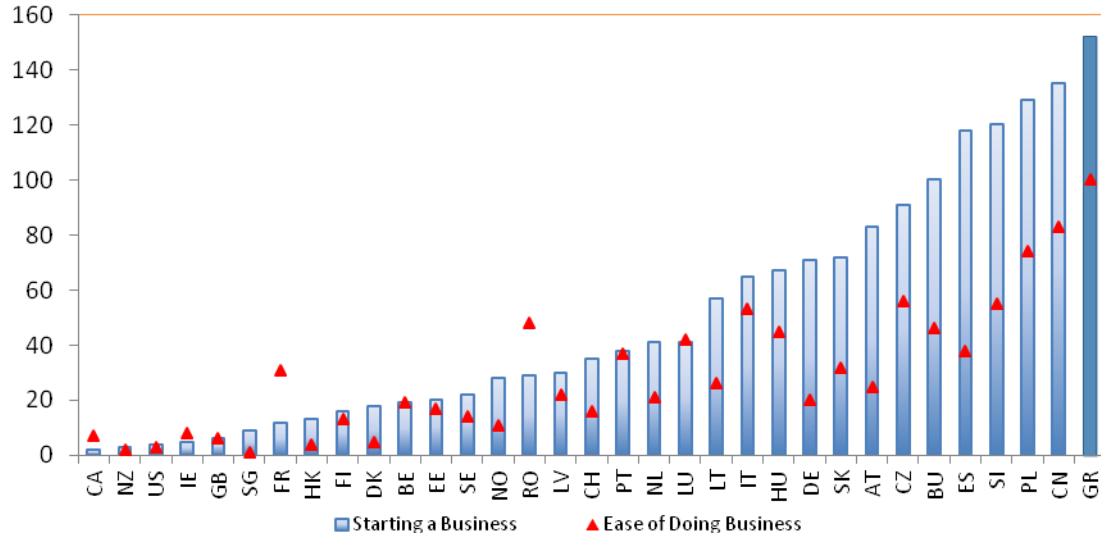
However, there are many inadequacies and problems in licensing procedures caused by the bureaucracy, the complicated legislation framework as well as the lack of technological advances and of specialized civil servants. In addition, too many public entities are still involved with the issuing of licenses, which results to the fragmentation of responsibilities among authorities, causing confusion to investors and complicating procedures. The Greek state should adopt a single national strategy to create a stable environment for investment, without interferences and bureaucratic impediments, in order to enhance economic development.

The relevant literature shows that administrative and regulatory barriers have negative impact on firm entry (De Soto, 1989), (Desai, Gompers, & Lerner, 2003) and especially on the entry of small-and medium-sized firms (Scarpetta et al., 2002), even in industries that usually have a high entry rate (Klapper, Laeven, & Rajan, 2006). Barriers to entry for new businesses also have a negative impact on competition, since the number of firms is limited and there is less availability of products and services (Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2002). A good investment climate (which is defined by the extent of administrative and regulatory barriers) has a positive effect on factor rewards, that is, on wages and profit rates. Less administrative and regulatory barriers imply greater competition in markets and greater factor productivity, which in turn means greater factor rewards under fairly general (product market) conditions (Dollar, Hallward-Driemeier, & Mengistae, 2005).

To address these problems, the Greek government updated the relevant legislation in 2012, by amending already existing laws and simplifying the procedures of environmental licensing. Law no.4014/2012 reduced the number and shortened procedures to complete studies on the environmental impact of investment for the acquisition of environmental permits. As a consequence, the average duration of approval procedures will gradually converge to EU levels. In addition, the range of projects subject to environmental licensing was reduced. Nonetheless, almost two years later, secondary legislation remains pending, resulting to the inefficiency of environmental licensing procedures with negative impact on investment.

Overall, the existing licensing framework can be characterized as introvert and inefficient, as it contains overlapping and contradictory regulations, while there are many cases that are subject to incoherent licensing provisions. The restrictions imposed mainly by the relevant legislation are obsolete and inconsistent with international standards, resulting in an inefficient policy framework that discourages investment. As a consequence of these policy failures regarding licensing procedures and, generally, the ease of doing business, in 2008, Greece ranks 100th among 185 countries with respect to the ease of doing business index (see Figure 4.3).

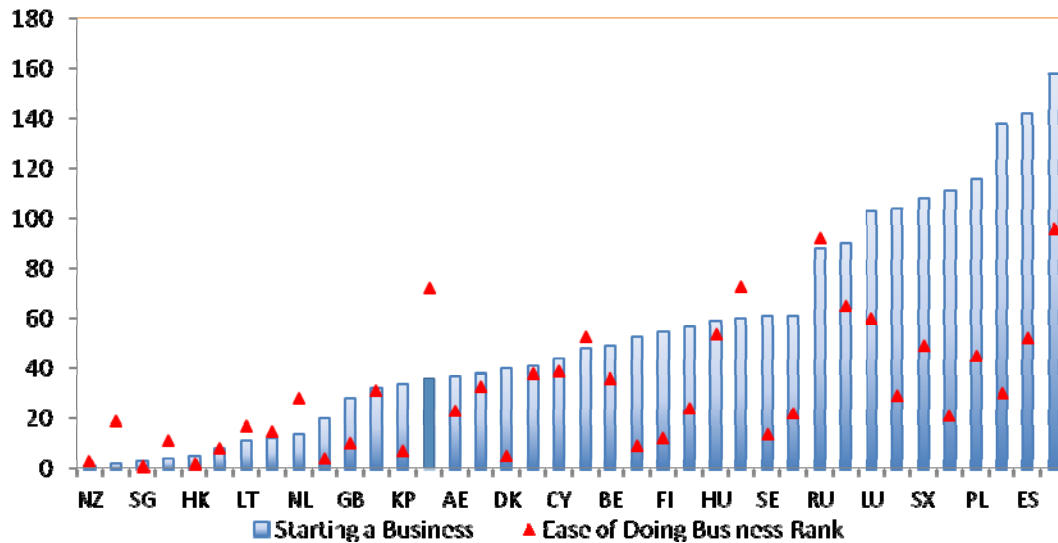
Figure 4.3 Ranking Economies in 2008



Source: World Bank, from www.doingbusiness.org

According to the country ranking of the World Bank Doing Business report, in 2013 Greece ranked 36th among 185 countries with respect to the ease of starting a business (see Figure 4.4). Five steps are required for the establishment of a new company, with associated costs amounting to 4.6% of income per capita. Klapper, Laeven, & Rajan (2004) show that high costs of entry reduce the entry of firms significantly, while Ciccone & Papaioannou (2007) show that state requirements on starting a business reduce entry especially in industries experiencing expansionary global demand and technology shifts.

Figure 4.4 Ranking Economies in 2013



Source: World Bank, from www.doingbusiness.org

So

Djankov et al. (2002) find that restrictive regulations for new investment projects are associated with higher corruption, but not higher quality of public and private goods. Beck & Maher (1986) and Lien (1986) proposed that inefficient regulations constitute an impediment to investment that can be overcome by bribing bureaucrats, leading to corruption issues. Desai et al. (2003) show that new business rates are not significantly affected by corruption in the Euro Area, but corruption significantly reduces implementation of investment in Central and Eastern European countries. Ovaka & Sobel (2001) found that corruption significantly reduces the number of new investment projects, while it can increase the speed with which bureaucrats issue permits (Méon & Sekkat, 2005) leading to “efficiency” but resulting to negative impact on growth (illegal income, low quality of products/services). Therefore, stricter capital requirements reduce entrepreneurial activity and, at the same time, increase the incidence of corruption.

The reduction of obstacles that impede new investment could potentially benefit countries. However, many regulations cannot simply be removed, as they often serve important and legitimate domestic objectives like product safety and environmental protection. However, such costs may be reduced through partial regulatory convergence among countries and recognition of different standards in each country.

Bruhn (2008)¹¹ shows that a reform increased the number of registered businesses by 5 percent in the corresponding industries, thus lending further support to the finding that simpler procedures lead to higher entry rates, while the employment in the specific industries increased by 2.8% after the reform.

Branstetter, Lima, Taylor, & Venâncio (2010)¹² establish a policy framework that reduces the time required for legal incorporation and also reduces monetary fees, concluding that if the costs and days for establishing a new firm were reduced by 50% or more, the number of new firms increased about 17%, mostly among firms that would have been most deterred by burdensome regulations, such as small firms in low-tech sectors.

Based on all these results from the literature on the effect of licensing procedures and/or their reform on investment and on entrepreneurship, the Greek authorities should revise

¹¹ The survey focuses on the effect of business registration regulation on economic activity using micro-panel data from the Mexican employment survey.

¹² using data set for 227.000 firms in Portuguese Economy for the period 2000-2008, evaluated the impact of entry deregulation. In 2005 Portugal implemented the “On the Spot Firm” program which established “one-stop-shops” that offered prospective entrepreneurs significantly reduced administrative fees, and simplified incorporation procedures.

the legislation framework and align it with international experience, aiming mainly at the simplification of licensing procedures (see Table 4.1). Furthermore, to facilitate and accelerate the licensing process, the codification and harmonization of regulations related to strategic investment plans are imperative.

Table 4.1 Facilitations for startup a business

Country	Are procedures online?	Is there an one-stop shop?	Is there a single window that links some of the relevant government agencies?
Austria	yes	no	yes
Belgium	yes	yes	no
Czech Republic	yes	no	no
Denmark	yes	yes	yes
Estonia	yes	yes	no
Finland	yes	yes	no
France	yes	yes	yes
Germany	yes	no	yes
Greece	yes	no	no
Hungary	yes	yes	yes
Italy	yes	yes	no
Netherlands	yes	no	yes
Poland	yes	yes	yes
Portugal	yes	yes	yes
Slovakia	yes	yes	no
Slovenia	yes	yes	no
Spain	yes	yes	no
Sweden	yes	yes	yes
Switzerland	yes	yes	yes
United Kingdom	yes	yes	no

Source: www.doingbusiness.org

Concerning the organization of public administration, many inadequacies arise from the deficient training of civil servants. Specifically, there is not an integrated training system for staff providing them with updated information and preparing them for potential upcoming changes in the institutional framework related to licenses (operational, establishment of industrial facilities, environmental). So, it is necessary to better organize staff training in the public sector in order to improve the skills of civil servants and provide them with relevant knowledge.

The Greek Government should also adopt a general strategy in order to achieve an efficient distribution of responsibilities and authorization among agencies involved with licensing procedures. The main scope of this strategy is to optimize the function of authorities and thereby to simplify the licensing procedure, in order to create a business friendly environment. This reform can be also implemented by creating a network of single-contact points providing services to investors, such as information and documents needed for acquiring a license.

In that context, it is also necessary for the Greek state to enforce cooperation among authorities, by creating a network for information diffusion and configuration of common practices between departments and executives of public administration involved in the licensing process.

In order to improve and facilitate licensing procedures, the Greek authorities should establish an independent committee to monitor and measure the efficiency of the system. This committee should not only focus on the process of starting businesses, but should also aim at identifying and removing obstacles that a business may encounter in its operation. This would entail strong cooperation between public authorities and the business community, in order to share knowledge and experience and to identify obstacles, thus promoting efficiency and the adoption of rational solutions.

So, concerning the aforementioned structural reforms, we conclude with the following:

- Implementation of an environmental licensing framework that contributes to the facilitation of licensing procedures
- Extension of use of the GEMI platform to manufacturing companies, contributing to ease of doing business

- Creation of a network of single-contact points providing services to investors, such as information and documents needed for acquiring a license, in order to avoid the fragmentation of responsibilities among authorities
- Integrated training system for civil servants providing them with updated information related to licensing procedures as well as technological advancements
- Cooperation among authorities, by creating a network for information diffusion and configuration of common practices among departments and executives of public administration involved in the licensing process.

It is essential that reform of the licensing system should focus not only on administrative burdens and legislation regulations but also on financial obstacles (such as opportunity, administrative and financial costs) that arise from the legislation framework and business environment. The Greek economy needs not only the identification of policy failures but also an implementation mechanism of licensing reforms.

4.2.2 Industrial Areas and Business Parks

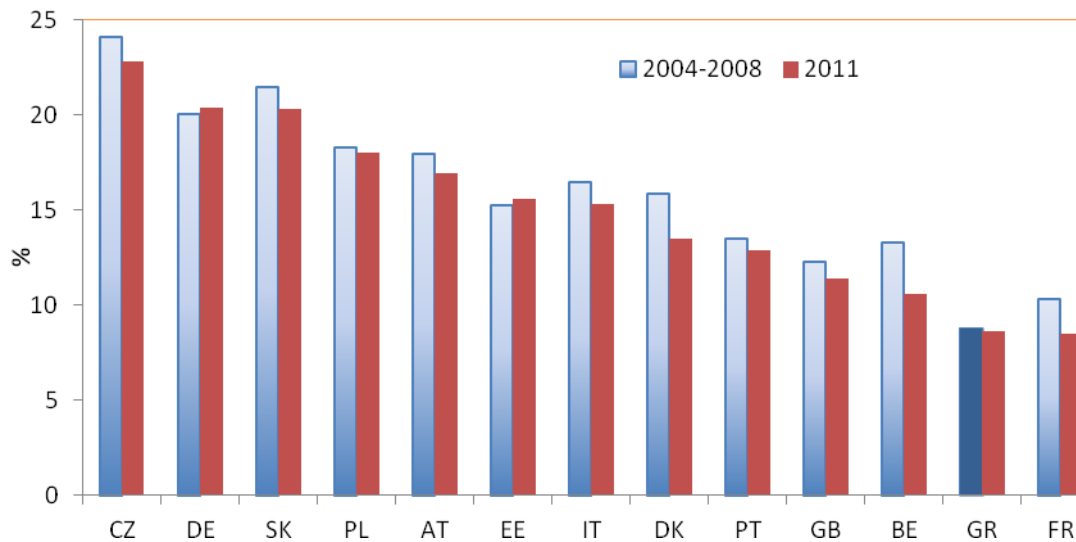
Another important area of policy failures is the lack of efficient industrial areas and modern business parks. Many failures and problems are observed in the operation of facilities in certain industrial areas because during the planning and construction process some important issues, such as the protection of the environment, efficiency of facilities and services, have not been considered. It is important to mention that integrated facilities and a wide range of services are observed only in specific Industrial Areas, especially in the larger, while in others, even if there are facilities, they are not operative.

Box 4.1. Industrial Areas in Greece

In Greece, there are 31 industrial areas in 8 regions, three of which are not in operation, according to the relevant authority. In 2007, the industrial areas occupy a surface of 45,000 acres with 2,500 established firms with 40,000 workers.

Industrial areas can attract foreign investment, enhancing local economies and decreasing unemployment by creating new jobs. Thus, industrial areas can be one of the most significant factors supporting economic development (see Figure 4.5).

Figure 4.5. GVA industry* in total activities

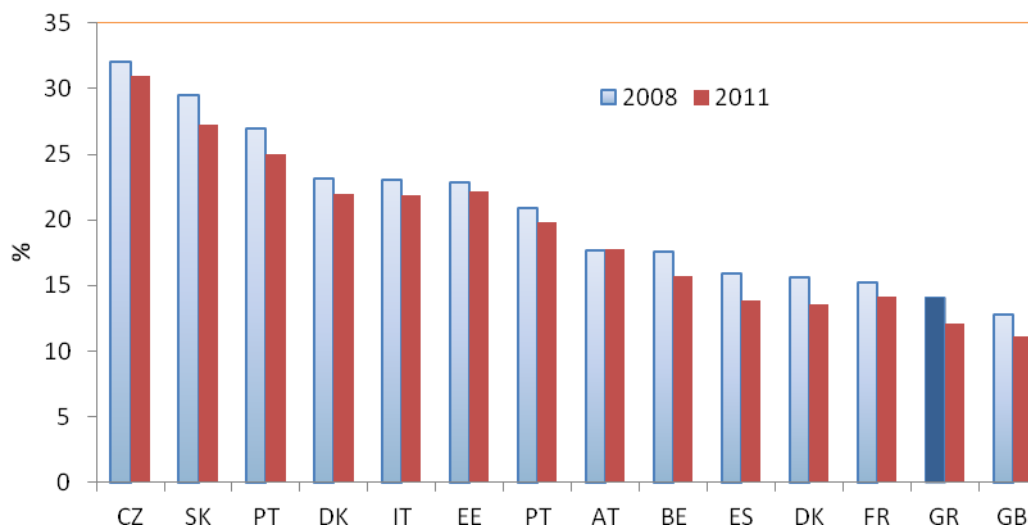


Source: Eurostat

*mining and quarrying, manufacturing

In addition, assessing the role of the industry sector in employment, we suggest that there is strong need for new industrial investment to regions where unemployment rates, especially among the young, are very high and there are pronounced signs of economic recession (see Figure 4.6).

Figure 4.6 % employment in industry



Source: Eurostat

*mining and quarrying, manufacturing

It is essential that the Greek agencies evaluate industrial areas in terms of their location and examine to what extent facilities are consistent with the current requirements industry. These actions (upgrading facilities, closure of outdated facilities, establishment of new facilities, renewal of equipment) should be implemented immediately and in accordance

with international standards. According to the relevant literature, the main issues on industrial areas are the following:

1. **Land and location.** Lack of available or poorly located land can have a negative impact on business environment, but the efficient use of infrastructure and appropriate facilities affect positively the business environment as well as the surrounding areas.
2. **Development opportunities.** Rigidities and restrictive regulations are inefficient and can adversely affect economic development.
3. **Environmental effects.** Business and industrial activities may affect negatively the business area and the surrounding areas including noise, pollution, traffic, thus the industrial areas should be ruled by environmental provisions.
4. **Retailing.** The location and the transportation of retail activities in industrial areas are important issues, resulting to adverse effects on traffic safety.

The Greek authorities should adopt a specific strategic plan to develop efficient industrial areas and to create the conditions for a business friendly environment aligning their strategy with practices of other Member States (see **Error! Not a valid bookmark self-reference.** and **Error! Not a valid bookmark self-reference.**).

Box 4.2 The case of Germany – Industrial Areas

In Germany, the first industrial area was established in 1963. An important impact of industrial areas is that they create conditions for the development of small and medium size companies and their cooperation with foreign companies, thus contributing to the creation of a competitive and dynamic knowledge-oriented economy. The German economy is thus expected to retain a powerful industrial component that is estimated to contribute well above 30% of German GDP.

Industrial areas should attract new businesses by providing them with full access to water supply, sewage, gas, roads, electricity infrastructure, as well as networks and telephony services. In addition, the establishment in Industrial Area offers many technical and business advantages to the investor, such as immediate installation of facilities with reduced bureaucratic requirements and preferential subsidy according to the Investment Law¹³ and

¹³ Law no.4146/2013

EU actions. An industrial area is based on a philosophy of integration of relatively different functions (production, services, education, products) into an industrial area. Thus, an important advantage of industrial areas and business parks is that businesses and industries, regardless of their specific field of activity, can be set up in areas that will enable them to cover a wide range of needs in terms of function and distribution of their products, the development of potential business partners and selected clientele, and development of business clusters. The efficient planning of industrial areas and business parks promotes local development and the decentralization of cities, enhances the protection of the natural environment, and finally, the attraction of new investment.

The improvement of operations in industrial areas and business parks near roads, ports and railway stations could be an important factor in attracting new investments across sectors, as the transportation of products would be facilitated considerably.

Therefore, the reinforcement of entrepreneurship can be achieved through the upgrading of industrial and business areas, especially in regions with sluggish economic development, emphasizing the comparative advantages of these areas and local characteristics. Aligning the policy framework with other Member States and international experience would be an important step towards the creation of efficient industrial areas.

Box 4.3 The case of Great Britain –Industrial Areas

In Great Britain, industrial areas were first founded in 1930. There were 46 industrial areas in 1960. Nowadays they are varied both in terms of character and size, ranging from areas with little or no equipment to huge areas equipped with technical and social infrastructure. In Britain law provisions were introduced which regulate the location of industries, directing them towards regions with high unemployment.

The evaluation, as well as the reconstruction of industrial areas, will attract new investment, enhance entrepreneurship and reinforce local economic development. In that case, investors will have a full picture about the location for establishing new businesses, the facilities that can be built, as well as the required permissions and evaluation studies necessary for the implementation of the investment. Also, the revision of the planning will facilitate the granting of environmental and building permissions for industrial activities and

relevant buildings/infrastructures, as well as the granting of the operation licenses for manufacturing companies.

Best practices from other Member States could provide lessons for the Greek authorities on the development and utilization of business parks/industrial areas. Moreover, business parks may be an attractive solution to licensing problems, by directing investment toward areas where the main environmental and planning conditions for investment are cleared in advance.

To conclude, the necessary reforms concerning Industrial areas are the following:

- Evaluation of industrial areas in terms of their location, facilities and infrastructure, since there are industrial areas that are not in operation, or face difficulties related to facilities, equipment and services.
- Reconstruction of existing industrial areas, if the facilities are consistent, in some degree, with the current requirements of the industrial sector, which mainly focuses on the upgrading of facilities, closure of outdated facilities, establishment of new facilities, renewal of equipment

4.2.3 Other policy failures relevant to investment

4.2.3.1 Spatial planning frameworks

It is important to notice that there are many different factors that influence investment. One such factor with negative impact on investment in Greece is the inadequacies and regulatory rigidities that are caused by incoherent and outdated spatial planning frameworks. In the following section, we identify some obstacles to investment arising from such problems and then propose reforms to be implemented.

The Draft Presidential Decree "Categories and content of land use", which was published in late 2011 is an important step towards reforming the urban planning in the country, since the existing institutional framework for land use is incomplete and anachronistic in the context of cities and country development. However, the new Presidential Decree of 2011, even if it has been almost 3 years since public consultation, has not been implemented yet. As a result, urban planning and land use categories are still determined under the provision of the Presidential Decree of 1987. The immediate implementation of the new Presidential Decree is important, as in the last 26 years there have been significant changes both in land

use and urban planning, as well as in the features and requirements of society. Also, urban areas have changed and new challenges have surfaced.

A general problem of the current legislative framework for land use is the limited registration and classification of building sites, as well as the lack of forest area maps. Ambiguities, which are created, and the lack of appropriate planning regulations which clearly define the allowable building areas and building requirements, as well as contradictory rules of real estate development, are major obstacles to fostering entrepreneurship and therefore to sustainable and green development. Additionally, there are bureaucratic problems and entanglement phenomena due to the huge delays of granting the construction permits¹⁴, and of planning permission procedures from the relevant public authorities. These inadequacies probably arise from the lack of detailed and rational spatial planning frameworks that weaken entrepreneurship and decelerate economic growth.

Suzuki (2010) studies the role of land use regulation as a barrier to entry in the case of the lodging industry. According to the results, the change in the stringency of land use regulation from the sample first quartile level to the sample third quartile level increases the level of the market specific operating cost by 5.4% and that of sunk-entry cost by 24%, respectively. As a result, the revenue-per-room, a proxy for the price, increases by 12%. It is imperative for Greek agencies to accelerate the procedures by redefining the land use categories and revising the relevant provisions.

The Draft Presidential Decree "Categories and Content land use" 2011 attempts an essential and necessary restructure of the existing land use framework and the direct alignment with modern economic features. By creating an efficient urban planning and coherent regulations, the Greek authorities simplify the procedures for investments and infrastructure projects, leading to a business friendly environment.

Furthermore, many obstacles to investments caused by the inconsistency between Regional spatial planning and the Sector spatial planning frameworks. Regulations in Sector spatial planning cannot be implemented due to their contradiction with the Regional planning provisions. Regional Frameworks for Spatial Planning and Sustainable Development were first established in 2003 and include studies which identify and assess the location of regions at international and European level, as well as their contribution to economic and environmental development in comparison with other regions. On the other hand, the

¹⁴ See section 4.2.1

Sector Frameworks for Spatial Planning and Sustainable Development¹⁵ were established in 2009 and are sets of texts or diagrams which specify the directions of the General Framework for Spatial Planning and Sustainable Development, relating to the development and organization of the national territory to the activity of specific sectors of the economy. The main purpose of the Regional frameworks is to identify the key priorities and a strategy for an integrated and sustainable development of an area -considering the local characteristics-, which will promote the equal integration, and development at international, European and national level.

The inadequacies and problems in the field of spatial planning remain strong. They are mainly caused by i) the delay in completion of the review of the 12 Regional Spatial Plans, compatible with the four Sector Spatial Plans, ii) the ambiguities in land use development, and iii) the lack of appropriate planning regulations to clearly define the allowable building areas, building terms and other development rules of property. In many cases, contradictory instructions and overlapping regulations between regional planning and sector planning are huge obstacles to entrepreneurship, since the complicated procedures to grant a permit for investment cause confusion, thus deterring the economic development of the region.

The integration of Regional Spatial Planning is an important step for the effective distribution and organization of local infrastructures, the implementation of investment projects, and the consideration of new challenges to the economic environment and the protection of the environment. Particularly, the institutional changes and the structural reforms that have been imposed recently, at national and European levels, highlight the need to revise Regional spatial planning, since it has been ten years since the adoption of the first Regional spatial planning framework.

Consequently, it is imperative for Greek authorities to revise the Regional spatial planning frameworks by evaluating incoherent and time-inconsistent regulations and, moreover, by aligning them with the regulations imposed by the General spatial planning, the Sectors spatial planning and the Land use provisions. The revision and the immediate implementation of these frameworks will contribute significantly to economic development,

¹⁵ Sector Frameworks for Spatial Planning and Sustainable Development for the Industry and strategic environmental assessment of this.

Sector Frameworks for Spatial Planning and Sustainable Development for Tourism and strategic environmental assessment of this.

Sector Frameworks for Spatial Planning and Sustainable Development for Aquaculture

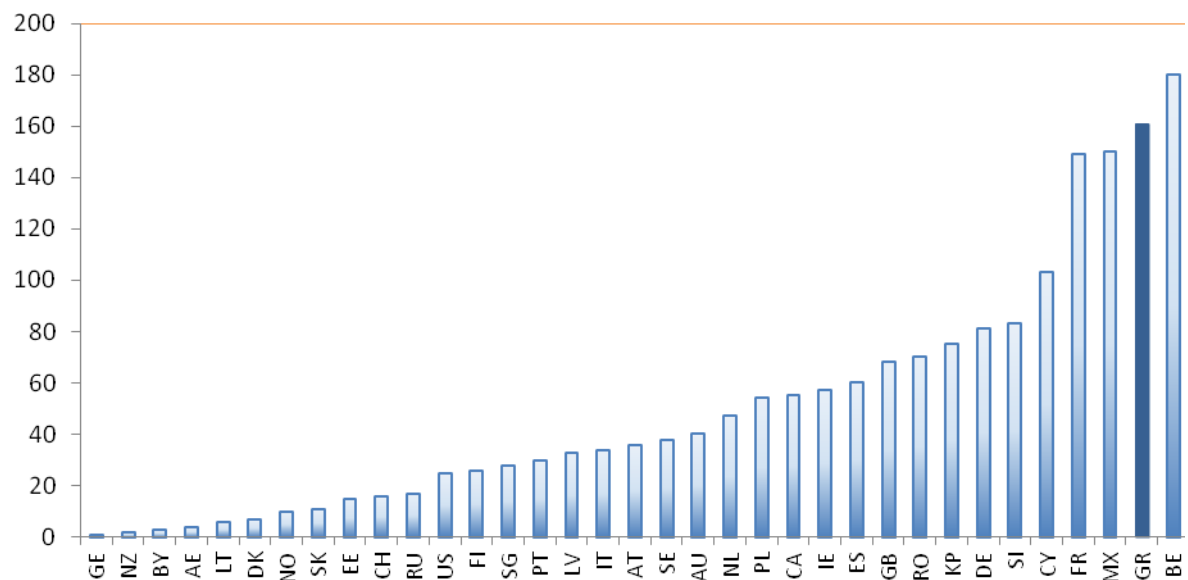
Sector Frameworks for Spatial Planning and Sustainable Development for Renewables and strategic environmental assessment of this.

since land planning procedures will be more convenient and immediate, facilitating the implementation of investment. The implementation and revision of the spatial planning framework should be integrated aligning it with international experience and best practices.

Finally, the primary goal for the Greek authorities is to achieve the completion of the National Cadastre, as it is a major prerequisite to enhance investment and economic growth. The Greek government must strive to complete the planned projects and attain 100% geographical coverage, in order to achieve full completion of property register covering all land and buildings in Greece. The completion of the National Cadastre is essential to provide the legal certainty needed to open up the real estate market to new investment, including foreign direct investment. The international experience and best practices from other Member States can be viewed as lessons including a number of activities that contribute to immediate and successful completion of National Cadastre.

Greece ranks 150th in property registry procedures, while the country with the most efficient procedures is Lithuania (see Figure 4.7). Overall, the countries of Northern Europe seem to be more efficient in land registry procedures¹⁶ (see Appendix).

Figure 4.7 Ranking economies 2013– registering property



Source: World Bank, from www.doingbusiness.org

The National Cadastre and generally the Land registry are essential for economic development, thus in most countries it has been established over 100 years¹⁷ ago. However,

¹⁶ However, we have to mention that the lower positions of France and Germany, even if they have developed an efficient land registry, can be explained from the number of steps to register a land parcel, and not from the complication of procedures. In Greece, the problems arise from complicated and incoherent urban and land planning provisions.

in Greece the National Cadastre has not been completed across the country but only in certain regions.

The role of the National Cadastre is crucial for investments, since the land registry as well as the land ownership and description of properties are the initial steps for the implementation of investment projects. The existence of the National Cadastre facilitates licensing processes related to real estate and constructions, and accelerates the implementation of investments, by improving investors' confidence, while limiting bureaucratic obstacles.

To conclude, the reforms should be the following:

- Revision of spatial planning frameworks, focusing on the harmonization among regulations and rules imposed on Regional and Sector spatial planning frameworks;
- Immediate implementation of Draft Presidential Decree of Land use of 2011, which contributes significantly to the facilitation of construction permits;
- Completion of the National Cadastre, which provides the legal certainty needed to open up the real estate market to new investments, including foreign direct investment.

4.3 Quantification of the impact of reforms on investment

Data set description

The purpose of this study is to assess the likely benefits from removing specific barriers in the field of business investment. To do this we collected data for 25 countries of the European Union¹⁷ and Switzerland for the period 2005-2011. Due to the lack of observations for some variables, in some countries, this resulted in an unbalanced panel data set. We chose to limit our interest to European Union countries due to the proximity of our economy to them and the necessity for adaptation of our business environment to that of other advanced (in terms of business environment) European economies. Data were collected from two sources, namely Eurostat and World Bank's "Doing Business" data bases. Eurostat provided us with data on business investment improvement whereas "Doing Business" data base provides objective measures of business regulations for firms.

¹⁷ For example, France, Belgium, Italy as well as U.S. and Canada acquired Land registry in 19th century

¹⁸ No available data for Bulgaria, Croatia and Malta.

We should mention that the choice of models and variables was driven mainly by the scope of better representing the benefits from lifting barriers to investment, but we also took into account econometric and data availability issues.

As far as the choice of variables is concerned, the dependent variable of our model, Y_{it} , is the business investment in country i in year t as percentage of GDP of country i in year t . Business investment includes investment both in the non-financial and financial sector with the scope of producing goods and services. We chose this as a dependent variable because it focuses only on investment in the business sector and does not take into account investment in dwellings which is made mainly from households for the purpose of acquiring permanent, privately owned residence. We consider investments in dwellings outside the scope of this study, as this exercise refers to business environment reforms, while investment in dwellings is affected by factors such as household's income, with little, if any, influence from the regulation of business practices. We divided business investment with GDP in order to normalize the data series and make the data on different countries comparable.

The vector of independent variables X_{it} includes variables (for a country i in year t) that give us information:

- i) on the cost (in terms of share capital) to set up a business and
- ii) on the cost (in terms of time and money) of getting a construction permit for building a warehouse, a factory or other similar structure.

We also considered a number of other business environment variables related to investment such as variables describing tax, trading and getting electricity regime. These variables are not included in the final model due to their inferior econometric performance—they were either strongly correlated with other independent variables, generating multicollinearity, or statistically insignificant. In this respect the variables used in this exercise are the following:

- **days2**, that is, the total number of days required to have a construction permit, build the facility (warehouse, factory or other similar structure e.tc.), inspect it from the urban planning authorities and start using it. The measure captures the median duration that is necessary to complete this procedure in practice. We include this in explanatory variables because for a businessman the time needed to build and start

using the appropriate business facility is one of the most important components of the business risk he undertakes. The delay caused by the immoderate bureaucracy in urban planning agencies has negative economic impact in the business dexterity. This implies that we expect from the estimations that this variable will have a negative coefficient.

- **cost2**, that is, the cost of getting a construction permit for a warehouse, a factory or other similar structure, which includes only official costs and is recorded as a percentage of the economy's income per capita. We include this variable in our estimations because excessive cost of getting a construction permit discourages potential investors to undertake business risk. We also expect that this variable will have a negative coefficient.
- **mincap**, that is, the amount that the entrepreneur needs to deposit as share capital to start a business and is recorded as a percentage of the economy's income per capita. The higher the initial share capital needed to start a business the lower the incentive for a businessman to start a business. Thus, we expect a negative coefficient for this variable too.
- **gdp**, that is, the annual percentage change of each country's gross domestic product in constant prices. We use this as a control variable in our estimations because business environment indicators, that is, x_{it}^f are cyclically sensitive.
- **yr***, which are year dummies.

From the above definitions it turns out that the coefficients produced from the estimations are slopes (we use nominal values of the variables) and not elasticities (log values of variables). We follow this approach because it is more convenient for the interpretation of the econometric estimations. Thus, we only have to be careful with the interpretation of the results.

Estimations Results

Because our sample consists of (unbalanced), panel data unobserved heterogeneity can be controlled (Baltagi, 1995). The standard methods of panel estimation are **Fixed Effects-where V_i is correlated with regressors X_{it} -or Random Effects-where V_i is uncorrelated with regressors X_{it}** (see Appendix for models description). In the Fixed Effects case, coefficients are calculated from differences within each country over time, whereas in the

Random-Effects case estimates are more efficient, since they incorporate information across countries as well as across periods. According to Arellano and Bover (1990), panel data is useful for this type of research because it allows for firm (country in our case) heterogeneity and reduces collinearity among the variables.

A second alternative method we employ is a **dynamic panel data regression model via the Arellano-Bond estimator** (Arellano and Bond, 1991) (see Appendix for model description). Before explaining estimation results, Table 4.2 below presents summary statistics of the data set used.

Table 4.2: Summary Statistics

	Observations	Average	Median	Standard Deviation	Min	Max
bigdp	171	12.74	12.32	3.84	4.53	24.43
cost2	171	70.39	62.30	51.66	3.40	332.60
days2	171	191.89	184.00	94.69	38.00	677.00
mincap	171	29.14	22.20	34.33	0.00	220.10
gdp	171	1.70	2.17	4.51	-17.73	11.15

Concerning the estimations results, which are presented in Table 4.4, a first general comment is that coefficients are usually stable across model specifications in terms of size, sign and significance. We should also mention that the estimated relationships are not “causal”, but establish empirically regular associations.

More analytically, the first two alternative models, that is, panel data regression models with Fixed and Random Effects assumptions give the same results in terms of the sign of the coefficients we are interested in and of their significance level. Also, the values of the coefficients are similar. The question that arises here is what model specification we should use. The answer to this question is given by the Hausman’s Specification Test. The result of this test [$\chi^2(9)=2.71$ and $\text{Prob}>\chi^2=0.9746$ -Table 4.4] clearly indicates that Random Effects Model more adequately models the relation between Y_{it} and X_{it} ’s. Despite the results of Hausman’s Specification Test, Random Effects Model is a more efficient approximation because it gives more degrees of freedom. Also, although it’s overall R^2 (goodness of fit of model in data) has a low value of 0.252 (due to the use of panel data), it is better than the corresponding overall R^2 in Fixed Effects case (0.167).

Before interpreting the results of Random Effects Model, the Wald Test [$\chi^2(10)=243.83$ and $\text{Prob}>\chi^2=0.000$] rejects null hypothesis that coefficients of X_{it} 's are jointly equal to zero, that is, our model produces statistically significant results.

From the estimations we can see that **cost2** coefficient has a negative sign-as expected-and this result is statistically significant at 10% level (90% confidence interval). The negative sign means that a reduction in the cost of getting a construction permit by one percentage point (for example from 6% to 5%) increases the ratio of business investment to GDP by 0.006 percentage points. *Bearing in mind that Greek GDP (in current prices) stood at EUR 183.5 billion, this translates into an increase of investments by EUR 11 million¹⁹.*

The coefficient of **days2** variable has-as expected-a negative sign and this result is statistically significant at 5% level (95% confidence interval). The negative sign means that if we reduce the total number of days required to get a construction permit by one day (for example from 13 to 12 days), the ratio of business investments to GDP will be increased by approximately 0.007 percentage points. *Bearing in mind that Greek GDP (in current prices) stood at EUR 183.5 billion, this translates into an increase of investments by EUR 12.9 million.*

The coefficient of **mincap** variable has negative sign and this result is also statistically significant at 5% level (95% confidence interval). The negative sign means that if we reduce the minimum capital share required starting a business by one percentage point (for example from 10% to 9%), the ratio of business investments to GDP will be increased by approximately 0.011 percentage points. *Bearing in mind that Greek GDP (in current prices) stood at EUR 183.5 billion, this translates into an increase of investments by EUR 20.2 million.*

In order to check the consistency of our results we made additional estimations using different econometric approximations that avoid econometric problems such as heteroskedasticity, endogeneity e.tc. As a first step in this direction, we re-estimate Random Effects Model in clusters of different countries, a procedure that attempts to determine the natural groupings (or clusters) of available observations, takes into consideration heteroskedasticity and produces more robust standard errors. From Random Effects GLS regression analysis, we can see that although coefficients of our interest are similar in terms

¹⁹ We derive this result as follows: Change in investments=(Coefficient/100)*Change in independent variable*GDP₂₀₁₃. The same logic is followed for the results presented below.

of signs and values, they differ in terms of statistical importance. In this case, only the **days2** coefficient is statistically significant at 5% level and has the same value as in Random Effects case without the cluster option.

In addition, we used Arellano-Bond dynamic panel data approximation (final two columns of Table 8.3 in the Appendix) that also produces consistent estimates because it takes into consideration endogeneity problems due to its structure. More analytically, this model is estimated using the Generalized Method of Moments (GMM) technique, which is considered the most appropriate estimating method when using data sets that involve a large number of countries (26 in our case) observed over a relatively small number of time periods (7 here). The basic advantages of this method refer to controlling for unobserved individual effects and also for potential endogeneity problems. Another advantage of GMM is that it enables the estimation of autoregressive models, analyzing thus the examined equation in a dynamic context using lag values of the dependent and independent variables as instruments. In this respect, we use a two period lag of the dependent variable and independent variables as instruments because we have better performance in terms of the post estimation tests we used to check **i)** for autocorrelation in the first differenced errors and **ii)** the validity of instruments we have used.

Going now to the estimation results (Table 4.4), the Wald Test [$\chi^2(12)=995.88$ and $\text{Prob}>\chi^2=0.000$] rejects null hypothesis that coefficients of X_{it} 's are jointly equal to zero, so the model produces statistically significant results. Also, from the result of the Arellano-Bond Test we accept the null hypothesis of no second order autocorrelation in residuals [$M_2: z=1.45$ and $\text{Prob}>z=0.1485$] meaning that there is no second order serial correlation in the first difference residuals and errors in our model are not serially correlated. Finally, from the results of Sargan Test we conclude that the instruments used are valid.

In terms of coefficients, we can see that in **mincap** variable the coefficient has the correct sign but in this estimation is no more statistically significant at conventional level (only 73.8% confidence interval). But in the other two variables, namely **cost2** and **days2**, the statistical significance of the coefficients is improved because in both cases the confidence interval has been increased to 99%. In the "cost2" case, *if we reduce the cost of getting a construction permit by one percentage point, investments will be increased by 0.005 percentage points of GDP, i.e. by approximately EUR 9.2 million in terms of the 2013 level of GDP (in current prices)*. In "days2" case, *if we reduce by one day the days required to get a*

construction permit, investments will be increased by 0.01 percentage points of GDP, i.e. by approximately EUR 18.4 million in terms of the 2013 level of GDP (in current prices).

To make sure that all the above estimations are consistent we performed an additional test to detect possible multicollinearity problems and in all estimations we do not have multicollinearity problems (see Table 8.3) because values of $1/VIF > 0.10$.

From the results presented above²⁰, it is obvious that there exist evidence of benefits when business environment is reformed in favour of investors (foreign or domestic). The econometric results indicate that benefits in investment climate (as measured by the ratio of business investment to GDP) stem mainly from reductions in the time and the cost required to complete the procedure of getting a construction permit, building the appropriate facility, inspecting it from the urban planning authorities and start using it. Also we found evidence of benefits after a reduction in the share capital required to start a business. Depending on the econometric approximation and the variables used, benefits from reducing administrative barriers in favour of investments, range from EUR 10.4 to EUR 22.9 million for one percentage point reduction in the explanatory variable taken into consideration. These results are not negligible. If we reduce only these three “barriers to investment” by 10 (or more) percentage points the potential benefit for the economy in terms of investment inflows in € will be multiple (see below in Table 4.3 for their effect in terms of % of GDP). In addition it is possible that these results are underestimated. Although Greece managed to reduce (to a considerable extent) the administrative barriers to the “ease of doing business”²¹ after 2009, at the same time due to the deep economic recession, both private and public investment were reduced significantly.

Of course the above results should be interpreted with caution because the available data set although rich enough in terms of the number of countries, is limited in terms of the number of years (only 7). Thus, more explanatory variables for a substantial higher number of years will give us a more accurate picture of the potential benefits that business environment reforms have in investment creation.

²⁰ We also used data on “starting a foreign business” administrative barriers from iab.worldbank data base. Data on the number of procedures and time needed to start a wholly foreign owned subsidiary, for 82 countries, for the year 2012 (cross section data) were collected and then regressed against total investment as percentage of gdp (we did not find data for business investment as percentage of gdp for countries outside Europe). Using a simple linear regression model (results are not presented here but are available upon request) we found evidence that the greater the days required to start a business the lower the total investment as percentage of gdp ($\beta = -0.36$, p-value=0.086, $R^2=0.148$, $F(3, 78)=4.52$ and $\text{Prob}>F=0.0057$).

²¹ See Greece’s rating in Doing Business ranking in period 2009-2011

Impact of reforms in Greek Economy

In this subsection we estimate the potential impact of the reforms in investment climate, in the Greek Economy. Based on our estimation results for the Random Effects Model (without cluster option) presented in the previous paragraph, we calculate the potential benefit (in terms of the 2013 level of GDP in current prices) after the reduction of these “barriers to investment” between years 2010-2013 for the “cost2” and “days2” cases and between years 2012-2013 for the “mincap” case, respectively.

Table 4.3: Impact of reforms

Variable	Reduction in Variable	Potential Gain (€) (in terms of the 2013 level of GDP)	Potential Gain (%)
cost2	from 52.9% in 2010 to 27.1% in 2013	€284,073,480	0.15%
days2	from 169 days in 2010 to 105 days in 2013	€822,124,800	0.45%
mincap	from 24.4% in 2012 to 0% in 2013*	€492,540,840	0.27%
TOTAL		€1,598,739,120	0.87%
cost2	from 27.1% to 6.6%	€225,717,300	0.12%
days2	From 105 days to 66 days	€500,982,300	0.27%
TOTAL		€726,699,600	0.40%

*This reduction is related only to Limited Liabilities Companies and not to companies with other legal form.

As we can see from Table 4.3 above, cost (as percentage of income per capita) of getting a construction permit was reduced from 52.9% in 2010 to 27.1% in 2013. This reduction is, ceteris paribus, translated into a potential gain for the Greek Economy that amounts to EUR 284 million (0.15% of year’s 2013 GDP).

The days of getting a construction permit were reduced from 169 in 2010 to 105 days in 2013. This reduction is, ceteris paribus, translated into a potential gain for the Greek Economy that amounts to EUR 822 million (0.45% of year’s 2013 GDP).

Finally, the minimum capital to start a business from 24.4% in 2012 was reduced to 0% in 2013 and this reduction could, ceteris paribus, potentially benefit economy by another EUR 492.5 million (0.27% of year’s 2013 GDP).

The total gain for the Greek Economy in terms of new investments, if all the above reforms take place, could potentially amount to approximately EUR 1.6 billion (0.87% of year's 2013 GDP).

Going further, if the cost of getting a construction permit was reduced more, from year's 2013 levels to the level of 6.6% (minimum cost in EU, found in Slovakia) the additional potential gain for the Greek Economy could approximately be another EUR 225.7 million (0.12% of year's 2013 GDP). Also, if the days of getting a construction permit were reduced from year's 2013 level to 66 days (minimum time in Europe, found in Finland) the additional potential gain for the Greek Economy could approximately be another EUR 501 million (0.27% of year's 2013 GDP).

As also mentioned in the end of the previous paragraph, the above results should be interpreted with caution because the available data set although rich enough in terms of the number of countries, is limited compared to the number of years. More explanatory variables for a substantial higher number of years will give us a more accurate picture of the potential benefits that business environment reforms have in Greek Economy in terms of new investment.

Table 4.4: Estimations Results

Dependent Variable bigdp	Random Effects	Fixed Effects	Random Effects (Robust Standard Errors)	GMM
constant	14.430*** (1.023)	16.737*** (1.110)	14.430*** (1.606)	6.746*** (1.429)
cost2	-0.006* (0.003)	-0.005* (0.003)	-0.006 (0.005)	-0.005*** (0.001)
days2	-0.007** (0.004)	-0.015*** (0.006)	-0.007** (0.004)	-0.010*** (0.004)
mincap	-0.011** (0.005)	-0.011** (0.005)	-0.011 (0.007)	-0.005 (0.005)
gdp	0.329*** (0.042)	0.314*** (0.041)	0.329*** (0.050)	0.281*** (0.032)
L1.				0.872*** (0.083)
L2.				-0.247***

				(0.078)
R² (overall)	0.252	0.167	0.252	
Wald Test	243.83 [0.000]	25.76 [0.000]	228.53 [0.000]	995.88 [0.000]
Hausman's Specification Test	2.71 [0.9746]			
Sargan Test				15.34 [0.9332]
M₁				-2.69 [0.0072]
M₂				-1.45 [0.1485]
Number of observations	171			140

Standard errors are reported in parentheses.

p-values of all tests are reported in brackets.

M₁: Test of no 1st order autocorrelation.

M₂: Test of no 2nd order autocorrelation.

*** The null hypothesis that each coefficient is equal to zero is rejected at 1% significance level.

** The null hypothesis that each coefficient is equal to zero is rejected at 5% significance level.

* The null hypothesis that each coefficient is equal to zero is rejected at 10% significance level.

List of Instruments: In GMM model, instruments used in the first-differenced equation are (bigdp)_{j,t-2}, (cost2)_{j,t-2}, (days2)_{j,t-2}, (mincap)_{j,t-2}, (gdp)_{j,t-2}. Year dummies have been also used as instruments.

4.4 Summary

Structural reforms are not a panacea to these pressing challenges. However, without deep reform of the business environment, there will not be solid foundations for sustained growth in the future. Given the importance of these reforms, the political decision on reforms and transition to implementation should proceed as quickly as possible. With investment expected to be a key component of Greece's recovery, it is imperative that barriers and rigidities should be removed.

The implementation of structural reforms should be the main objective of government policy in the foreseeable future. Reform, through elimination of excessive regulations,

reducing the burden of the public sector, facilitating licensing procedures for investment, and improving the functioning of the judicial system, are essential ingredients towards strengthening the investment climate and domestic competition and, therefore, contributing to economic development. Investment is expected to be the key component of Greece's recovery, so, it is imperative that barriers and rigidities that arise from the function of the Greek State should be removed. Even though some progress has been made in improving the business environment, there are still important obstacles that should be eliminated through reforms, in order to enhance investment and growth. The Government actions and plans need to transform the investment climate by delivering rapidly structural reforms, in order to unlock growth and create investment opportunities, since investment appear to have stabilized at a depressed level. These regulatory barriers discourage investment, lead to weak competition, facilitate collusion, and result in high and sticky prices for consumers. Thus, concerning the role of investments in the Greek economy, we identified the areas of policy failures relevant to investment.

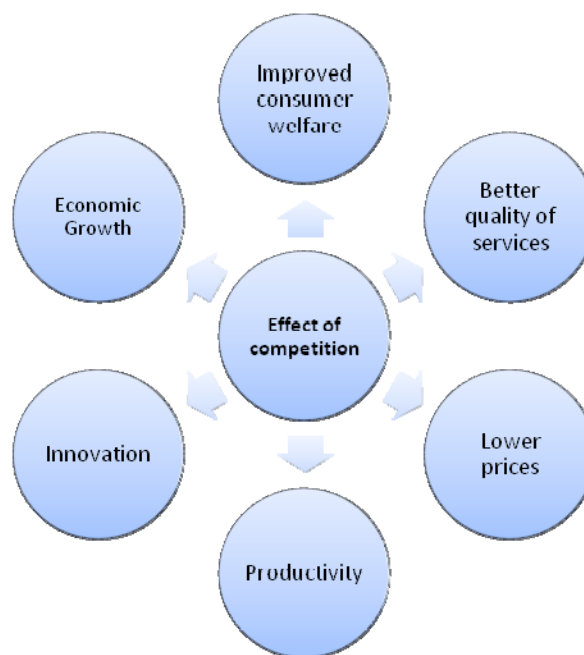
5. Competition

5.1 Regulatory barriers to competition

Well-regulated and competitive markets can maximize consumer welfare and contribute to the overall efficiency of the economy. In this way, effective competition is beneficial for consumers through greater choice, lower prices, and better quality of goods and services provided.

According to economic theory, under perfect competition economic agents are price-takers and firms can enter and exit the market without significant costs. From a theoretical point of view, competition prevents firms from sustaining prices above marginal costs. Of course, in the real world there are few perfectly competitive markets. In general, competition affects economic activity in six broad areas; namely, consumer welfare, better quality of services, lower prices, productivity, innovation, which overall result to a positive effect on the level of GDP (see Figure 5.1).

Figure 5.1: Impact of competition



With regard to prices, empirical studies examine the impact of competition on inflation through the effect of downward pressure on profit margins and mark-ups (e.g. Neiss, 2001;

Przybyla and Roma, 2005). In general stronger competition can increase efficiency and reduce price rigidities. According to a Eurobarometer survey, more than 80% of EU citizens consider that competition between companies can lead to better prices and to more choice.

Additionally, competition can stimulate innovation and productivity. Firms facing vigorous competition have strong incentives to reduce their costs, to innovate and become more efficient compared to their competitors. This process provides incentives for firms to offer competitive prices, higher quality, and develop new products / services that conform to the consumers' preferences. Nickell (1996), for instance, finds that an increase in price mark-ups by 10% could result in a loss of 1.3–1.6%, on average, in productivity growth.

Box 5.1: Evidences from the literature

i) Cross-country evidence supports a positive long-run impact of competition enhancing reforms on growth and productivity. A number of studies establish a strong positive relationship between the effectiveness of competition policy and long-run growth (Dutz and Hayri, 1999; Nicoletti and Scarpetta, 2003).

ii) Salgado (2002), using a panel of 20 OECD countries for the period 1985–1995, shows that the impact of structural reforms on productivity may be weak or negative in the short run, possibly due to adjustment and learning costs. In contrast, he estimates the impact of product market reforms on total factor productivity growth to be between 0.2 and 0.3 percentage points a year in the long run.

iii) Bayoumi et al (2004) calculate that pro-competition product market reforms, which lower price mark-ups in the euro area to the US level, would increase output by some 8.6% (relative to its baseline level) in the long run.

Source: IMF

iv) A study based on OECD countries found that reducing pronounced state controls and barriers to competition would increase long-run employment rates by 2.5% to 5%. Another study illustrates that removing anticompetitive regulation in energy, telecommunications, and transport in Croatia would increase GDP per capita by about 1.4% to 3%, as it would provide firms with incentives to reallocate resources to more productive activities, and increase innovation and technological diffusion.

Source: Investment Climate

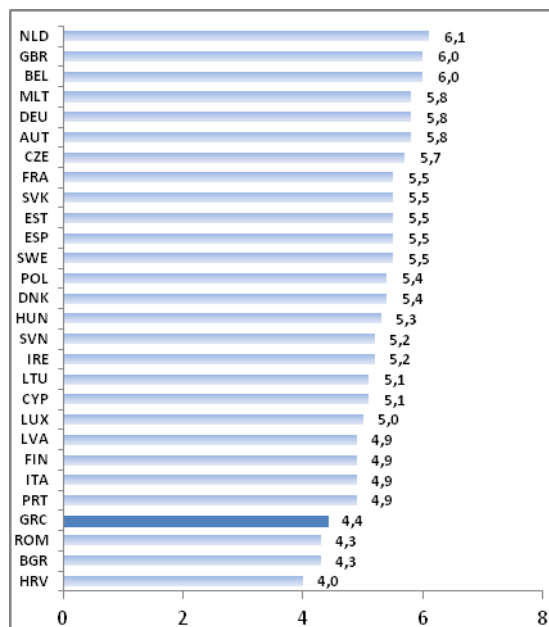
Finally, domestic competition can improve competitiveness of the economy overall, by driving exporting firms to become more efficient. Domestic firms which use inputs from other firms in the local markets (e.g. transportation, financial services) benefit from supplies at lower prices. These enterprises can benefit from the reduction in operating costs, which subsequently makes their products or services more competitive in international markets.

The case of Greece

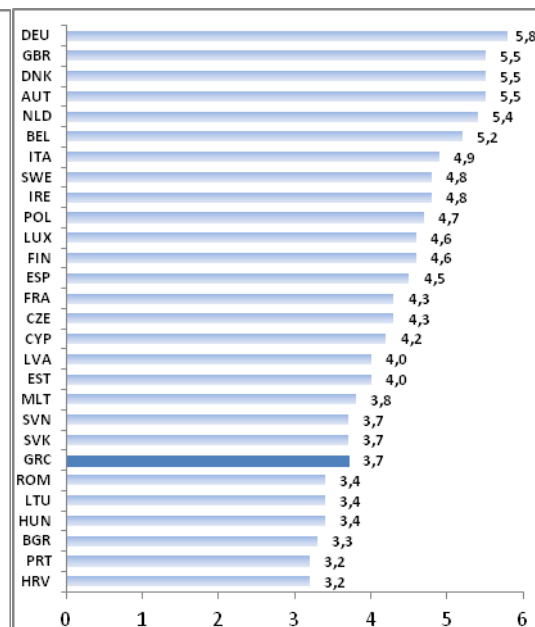
Product and service markets in Greece exhibit competitive constraints (e.g. entry barriers, regulated professions, cumbersome licensing requirements, minimum fees), which are mainly attributed to the transposition of divergent and sometimes inconsistent regulations. Due to that reason, market failures in the past resulted in a loss of economic and social welfare. For instance, despite the significant wage cuts and the disproportionately high level of unemployment prices in many product and service markets have not adjusted adequately. This downward rigidity of prices is, among other reasons, attributed to the low degree of competition in certain markets and the structural deficiencies stemming from existing legislation.

Figure 5.2: Competition related indicators in the EU-28, WEF 2012

A. Intensity of local competition¹



B. Extent of market dominance²



(1) How would you assess the intensity of competition in the local markets in your country? [1 = limited in most industries; 7 = intense in most industries]

(2) How would you characterize corporate activity in your country? [1 = dominated by a few business group; 7 = spread among many firms]

Source: WEF

Inefficient competition in the Greek economy is also highlighted in the World Economic Forum Competitiveness report, according to which the goods market is characterized by weak local competition (95th place) and higher market dominance of large companies (69th place). These results classify Greece in the lowest rank among the EU-28 countries (see Figure 5.2A and Figure 5.2B).

However, in the context of the Economic Adjustment Program, reform implementations have taken place in various sectors of economic activity. Identifying and removing anti-competitive measures (by amending specific provisions of the law or by introducing new legislation) is considered a necessary procedure for the Greek economy in order to strengthen economic activity and restore competitiveness.

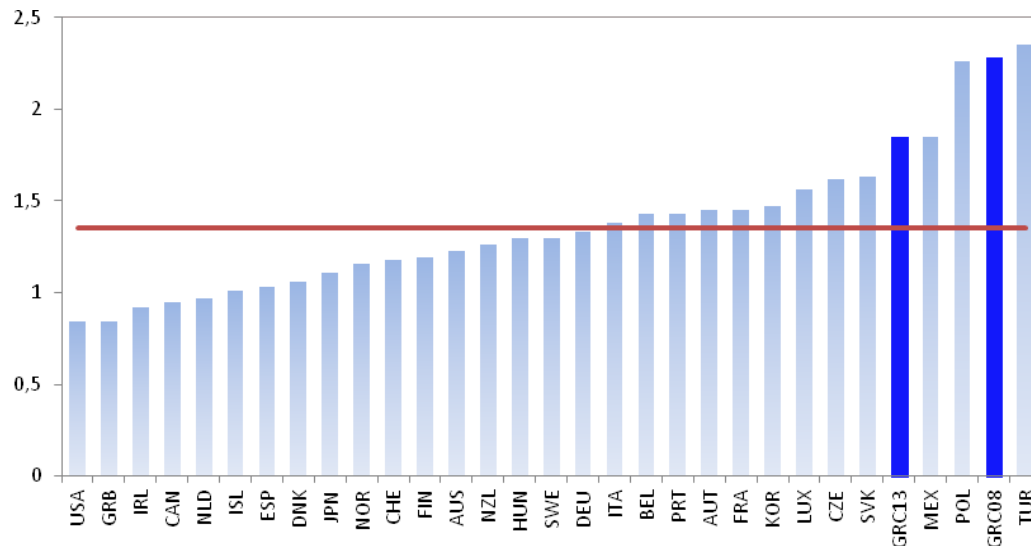
Against this backdrop, Greece adopted a new competition law in 2011 (Law no.3959/2011), which replaced Law no.703/1977. The enforcement of this legislation falls under the competence of the Hellenic Competition Commission (HCC), which is also in charge for the application of the equivalent EU provisions. Respectively, the regulation of energy, telecommunications and postal services fall under the responsibility of the Regulatory Authority of Energy (RAE) and the Hellenic Telecommunications and Postal Services Commission (EETT) respectively.

Within this framework, the OECD undertook in 2013 an assessment of laws and regulations in certain sectors of the Greek economy (i.e., Food processing, Retail trade, Building materials and Tourism). The purpose of the project was to identify legislative provisions that hinder the efficient functioning of firms and recommend on practices that can increase competition in the specific sectors. The report suggests that, by removing the restrictions identified, the Greek economy could benefit by an increase of EUR 5.2 billion in GDP.

Overall, Greece has made significant progress with regard to reforms related to competition. According to the OECD's latest aggregate indicator concerning the product market regulation (PMR index), Greece has improved its position in 2013 (the respective indicator

has declined from 2.28 in 2008 to 1.85 in 2013, Figure 5.3). Still, Greece remains above the OECD average²², exhibiting the highest value among the Eurozone OECD countries.

Figure 5.3: Overall product market regulation



Source: OECD

In the final section (see Section 5.3) we use sub-indices related to the PMR index to evaluate and quantify the potential impact of competition-related reform in the Greek economy with respect to prices and unemployment.

²² It should be underlined that indicators such as the PMR index present a one-time snapshot, whereas the reforms are a continuous process.

Box 5.2: Competition assessment in Greece – Key Recommendations

Key recommendations (out of a total of 329 recommendations)

- Abolish barriers to entry that have been identified. These include the strict licensing requirements in the asphalt sector; minimum requirements for storage, or minimum capital requirements in the building materials sector; numerous barriers to investment in tourism activities, such as geographical restrictions or minimum quality requirements; limits on tourist coach activities; restrictions on offices of travel agents; limits to the trade of blended olive oils; and so on.
- Fully liberalise Sunday trading, including for stores above 250m², shopping malls and outlets.
- The five-day restriction on the shelf life of milk should be lifted. The product's use-by date should be determined by the producers, according to their pasteurisation methods and the relevant EU regulation. Milk cartons should be clearly stamped with the date of production and the valid-to date.
- Prices of over-the-counter medicines (OTCs) and dietary supplements such as vitamins should be liberalised. This should be done in conjunction with a full liberalisation of the distribution channels.
- Retailers should be able to decide freely on shop promotions and discounts, including on the determination of periods of seasonal sales.
- Horizontal regulations that hamper or thwart the proper functioning of markets should be removed to allow competition to drive efficiency gains and increase productivity across all sectors of the Greek economy.

Source: OECD Competition Reviews, Greece

5.1.1 Reforms related to competition in Greece

It is commonly accepted that the Greek economy should adjust to a basic rule that consumption growth should follow the growth of productivity. The latter implies, among others, the necessity of product market reforms as a means of strengthening overall economic performance. Usually, the direct effects from these reforms are related to the removal of barriers to enter new markets and the elimination in the costs of doing business. An OECD report estimates that the effective competition policy in Australia added 2.5% to GDP.

Over the past few years the Greek government has introduced reforms that aim to strengthen the competition policy framework. The objective of promoting competition is to encourage entrepreneurship by facilitating new entry, to preserve purchasing power and subsequently to increase consumer welfare. Disentangling, however, the effect of these reforms in the economy is difficult not only due to the early stage of implementation in many of them but also because of the long lasting recession. The largest scope for improvement in Greece has been identified in reducing the number of procedures and time required to start a business. In addition, significant progress have been made in easing the regulation of professional services, where cumbersome licensing requirements and restrictions on fees or prices charged raised important obstacles to competition.

However, delays to implement substantive changes still exist. Despite many positive breakthroughs, overregulation -and its inconsistent interpretation or application in some cases- creates burdens on entrepreneurship. In certain cases also, the pressure from interest groups has proven to be a strong constraint, which delays significantly the abolishment of unnecessary impediments to competition. In some cases also, the market exhibits significant concentration, as in the case of the airlines industry. Currently there is a single airline carrier in Greece following the merge of the two largest operators in the country. The European Commission has justified the merge of the two companies on the grounds that the difficult financial condition faced by Olympic Air would force the carrier to leave the market in due time. Yet, whether any potential benefits should emerge for the consumers have to be examined in the near future.

On the other hand, regulations that distort competition are related to barriers to entry, price notification obligations and geographical restrictions. Even though the policy makers'

attempt was to set quality standards and protect consumers, in most of the cases the effect is counterproductive since it prevents firms from competing against each other. This holds back productivity by limiting the entry and expansion of more productive firms.

For instance, the exclusive distribution of infant milk in Greece by pharmacies until 2010 is a typical example of a legal barrier to potential competitors (e.g. food retailers) with adverse consequences for consumers. Following the amendment of the provision the price of the product declined by 12% on average in supermarkets compared to pharmacies, according to the Ministry of Development.

The preceding implies that reforms related to the abolishment of anti-competitive regulations can have substantial economic impact for the Greek economy. By simplifying the regulatory framework significant reductions in operational costs for firms can emerge. In particular, the impact of product market reforms is mainly in terms of increased efficiency, implying that increased competition can reduce rents and consequently prices. Allocative efficiency therefore, which is considered a critical transmission channel of these reforms, should be accomplished through the reduction of the market power of incumbents and the increase in the number of firms. Over time, a more competitive business environment should drive less efficient firms to exit the market. Through this channel is expected that market shares will shift to higher productivity firms leading in this way to a more efficient allocation in a specific industry.

Additionally, entry deterring strategies related to industry specific characteristics that allow incumbents to gain competitive advantage continue to take place in the market²³. In Greece, articles 1 and 2 of the antimonopoly law (Law no.3959/2011) are designated to deal with anti-competitive behavior and abuse of dominance. Usually power over price is the starting point in order to evaluate potential infringements in competition. Examples of those practices are price fixing, limiting production or sales and allocation of market or clientele.

These actions impose constraints on market initiatives and the distribution channels and harm consumer welfare. Therefore, the competition authority that supervises the operation of product and services markets must enforce their proper functioning.

²³ For instance, the illegal context that these actions carry can be seen from a recent decision of the HCC to impose fines (EUR 855 thousand) on five foreign language school associations for price fixing and restricting the activities of their members.

Finally, credit constraints are also a significant impediment to competition among incumbents and potential entrants in specific industries in Greece. Difficult access to credit comprises a substantial entry cost for firms that lack capital to start a business. This is evident mainly in product markets where start-up costs are usually higher compared to service markets.

5.2 Impact of reforms on competition

This section identifies some of the restrictions in competition and the measures, which have been undertaken to tackle them. In addition, it offers an overview of the potential impact on the Greek economy of abolishing inefficient regulations and stimulating competition, based on examples from international experience.

In transport, law no.3887/2010 provides for the gradual liberalization of the road freight transportation under a transition period (approximately 2 and a half years). In this way, licensing restrictions that constrained the road haulage capacity were removed and administratively determined prices were abolished. The previous legal framework imposed anti-competitive practices in the market because new licenses were granted by the state. As a result, their number was small leading to high rents for incumbents. As a consequence, an individual or an enterprise could only enter the market by purchasing an existing license in the secondary market at a significant cost (according to the European commission prices varied from 30 thousand to 300 thousand euros), which was a major distortion in the market.

Box 5.3: Evidences from the liberalisation of freight transport

Liberalization of the road freight sector in Europe in the 1990's led to rapid productivity growth. Measures included the removal of barriers to market access, the deregulation of fixed price lists and a relaxation of capacity restrictions. These reforms stimulated competitive intensity and cross-border demand, resulting in higher average truck sizes, longer hauls, industry consolidation and investment in IT tools (e.g. GPS and route optimization). Productivity in the freight sector in France and Germany increased by 5% per annum and 5.2% percent per annum respectively from 1990 to 2000, far exceeding productivity gains in the US (which averaged 1.2 percent per annum

Source: McKinsey Copenhagen

In the **cruise market** cabotage restrictions were imposed until 1999 according to which only cruise ships flying the Greek flag had the right to use Greek ports as homeport for their cruises. According to the European Regulation 3577/92, which aimed to create a unified market and facilitate competition to maritime transportation, the Greek cruise market was partially liberalised allowing cruise ships flying European flags to operate in Greek waters and use national ports as homeports. However, restrictions were left in force for non-European flagged cruise ships until 2010 when law no.3872/2010, passed by the Greek government, provided to third-country flag cruise ships the right to operate cruise trips using Greek homeports.

By allowing only EU-flag cruise vessels to homeport in Greek ports, Greece made substantial losses in tourism receipts from the cruise industry over the past decades and at the same time lacked in infrastructure compared to major European cruise destinations. This is due to the fact that the leading cruise operators worldwide (Carnival Group, Royal Caribbean and Norwegian Cruise Lines which control almost 75% of the total cruise ships capacity) sail under non-EU flags. Those cruise operators, which on average carry 2000 passenger in each cruise, embarked and disembarked their passengers in European countries other than Greece (e.g. Spain, Italy), while they used Greek ports only as transit destinations. The latter, explains the difference in tourism receipts among cruise destinations, since cruise travelers tend to have almost twice as high expenditure in the places they begin and end their cruise compared to the places they visit during their cruise.

Along these reforms, new legislation or amendments of existing law have taken place. Table 5.1 summarizes some of the reforms undertaken by the Greek government to mitigate market inefficiencies and allow competition to become more effective.

Table 5.1: Reforms related to competition in Greece

Reform	Law / When / Description	Macroeconomic implication
Competition framework: Strengthen competition framework	Law no.3959/2011 reforms the legal framework of the Hellenic Competition Commission	Strengthen the independence of the competition authority and the enforcement of the competition law
Retail market: Flexibility in	Law no.4177/2013 provides for the possibility of retail stores to open	Extending operation hours can improve the performance of the

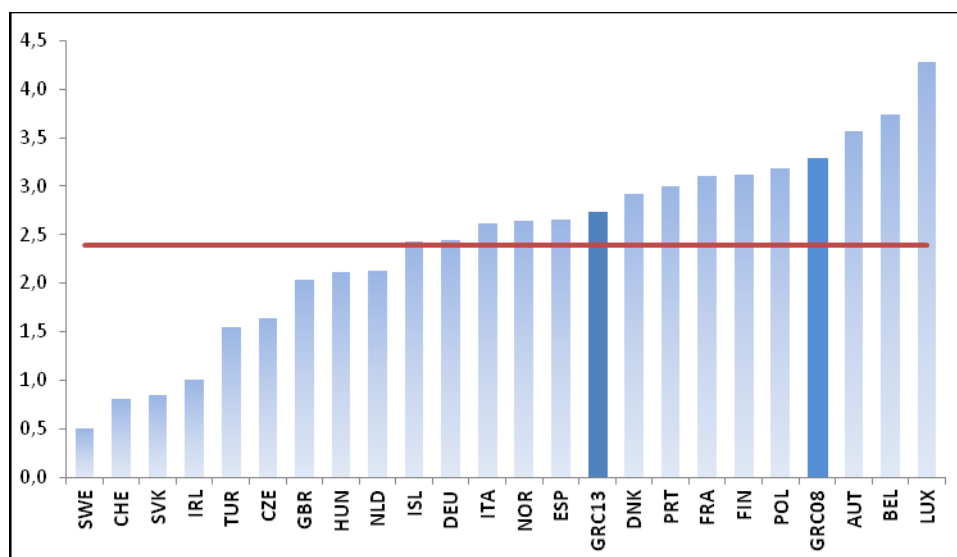
retailers opening hours	up to seven Sundays per year	retail sector overall
Retail market: removing restrictions against discount sales outside sale periods;	Law no.4177/2013 provides for the possibility of discounts four times per year	Lower prices, consumer welfare, ability of retail business to handle in a more appropriate way their stocks
Regulations on over-the-counter medicines	Amendment of the law that liberalizes the distribution channel is expected	Increase consumer welfare
Liberalization of professional services	Law no.3919/2011 removes exclusivity rights for lawyers, notaries, engineers, architects, auditors and other professions	Increase economic activity by reducing the cost of provision for these services
Cruise market: Liberalization of cruise ships (cabotage). Allow cruise ships with non-EU flag to embark or disembark passengers from a Greek port	Law no.3872/2010 provides to cruise ships with non-EU flag the right to operate cruise trips using Greek home ports	Develop home-porting activity and raise tourism receipts from cruises
Road freight transportation: Unlimited licenses with fees on road transport operator licenses declining to a small administrative fee since the beginning of 2012	Law no.3887/2010 provides for the gradual liberalization of the road freight transportation	Cost-efficient service provision and lower prices
Long distance buses (KTEL) and tourism coaches	Pending legislation on liberalizing tourist coaches to perform domestic passenger transportation	Increase competition, by offering services of better quality in competitive prices
Generic and off-patent medicines	Law no.4052/2012 adopts the use of generic drugs in the healthcare sector	Encourage generic substitution and achieve savings in the healthcare system
Energy Sector	Law no.4001/2011 harmonizes energy policy with the 3rd EU Energy Package	Improve competition in the electricity and natural gas markets

Source: IMF, Task Force, Ministry of Economics

Many of these reforms concern the operation of the Retail trade which has a significant share in economic activity in Greece (it accounts for 7% of GDP and 10% of total

employment in 2011). According to an indicator²⁴ concerning the regulatory barriers in the sector the legislative framework of retail trade in Greece still restricts competition more strongly compared with other EU (and OECD as well) countries (see Figure 5.4).

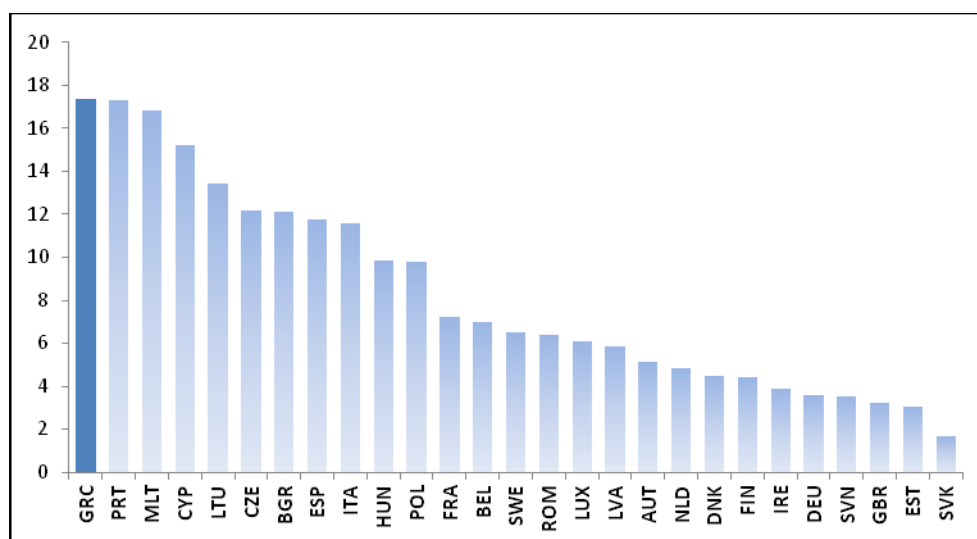
Figure 5.4: Regulatory barriers in retail trade in EU member states*



(*) The reference year is 2008. The indicator for Greece for 2013 is preliminary

Source: OECD

Figure 5.5: Enterprises per 1000 inhabitants in the retail sector in EU-27, 2007



Source: Eurostat

The main feature that the sector exhibits relates to the large number of firms (see Figure 5.5), as a result of the significant proportion of small shops across the country. The

²⁴ The specific index covers general regulatory issues in the fields of legal and administrative barriers to entry. The methodology assigns a numerical value to each of the possible responses to a given question and is defined over a scale of zero to six, reflecting increasing restrictiveness of regulatory provisions for competition.

provisions considered to inhibit competition in the retail trade are mainly related to the operating hours of stores (hours and days which remain open), the distribution channel of specific products (e.g. OTCs and vitamins) coupled with price regulations. By advancing pro-competitive reforms the overall efficiency of the sector is expected to increase. This should be reflected in lower prices, higher employment and increased consumer welfare. Employment, in particular, can benefit substantially by removing unnecessary restrictions related to competition. There is evidence from international experience that the level of employees has increased following the removal of market regulations in the sector (see Box 5.4).

Box 5.4: Evidences from the literature

A study in the French retail industry highlights how restrictive zoning regulation in France had a negative impact on employment. A 1973 legislation of the French parliament introduced measures to protect small shopkeepers and craftsmen in the French retail industry in the face of a rapidly evolving large distribution market. This regulation implied that creation of any new large store had to be first approved by a regional zoning board. The study found that the specific type of barriers to entry had a negative impact on employment. In particular, retail employment could have been more than 10 percent higher at the time of the study (2002), had this entry regulation not been introduced.

Source: Investment Climate

With regard to regulatory barriers in the sector, the over-the-counter (OTC) medicines and the generics pharmaceuticals are examples of domestic markets, in which regulations can cause significant harm to competition:

OTC medicines

OTC medicines are drugs which do not require prescription by doctors in order to be dispensed. According to the existing legislative framework, the price and distribution of OTCs in Greece are regulated. Prices are determined according to a reference price system, they are sold exclusively through pharmacies and they are not eligible for reimbursement. Usually the objective of regulations in OTCs is the protection of the public interest implying that people have different levels of knowledge and understanding of self-medication and for

that reason they need information for the benefits and the potential risks from their use. Similarly, the regulation of prices aims at keeping the cost of a therapy low for the patients.

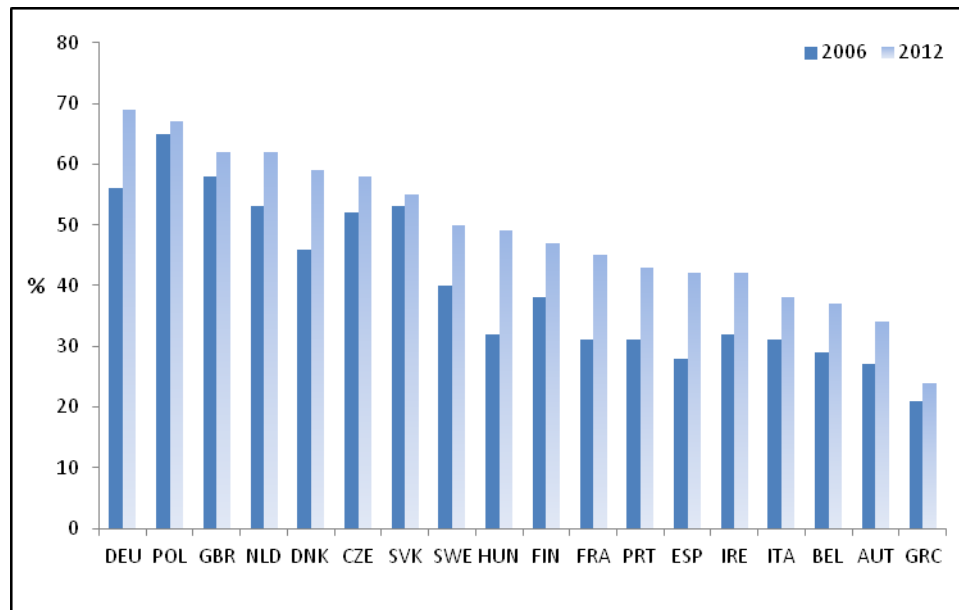
Regarding the distribution where non-prescription medicines can be sold there is considerable variation in policy among EU member-states. OTC medicines are sold exclusively through pharmacies in ten out of 28 European countries. For example, Greece and Spain allow the sale of OTCs only through pharmacies, in Italy the sale of non-prescription medicines is permitted from non-pharmacy outlets, provided that it is supervised by a pharmacist, whereas in Portugal the sale of non-prescription medicines is allowed through non-pharmacy outlets without the need for the presence / supervision of a pharmacist.

The provisions of the law on OTCs reduce significantly competition in the market. Mainly they affect the availability and the variety of these medicines (and the dietary products as well) in the Greek market because the regulated price might keep a medicine out of the market, in case it cannot compensate the supplier for the incurred cost. In addition, it has a negative impact on consumer welfare. For instance, assuming an individual who wants to buy an OTC drug is restricted to do so during the hours that pharmacies are open. In any other case, for instance in case of emergency, he will have to buy it from a pharmacy on duty, which implies significant costs related to the time spent to visit the closest open pharmacy and the travelling expenses as well. Finally, allowing alternative channels to distribute OTCs and dietary supplements (for instance supermarkets) may lead to lower profit margins.

Generic medicines

Generics are medicines with the same qualitative composition in active substances and with the same strength and pharmaceutical form as the originator medicine. Therefore, they have the same quality, safety and efficacy and can be used interchangeably with originator medicines.

Figure 5.6: Generic medicine market share by volume



Source: IMS Health

The use of generics medication varies significantly among EU member-states, with Germany and Poland recording the highest levels of generic penetration, whereas Italy, Belgium and Austria exhibit slightly higher average levels compared to Greece, which is the country with the lowest generics use among the EU (see Figure 5.6). According to the National Medication Organization (EOF) the generics medicines were approximately 40% of total drugs in the market in 2012.

The low penetration may be associated with the lack of information on the use of generics medicines, which makes patients reluctant, or even unwilling, to switch from the medications they use and are confident for their effective treatment. On the other hand, the regulatory framework in Greece does not support the development of the market mainly due to the lack of demand side policies (i.e., incentives for physicians, pharmacists and patients to prescribe, dispense and consume generics medications respectively). This can be considered as a (natural) barrier on its own.

According to Kavanos (2007)²⁵, the use of a generic product in the market is affected by regulatory barriers, in the context of demonstrating bioequivalence to the originator medicine or price capping. For instance, in Portugal and Spain disputes have been recorded

²⁵ Kavanos P, Font J. and Seeley E. (2007). "Competition in Off-patent drug market: Issues, Regulation and Evidence", LSE

about the patent status between originator and generic medicine companies, which adversely affects the development of the generic medicines market (Simoens, 2013)²⁶.

Against this backdrop, the Greek government introduced law 4052/2012, which adopts the use of generics in the healthcare sector. The new law sets the terms and conditions for the use of prescribing medicines and increase the use of generics in an attempt to reduce the cost of pharmaceutical care. The key actions with respect to the use of generic medicines include the compulsory prescription by active substance and the reduction in the maximum price of generics to 60% of the price of the originator medicine.

²⁶ Simoens S. (2013). "Sustainable provision of generic medicines in Europe" KU LEUVEN

Box 5.5: Implications from the use of generic medicines

i) The European Generic Medicine Association (EGA) have estimated that, up to 2010, generics medicines in the EU had generated savings in the order of €30 billion, excluding those made from the stimulation of competition with the pharmaceutical sector as a whole. In addition, with the expansion of the European Union to 27 Member States, the accrued savings could certainly be projected to double this figure.

Source: IMS Health

ii) In USA the avoidable cost opportunity from underutilization of generics is estimated at USD 12 billion. The specific figure implies that 85 million prescriptions could be prescribed and dispensed using low cost generic medications instead of unprotected brands.

Source: IMS Institute for Healthcare informatics

Given the substantially high expenditure on pharmaceuticals in the recent past in Greece, the “brand-generics drug substitution” is expected to benefit the financing of the health system, given that the price of a generic medicine is lower from 20% to 90% compared to the brand-name original²⁷ (see Box 5.5). In addition, the availability of lower-priced generic medicines can reduce the price of originator medicines through the stimulus on market competition among the specific types of medicines.

5.2.1 Reforms related to price regulations

Usually, professional associations argue that fixed prices are used as a means to protect the quality of services provided. They underline that in many cases consumers do not have the ability to judge the quality of the services they receive from professionals. Therefore, price is a useful indicator to base their decision when they purchase certain services. In addition, fixed prices prevent professionals from employing illegitimate means to attract larger clientele. On the other hand, however, price regulations may distort competition by

²⁷ European Generic Medicine Association

encouraging inefficient entry, which in turn may lead to inadequate use of the products or services.

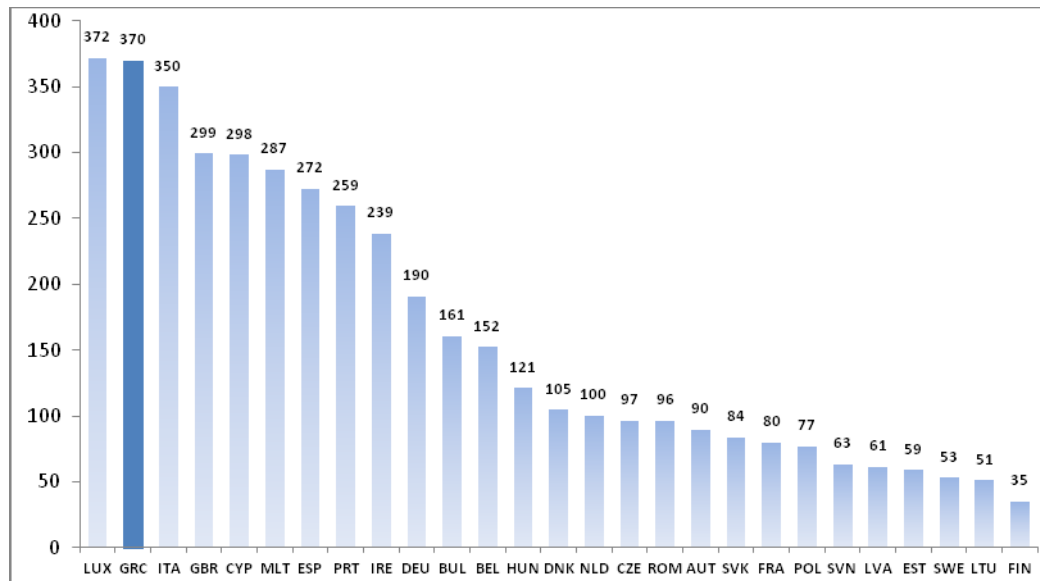
A revision of the regulatory framework related to professions in Greece has focused on the amendment of provisions which are considered to inhibit competition. For instance, Law no.3919/2011 on liberal professions provides for the abolishment of restrictions related to the access and the exercise of professions, including also regulated minimum fees, geographic restrictions in the exercise of a profession and restrictions related to a second-establishment.

Concerning minimum fees, the previous legislative framework determined binding payments for lawyers. These were determined by the Lawyers National Council and approved by the Ministry of Justice. These tariffs were detailed and distinguished between in and out of court services, and according to the nature of the tasks performed by lawyers. In contrast, the recent reform has eliminated minimum fees and according to the new rules lawyers have the ability to set fees that are related to the outcome of the case.

According to the OECD²⁸, fee restrictions may have negative effects on social welfare as they reduce the level of uncertainty on the supply side and hinder competition among professionals. Although, the implication of a scale imposed minimum fees is thought to prevent professionals from offering mediocre quality services, it is conceivable that such a scale prevents competition. For instance, professionals such as lawyers are held back by offering discounts for the services they provide. The latter can be of particular interest in the case of Greece, which is characterized by a large number of lawyers (the larger number of lawyers per 100 thousand inhabitants after Luxemburg in the EU (see Figure 5.7). Along with the abolishment of geographic restrictions the deregulation of minimum fees can lead to substantial savings for consumers.

²⁸ <http://www.oecd.org/regreform/sectors/40080343.pdf>

Figure 5.7: Number of lawyers per 100 thousand inhabitants in EU-27



Source: European Commission for the Efficiency of Justice (CEPEJ)

The inefficiency of regulated prices is also evident from the decision of the European Court of Justice, which has concluded (Cipolla case) that a minimum fee scale for in-court services constitutes a restriction on the freedom to provide services (Article 49 EC Treaty).

Box 5.6: International experience on professional services

The removal of price floors and advertising ban in the legal profession in Italy led to a market correction where more productive lawyers are more likely to stay in the profession.

Source: Pellizari and Pica, 2011

Deregulation and the resulting increase in competition had a clear impact on the market for real estate agency services. Where Dutch agent fees used to be a standard 2 percent of the sale price, prices began to vary between 0.5-2.5 percent after deregulation. The Netherlands also saw a modest increase in scale, with the share of real estate agencies employing more than five people increasing from 14 percent of all real estate agencies in 2000 to 21 percent in 2007.

Source: Deloitte

International experience shows that by removing restrictive provisions with regard to professional services competition policy strengthens and lower prices can be achieved (see Box 5.6).

Price regulations on OTCs

Pricing and reimbursement policies in the health care system are implemented in an attempt to control pharmaceutical spending and promote the rational use of pharmaceuticals. The question which is raised, however, is whether these regulations should be applied for OTCs. The rationale for this exclusion is that market-based price competition could work better than price controls for non-prescribed medicines.

A justification is that the use of OTCs does not burden public health expenditure since they are dispensed without prescription and they are not eligible for reimbursement. In addition, the non-prescription market is less restricted compared with the prescription market. The latter involves general practitioners, pension funds and health insurers, whereas the OTC market involves in essence the industry, the distribution channel and the consumers.

On the other hand, however, an argument against this perspective is that regulating authorities have the ability to decide on the appropriate price of the medicine, in contrast to patients who often lack the necessary information; hence they act in favor of the public interest. Still, though, fixed prices might prohibit pharmaceutical companies from introducing in the market medications that are not sufficiently profitable under the regulated price scheme.

A cross country comparison in the EU-28 indicates that in the majority price controls are not imposed on OTC medicines. In particular, only Belgium, Greece, Luxembourg and Malta impose controls at ex-factory, wholesale and pharmacy levels (see Table 5.2) for OTCs. Respectively, Austria, Croatia, Estonia, Hungary, Latvia and Spain restrict the trade margins of wholesalers and retailers of non-reimbursable OTCs, without controlling the ex-factory prices.

Table 5.2: Price controls of non-reimbursable OTCs in EU-28

Country	Ex-factory price controls	Wholesale profit margin controls	Pharmacy profit margin controls
Austria	X	√	√
Belgium	√	√	√
Bulgaria	X	X	X
Croatia	X	√	X
Cyprus	X	X	X
Czech Republic	X	X	X
Denmark	X	X	X
Estonia	X	√	√
Finland	X	X	X
France	X	X	X
Germany	X	X	X
Greece	√	√	√
Hungary	X	√	√
Ireland	X	X	X

Italy	X	X	X
Latvia	X	√	√
Lithuania	X	X	X
Luxembourg	√	√	√
Malta	√	√	√
Netherlands	X	X	X
Poland	X	X	X
Portugal	X	X	X
Romania	X	X	X
Slovakia	X	X	X
Slovenia	X	X	X
Spain	X	√	√
Sweden	X	X	X
United Kingdom	X	X	X

Source: PHIS (2010), Pricing Policies

For instance, in the Netherlands, price setting does not apply to OTCs with prices set by pharmacies typically following the so-called “taxe”, which is a list of recommended

pharmacy retail prices for all available pharmaceutical products in the Dutch market (Ruggeri et al., 2013²⁹).

5.2.2 Reforms related to the energy sector

In recent years, EU member states have adopted legislation related to the third Internal Energy Market Directive, which urges for further liberalization of the electricity and natural gas markets. In particular, law no.4001/2011 (which repealed statute 2773/1999) transposed into national legislation the third internal Energy Market directive, which stipulates the unbundling of the system operator and enhances the role of the independent regulator regarding the security of supply³⁰.

Following the implementation of the new law, an Independent Power Transmission Operator (ITO), known as ADMIE, was established, which is a 100% subsidiary of PPC (51% state-owned). In this subsidiary PPC has transferred the ownership of the transmission assets, while DESMIE (the former Transmission System Operator) transferred the operation, maintenance and development of the system. In this context, the production and supply activities of PPC are separated from the system operation in accordance with the ITO model.

According to the European Commission³¹ unbundling is an essential condition to allow fair competition between suppliers, while it can stimulate investment in infrastructure which are necessary for an efficient electricity sector.

It should be underlined, however, that even though the electricity and gas markets have become more competitive, there are still distortions and impediments that allow incumbents to retain their market power (according to IEA, in 2010 PPC commanded more than 75% of the wholesale market and more than 90% of the retail market). For instance, the structure of the power industry in Greece has remained strongly concentrated prompting plans for adopting additional measures (e.g. separation of the production plant portfolio of PPC into two independent and competing entities rather than reducing government ownership in PPC).

²⁹ Ruggeri K. and Nolte E. (2013). "Pharmaceutical pricing. The use of external reference pricing". RAND Europe.

³⁰ <http://www.iea.org/Textbase/npsum/greece2011SUM.pdf>

³¹ http://ec.europa.eu/energy/gas_electricity/legislation/doc/20110302_entry_into_force_third_package.pdf

5.3 Quantification

This section examines the impact of competition on economic performance. The empirical literature demonstrates evidence on the benefits of competition (see introduction of the Competition chapter), whereas country case studies have indicated the positive impact on the economy by implementing pro-competitive reforms (for instance, the case of Australia). In this context, we examine the impact of competition on prices and the labor market in an attempt to draw some evidence from international experience as to the likely impact for Greece.

For that purpose, we use the Product Market Regulation (PMR) index compiled by the OECD. The PMR indicator is employed as a benchmark of the regulatory framework across the OECD countries, by integrating measures for policies that either promote or restrict competition in product and service markets. Additionally, PMR comprises of sub-indicators that broadly fall into three main categories: i) state control, ii) barriers to business environment and iii) barriers to international trade and investment.

These indicators are estimated on a 5-year basis (beginning from 1998 onwards) for 30 OECD countries and defined over a scale from 1 (least restrictive) to 6 (most restrictive). For the empirical work undertaken in this section the indicators incorporated are: i) Barriers to entrepreneurship (BTE), ii) Legal barriers to entry (LBE) and iii) Barriers in Services sectors. Intuitively, these variables can be considered as proxies for domestic competitive pressures as they are measures of barriers to entry.

The empirical analysis is based on the estimation of a panel data model of 24 OECD countries³² constructed for the years 1998, 2003 and 2008 respectively³³. The panel controls for the degree of market competition that may determine a response on the price level or employment. For that purpose, data have been collected from Eurostat with regard to the Price Level Index³⁴ and the number of people employed based on the Labor Force Survey³⁵.

The empirical analysis is based on the following specification:

³² The sample considered includes Australia, Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Mexico, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

³³ Data for 2013 were not publicly available upon the completion of the study.

³⁴ <http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/data/database>

³⁵ http://epp.eurostat.ec.europa.eu/portal/page/portal/employment_unemployment_lfs/data/database

$$Y_{jct} = \alpha_t + \beta_i(\text{PMR Sub-indicator})_{ct} + \gamma X_{ct} + \varepsilon_{jct} \quad (5.1)$$

Y_{jct} describes the dependent variable (logarithm or level) of interest for country j in year t , whereas the term “Indicator $_{ct}$ ” denotes the independent variable (or variables) from the group of the PMR index. Respectively, X_{ct} controls for wide economy effects (variables such as, GDP, GDP per capita or disposable income are employed). Finally, the fixed effect specification (α_t) controls for time invariant sector-country differences that may influence both regulation and prices, or employment.

Table 5.3 presents the results by applying equation (5.1) on Price Level Index for services³⁶. The estimated coefficient indicates a positive relationship between entry barriers and prices. Intuitively, higher entry barriers imply a smaller number of market participants; hence higher profit margins and prices.

Table 5.3: The impact of competition on the Consumer Price Index

Estimation Method	GLS
Dependent Variable	log(PLI)
BIS	0.056 (0.032)***
Disposable Income	1.075 (0.218)***
1/VIF _{MAX}	0.123
R ² (overall)	0.74

*The null hypothesis that each coefficient is equal to zero is rejected at the 10% level of significance. **The null hypothesis that each coefficient is equal to zero is rejected at the 5% level of significance. ***The null hypothesis that each coefficient is equal to zero is rejected at the 1% level of significance. Standard errors are reported in parentheses.

³⁶ Hausman test indicates the use of the Random effects estimation for the Panel Data regression. In addition, clusters have been used to control for heteroskedasticity.

In particular, the results show that a unit reduction of the “Barriers in Services” index leads to the decline of the Price Level Index on services by 5.5% (semi-logarithmic relationship). It can be inferred therefore, that in case the respective index for Greece converges to the EU average³⁷ (i.e., entry barriers in the tertiary sector are reduced) the effect would be a reduction by 4.4% on the price level index on services.

Respectively, Table 5.4 presents the impact of regulatory provisions for competition in the labor market under the specification (5.1). The estimated coefficients suggest that entry barriers have a negative impact on workforce (apparently restrictions on establishing new firms have a negative effect on jobs). In particular, a reduction (increase) of the LBE index by 1 unit leads to an increase (decline) in employment by 3.3%.

The result implies that employment in Greece could increase by as much as 51.7 thousand (based on the average estimate of 3,621.3 thousand employed people during the first nine months of 2013) in case competition improves and the corresponding index converges to the EU average (i.e., 0.817 compared with 1.250 for Greece in 2008).

³⁷ The value of the index for Greece is 4.491 in 2008, whereas the respective estimate for the OECD average (estimated on EU member states) is 3.699.

Table 5.4: The impact of competition in employment

Estimation Method	GLS	GLS
Dependent Variable	log(Emp)	log(Emp)
	(1)	(2)
LBE	-0.033 (0.018)*	
BTE		-0.091 (0.031)***
logGDP	0.884 (0.153)***	0.885 (0.044)***
1/VIF _{MAX}	0.206	0.082
R ² (overall)	0.69	0.81

*The null hypothesis that each coefficient is equal to zero is rejected at the 10% level of significance. **The null hypothesis that each coefficient is equal to zero is rejected at the 5% level of significance. ***The null hypothesis that each coefficient is equal to zero is rejected at the 1% level of significance. Standard errors are reported in parentheses.

Respectively, in the case of the “Barriers to entrepreneurship” index the result obtained implies an increase in employment by 88 thousand people³⁸ in case the indicator for Greece approximates the average value for the EU countries.

³⁸ The result should be treated with caution due to the presence of weak multicollinearity ($1/VIF_{MAX} < 0.10$).

5.4 Summary

Over the last few years Greece has made significant progress by adopting pro-competitive reforms. These reforms, which have been put in place in order to restore weak competition in major product markets and services, are mainly related to the abolishment or amendment of regulations and legislation that impede competition among firms and inhibit entry. Most of these reforms, which were adopted in the past under the justification that they could protect consumers' interest, have been proven to be obsolete. In addition, there is significant evidence from other countries that by adopting pro-competitive reforms the benefits for the economy are substantial, in terms of productivity, GDP growth and employment.

In this context, Greece is among the countries with significant progress in reform policies related to competition. This is reflected, for instance, in the progress the country has made according to specific indicators, such the Product Market Regulation index compiled by the OECD. Still, however, the effect of the reforms adopted so far is weak, mainly due to the deep recession which holds back economic recovery. Despite this fact, the Greek government has significant steps to take in order to further improve the regulatory framework related to competition so as to accelerate price adjustment and advance the available resources towards more productive economic sectors.

6. Export facilitation

6.1 Greek exports

One of the fundamental components of the Greek economic recovery strategy and arguably a pillar of the new growth pattern for Greece is the boost of exports. Especially in times where the domestic demand is weak, targeting markets across borders is essential to facilitate economic activity. In that context, the National Export Strategy for Greece - which has been designed by the Greek government with the cooperation of several ministries - sets two main goals: first, to minimize the trade deficit by 2014 and, second, to boost exports of goods to 16% of GDP by 2014 (Hellenic Republic, 2012a).

The National Export Strategy is based on three pillars. The first pillar is to enlarge Greece's export base by encouraging Greek firms to produce and offer internationally competitive goods and services in a sustainable business model. The second pillar is to promote exports

by supporting Greek products and firms through an internationally well established trade network. The third pillar, which is also the focus of the analysis in this section, is to facilitate trade by mainly simplifying the pre-customs and customs procedures.

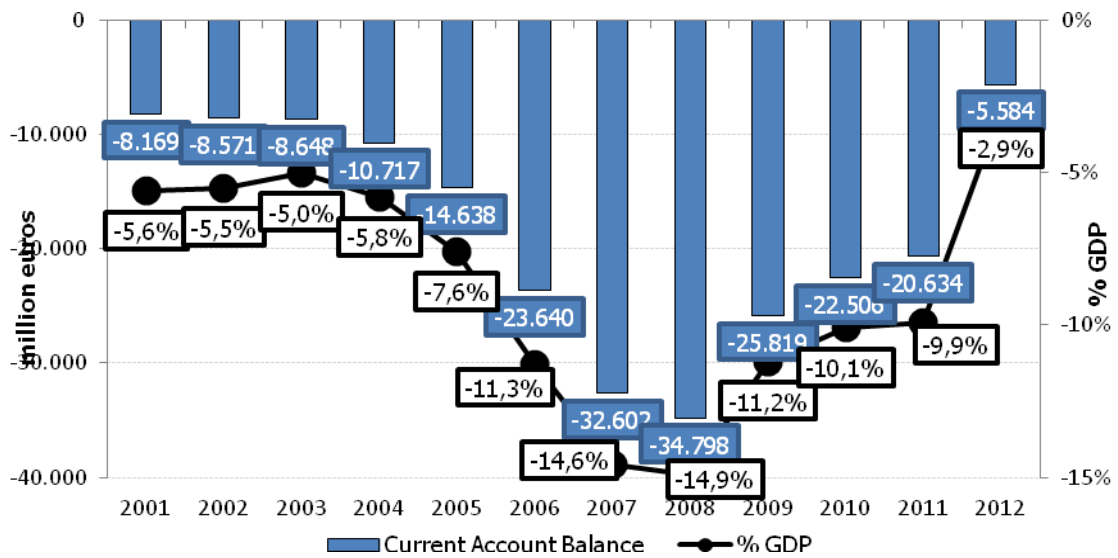
While some progress has already been achieved towards the two main goals (see Figure 6.1, Figure 6.6, Figure 6.3), Greek exports of goods continue to lag behind the EU average (see Figure 6.4). Most policy makers would agree that the establishment and sustainability of a positive trade environment can be reached via combined and deep structural reforms. Therefore, the third pillar of the National Export Strategy, which focuses on structural reforms to facilitate trade, is very important in setting a steady ground for Greek exports and, subsequently, in accelerating economic growth and job creation. Today, as the role of traditional trade barriers gradually vanishes, the focus of trade policy has shifted to non-tariff barriers to trade, including trade facilitation.

Figure 6.1: Greek goods imports and exports 2001-2012



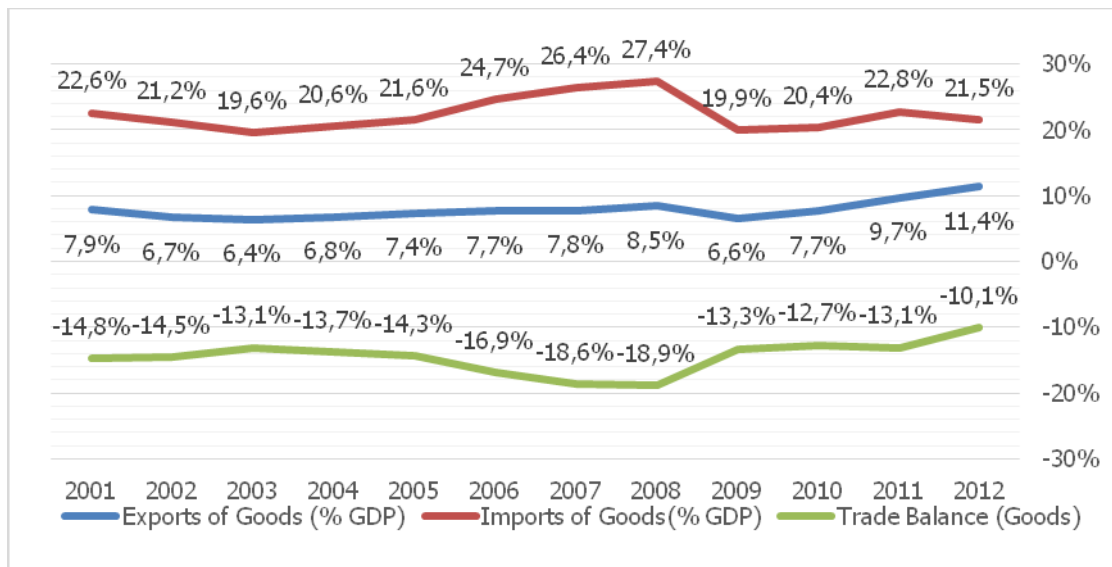
Source: Bank of Greece

Figure 6.2: Greek Current Account Balance 2001-2012



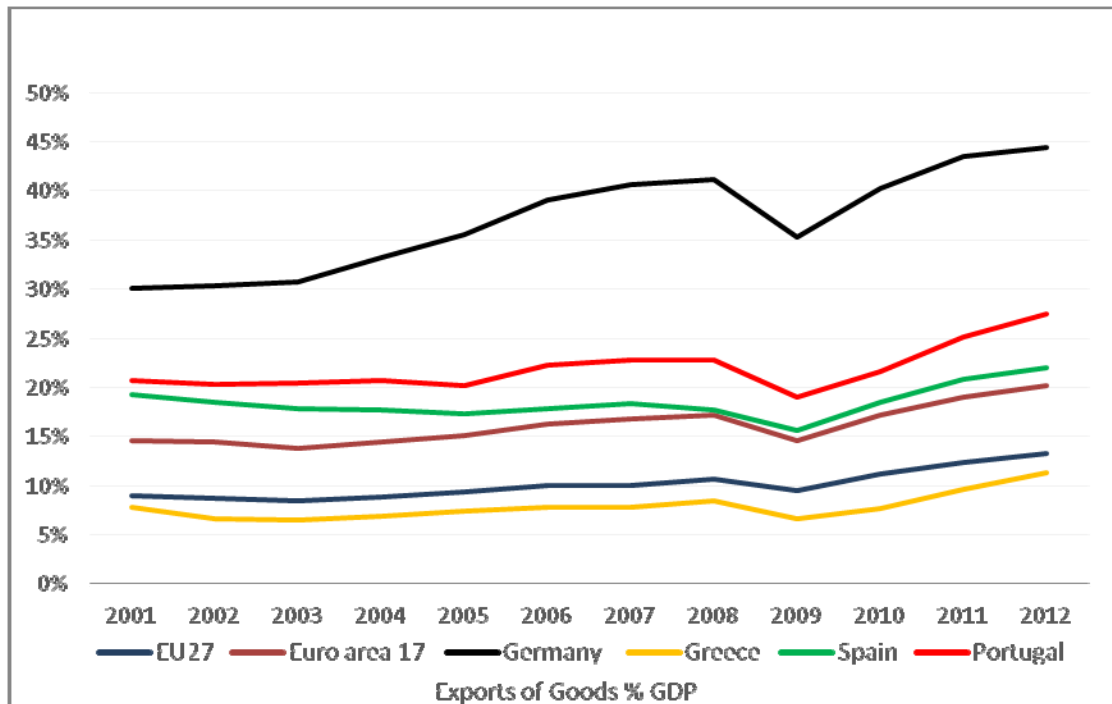
Source: Bank of Greece

Figure 6.3: Greek imports and exports % GDP 2001-2012



Source: Bank of Greece

Figure 6.4 Performance of the Greek exports % GDP compared to EU average 2001-2012



Source: Eurostat

Currently, Greek exporters face widespread administrative barriers and structural deficiencies. The high administrative costs and time to export especially in the pre-custom procedures, as well as the lack of automated and electronic processes discourage those entrepreneurs that are potentially exporters. The availability of updated trade related information, the simplification and harmonization of the documentation, the streamlining of procedures and the use of automated and digital processes are imperative to facilitate and strengthen Greek exports.

An extensive program of reforms to reduce these costs and obstacles, the National Trade Facilitation Strategy & Roadmap 2012-2015 (NTFS) is set out by the Greek government with the use of 25 planned actions (Hellenic Republic, 2012b). The implementation of the NTFS, with the advisory support of the United Nations Economic Commission for Europe (UNECE) and the World Customs Organization, started on November 2012. Some quantitative targets have been set: i) reduce the number of days needed to export by 50% by 2015, ii) reduce the administrative cost to export by 20% by 2015 and iii) establish a National Single Window for exports. Importantly, while some reforming steps have already been made and some are planned ahead, much inefficiency is still present.

In the following section, we briefly present the way the Greek economy is ranked on trading across border in comparison to other EU economies. Then we identify the main barriers to export concerning the pre-customs and customs procedures, the relevant reforms and the current situation in Greece. Finally, we present the international experience and some quantitative results, before summarizing.

6.2 Greece and its main competitors

World Bank publishes on an annual basis the Doing Business report which tries to assess the ease of doing business in a wide set of countries around the globe. The most recent report (Doing Business 2014, DB 2014) includes data for 2013. Based on the Trading Across Border (TAB) indicators for 2013, Greece is ranked 52 out of 188 countries in the ease of trading across borders list.³⁹ Compared to the DB 2013 (data from June 2012), Greece has improved its TAB ranking by 8 points (60 out of 185 countries last year).⁴⁰ According to the DB 2014, Greece made trading across borders easier by implementing a system allowing electronic submission of customs declarations for exports.

Despite the progress made, the time and cost of trading across borders in Greece still lags behind several economies in the European Union. Germany ranks 14th and UK 10th out of 188 countries, while Spain and Portugal rank at the 32nd and 25th position respectively, at the DB 2014 TAB list. Several barriers on the ease of exports and imports still exist in Greece.

Table 6.1: Trading Across Border Rankings for DB 2014 and DB 2013

Economy	TAB Ranking	DB 2014	TAB Ranking	DB 2013
Greece	52		60	
Germany	14		14	
Spain	32		35	
Portugal	25		17	

³⁹ *Doing Business-Trading Across Borders* measures the time and cost (excluding tariffs) associated with exporting and importing a standardized cargo of goods by sea transport. The time and cost necessary to complete every official procedure for exporting and importing the goods are recorded; however, the time and cost for sea transport are not included. All documents needed by the trader to export or import the goods across the border are also recorded. The most recent round of data collection was completed in June 2013 (Doing Business 2014).

⁴⁰ All Doing Business yearly rankings have been recalculated to reflect changes to the methodology and revisions of data due to new information. The methodology for the trading across borders indicators was updated this year (Doing Business 2014). Documents that are required purely for purposes of preferential treatment are no longer included in the list of documents (for example, a certificate of origin if the use is only to qualify for a preferential tariff rate under trade agreements).

Poland	49	50
Belgium	28	28
United Kingdom	10	11

Source: World Bank Doing Business

The various barriers to exports and the necessary structural reforms are analyzed in detail below. Most of these reforms are part of the NTFS, nevertheless, the slow implementation of the program and the poor monitoring of the progress made constitute significant policy failures that hinder the fast formation and, subsequently, the sustainability of a solid export environment in Greece.

6.3 Barriers to exports

In this section, we identify the main barriers to exports relevant to the pre-customs and customs procedures in Greece.⁴¹ These impediments tend to keep the time and cost to export at high levels, thus, the reduction or elimination of these impediments would facilitate trade. We should emphasize that the biggest delays are observed at the pre-custom phase. The main barriers to the exporting process are listed below.

- Bureaucratic paperwork and delays on preparing and obtaining the necessary documents and certificates to export goods.
- The non-automated custom practices across the custom offices cause high uncertainty and non-predictability about the essential steps for exports. Thus, unnecessary steps might be realized during the custom clearance.
- There is a large number of controls from different agencies and different offices and some of them are even duplicated. In addition, there is a lack of coordination between inspection officers from the various custom offices and agencies and there can also be significant delays during the inspection research (e.g., due to long laboratory tests, insufficiently staffed laboratories, non-modernised equipment etc).
- The complex legislation and the large number of rules, many times create problems in the implementation of export activity due to differences in the interpretation of the law (policy ambiguity).

⁴¹ Note that there also other potential barriers to exports, such as infrastructure and storage deficiencies at the custom offices, nevertheless the focus of this section is the administrative burden and structural impediments to exports.

- The customs office hours are not always enough or in accordance to the export needs. Also, some custom offices are insufficiently or non-effectively staffed.
- Only exporters, their authorised employees or their licensed agent (custom brokers) can submit an export declaration.
- Multiple agents require the same original supporting documents and multi-application of the same data.
- Considerable delays exist also in the VAT clearance process, which constitute a significant barrier to export.
- Lack of information to the exporters with respect to the items that has to be controlled and by which ministry or agency.
- Uncertainty on the number and the specificity of documents and procedures required to export.
- The complexity and plurality of the documentation and the custom procedures often make the export companies to use specialists in custom clearance (intermediaries), thus adding cost to their exports.
- Several fees are required in many steps of the export procedure.
- The poor usage of Information and Communication Technologies (ICTs), that is, the non-modernized export procedures with the absence of electronic services in various steps of export activity (concerning the information of the exporters, the documentation and the custom procedures).
- The necessity of the physical presence of the exporter (or a representative) in almost all custom procedures.
- Red tape and paperwork.

6.4 Reforms to facilitate exports

The reduction of the aforementioned administrative burdens and structural problems should be the main priority of the Greek government in the foreseeable future. The following main reforms are considered as essential towards this direction that could lead to an improvement in the time and cost to export.

- Keep the procedural, document and data requirements to a minimum with ICTs applied to the recommended international best practices and standards.
- Enhance the availability of information provided to the exporters via improved and/or new information exchange points (physical support in the involved ministries and agencies,

call centres and electronic support via the modernization and regular update of the relevant websites with all information available also in English).

- Establish an efficient control procedure with less product controls (according to the international best practices) and with the coordination of the various ministries and agencies involved in the export procedure.
- Simplify the national legislation and modernize the legal framework.
- Increase the number of companies that enjoy the simplified procedures during the custom clearance.
- Expand the customs office hours and monitor the effectiveness and efficiency of the custom office personnel.
- Adjust, reduce or eliminate the fees of the government agencies related to exports.
- Build simplified, harmonized, integrated and automated procedures within a paperless custom environment (the Integrated Customs Information System, ICISnet).
- Enable the electronic submissions and receipt of all data/documents related to export procedure (certificates, licenses, authorizations, invoices, online payments). The Greek state should also encourage exporters to use electronic procedures (the proper information and skill adoption of the exporters is a prerequisite).
- Gradually, implement a national Single Window (SW) for exports. The SW refers to the simplification of procedures and then to the implementation of a digital platform that allows parties involved in trade and transport to lodge standardized information and documents in a single entry point to fulfil all import, export, and transit-related regulatory requirements. A prerequisite for the digitization of exports is, of course, the streamlining of the various steps of the export process.

According to the NTFS, the SW will reduce clearance times and ensure that necessary information for completing these processes is only submitted once. The SW also promotes transparent trading in which rules and procedures are clearly defined and automated. Some potential benefits to the public sector include administrative burden reduction, freeing up resources, increasing efficiency, improving statistical data, making all information available in one central outlet for government to access, and ensuring correct revenue yield. The SW is also recommended by the United Nations as international best practice (United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) Recommendation 33/2004).

Finally, it is important to note that the various structural reforms on exports are not independent of each other, but should be planned and combined to target the same goal, that is, the facilitation of the pre-custom and custom procedures.

6.5 Greek goals and the current situation

The Greek government is currently conducting Business Product Analysis for specified products (already performed for fresh fruits and white cheese) and has launched pilot programs in selected custom offices (Athens airport and Piraeus port) to analyze and diagnose the custom processes and optimize the clearance procedure with the view to roll out to all other offices. The reforms planned by the NTFS initiative 2012-2015 and, currently, partially implemented in the Greek export market, have clear and specific goals:

- to reduce the time to export by 25% until the end of 2013 (i.e., 15 days to export) and by 50% till 2015 (i.e., 10 days to export),
- to reduce the administrative costs to export by 10% until the end of 2013 and by 20% until 2015,
- to reduce the percentage of physical and documentary controls to align with EU best practices, that is, 5% by the end of 2014,
- to increase the number of companies approved for Simplified Procedures including local clearance: increase to 50 by the 4th quarter of 2013, increase to 100 by the 4th quarter of 2014, represents 50% of total value of exports by 4th quarter of 2015
- to increase the number of Authorised Economic Operators: increase to 50 by the 4th quarter of 2013, increase to 100 by the 4th quarter of 2014, represents 20% of total value of exports by 4th quarter of 2015
- to establish and grow the number of Authorised Traders of fresh products to 50 companies by 4th quarter of 2013, and
- to launch the SW in 2015 and operate fully till 2017.

These goals are monitored by the respective key performance indicators.

According to the first Newsletter (October 2013) of the Greek trade facilitation Operational Steering Committee, significant progress and reforms have been achieved with direct impact on the time and cost of export procedures and the volume of documentation.⁴² In April 2012 the productive operation of the electronic submission of the export declaration via the

⁴² The Newsletters of the Greek trade facilitation Operational Steering Committee are available at <http://www.mindev.gov.gr/?p=6807>

ICISnet (Law provision 19A 5012006/12.03.12 Special order Ministry of Finance) has been implemented, while the first results in the pilot programs in the selected custom offices are positive.

More specifically, in the 5th and 6th custom office of Piraeus port and the custom office of Athens airport, important reforms have been implemented:

- i) there is electronic submission of the export declaration,
- ii) after the submission of the declaration, the exporter is directly informed if the declaration is approved or not,
- iii) there are additional areas (approved by the custom officers) apart from the custom offices where the exports can bring the goods about to export,
- iv) the Export Accompanying Document can be received also by an authorized person, apart from the custom representative and
- v) the custom office hours are expanded.

In the pilot custom offices, the time to export the low risk goods has been reduced significantly and the custom controls of the medium and high risk goods has been aligned to the EU standards (5%). The trade facilitation Operational Steering Committee also presents some progress in all custom offices concerning the simplification of the custom procedures, such as:

- i) custom clearance can be done also by other persons apart from the custom clearer (Law no.4093/2012 in place of the Law no.718/77),
- ii) there is no authenticity requirement of the signature of the exporter in the authorization of the legal representative,
- iii) there is the possibility of electronic submission of the supporting to the export declaration documents in pdf,
- iv) the simplified import and export procedures are applied with common criteria as in all the member states of the EU.

In the near future, the Greek custom offices plan to make additional changes in the productive operation of the ICISnet. The main changes include: i) the electronic submission of the import declaration as well, ii) the ability to pay the various tariffs and taxes electronically, iii) the immediate release of the low risk declarations, iv) The ability to print the export accompanying document by the exporter himself, v) The gradual implementation of the processes involved in the pilot program also at the other Greek custom offices.

The second Newsletter (November 2013) of the Greek trade facilitation Operational Steering Committee presents the formation of a practical guide on e-commerce that will help inform the Greek firms on how to build an e-shop and, thus, will facilitate the online trade. Finally, the third Newsletter (December 2013) of the Greek trade facilitation Operational Steering Committee presents three important measures that target the export facilitation. First, from December 3, 2013 the full productive operation of the ICISnet is implemented where the necessary export documents are exchanged electronically. Second, a special team on legal issues created a useful guide that includes all national and international trade rules sorted by product and by export destination. Third, the Ministry of Rural Development and Food targets the export facilitation of the Greek fresh agricultural products by the establishment of the Authorised Trader of fresh agricultural products that enjoys reduced administrative and economic burdens and reduced export time. In addition, a new Risk Analysis System is introduced for the fresh agricultural products according to the EU recommendations and the best practises of the EU countries, while the information system of the Ministry of Rural Development and Food is interconnected with the ICISnet, thus, the collaboration of the Ministry with the custom offices is achieved electronically leading to the facilitation of the pre-custom and custom procedures. All these measures target the reduction of the export barriers and the boost of the extroversion of the Greek agricultural products by rewarding the firms that trade safe, competitive and of high quality products in the international markets.

While some reforming steps have already been made, the key ingredient for a successful continuation of the reform program is the formation of a reliable system of monitoring and evaluation to ensure that reforms are implemented on time, are effective and can be adapted if needed.

6.6 International experience

The facilitation of exports (easier, faster and less costly processes) aims to increase the number of exporting firms and the exporting volumes, to attract Foreign Direct Investments and to, ultimately, boost economic growth and job creation. Although many factors may play a role in this process, there is experience from other countries and relevant literature that measures the impact of a reduction in the time and cost to export. The literature review revealed also some examples of the international experience on the digitization of custom procedures. Finally, there is some empirical evidence from the combined impact of all trade facilitation reforms presented in this subsection.

Time and cost to export

According to the World Bank analysis each day gained in exports, increases the total value of exports by 1% (Djankov, Freund, & Pham, 2006). Since the NTFS goal is to decrease the number of days of exports by 10 days till the end of 2015 (from 19 days in 2012 according to the DB 2013), the impact on the value of exports is estimated to be a 10% increase per annum. The Greek state has also estimated the expected impact of such an improvement on growth, 1.7% of GDP, and employment, 80,000 new jobs.

A study focusing on Asia-Pacific Economic Cooperation (APEC) economies estimates that cutting the days needed to clear exports by half could enable a small to medium-size enterprise to increase its share of exports in total sales from 1.6% to 4.5% (Li & Wilson, 2009). International trade plays an important part in the development of economies, thus, facilitating trade is a natural concern for policy makers.

Importantly, according to a 2009 OECD report, when trade facilitation is expected to lead to a reduction in trade transaction costs of 1% of the value of world trade, aggregate welfare gains are estimated to amount to about USD 40 billion worldwide, with all countries benefiting and non-OECD countries experiencing the biggest gains in relative terms (Walkenhorst & Yasui, 2009).

Digitization of the pre-custom and custom procedures

Several countries have already implemented deep reforms towards the digitization of the pre-custom and custom procedures. In Box 6.1, we summarize evidence from EU countries

(DB data), while Box 6.2 and Box 6.3 present some worldwide experiences. According to the DB arguments, electronic services facilitate trade and reduce significantly the time to export.

Electronic systems for filing, transferring, processing and exchanging customs information have become an important tool for managing flows of information, now widely used in complex trading systems. The newest web-based systems allow traders to submit their documents from anywhere and to pay duties online. The key to success is the ability of an economy to accommodate its regulatory framework to the new information technologies.

If implemented effectively, such a system saves time and money. It can also reduce interactions with officials, which improves transparency as it narrows opportunities for corruption. But introducing an electronic system often requires governments to enact legislation on electronic signatures and transactions. Otherwise it can lead to redundancy and delays, requiring paper submission of signed documents after they have been filed electronically. For small and low-income economies the infrastructure and training costs of implementing such systems can be significantly high and meaningful effects for local traders may take time to materialize.

Exchange of customs data and harmonization of customs procedures are important pillars of many regional communities, and electronic data interchange systems can support these regional integration initiatives. Increasingly, economies are going a step further by virtually linking not only traders and customs but all agencies involved in trade and transport through an electronic SW system. In the best case such a system allows traders to file standard information and documents through a single entry point to fulfil all import, export and transit-related regulatory requirements—then shares relevant information with all parties involved in trade, including private participants such as banks and insurance companies as well as public agencies such as immigration and vehicle registration authorities.

Box 6.1: EU experience in digitization of the export procedures

DB 2008: Austria eased trade by introducing an electronic customs clearance system on January 1, 2007 and application of a risk management system.

DB 2013: The **Czech Republic** reduced the time to export and import by allowing electronic submission of customs declarations and other documents.

DB 2009: **France** speeded up and simplified its customs clearance procedures by introducing an electronic customs declaration and eliminating the need to submit certain documents.

DB 2012: **Poland** made trading across borders faster by implementing electronic preparation and submission of customs documents.

DB 2013: **Portugal** made trading across borders easier by implementing an electronic single window for port procedures.

Source: World Bank Doing Business

Box 6.2: Allowing electronic submission and processing - international experience

In Central America the International Goods in Transit (TIM) system harmonizes previously cumbersome procedures in a single document to manage the movement of goods across 9 economies. At some border locations this has reduced clearance times for goods in transit by up to 90%. But linking 2 or more information technology systems through a common interface is not always easy. Integrating Kenya's Simba system with Uganda's ASYCUDA++ through the development of the Revenue Authorities Digital Data Exchange (RADDEx) system has taken several years and does not yet cover all trade between the 2 countries. Expanding this system to the rest of the East African Community also remains an ongoing challenge.

Today 83% of economies around the world allow traders to submit at least some of their export and import declarations, manifests and other trade-related documents to customs authorities electronically, though many of these systems are not linked to the internet and others still require hard copies. Across economies, regardless of income level, allowing electronic submission and processing of customs-related documents has been one of the most common and effective ways to reduce delays in the trading process. Statistics from the Pakistan government show how large the effect can be. Before Pakistan implemented its electronic system in 2006, only 4% of goods were cleared within a day; for a quarter of the goods, clearance took more than 6 days. By 2008, 93% of goods were cleared within a day.

Over the past 9 years, 119 economies have introduced or improved such systems, with 9 doing so in 2012/13. Today traders can submit all trade documents electronically in more than half of OECD high-income economies with no need to provide hard copies. In Sub-Saharan Africa and Eastern Europe and Central Asia, by contrast, most economies that have electronic systems still require traders to submit hard copies.

Source: World Bank Doing Business

Box 6.3: Electronic Single Window- international experience

Today 71 economies around the world have implemented SW systems of varying complexity. Developing economies are increasingly interested in such systems. Colombia and Senegal have both implemented SW systems, though achieving complete functionality is an ongoing process. El Salvador set up a SW linking customs, government ministries and tax and social security authorities. This cut the number of documents traders need to submit by 2.

The SW is being embraced by regional communities. The 10 member nations of the Association of Southeast Asian Nations (ASEAN) have set an ambitious goal of establishing an ASEAN-wide SW. Plans call for integrating members' national SW so that a single submission of data and information suffices for the entire ASEAN region.

Several economies have reported positive results from the implementation of SW systems.

In Singapore the implementation of a SW led to big gains in government productivity. The government established the world's first national SW for trade (TradeNet) in 1989, bringing together more than 35 border agencies. Thanks to such initiatives, today TradeNet handles more than 30,000 declarations a day, processes 99% of permits in 10 minutes and receives all collections through interbank deductions.

Source: World Bank Doing Business

In the Single Window Planning and Implementation Guide published by UNECE (October 2013), it is stated that several countries have reported positive results from the implementation of the SW (United Nations, 2013). For example, in Singapore, in 1989, the government set up the first SW worldwide by bringing together more than 35 border agencies. Government productivity has benefited from this SW system. Singapore Customs

claims that for every USD earned in Custom revenue it spends only one cent (i.e., a profit margin of 9.9%).

Combined impact of all trade facilitation reforms

There are also some studies that sum up the benefits across all trade facilitation reforms. For instance, Wilson, Mann & Otsuki, (2003) study the relationship between trade facilitation, trade flows and GDP per capita in the Asia-Pacific region for the goods sector. They define and measure trade facilitation using four broad indicators. These are constructed using country-specific data for: port efficiency, customs environment, regulatory environment, and e-business usage. They find that enhanced port efficiency has a large and positive effect on trade. Regulatory barriers deter trade. Also their findings suggest that improvements in customs and greater e-business use significantly expands trade, but to a lesser degree than the effect of ports or regulations. Then, based on a scenario in which Asia Pacific Economic Cooperation members below average improve capacity halfway to the average for all members, they find that intra-APEC trade could increase by 21%. In addition, these improvements in trade facilitation suggest an increase in APEC average per capita GDP of 4.3%.

Wilson, Mann, & Otsuki, (2004) extend their 2003 study to include 75 countries in their now global dataset and a better measure of the regulatory environment. They find that the total gain in trade flow in manufacturing goods from trade facilitation improvements in all four areas is estimated to be USD 377 billion; all regions gain in imports and exports. Most regions gain more in terms of exports than imports due mainly to the increasing exports to the OECD market. They also argue that the most important ingredient in getting these gains, particularly to the OECD market, is the country's own trade facilitation efforts.

More recently, Iwanow & Kirkpatrick, (2007), provide a quantitative assessment of the potential contribution of trade facilitation reform to export performance. They estimate the model with 5-year panel data (2000 to 2004) for 78 countries (including Greece). Quantitatively, their results suggest that a 10% improvement in trade facilitation would yield an increase in exports of about 5%. Identical percentage improvements in the regulatory environment and in the quality of infrastructure provision would result in increases of 9%–11% and 8%, respectively.

Hoekman & Nicita (2011) argue that the focus of policy debates and international cooperation is more and more on non-tariff measures, regulatory policies and on efforts to

facilitate trade. They investigate the impact on trade of a subset of such policies, and compare these with the effects of traditional trade policies (their dataset covers 105 countries for 2006). They find that while traditional trade policies continue to be important in developing countries as well as for some sectors in high-income countries (agriculture in particular), non-tariff measures and domestic trade costs are also of great importance. The impact of reducing the costs associated with policies that reduce the behind-the-border domestic cost of trade could have a greater payoff than further reductions in border barriers such as tariffs. They state that focusing attention on the policies that affect logistics performance and the internal cost of trading is likely to generate large trade gains, especially in terms of exports. Therefore, we can argue that there is considerable evidence worldwide that the structural reforms to facilitate trade have a positive impact on economic development. The overall reform benefits overcome the cost of implementation.

Finally, the Enabling Trade 2013 report (World Economic Forum - Enabling Trade, 2013) estimates that if every country improved just two key supply chain barriers – border administration and transport and communications infrastructure and related services – even halfway to the world's best practices, global GDP could increase by USD 2.6 trillion (4.7%) and exports by USD 1.6 trillion (14.5%). For comparison, completely eliminating tariffs could increase global GDP by USD 0.4 trillion (0.7%) and exports by USD 1.1 trillion (10.1%). The reason is that it eliminates resource waste, whereas abolishing tariffs mainly reallocates resources. Moreover, the gains from reducing barriers are more evenly distributed among nations than the gains from eliminating tariffs. The study also states that reducing trade barriers benefits households by lowering prices and improving employment prospects.

6.7 Quantification results

Data set description

To quantify the potential impact of the trade facilitation reforms on the Greek economy, we collected data for the EU 27 countries for the period 2005-2012, that is, 8 years (unbalanced panel data set due to the lack of some observations). Data on exports, GDP and GDP growth are collected from Eurostat and data on the structural reforms illustrated in the documents to export, time to export and cost to export are collected from the World Bank Doing Business data base. More analytically, we have used the following variables:

- **exppercntgdp**: exports of goods as percentage of GDP. This is our dependent variable and is calculated by: $[\text{exports of goods (in million ECU/EUR)}/\text{GDP (in million ECU/EUR)}]*100$. “Exports” is the fundamental variable that we want to study in relation to the reforms on the pre-customs and customs procedures. The basic task is to study and explain how the various reforms on export facilitation affect the export activity. We harmonize the exports with the GDP in each country to take the exports of goods as percentage of GDP and make the comparisons among countries relevant.
- **doc**: the number of the documents to export⁴³. A basic goal of the NTFS is to reduce the bureaucratic paperwork, thus the number of documents to export is a relevant explanatory variable to capture this target.
- **time**: the days to export (see also footnote 43). A fundamental goal of the NTFS (with specific target levels and deadlines as already discussed) is the reduction in the time to export, thus this explanatory variable captures this goal (and the relevant reforms that affect the time to export).
- **cost**: the cost to export (USD per container, see also footnote 43). Another specific goal of the NTFS is the reduction in the cost to export, thus this explanatory variable captures the relevant reforms on the cost to export.
- **gdpgrowth**: Percentage change on previous period of the GDP at market prices. We use this variable to capture the cyclical sensitivity.
- **gdpgrowthlag**: one year lag of the gdpgrowth.
- **exppercntgdplag**: one year lag of the **exppercntgdp**.
- **yr***: year dummies.

Before presenting the estimation results, we provide the summary statistics in the Table 6.2.

Table 6.2 Summary statistics

Variable	Observations	Mean	Standard Deviation	Min	Max
exppercntgdp	216	39.10531	18.36298	5.93331	87.87764
doc	206	4.179612	1.109503	2	7
time	206	12.45631	5.196203	6	28
cost	206	990.5825	262.7137	470	1601
gdpgrowth	216	1.631019	4.274033	-17.7	11

⁴³ Definitions and methodology is available at <http://www.doingbusiness.org/methodology/trading-across-borders>.

Source: Stata computations

From the Doing Business data set some observations are missing for Cyprus, Luxembourg and Malta.

Estimation results and impact of the reforms

To estimate the impact of the various reforms on exports, we use the dynamic panel data regression model of the Arellano-Bond estimators.^{44,45} More analytically, this model is estimated using the Generalized Method of Moments (GMM) technique, which is considered the most appropriate estimating method when using data sets that involve a large number of countries (27 in our case) observed over a relatively small number of time periods (8 years here). The basic advantages of this method refer to controlling for unobserved individual effects and also for potential endogeneity problems (in the present analysis the explanatory variables *doc*, *time* and *cost* are considered as possibly endogenous). Another advantage of GMM is that it enables the estimation of autoregressive models, analyzing thus the examined equation in a dynamic context using lag values of the dependent and independent variables. This methodology also assumes that there is no second order autocorrelation in the first differenced errors, so we additionally provide the relevant test in Table 6.3 along with the estimation results.

Table 6.3: Estimation results of the Arellano-Bond estimators, dependent variable “*exppercentgdp*”

Dependent variable: <i>exppercentgdp</i>	<u>Model I</u> Coefficient	<u>Model II</u> Coefficient	<u>Model III</u> Coefficient
Constant term	20.51267*** (6.652879)	28.27369*** (8.563265)	21.27861*** (6.294599)
<i>doc</i>	0.7869498 (0.7821084)		
<i>cost</i>	-0.005802 (0.003703)	-0.0082712** (0.0041604)	
<i>time</i>	-0.794441* (0.4275009)	-0.9941906** (0.4563868)	-0.9832078** (0.4286028)
<i>gdpgrowth</i>	0.1836214 (0.1428368)	0.1757064 (0.1457909)	0.2027132 (0.1672263)

⁴⁴ Technical details are provided in the Appendix of Section 9 on investment.

⁴⁵ We have also used alternative econometric models like the fixed effect model or the random effect model, nevertheless, the dynamic panel data model gives more robust results. In addition, we have tried many different model specifications with alternatives variables included.

gdpgrowthlag	-0.417122*** (0.0855196)	-0.4248988*** (0.0915251)	-0.4109022*** (0.1005657)
exppercentgdplag	0.7136296*** (0.0883052)	0.7259859*** (0.0839141)	0.6854242*** (0.0791263)
Number of observations	155	155	155
Number of instruments	109	97	76
Wald test	384.01 [0.0000]	333.39 [0.0000]	316.80 [0.0000]
M ₁	-2.728 [0.0064]	-2.9337 [0.0033]	-2.6947 [0.0070]
M ₂	-1.3262 [0.1848]	-1.1092 [0.2673]	-1.3182 [0.1874]
Sargan test	19.76283 [1.0000]	14.75935 [1.0000]	16.40453 [1.0000]

Notes: *The null hypothesis that each coefficient is equal to zero is rejected at the 10% level of significance. **The null hypothesis that each coefficient is equal to zero is rejected at the 5% level of significance. ***The null hypothesis that each coefficient is equal to zero is rejected at the 1% level of significance. Standard errors are reported in parentheses. P-values of all tests are reported in square brackets. M1: Test of no 1st order autocorrelation. M2: Test of no 2nd order autocorrelation. Year dummies are also included in the regressions. List of Instruments: Instruments used in the first-differenced equation are (exppercentgdp)_{j,t-2}, (doc)_{j,t-2}, (time)_{j,t-2}, (cost)_{j,t-2}, (gdpgrowth)_{j,t-2}, (gdpgrowthlag)_{j,t-2}. Year dummies have been also used as instruments. The instrument (cost)_{j,t-2} is excluded from Model III and the instrument (doc)_{j,t-2} is excluded from Model II and III.

Source: Stata computations

Table 6.4: Multicollinearity Test

	<u>Model I</u> 1/VIF	<u>Model II</u> Coefficient	<u>Model III</u> Coefficient
doc	0.060964		
cost	0.073950	0.077204	
time	0.105034	0.126443	0.174758
gdpgrowth	0.352946	0.360815	0.415270
gdpgrowthlag	0.253319	0.259784	0.263861
yr2	0.331340	0.360815	0.404284
yr3	0.346711	0.369621	0.407895
yr4	0.436084	0.455300	0.519675
yr6	0.217845	0.239528	0.281090

yr7	0.383142	0.415078	0.506580
yr8	0.460512	0.488424	0.564899

Source: Stata computations

In Table 6.3 we present three alternative dynamic panel data models, while in Table 6.4 we provide the relevant multicollinearity tests. In all three models year dummies are included and the Wald test rejects the null hypothesis that all coefficients are jointly equal to zero, thus, the latter indicates that all independent variables jointly are statistically significant. In addition, the Arellano-Bond test (M1 and M2) accepts the null hypothesis that there is no second order autocorrelation in the first differenced errors in all models and the Sargan tests perform sufficiently for the validity of the instruments.

Now let us discuss each model separately. Model I includes as independent variables the **doc**, **cost**, **time**, **gdpgrowth** and **gdpgrowthlag**. The time and the **gdpgrowthlag** are statistically significant at 10% and 1% level, respectively. The coefficient of the time appears with a negative sign, which means that a one day reduction in the time of the export procedure will result in a 0.79 percentage increase in the exports to GDP. Nevertheless, the **gdpgrowthlag** appears with a negative sign which is not intuitive. The other independent variables (apart from the time dummies) are not statistically significant. In Table 6.4, we additionally observe that the **doc** and **cost** variables suffer from multicollinearity since the inverse of the Variance Inflation Factor (1/VIF) is lower than 0.1 (which is the 1% tolerance level that we use in our case to exclude multicollinearity among the explanatory variables).^{46,47}

More investigation reveals that the **doc** and **cost** variables are highly correlated to the time to export according to the correlation matrix below.

<u>Correlation matrix</u>	doc	cost	time
doc	1		

⁴⁶ Note that the VIF test can be applied in our case where we estimate the GMM estimators at the Arellano-Bond dynamic model.

⁴⁷ Problems arise in regression when the explanatory variables are highly correlated. In this situation, there may be significant change in the regression coefficients if you add or delete an independent variable. The estimated standard errors of the fitted coefficients are inflated, or the estimated coefficients may not be statistically significant even though a statistical relation exists between the dependent and independent variables. In the comparison, if the 1/VIF is smaller than the tolerance, the associated predictor variable is removed from the regression model. However, analysts may also rely on informal rules of thumb applied to the VIF (see Chatterjee and Hadi, 2006).

cost	0.1097	1	
time	0.4384	0.3316	1

The problem with these variables is that they are highly correlated, since the number of documents to export and the cost to export affect the time to export (0.4384 and 0.3316 level of correlation, respectively). Thus, some information that is included in the documents to export and the cost to export is also included in the time to export as explanatory variable (these variables are related and move together).⁴⁸ Therefore, we next estimate dynamic models where we exclude gradually the variables that are correlated and not statistically significant, check again for multicollinearity and comment on the results.

Model II includes the same independent variables as Model I *apart from* the variable **doc**. When excluding the doc, the cost becomes statistically important at 5% level and appears with a negative sign, but still there is multicollinearity problem (see the third column of Table 6.4). Thus, when we further exclude the variable **cost** from the estimation model, we observe that the multicollinearity problem disappear in Model III. In Model III, we observe that a one day reduction in the time to export, results in a 0.9832078 percentage increase in the exports to GDP. We could argue that Model III illustrates better the data set, since it corrects the multicollinearity problem. Importantly, note that the estimated relationships are not causal, but establish empirically regular associations.

The results presented, suggest that the time to export is a non-negligible driver of the exports as percentage of GDP. There is evidence of the benefits of the structural reforms that reduce the time to export. Focusing on the econometric model specification III, a one day reduction in the days to export could lead to a 0.9832078 percentage increase in the exports to GDP. And if the days to export are further decreased the benefit will be multiple.

In 2012 there was a one day reduction in the time to export in the Greek custom offices, the necessary days to export was 19 in 2012 compared to 20 the previous year. Now we translate this change in the days to export in EUR million by using Model III. Model III predicts that, *ceteris paribus*, a one day reduction in the time to export will result in a *potential gain* in the Greek economy of around EUR 1.9 billion (0.98% of the 2012's GDP), which is not minor given that, in parallel to the trade facilitation reforms there are additional

⁴⁸ Also note that multicollinearity is a matter of degree; if it is too high the coefficients will have to be larger in order to be statistical significant.

structural reforms taking place in the Greek economy.⁴⁹ This result is actually rather ambitious. Since Model III includes as an export facilitation reform variable only the time to export, the potential gain of the EUR 1.9 billion also includes the impact of the other trade facilitation reforms supported by the reduced documents to exports and the reduced costs to exports. As already discussed, the doc, cost and time variables are correlated, as the one affects the other endogenously (we have excluded this multicollinearity problem in Model III). We should also pay attention to the fact that the data set includes the EU 27 countries, thus, the estimation results reflects the impact in all these countries and this might be the reason why the impact on the GDP of a one day reduction in the time to export is relatively high.

Finally, it is important to mention that the quantitative results in this section are subject to data limitations. Data availability in the structural measures is very scarce, thus, a more extended data set in terms of years and explanatory variables (ideally for the Greek economy) would give more accurate (and maybe more conservative) results.

6.8 Summary

To facilitate exports, the Greek state should first simplify the processes (also eliminate steps where possible), change the legal framework and then automate the simplified processes to, finally, integrate the key agencies in an electronic platform. Key ingredient for a successful reform program is the formation of a system of monitoring and evaluation to ensure that reforms are effective and can be adapted if needed. However, significant challenges remain especially with respect to the lack of skills (retraining of the personnel), incentives (motivation to apply the new working methods), coordination and financial resources to implement the reforms.

In summary, deep structural reforms to facilitate exports are not an easy task given the challenges faced in the Greek economy, in companion with the Greek mentality and way of economic functioning till recently. However, these reforms are necessary to boost the Greek exports and build a solid base for sustained economic growth combined with the reforms in other parts of the economy (on competitiveness, investment, labour and product markets

⁴⁹ Since in 2012 the GDP in Greece was EUR 193749 million, we calculate that a 0.98% increase of the 2012's GDP (due to the one day reduction in the time to export) is around EUR 1.9 billion (precisely it is $0.98 \times 193749000000 / 100 = 1898740200$).

etc).⁵⁰ Therefore, the government should proceed fast and with decisiveness on the implementation of these deep reforms (as already planned in the NTFS) to gradually and steadily remove the barriers and rigidities that impede the economic development.

⁵⁰ Note that there is interlinkage between the reforms in the various areas of the economic activity (sometimes there are synergies, but also sometimes there are conflicting forces). Thus, a proper and careful planning of the individual targets in the various policy areas is essential in achieving the desired outcome.

7. References

- Aberdeen Group. (2005). Best Practices in E-Procurement: Reducing Costs and Increasing Value through Online Buying.
- Albano, G.L., Sparro, M. (2010). Flexible strategies for centralized public procurement. *Review of Economics and Institutions*, 1, 1–32.
- Aschhoff, B., & Sofka, W. (2009). Innovation on demand—Can public procurement drive market success of innovations? *Research Policy*. doi:10.1016/j.respol.2009.06.011
- Bayoumi, T., D. Laxton & Pesenti P. (2004). “Benefits and Spillovers of Greater Competition in Europe: A Macroeconomic Assessment”. Working Paper 341, ECB.
- Beck, P. J., & Maher, M. W. (1986). A comparison of bribery and bidding in thin markets. *Economics Letters*, 20(1), 1–5. Retrieved from <http://ideas.repec.org/a/eee/ecolet/v20y1986i1p1-5.html>
- Birks, C., Bond, S., Radford, M. (2001). *Guide to e-procurement in the public sector: cutting through the hype*. London.
- Brammer, S., Walker, H. (2011). Sustainable procurement in the public sector: an international comparative study. *International Journal of Operations & Production Management*, 31, 452–476.
- Branstetter, L. G., Lima, F., Taylor, L. J., & Venâncio, A. (2010). Do Entry Regulations Deter Entrepreneurship and Job Creation? Evidence from Recent Reforms in Portugal. NBER Working Papers. Retrieved from <http://ideas.repec.org/p/nbr/nberwo/16473.html>
- Bruhn, M. (2008). License to sell : the effect of business registration reform on entrepreneurial activity in Mexico. Policy Research Working Paper Series. Retrieved from <http://ideas.repec.org/p/wbk/wbrwps/4538.html>
- Buchinsky, M. (1994). Changes in the U . S . Wage Structure 1963-1987 : Application of Quantile Regression. *Econometrica*, 62, 405–458. doi:10.2307/2951618
- Buchinsky, M. (1998). Recent Advances in Quantile Regression Models: A Practical Guideline for Empirical Research. *The Journal of Human Resources*, 33, 88–126. doi:10.2307/146316
- Carayannis, E. G., & Popescu, D. (2005). Profiling a methodology for economic growth and convergence: learning from the EU e-procurement experience for central and eastern European countries. *Technovation*, 25, 1–14. doi:10.1016/S0166-4972(03)00071-3
- Ciccone, A., & Papaioannou, E. (2007). Red tape and delayed entry. Working Paper Series. Retrieved from <http://ideas.repec.org/p/ecb/ecbwps/20070758.html>

- Desai, M., Gompers, P., & Lerner, J. (2003). Institutions, Capital Constraints and Entrepreneurial Firm Dynamics: Evidence from Europe. NBER Working Papers. Retrieved from <http://ideas.repec.org/p/nbr/nberwo/10165.html>
- De Soto, H. (1989). *The Other Path: The Invisible Revolution in the Third World*. Hernando de Soto (p. 271).
- Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). The Regulation of Entry. *Quarterly Journal of Economics*, 117, 1–37. doi:10.1162/003355302753399436
- Djankov, S., Freund, C., & Pham, C. S. (2006). Trading on Time, World Bank Policy Research Working Paper 3909.
- Dollar, D., Hallward-Driemeier, M., & Mengistae, T. (2005). Investment Climate and Firm Performance in Developing Economies. *Economic Development and Cultural Change*, 54, 1–31. doi:10.1086/431262
- Dreher, A., & Gassebner, M. (2007). Greasing the wheels of entrepreneurship? The impact of regulations and corruption on firm entry. KOF Working papers. Retrieved from <http://ideas.repec.org/p/kof/wpskof/07-166.html>
- Edler, J., & Georghiou, L. (2007). Public procurement and innovation — Resurrecting the demand side. *Research Policy*, 36, 949–963. doi:10.1016/j.respol.2007.03.003
- ECOM Group. (2002). *e-Procurement in the UK Public Sector: A Guide to Developments and Best Practices (A CIPFA e-Government Forum Report)*. London.
- European Commission. (2004a). EUR-Lex - 32004L0017 - EN. OPOCE. Retrieved from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32004L0017:EN:HTML>
- European Commission. (2004b). EUR-Lex - 32004L0018 - EN. European Commission. OPOCE. Retrieved from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32004L0018:EN:HTML>
- European Commission. (2012a). Annual Public Procurement Implementation Review (p. a).
- European Commission. (2012b). A strategy for e-procurement.
- European Commission. (2013a). European Public Sector Innovation Scoreboard.
- European Commission. (2013b). The Second Economic Adjustment Programme for Greece Third Review.
- European Union. (2009). Directive 2009/81/EC of the European parliament and of the Council of 13 July 2009. *Official Journal of the European Union*, 52, 76–137. Retrieved from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:216:0076:0136:EN:PDF>
- Evenett, S. J., & Hoekman, B. M. (2003). Transparency in government procurement: What can we expect from international trade agreements. In S. Arrowsmith & M. Trybus

- (Eds.), *Public procurement: The continuing revolution* (pp. 269–282). MA: Kluwer Law International.
- Evenett, S. J., & Hoekman, B. M. (2005). *International cooperation and the reform of public procurement policies*.
- Fisman, R., & Sarria-Allende, V. (2004). *Regulation of Entry and the Distortion of Industrial Organization*. Retrieved from <http://www.nber.org/papers/w10929>
- Hayri A. & M. Dutz (1999). "Does more Intense Competition lead to Higher Growth?". CEPR Discussion Paper No. 2249.
- Hellenic Republic. (2012a). *Greece, National Export Strategy (update of the 2010 initiative)*. Retrieved from <http://www.mindev.gov.gr/?p=6807>
- Hellenic Republic. (2012b). *National Trade Facilitation Strategy and Roadmap Hellenic Republic - October 2012*.
- Hoekman, B., & Nicita, A. (2011). Trade policy, trade costs, and developing country trade. *World Development*, 39(12), 2069–2079.
- Hunja, R. (2001). *Obstacles to public procurement reform in developing countries*. Washington D.C.
- IMS Health (2011). "Generic Medicines: Essential contributors to the long-term health of society."
- IMS Institute for Healthcare Informatics (2013). "Avoidable costs in U.S. Healthcare".
- Iwanow, T., & Kirkpatrick, C. (2007). Trade Facilitation, regulatory quality and export performance. *Journal of International Development*, 19, 735–753.
- Kaplan, D. S., Piedra, E., & Seira, E. (2011). Entry regulation and business start-ups: Evidence from Mexico. *Journal of Public Economics*, 95(11), 1501–1515. Retrieved from <http://ideas.repec.org/a/eee/pubeco/v95y2011i11p1501-1515.html>
- Kastanioti, C., Kontodimopoulos, N., Stasinopoulos, D., Kapetaneas, N., & Polyzos, N. (2012). Public procurement of health technologies in Greece in an era of economic crisis. *Health Policy*. doi:10.1016/j.healthpol.2012.03.015
- Klapper, L., Laeven, L., & Rajan, R. (2004). *Business Environment and Firm Entry: Evidence from International Data*. Retrieved from <http://www.nber.org/papers/w10380>
- Klapper, L., Laeven, L., & Rajan, R. (2006). Entry regulation as a barrier to entrepreneurship. *Journal of Financial Economics*, 82, 591–629. doi:10.1016/j.jfineco.2005.09.006
- Klapper, L., & Love, I. (2010). *The impact of business environment reforms on new firm registration*. Policy Research Working Paper Series. Retrieved from <http://ideas.repec.org/p/wbk/wbrwps/5493.html>

- Koenker, R., & Jr, G. B. (1978). Regression Quantiles. *Econometrica: Journal of the Econometric Society*, 46, 33–50. doi:10.2307/1913643
- KPMG Consulting. (2001). *Wide E-Procurement Assessment and Strategy Recommendation* Berkely.
- Krishna, V. (2009). *Auction Theory*. Elsevier Academic Press Publications. Retrieved from <http://books.google.gr/books?id=qW1128ktG1gC&printsec=frontcover&dq=inauthor:“Vijay+Krishna”&hl=el&sa=X&ei=roKpUuiZKKe6ygOp1YDQCg&ved=0CDIQ6AEwAA#v=onepage&q&f=false>
- Li, Y., & Wilson, J. S. (2009). Trade Facilitation and Expanding the Benefits of Trade: Evidence from Firm Level Data. Working Papers. Asia-Pacific Research and Training Network on Trade (ARTNeT), an initiative of UNESCAP and IDRC, Canada.
- Lien, D.-H. D. (1986). A note on competitive bribery games. *Economics Letters*, 22(4), 337–341. Retrieved from <http://ideas.repec.org/a/eee/ecolet/v22y1986i4p337-341.html>
- McKinsey Copenhagen (2010). *Creating economic growth in Denmark through competition*.
- Méon, P.-G., & Sekkat, K. (2005). Does corruption grease or sand the wheels of growth? *Public Choice*, 122(1), 69–97. Retrieved from <http://ideas.repec.org/a/kap/pubcho/v122y2005i1p69-97.html>
- Moon, M.J. (2005). E-procurement management in state governments: diffusion of e-procurement practices and its determinants. *Journal of Public Procurement*, 5, 54–72.
- Neef, D. (2001). *E-procurement: From Strategy to Implementation*. Upper Saddle River, NJ: Prentice Hall.
- Neiss K. (2001). “The markup and inflation: evidence in OECD countries”. *Canadian Journal of Economics*, Vol. 34 (2), pp. 570-587.
- Nickell S. J. (1996). “Competition and corporate performance”. *Journal of Political Economy*, vol. 104 (4), pp. 724-46
- Nicoletti, G., & Scarpetta, S. (2003). Regulation, productivity and growth: OECD evidence. *Economic Policy*, 18, 9–72.
- OECD. (2010). *Methodology for Assessing Procurement Systems (MAPS)*.
- OECD. (2013). *Discussion Paper on Public Procurement Performance Measures*.
- OECD (2013). *Competition Assessment Reviews, Greece*.
- Ohashi, H. (2009). Effects of Transparency in Procurement Practices on Government Expenditure: A Case Study of Municipal Public Works. *Review of Industrial Organization*. doi:10.1007/s11151-009-9208-1
- Pellizzari, M and G. Pica (2011). “Liberalizing professional services: Evidence from Italian lawyers”. IGIER Working Paper 372.

- Przybyla M. and M. Roma (2005). "Does product market competition reduce inflation? Evidence from EU countries and sectors". ECB Working Paper No 453.
- Pwc. (2011). Public procurement in Europe: Cost and effectiveness.
- Ramanujam, P. J. (2012). E-government: strategies for successful e-procurement. *International Journal of Engineering and Management Sciences*, 3, 53–59.
- Salgado R. (2002). "Impact of Structural Reforms on Productivity Growth in Industrial Countries". IMF Working Paper, WP/02/10.
- Scarpetta, S., Hemmings, P., Tressel, T., & Woo, J. (2002). The Role of Policy and Institutions for Productivity and Firm Dynamics: Evidence from Micro and Industry Data. OECD Economics Department Working Papers. Retrieved from <http://ideas.repec.org/p/oec/ecoaaa/329-en.html>
- Schapper, P., Malta, J., & Gilbert, D. (2006). An analytical framework for the management and reform of public procurement. *Journal of public procurement*, 6, 1 – 26.
- SEV observatory (2013). Business Licensing, Executive Summary, Athens
- Silverman, B. W. (1986). Density Estimation for Statistics and Data Analysis. *Applied Statistics* (Vol. 37, p. 120). doi:10.2307/2347507
- Steinberg, R. (2003). Strategies for Successful Government E-procurement.
- Stel, A. van, Carree, M., & Thurik, R. (2005). The effect of entrepreneurial activity on national economic growth. *Papers on Entrepreneurship, Growth and Public Policy*. Retrieved from <http://ideas.repec.org/p/esi/egpdis/2005-04.html>
- Stenning & Associates Pty Ltd (S&A). (2003). Evaluation and Review of the e-Procurement Pilot Project. Hobart, Australia.
- Suzuki, J. (2010). Land Use Regulation as a Barrier to Entry: Evidence from the Texas Lodging Industry. Working Papers. Retrieved from <http://ideas.repec.org/p/tor/tecipa/tecipa-412.html>
- Tavares L.V. (2010). Public eTendering in the European Union: Trust in eVolution.
- Thai, K. V. (2001). Public Procurement Re-examined. *Journal of Public Procurement*, 1, 9–50.
- Trade facilitation Operational Steering Committee. (2013). 1st Newsletter, October 2013.
- United Nations. (2011). Transparency and public procurement.
- United Nations. (2013). Single Window Planning and Implementation Guide.
- Vaidya, K., Sajeev, A. S. M., & Callender, G. (2006). CRITICAL FACTORS THAT INFLUENCE E-PROCUREMENT IMPLEMENTATION SUCCESS IN THE PUBLIC SECTOR. *JOURNAL OF PUBLIC PROCUREMENT*, 6, 70–99.

- Walkenhorst, P., & Yasui, T. (2009). Quantitative Assessment of the Benefits of Trade Facilitation. In *Overcoming Border Bottlenecks: The costs and benefits of trade facilitation*. OECD publishing.
- Wilson, J. S., Mann, C. L., & Otsuki, T. (2003). *Trade Facilitation and Economic Development: Measuring the Impact*, World Bank Policy Research Working Paper 2988.
- Wilson, J. S., Mann, C. L., & Otsuki, T. (2004, February 10). *Assessing the Potential Benefit of Trade Facilitation: A Global Perspective*, World Bank Policy Research Working Paper 3224.
- World Bank. (2003). *Electronic Government Procurement (e-GP): World Bank Draft Strategy*. Washington, DC.
- World Economic Forum - Enabling Trade. (2013). *Enabling Trade Valuing Growth Opportunities*.
- World Economic Forum - Global Enabling Trade. (2012). *The Global Enabling Trade Report 2012 Reducing Supply Chain Barriers*.

8. Appendix

Investment Licensing

Table 8.1: Environmental licensing process across European countries in 2010

Country	Number of application forms for granting environmental licensing	Application forms per population (mil)
Austria	23	3
Finland	38	7
Denmark	125	23
Hungary	152	15
Belgium	183	17
Great Britain	334	5
Germany	1000	12
Spain	1054	23
Poland	2200	58
France	3867	60
Greece	21500	1902

Source: from Ministry of Environment Energy and Climate Change

Table 8.2: Environmental licenses-Evidence from European countries

Country	Length of permit	Granting
Austria	not limited in duration	The regulator must periodically review the conditions attached to the permits and ensure that they are complied with.
Belgium	15 years, but it may be extended for 15 years.	Permits cannot be extended for more than one period of 15 years. However, after expiry of the extended permit, a new permit can be applied for.
Czech	usually 5 years	A permit can be granted for a definite or indefinite time period, depending on the projected lifespan of the facility.
Denmark	8 years	It must be reviewed or renewed
France	not limited in duration, but in certain circumstances, it can be	The regulator must periodically review the conditions attached to the permits and ensure

	limited.	that they are complied with.
Germany	not limited in duration	A permit becomes invalid if the operations covered by the permit are not carried out during any period of three years.
Italy	Usually 5 years, but different time limits may apply in certain cases, from 6 years to 10 years.	A renewal is applicable for a further five years to the competent authority, six months before the expiry of the permit.
Spain	8 years	Renewal of permit
United Kingdom	not limited in duration	The regulator must periodically review conditions of permits and ensure that they are being complied with. The regulator can suspend a permit if operations involve a risk of serious pollution

Source: <http://uk.practicallaw.com/practice/uk-environment>

Box 8.1: Spatial Planning Frameworks – International Experience

The case of Italy

The basic framework of Italy for statutory urban plans is devised by each of the 20 regional governments as a general plan. The regional plan covers regulations on particular land usage, the development of particular large land areas, and the planning of infrastructure such as road network and railways, in accordance with the environmental protection provisions.

The case of France

The national government develops national-level sector plans and Public Service Plans as guidelines (related to higher education and research, culture, health and hygiene, information and communication, passenger and cargo transport, energy, natural and agricultural space, sports). The regions are able to formulate regional economic development plans, as well as Regional Spatial Planning and Development Schemes, which are also locally-oriented plans that relate to both regional spatial improvement and municipal-level urban planning, with consistence to National level sector plans.

Box 8.2: Spatial Planning Frameworks – International Experience

The case of Belgium

The federal government, as well as the three Regions, has developed their own urban approach with their own distinct characteristics. In Urban planning framework attention is primarily paid to social cohesion, sustainable development and urban regeneration in general; this relates frequently, but not exclusively, to vulnerable or underprivileged neighborhoods. In addition the government intends to use the Urban Fund to achieve the following objectives: i) increasing the quality of life in cities, both at the urban and local level; ii) combating the separation of powers; iii) increasing the quality of democratic government.

The case of Germany

The "Spatial Development Concept and Strategy in Germany (2006)," is placing emphasis on three areas: i) achieving growth and innovation, ii) ensuring public services, iii) conserving resources, and preserving and nurturing cultural landscape. Under the federal system, the authorities of the federal and state governments are defined by the Basic Law for the Federal Republic of Germany, while the States have certain authorities and their own laws concerning spatial planning. *The objectives for an efficient spatial planning system* in Germany are: i) Integrated and comprehensive Spatial (and Local Land Use) Planning and its hierarchical system, ii) Sector Plans with impact on space, place and use of parcels like settlement, road construction, water resource or flooding protection, energy, mining, nature protection, landscape plans etc. Basic principle: the sector plans should first follow the directives of spatial planning and after weighing up should even become integrated in the Spatial planning system again. Spatial planning starts in official German understanding on the top level of the whole country and even – currently still informally – on European level.

Box 8.3: Land Registry – International Experience**The case of Lithuania**

Lithuania's State Enterprise Centre of Registers is responsible for the nation's real property cadastre and register, address register, and register of legal entities. All of Lithuania's real estate records and cadastral data are integrated into one system. The digital cadastral map contains a wealth of information on administrative boundaries of counties, municipalities, cities, and settlements; centerlines of streets and roads; land parcel boundaries, and reference point coordinates; centerlines of engineering utilities. In addition, cadastral maps web application allows users to obtain information on real property cadastre and register data. The system also includes digital signatures, which are already used by notaries who approve real estate deeds and other administrative documents.

The case of Sweden

The Swedish cadastral system is well regarded worldwide for its effective land legislation and administration. It supports many aspects of land administration in Sweden, including surveying and mapping; real property formation; production of cadastral maps; public utilities mapping; property valuation and tax assessment; and national, regional, and local planning. This new cadastral case handling system is part of a service-oriented architecture, whereby more general systems (e.g., financial and document systems) are connected. A central component of the system is the process engine, which has the ability to hold a cadastral case together throughout the process. Once the new system is in full-scale production, it is anticipated that process times will be reduced by 20 to 30 percent and that maintenance costs for the more integrated system will be lower.

Investment licensing - Quantification

The first alternative model we employ is a **panel data regression model** which has the following form:

$$y_{it} = \alpha + x_{it}\beta + v_i + \varepsilon_{it}$$

for $i = 1, \dots, N$ and $t = 1, \dots, T_i$,

where

- y_{it} is the dependent variable of our model, namely the ratio business investment to GDP,
- α : constant term,
- x_{it} : a $(n \times m)$ matrix of independent variables, that is variables days2, cost2, mincap, gdp and year dummies, described above,
- β : is a $(n \times 1)$ vector of parameters to be estimated
- ε_{it} : varies unsystematically (i.e. independently) across time and countries,
- v_i : is a residual that varies across countries but is constant across time. In literature depending on the assumptions about the individual effect v_i there exist two alternative model specifications:
 - Fixed Effects Model, where v_i is correlated with regressors x_{it} and
 - Random Effects Model, where v_i is uncorrelated with regressors x_{it} .

[For both models see Johnston & Dinardo (1997), Chapter 12 or Greene (1997), Chapter 14]

Fixed Effects Model:

The **Fixed Effects** case produces estimates by running OLS (Ordinary Least Squares) on the following model:

$$(y_{it} - \bar{y}_i + \bar{y}) = \alpha + (x_{it} - \bar{x}_i + \bar{x})\beta + (\varepsilon_{it} - \bar{\varepsilon}_i + \bar{\varepsilon}) + \bar{v}$$

where:

$$\bar{y}_i = \frac{\sum_{t=1}^{T_i} y_{it}}{T_i} \text{ and}$$

$$\bar{y} = \sum_i \sum_t \frac{y_{it}}{N_i T_i}$$

From the estimates $\hat{\alpha}$ of α and $\hat{\beta}$ of β estimates u_i of v_i are obtained because $u_i = \bar{y}_i - \hat{\alpha} - \bar{x}_i \hat{\beta}$.

Random Effects Model:

The key to the **Random Effects** case is the GLS (Generalised Least Squares) transform. Given the estimates of $\hat{\sigma}_v^2$ and $\hat{\sigma}_u^2$ the GLS transformation of a variable z for the Random Effects Model is:

$$z_{it}^* = z_{it} - \hat{\theta}_i \bar{z}_i$$

where:

$$\bar{z}_i = \frac{\sum_{t=1}^{T_i} z_{it}}{T_i} \text{ and}$$

$$\hat{\theta}_i = 1 - \frac{\sqrt{\hat{\sigma}_v^2}}{\sqrt{T_i \hat{\sigma}_u^2 + \hat{\sigma}_v^2}}.$$

Given an estimate of $\hat{\theta}_i$, one transforms the dependent and independent variables, and then the coefficient estimates come from an OLS regression of y_{it}^* on x_{it}^* and the transformed constant $1 - \hat{\theta}_i$.

The second alternative model we employ is a **dynamic panel data regression model via the Arellano-Bond estimator** (Arellano & Bond, 1991). The model has the following form:

$$y_{it} = \sum_{j=1}^p \alpha_j y_{it-j} + x_{it} \beta_1 + w_{it} \beta_2 + v_i + \varepsilon_{it}$$

for $i = 1, \dots, N$ and $t = 1, \dots, T_i$,

where

- y_{it} is the dependent variable of our model,
- α_j : represents the p parameters to be estimated,
- x_{it} : is a $(1 \times k_1)$ vector of strictly exogenous covariates,
- β_1 : is a $(k_1 \times 1)$ vector of parameters to be estimated,
- β_2 : is a $(k_2 \times 1)$ vector of parameters to be estimated,
- v_i : are the random effects that are independent and identically distributed with variance $\hat{\sigma}_v^2$.

- ε_{it} : are independent and identically distributed with variance σ^2 .
- v_i and ε_{it} are independent for each i over all t .

First differencing the above equation removes the v_i and produces an equation that is estimated by instrumental variables. Arellano and Bond (1991) derived a generalized method of moments estimator for α_j , β_1 and β_2 using lagged levels of the dependent variable y_{it} and the predetermined variables and differences of the strictly exogenous variables x_{it} . The above methodology assumes that there is no second order autocorrelation in the first differenced errors.

Multicollinearity Test:

To make sure that all estimations are consistent we performed an additional test to detect possible multicollinearity problems using the Variance Inflation Factor (VIF). The Variance Inflation Factor is the reciprocal of $1 - R_{X_k}^2$ where G_k is the set of all x 's except variable X_k . The coefficient determination of $R_{X_k}^2$ is derived from regressing X_k on the remaining explanatory variables. The $1 - R_{X_k}^2$ is referred to as the tolerance of X_k . If tolerance (or $1/VIF$) is close to 1 this means there is little multicollinearity, whereas if tolerance (or $1/VIF$) is close to 0 suggests that multicollinearity may be a threat. The VIF shows us how much the variance of the coefficient estimate is being inflated by multicollinearity. In this study we used the most common rule of thumb, i.e. a cut-off value of 0.1 for $1/VIF$ to determine the acceptable level of tolerance (see Chatterjee and Hadi 2006⁵¹).

Table 8.3: Multicollinearity Test

Random Effects		Fixed Effects		Random Effects (Robust Standard Errors)		GMM	
Variable	1/VIF	Variable	1/VIF	Variable	1/VIF	Variable	1/VIF
days2	0.23	days2	0.26	days2	0.23	days2	0.15
cost2	0.38	cost2	0.36	cost2	0.38	cost2	0.34
mincap	0.52	mincap	0.51	mincap	0.52	mincap	0.49
gdp	0.40	gdp	0.49	gdp	0.40	gdp	0.42
yr3	0.65	yr3	0.48	yr3	0.65	yr3	0.40
		yr4	0.44			yr4	0.34

⁵¹ Some authors/analysts choose a more conservative threshold value for $VIF=30$, i.e $1/VIF=0.033$)

yr5	0.67	yr5	0.48	yr5	0.67	yr5	0.37
yr6	0.69	yr6	0.64	yr6	0.69	yr6	0.48
yr7	0.38			yr7	0.38		
yr8	0.68	yr8	0.61	yr8	0.68	yr8	0.34
yr9	0.72	yr9	0.64	yr9	0.72	yr9	0.50

Exports

Table 8.4: Impact of change in metric on trade flows, except where specified differently

Article	Port efficiency	Customs environment	Services/Infrastructure/transport	Regulatory environment/corruption/transparency	eCommerce/ICT	Enabling Trade Index	Denominator explanation	Geographic focus
Wilson, Mann, Otsuki (2003)	9,7%	1,8%		7,3%	2,3%		Bringing below-average Asia-Pacific Economic Cooperation (APEC) countries halfway to average	APEC
Wilson, Mann, Otsuki (2005)	2,8%	0,8%	4,0%	2,1%			Bringing below-average world countries halfway to average	World
Abu, Wilson (2008)				9,7%			Bringing underperforming APEC countries up to average	APEC
Freund, Rocha (2010)			7,0%				1 day reduction in inland transport time, impact on exports (equivalent to 1.5% decrease in tariffs)	Africa
Djankov, Freund, Pham (2010)			1,3%				1 day decrease in transport time across 98 countries, impact on trade	World
Portugal-Perez, Wilson (2012)	2,5%		5,0%	19,0%	15,0%		Bringing exporter's indicators halfway to the top performer in the region, across 101 countries, impact on exports	World
Portugal-Perez, Wilson (2009)	7,5%						Bringing African exporter's indicators halfway to the top performer in the region, illustrative figure provided (7.5% is for Ethiopia)	Africa
Korinek, Sourdin (2009)	4,5%						5% decrease (1 day) in time in transit	World
Korinek, Sourdin (2011)						36,0%	10% increase in Enabling Trade Index	World
World Economic Forum, Global Enabling Trade Report (2009)						4,0%	1% increase in Enabling Trade Index impact on country-pair trade flow	World
Otsuki, Wilson, Sewadeh (2001)		11,0%					10% decrease in restrictiveness of aflatoxin standards, impact on trade volume	EU/Africa
Lima, Venables (2001)			28,0%				Reducing infrastructure from median to 75th percentile, reduction in trade	World
Freund, Weinhold (2004)					0,2%		10% increase in Web volume, impact on exports	World
Anderson, Marcouiller (2002)				34,0%			Aligning Latin American institutions with European Union standards	Latin America
Behar, Manners, Nelson (2012)			36,0%				1 standard deviation increase in logistics index (incl. affordability/speed of shipments, IT and other metrics), impact on exports	World
Helble, Shepherd, Wilson (2007)				7,5%			Bringing APEC nations with transparency measures below average to the regional average	APEC

Source: World Economic Forum, Enabling Trade 2013 (page 15)