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Reform of Public Administration in Greece; Evaluating Structural Reform of Central Government Departments in Greece: Application of the DEA Methodology

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ABSTRACT

The focus of this study is the evaluation of the efficiency and effectiveness of Central Government Departments (CGDs) in Greece. Measurements are compared with those defined by the Administrative Reform 2013 (AR2013) to assess whether the reforms introduced by the AR2013 to the CGDs attain the objectives of efficiency and effectiveness. The efficiency and effectiveness measurements of 19 CGDs drew on four Data Envelopment Analysis (DEA) models (i.e. Variable Returns to Scale DEA; Targeted factor-oriented radial DEA; Stochastic DEA; and Quality-driven Efficiency-adjusted DEA). This analytical methodology does more than merely attempt to defend or argue against the AR2013. It rather provides a concrete analytical framework for evaluating the performance of public organisations across the board, suggesting reforms that promote efficiency and effectiveness, and advance managerial capacity.

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1. Introduction

Governmental activities in the public sector are commonly regarded as inefficient by international organisations, such as the World Bank and the International Monetary Fund (Afonso et al., 2010). The reform of public administration and, in particular, the improvement of efficiency and effectiveness are key priorities for every country (UNDP, 2004). Efficient and effective public administration ensures the optimal utilisation of the resources engaged by public bodies and also the allocation of excessive public funds to the society or to actions for boosting the economy. According to the United Nations (UNDP, 2004), public administration reform includes changes in the organisational structure of public administration, human resource management, and public finance, as well as decentralisation, regulatory reforms and results-based management. This study emphasises changes in the organisational structure of the Greek public administration.

The reform of the 'machinery of government' (e.g. structure of ministries and public entities) towards the attainment of efficiency and effectiveness is one of the fundamental objectives of the Greek National Reforms Programme (2014). This programme highlights the need for downsizing the Greek public administration and reducing the resources utilised. The reform of the Greek public administration for enhancing efficiency is a key recommendation put forth by the OECD (2015). The Administrative Reform 2013 (AR2013), which is the most recent reform project of the Greek public administration, aims to reform the central public administration and, in particular, the Central Government Departments (CGDs), by downsizing the structure and reducing the number of staff and the budget allocated to every CGD. The objectives of the AR2013 underlie the achievement of a more efficient and less costly central administration.

The efficiency and effectiveness of public organisations are commonly measured through certain indicators (Smith and Street, 2005; Poister and Streib, 1999; Smith and Mayston, 1987). A limitation of quantitative indicators is that they evaluate specific aspects of efficiency and effectiveness of public organisations, while providing a high probability of conflicting results (Smith and Street, 2005). For instance, a public organisation might appear to perform well on the basis of one indicator (i.e. the score of the indicator is higher than a threshold value or than the previous year's score obtained from the same indicator), but the organisation is disqualified on the basis of another indicator. In this context, indicators cannot provide an absolute guarantee for qualitative decision-making.

Among the widely used methodologies for measuring efficiency are the Data Envelopment Analysis (DEA) (Charnes et al., 1978) and the Stochastic Frontier Analysis (SFA) (Meeusen and van den Broeck, 1977; Aigner et al., 1977). The former methodology is non-parametric drawing on linear programming for measuring the relative efficiency of operational units. DEA constructs empirical production frontiers consisting of relatively efficient operational units. Unlike DEA, SFA is a parametric methodology, which takes into account the effect of 'noise' in efficiency measurement. Unlike DEA, which regards any deviation of an operational unit from the frontier as inefficiency, SFA distinguishes such deviations between inefficiency and 'noise'. A crucial difference between DEA and SFA is found to be in the construction of the production frontier. The latter methodology assumes the form of the production function (e.g. Cobb-Douglas, translog) rather than defining it from empirical data.

Drawing on the literature of efficiency and performance measurement, DEA is a widely used methodology (Liu et al., 2013; Emrouznejad et al., 2008). DEA has been applied to various industries, such as banking, education, health care and energy (Liu et al., 2013). The applications of DEA to the public sector have been so far limited and mainly focused on local government institutions (Afonso and Fernandes, 2006; García-Sánchez, 2006; Worthington and Dollery, 2002; De Borger and Kerstens, 1996; Smith and Mayston, 1987). All of the applications of DEA to the public sector define optimal levels for resources engaged by public organisations in order for the organisations to become adequately efficient.

To the best of our knowledge, this is the first study that applies DEA to measure efficiency and effectiveness of the central public administration. This study is in line with the priorities of the Greek public administration, namely the improvement of efficiency and the attainment of effectiveness of the CGDs, and the significant reduction of public spending for the operations of the CGDs. An additional novelty of this work is the evaluation of a public administration reform project (i.e. AR2013) based on the achievement of efficiency, effectiveness and economy. This study applies three DEA programmes to measure the efficiency of the Greek CGDs (i.e. Variable Returns to Scale DEA, Targeted factor-oriented radial DEA and Stochastic DEA) and a DEA programme to measure effectiveness (i.e. Quality-driven Efficiency-adjusted DEA). Each DEA programme expresses a different perspective of efficiency and effectiveness. In this context, the four DEA programmes provide a versatile approach to the evaluation of efficiency and effectiveness of the Greek CGDs. Ultimately, this study aims to answer the following research questions: (1) whether the AR2013 facilitates the Greek CGDs to become efficient and effective; (2) whether structural reforms in central government affect the quality of governance; (3) whether the reduction of the size in CGDs affects positively the coordination of policy – related with qualitative aspects such as professionalism in the public service, etc.; and (4) whether structural reforms in the Greek CGDs need to take place for them to become efficient and spend no more than the target budget allocated to every CGD by the AR2013.

This work unfolds as follows: Section 2 highlights aspects of the profile of the Greek public administration, reviews public administration reforms before the AR2013, and discusses the priorities of the AR2013. Section 3 presents the four DEA programmes and discusses the variables introduced in these to measure the efficiency and effectiveness of the Greek CGDs. Section 4 analyses the results obtained from the DEA programmes, and Section 5 concludes.

2. Reforming the administrative structure

One of the crucial factors delaying reforms in economy and society in Greece is the poor condition of public administration. Namely, the administrative system of the country exhibits certain curious aspects and

features which are conducive to remarkable weaknesses of performance and rather limited capacity of achieving results (Mergos et al., 2012: 195 ff.).

Greek bureaucracy has been in such a state of affairs for a rather long period of time. Suffice it to mention here that Spyridon Eulamblos, who wrote a book in 1894 under the very insightful title *Maladministration in Greece* (he was actually the first Greek author who used this term), was even then talking about the crisis of bureaucracy in Greece, its deficiencies and pathologies, which he thought could be redressed by wide radical reform and modernisation.

The fact that the Greek administrative system is undergoing a crisis is an open secret among professionals, academics, and the public. A number of official reports have also been addressed to the biggest malady of the country, as it is often called, and have tried to identify the symptoms and the means of redress (Makrydemetres and Michalopoulos, eds, 2000). These reports have not differed greatly in the diagnosis, nor as far as the reform recommendations were concerned.

To go a little bit into the past, according to Kyriakos Varvaressos, who produced his influential report on the "Greek Economic Problem" in the beginning of the 1950s, the inefficiency of the public services posed the most difficult problem confronting the country in its effort to reconstruct and develop in the aftermath of the war and 1940's crisis period. He also underlined that administrative dysfunction rendered practically impossible the amelioration of the economic condition of the country. Varvaressos considered the most serious factors of administrative pathology to be:

(a) The uneven distribution of personnel in the various governmental services and institutions which resulted in their concentration in the central departments placed at the capital and the very weak staffing of the regional and decentralised units. This problem was further aggravated by the unabated preservation of an unorthodox system of position classification which rendered virtually impossible the interagency transfer and circulation of personnel.

(b) The long established practices of clientelism, favouritism, and patronage, the blatant violation of meritocracy and the widespread corruption, as well as bribery and low morale even among the top ranking officials and administrators.

(c) The prevalence of legalism, formalism and bureaupathology in the functioning and performance of public services, which not only inhibited initiative and creativity in tacking the nation's problems, but also severely troubled and disturbed citizens, especially those of the lower and more vulnerable classes and strata of the society.

Along with proposing concrete measures and reforms to meet these particular drawbacks, K. Varvaressos insisted in unmistakable terms that an essential, indeed sine qua non, condition to overcome the acute administrative plight would be to maintain genuine impartiality and to abandon party interference in the affairs of the civil service (including appointments and promotions). For that purpose he strongly recommended the establishment of an independent Commission of Experts that would oversee and evaluate the reform measures and strategy.

At about the same period Georgios Marangopoulos, who subsequently became President of the Conseil d'État, drafted a blueprint for the new "Methods of Recruitment and Training of the Civil Service Personnel" (1950) providing for the generalised application of a system of meritocratic appointments in the public service based on competitive examinations, the establishment of a distinct class of senior administrators and the continuous in-service training and skills improvement of public employees.

A few years later, F.M.G. Willson, an OECD consultant and university professor from Great Britain, analysed the "Machinery of Government in Greece" (1964), pinpointing the structural deficiencies of the central departments of Government, the weak coordination among them and the inadequate development of decentralisation.

At about the same time, another OECD consultant, professor Georges Langrod from France, produced the most comprehensive report theretofore on the "Reorganisation of Public Administration in Greece" (1965). Langrod identified the capacity deficit of the civil service at the structural, procedural and personnel levels, and in components of the administrative system. He even underlined the fact that the operational inadequacy and failure of the civil service contrasted sharply with the requirements posited by Greece's eventual accession to the European Community with which Greece had already, since 1961, signed an association agreement. (This agreement provided for the first time for a full accession date 20 years later, and that was what actually happened

in 1981.) In his report, Langrod strongly emphasised the need to raise the level of professionalism in administration with all that it entails, the intensification and professional re-orientation of the educational component at the secondary and tertiary levels, as well as the updating and proliferation of in-service training and developmental opportunities.

Other commentators in the meantime and in view of Greece's entrance to the, then, European Economic Community had pointed out the impotence of Greek bureaucracy and had argued that it constituted an obstacle to rather than a means toward development and modernisation (inter alia, Argyriades, 1970).

The last three reports which will very briefly be referred to here are the "Report on Public Administration" produced in 1988 by a team of experts who were brought together by the Centre of Planning and Economic Research (KEPE); the white paper on the "Reform and Modernisation of the Civil Service", produced in 1990 by another team of experts under the auspices of the Department of Public Administration; and, finally, the Mikhail Decleris' Report on "Greek Administration 2000", which formed the basis of a Cabinet resolution that was, however, never implemented.

Understandably perhaps, after each report was published and promulgated, a number of reform measures were announced or even enacted in accordance with the recommended interventions. But they hardly affected the practical horizon of administrative (poor) performance.

2.1. Aspects of crisis in the administrative system

As already analysed above, the malfunctioning of the administrative system in the country has been identified over the years by numerous experts' reports, as well as by pieces of academic analysis and public opinion. The main factors responsible for this quality deficit include not only the overall extent of public intervention in economy and society, which has been excessive by any means and standards of comparison, but also the long tradition of legalism, rigidity and formalism of administrative behaviour almost at any level and aspect of state action. Furthermore, the infiltration of political —or rather party-political— concerns into the operation of state agencies and organisations at the

centre and the periphery of the administrative machinery of the country does only aggravate the condition of limited professionalism and low performance in public administration. Excessive size, political dependence, legalistic culture and lack of professionalism, if combined as they actually are, become factors which explain much of the predicament of public administration in Greece (Makrydemetres, 2013: 118).

Whether administrative crisis is a persistent phenomenon in a developed country like Greece remains a basic question. The reason is that despite various reforms and interventions which have taken place over the last 40 years or more and the widespread consensus for the need to modernise the political system as a whole, state bureaucracy and administration have failed to improve in a substantial way. Nor have the worst symptoms of maladministration and bureaupathology been overcome (Makrydemetres, 2013: 121).

On the contrary, the features and characteristics of crisis seem to persist, if not intensify, and manifest themselves not only in the widening gap or deficit of public finance (Makrydemetres, 2013: 131-132; Kazakos, 2010: 168; Argeitis, Dafermos and Nikolaidi, 2011; Manitakis, 2012), but also in the nearly negative efficiency and effectiveness of the administrative behaviour in the public sector. Related aspects of the administrative crisis include: (1) the size of personnel that has been found excessive, especially in the past (Makrydemetres and Pravita, 2012: 559 ff.; Iordanoglou, 2010: 35 ff., 51 ff.; Manitakis, 2012), (2) the uneven allocation of duties and responsibilities, and the limited professional expertise of public employment, (3) the outmoded and ill-shaped organisational structures, (4) the virtual absence of modern management methods, principles and techniques, and (5) the prevailing legalism, formalism and underdevelopment of professional ethos and disrespect for morality in the administrative culture of modern Greece. As a result, a sense of implementation failure has prevailed in almost every sector of state activity and performance.

The above factors of administrative crisis, linked with others in adjacent social systems (i.e. education, party politics, urbanisation, weak industrialisation, etc.), produce the particular symptoms of the endemic pathology and incapacity of state bureaucracy. Accordingly, the administrative crisis does also seem to reflect and perpetuate a wider

inertia and weakness of the public sector as a whole. The causes of this inertia ought, however, to be sought at the structure and foundations of the political behaviour over the years rather than a particular coincidence.

For analytical purposes, it is perhaps warranted to distinguish between two main categories of concurring factors or causes of administrative crisis in the Greek case, namely the limited external differentiation of the administrative domain from politics, political control and party dominance (Lyrintzis, 2011; Mavrogordatos, 2001: 225 ff.; Sotiropoulos, 2007: 31, 106 ff.). And, secondly, the insufficient internal development and differentiation of the administrative subsystem in terms of structures, functioning and personnel professionalism, which amount to an overall capacity crisis of state bureaucracy and administration.

It does, therefore, seem to be the case that an inverse relationship tends to obtain among the above factors. Thus, the intensification of political control and domination over state bureaucracy tends in the longer term to undermine the conditions of steady development and professional advancement —including meritocracy— in the administrative structure and culture. As a result, crisis phenomena tend to perpetuate themselves, which in turn creates the need for more political intervention and control, and so on in a vicious circle. It comes as no surprise, therefore, that the perception of failure and ineffectiveness of reform measures could be regarded as an instance of the phenomenon of 'crisis of the crisis management'.

The fact that the administrative system in its present shape and condition presents itself as an obstacle rather than as a tool and sufficient instrument for advancing and serving reforms in economy and society needs hardly to be emphasised. Indeed, it is increasingly being realised that unless and until administrative reform and modernisation is rapidly, effectively and substantially advanced, economy and society will be left unsupported in the desert of backwardness and dependence. Requisite types and forms of administrative renewal and reform are indispensable, in order to open up new possibilities and unleash forces, which will contribute to further development in the economic, political and social domains in the country.

2.2. Capacity deficit and reform

As far as the prospects of reform are concerned, the optimal strategy would then rather tend to focus on increasing and improving the capacity and quality of state machinery. That would perhaps have to entail to a certain extent taking measures to reduce the overall size and scope of state involvement and intervention in economy and society. The overstretched and oversized state involvement in an overregulated economy and society looks likely as necessary to be reversed and rolled back to more manageable proportions (Makrydemetres, 2013: 133-135). At the same time, a relevant precondition —a *conditio sine qua non*— for further development in the productive sectors of the economy would relate to the substantial amelioration of the quality and professionalism of public services. Namely, what is urgently needed is the capacity of the state to act efficiently and effectively, in a manner that is responsible and accountable to the people and civil society at large.

The twin strategy of size reduction and capacity improvement lies at the heart of the more inclusive policy ideal of reform and 're-founding' or reconstructing the state. Re-founding or re-establishing the role and functions of the state would then entail striking a new balance in its relations with market economy and civil society. Above all, the idea to reconstruct the state machinery in the face of new challenges would involve special emphasis and attention on the capacity and quality of the administrative machinery (Papoulias and Tsoukas, 1998; Michalopoulos, 2003, 2007; Karkatsoulis, 2004; Maïstros, 2009; Tsekos, 2007; Osborne and Gaebler, 1992; Kliksberg, 2001; Rondinelli and Cheema, 2003; IRAS, 2009). The quality of state performance in the various branches of Government and public administration forms an indispensable condition for sustainable development. And development ought to be understood in qualitative terms too, enhancing the potential for an open and more democratic policy, enriched with public services and institutions that function well and respond to people's desires and demands in the context of the rule of law.

Raising the capacity level of the Greek administrative system does certainly involve reshaping the structure of central service units, and in particular the reduction of the number of units related to the central policy determination. That is being suggested by the Memorandum of Understanding, as it is going to be explained further on, but it has also been part of the Greek government experience that the coordination

policy is facilitated by the rationalisation of the central government structures, including the reduction of CGDs (Pravita, 2013).

Overall, a kind of a 'paradigmatic shift' is underlying the whole effort to 'reinvent' public governance and administration in contemporary Greece. Thus, a new emphasis is more than visible on the need to circumscribe the institutional monopoly of the centralised state administration by attempting to reduce and optimise its regulatory intervention in the economy and society.

2.3. The recent crisis and administrative reform in Greece

The modernisation of public administration formed one of the structural policies that Greece assumed the responsibility to implement in the context of the Memorandum of Economic and Financial Policy (confirmed by Law 3845/2010 concerning the "measures to be taken for the implementation of the support mechanism for the Greek economy by the Euro area Member States and the International Monetary Fund"), with the aim to contain expenses as well as to improve the effectiveness of public services. It was envisaged inter alia that the Greek Government would collaborate with the European Commission in order to "launch an independent external functional evaluation" of central administration of the country. In subsequent Law 4024/2011, which referred to the implementation of the Midterm Fiscal Strategy Framework 2012-2015, enacted by the Government of the then Prime Minister Georgios A. Papandreou, it was specified that evaluation of structural units and the personnel is necessary for the rationalisation of public administration and, in particular, the reconstruction of public services by means of drafting new organisational charts of ministerial structures, the merger of service units, the transfer of personnel and the abolishment of redundant posts.[1] For that reason a special Committee was set up in each ministry (article 35).

Despite the change of Government in 2011 and again in 2012, the country continued to be under the obligation to curtail and downsize general government units (Law 4046/2012 "Approval of Plans of Financial Facilitation between the European Financial Stability Facility

[1] The typical structure of a ministry (or department of State) includes General Secretariats, General Directorates, Directorates, Sections and Bureaus. The political leadership of a ministry, apart from the minister, often includes alternate ministers, deputy ministers and secretaries general (or special). Civil servants employed in the above-mentioned organisational units perform the corresponding duties and competences.

(EFSF), the Greek Republic and the Bank of Greece, the Plan of Memorandum of Understanding between the Greek Republic, the European Commission and the Bank of Greece, and other urgent measures to reduce the public debt and rescue the national economy"), which is suggestive of the fact that rather little of previous obligations had been efficiently and effectively implemented. Therefore, the effort for reorganising public administration was maintained. In this context, and taken account of the concrete schedule for the implementation, it was considered as necessary the establishment at the Ministry of Administrative Reform and E-Governance of a stable structure for Inter-Ministerial Coordination, which would provide better guidance and break the intra-Ministry attitude of neglect and inertia (European Commission, 2012: 12-13, 38). Equally necessary was considered the setting up of a high-level transformation steering group, under the Prime Minister's authority, with the responsibility to "supervise, monitor and ensure the implementation of administrative reforms". Thus, the Governmental Council of Administrative Reform was set up and assumed the responsibility of policy design for the improvement of organisation, functioning and effectiveness of public services, as well as of the evaluation of the results achieved and the decisions taken on them.

Additionally, various Committees in distinct departments of State comprised of civil servants in the Greek public administration and their colleagues from other European countries (e.g. France) prepared reports on the reshaping of the internal structure of ministries, which were further elaborated by the Ministry of Administrative Reform and E-Governance. They were even further revised after a certain period of time elapsed by the Governmental Council of Administrative Reform, which finally approved them.

2.3.1. The Administrative Reform 2013

In the publication *Greece: Review of the Central Administration* (OECD, 2011: 24) it has been highlighted that a fundamental role is played by the Central Government Departments (CGDs), "which are formally responsible for the supervision of all other entities of the public sector". As a matter of fact, however, government departments are characterised by organisational sprawl, which leads —among others— to poor quality of public services and ineffectiveness (Ministry of Administrative Reform and E-Governance, 2012: 39).

The Administrative Reform 2013 (AR2013) is the most recent reform project for the Greek public administration, the details of which were announced by the Ministry of Administrative Reform and E-Governance in late April 2013. The AR2013 aimed to reform the administrative machinery of the State regarding the central government, adopting the managerial and organisational principle of the 'unity of direction' and attaining the appropriate span of control for a more effective public management.

The government machinery in Greece —the way it was shaped after the government reshuffling of June 24th 2013, under the premiership of Mr. Antonios Samaras— had been structured into a complex of eighteen separate central departments (ministries),[2] among which the members of the Government were distributed, with the exception of the Prime Minister and Minister of State, who were not in charge of any specific ministry.[3]

The CGDs consist of usually untidy agglomerations of public services and respective jurisdictions at the central level of the government, under the leadership of members of the Government, and function with the aim of the formulation and implementation of goals of public interest and respective spaces of public policy. The forms and denominations of departments of State delineate and share basic branches of public services at the central level of the government, as is the case in most contemporary and in particular European countries. They assume a guiding role in the formulation of public policy including the design and implementation of the legal and regulatory framework in various domains of public action. As a result, government departments not only represent the most basic pillars of the organisation of the central administrative machinery of the State, but also form the most crucial institutional components in the process of formulation and implementation of public policy. Thus, it comes as no surprise that the

[2] See infra, pages 56-57: Table 1. Configuration of the General Government structure.

[3] The structure of the government mechanism in Greece has developed till recently (January 2015) into 18 distinct ministries. This shows that the somewhat 'generous' arrangement of the government structure has continued to remain a 'constant' throughout almost all the post-War period and, in any event, during the period of the Third Hellenic Republic (from 1975 onwards). It would, therefore, not be unfair to say that this is perhaps indicative both of the wide range of public policy, which extends into almost all areas of social action and of the magnitude of state intervention in the social sphere. It also reflects the corresponding need for control of public bureaucracy by an equally complex and extensive political superstructure, with numerous government posts and appointed political offices for the guaranteeing of policy guidance over the administrative infrastructure (bureaucratic machinery).

greater part of policy making takes place in association with or within them.

Taking account of the historical evolution of the CGDs (Makrydemetres and Pravita, 2012: 290 ff.), they include major institutional components in respective policy areas, such as: home administration and security of the State, foreign policy and defence, economic policy, public works and infrastructure, social policy, education, national heritage and culture. Despite the fact that the size and extent of policy composition of state machinery may vary through time and with the political orientations of the social forces, the core element of the Government composition is formulated in respective ministerial or departmental structures and services.

The AR2013 placed emphasis on the operational restructuring (downsizing) of the following Greek CGDs and Secretariats General:[4]

- Ministry of Finance
- Ministry of the Interior
- Ministry of Development, Competitiveness, Infrastructure, Transport and Networks

Heretofore:

  - Ministry of Development and Competitiveness
  - Ministry of Infrastructure, Transport and Networks
- Ministry of Education and Religious Affairs, Culture and Sport

Heretofore:

  - Ministry of Education and Religion
  - Ministry of Culture and Sports
- Ministry of Administrative Reform and E-Governance
- Ministry of Health
- Ministry of Labour, Social Security and Welfare
- Ministry of Rural Development and Food
- Ministry of Environment, Energy and Climate Change
- Ministry of Justice, Transparency and Human Rights
- Ministry of Tourism
- Ministry of Shipping and the Aegean
- Ministry of Macedonia and Thrace

[4] See http://www.minpress.gr/minpress/index/other_pages2/dioikitiki_metarithmisi_2013.htm.

- Secretariat General of Information and Communication, and the Secretariat General of Mass Media.

The scope of the AR2013 was the enhancement of performance, efficiency and control over the expenses of these particular public bodies, the reduction of their size through the reshaping of their structure, and the amelioration of the quality of the related public services. In addition, it was regarded by the Ministry of Administrative Reform and E-Governance as the basis for the implementation of mobility and the dismissal of redundant civil service staff.

Taking into account that the Greek economic crisis is mainly due to fiscal problems, the importance of the AR2013 was significantly high for the Greek economy and public administration. The urgency of this administrative reform and its immediate implementation was made explicit in the reports of the European Commission (2013) that reviewed the Second Economic Adjustment Programme for Greece, and in the press releases of the Ministry of Administrative Reform and E-Governance.

2.3.1.1. Focus of reform analysis

Analysing the internal environment of public administration refers to parameters and processes which characterise a complex system as such. Formal study of the internal structure of the administrative organisation is usually inclusive of the following elements:

(a) Operational activities which pertain to the description of professional structuring, categories of the public that are being served, relations with relative institutions, etc.

(b) Organisation and functioning of the dominant administrative structure including political guidance and control, organisational charts of the basic service units as well as description of the function at the level of directorates general, directorates, sections, and the rest of the service units.

(c) Human and material resources, the personnel and their skills, competencies and capabilities (moral, professional and intellectual), technical and informational infrastructure, financial resources.

The following analysis adopts a structured approach that is based on the collection and classification of information concerning the above in an organised and methodical manner, including flowcharts, budgetary information and size of personnel.

The study of the internal environment is being conducted at a certain depth and scope which may perhaps facilitate the identification of a series of strong and weak points. The in-depth analysis of the internal environment of the administrative machinery aimed particularly at the following elements or aspects of its functioning, on the basis of which may be extracted the conclusions:

(a) Depicting the existing organisation and structure of the central service units of the government departments on the basis of the available material envisaging it (legal documents and enactments referring to the administrative structure of CGDs),

(b) Extracting the relevant information resulting from the above in the form of organisational flowcharts, span of control in units at the various administrative hierarchy,

(c) Describing and analysing jurisdictional demarcations along the lines which the policy space of the respective departments is being defined and organised, and

(d) A certain element of comparative evaluation and benchmarking at the empirical administrative analysis of the available material that may contribute to the more objective evaluation of the manner of the organisation and functioning of the system under examination.

2.3.1.2. New structure of the ministries

New organisation charts of the ministries were issued (in the form of presidential decrees) by the end of August 2014 and were put in force about two months later (by the beginning of November 2014). The Ministry of Administrative Reform and E-Governance announced that the overall reduction of the size of the service units in the ministries exceeded 40%, which led to respective reduction of expense. The latter further contributed to efficiency and effectiveness improvement in public administration. Presumably, contraction of the structure of the services facilitates the coordination of the units. The OECD Review for

Greece (2011: 57) underlined the need for drastic reduction of administrative structures in the central level of governance, as well as the rationalisation of their internal organisation to achieve increased administrative productivity.

In the process of restructuring of the organisational charts by the then Government (2014), an effort was made so that certain concrete principles of organisational rationality would be taken into account. It was expected, therefore, that the criteria of internal differentiation of the ministries would follow the precepts of 'unity of direction' and 'unity of command' as well as the optimisation of 'span of control'. As far as the 'unity of direction' is concerned, it is worth mentioning that the units of administrative support of the central services of the ministries were merged with those of secretaries general which existed in the various departments of State. The same occurred with the service units with the responsibility regarding matters of finance and information technology.

The Ministry of Administrative Reform has identified the 'span of control' within the central administrative structure of the country as a particularly "problematic aspect of the Greek central administration" (Ministry of Administrative Reform and E-Governance, 2012: 40-41). In one out of five sections, for instance, the head of the respective unit had no subordinate employees at all, while one in three sections has only one employee (OECD, 2011: 26, 56).

The optimal span of control of 1/5-7 with regard to the head of the section and its subordinates may be overcome, when that is necessary and is required by the particularities of the subject matter of the service unit. The new organisational charts have frequently included a rather narrow span of control, even with a ratio of ½, which can hardly be considered sustainable. Such are, indicatively, the cases of the Directorate of Elections in the Ministry of the Interior (Presidential Decree 105/2014, article 16), as well as the Directorate of Buildings Infrastructure in the Ministry of Infrastructure, Transport and Networks (Presidential Decree 109/2014, article 47). Related examples are those of the Directorate General of University Education in the Ministry of Education and Religion (Presidential Decree 114/2014, article 35); the Directorate General of Personnel Administration in the Ministry of Administrative Reform and E-Governance (Presidential Decree 99/2014, article 13); and the Directorate General of Justice, Transparency and Human Rights in the same titled Ministry (Presidential Decree 101/2014,

article 5). The Directorate General of Public Investment in the Ministry of Development and Competitiveness is comprised by a single Directorate, the one of Public Investment (Presidential Decree 116/2014, article 37).

Nevertheless, the criticism that has been exerted regarding the whole effort has indicated that the process of reform seems to be rather fragmentary. It has placed special emphasis on the numerical reduction of the service units without taking account of the necessary extent of the functional complementarity of administrative units, as well as the overlapping of competences even within the same ministry and even more among different ministries. Moreover, the restructuring was based on the existing government scheme at the time, without examining the possibility of each reform in the direction of the reduction of the number of ministries themselves or an alternative agglomeration of various sectors of public policy. Otherwise, internal restructuring of particular ministries which form part of a rather extended or fragmented governmental structure (comprised of a rather large number of ministries headed by full ministers or alternate ministers, not to include deputy ministers) seems to have little impact on the efficiency and effectiveness of the Government as a whole. That is why, although the number of CGDs has been reduced, the phenomenon of scattered office locations has not been dealt with at all.[5]

3. Methodology

In this study, an attempt is made to measure efficiency and effectiveness of administrative units in the 19 CGDs. Accordingly, a comparison takes place between the results of this measurement and those of the AR2013. The measurement of efficiency and effectiveness draws on four Data Envelopment Analysis (DEA) models: i) Variable Returns to Scale DEA (VRS DEA), ii) Targeted factor-oriented radial DEA (Targeted DEA), iii) Stochastic DEA, and iv) Quality-driven Efficiency-adjusted DEA (QE-DEA).

DEA is a widely applied non-parametric technique for measuring the relative efficiency and performance of operational or decision making units (DMUs). Based on the seminal paper of Charnes, Cooper and Rhodes (1978), standard DEA programmes use linear programming to

[5] Regarding the sitting of the administrative centre, see Ministry of Administrative Reform and E-Governance, 2012: 65 ff., OECD, 2011: 63-64.

evaluate the production process of operational units. Conventional DEA programmes are either input-oriented, where the objective is the minimisation of inputs while holding the outputs fixed, or output-oriented, where the objective is the maximisation of outputs while the inputs remain unchanged.

Since the AR2013 suggests a decrease of inputs of the CGDs, in this paper an application takes place of four input-oriented DEA expressions. The DMUs that use relatively minimum inputs for the amount of outputs they engage (input-oriented approach of the measurement of efficiency) are regarded as benchmarks. The benchmark units are located in the production frontier and are assigned efficiency scores equal to unity, or 100% while the slacks of their production process is zero.

The scope of the study is to assess whether the input levels of the 19 CGDs, as defined by the AR2013, lead these units to efficiency, optimal economy and effectiveness. This assessment draws on a comparative analysis between the input levels identified by the AR2013 and those measured by the four DEA expressions. The VRS DEA, Targeted DEA and Stochastic DEA measure efficiency, under different assumptions, while the QE-DEA measures effectiveness.

Prior to the presentation of the four DEA expressions, it is useful to provide an analytic description of the notions efficiency and effectiveness, and the way they are perceived and applied in the context of the present study:

Efficiency of a unit refers essentially to the production of as many outputs as possible from a given set of inputs (output-oriented efficiency) or the utilisation of as few inputs as possible to produce a fixed amount of outputs (input-oriented efficiency) (Farrell, 1957). In the case of single-output and single-input, the measure of efficiency points to the ratio of output over input. Output-oriented efficiency is measured by the maximum ratio of the sum of weighted outputs to the sum of weighted inputs, as long as that ratio for every unit under evaluation is less than or equal to unity. Similarly, input-oriented efficiency is measured by the minimum ratio of the sum of weighed inputs to the sum of weighted outputs as long as that ratio for every unit under evaluation is greater than or equal to unity (Charnes et al., 1978). It is evident then that efficiency is regarded as an operational measure; as it only takes into account the inputs and outputs of a production process.

Effectiveness, on the other hand, refers essentially to the capacity to achieve desired results (Sherman and Zhu, 2006; Pollitt and Bouckaert, 2004; Poister, 2003). Effectiveness goes then beyond efficiency as the latter can be one of the goals that a unit is expected to achieve. An objective for the administrative units forms the provision of perceived high-quality services that satisfy users (i.e. citizens) (Ferlie et al., 2007; Pollitt and Bouckaert, 2004).

In this study, effectiveness is defined as referring to the attainment of efficiency and employees' satisfaction from the work environment, too. Employees' satisfaction is regarded as the users' perspective of the performance of the unit. Citizens' satisfaction is not, however, an appropriate measure for evaluation since there is usually no interaction between citizens and CGDs, but mainly between citizens and the decentralised units of the government departments as well as the local agencies.

3.1. Variable Returns to Scale DEA

An extension of the original Constant Returns to Scale DEA (CRS DEA) programme put forth by Charnes et al. (1978) is the Variable Returns to Scale DEA (VRS DEA) programme introduced by Banker et al. (1984). The input-oriented VRS DEA programme is defined as follows:

$$\min \theta$$

$$s.t. \quad \sum_{j=1}^{n} \lambda_j x_{ij} \leq \theta x_{io} \qquad i = 1, \ldots, m$$

$$\sum_{j=1}^{n} \lambda_j y_{rj} \geq y_{ro} \qquad r = 1, \ldots, s$$

$$\sum_{j=1}^{n} \lambda_j = 1$$

$$\lambda_j \geq 0 \qquad j = 1, \ldots, n \tag{1}$$

where θ $(0 \le \theta \le 1)$ is a scalar and represents efficiency, x_{ij} stands for the *i*th input of the *j*th unit and y_{rj} denotes the *r*th output of the *j*th unit. The x_{io} and y_{ro} are the *i*th input and *r*th output of the unit under evaluation, respectively. In addition, λ_j are non-negative scalars. The non-zero optimal λ_j identify the benchmarks for the unit under evaluation.

3.2. Targeted factor-oriented radial DEA

The Targeted factor-oriented radial DEA (Targeted DEA) programme developed by Lim and Zhu (2013) incorporates target levels in DEA. In addition to traditional inputs and outputs, variables which have a specific target level are introduced in the DEA programme. In conventional DEA programmes, the objective is either the minimisation of inputs (input orientation) or the maximisation of outputs (output orientation). In the Targeted DEA programme, the objective for inputs and outputs remains the same as that of the conventional DEA programmes. The novelty in the Targeted DEA programme is the introduction of a third type of variable, called 'factors', which can move in two directions (i.e. increase or decrease) aiming to reach a targeted level that is set by the decision-makers. In this study, when the Targeted DEA programme is applied, the variable 'Budget 2013' is treated as a factor, and its target level is the 'Budget 2014'.

The input-oriented Targeted DEA programme developed by Lim and Zhu (2013) can be written as follows:

$$\min \theta$$

$$s.t. \quad \sum_{j=1}^{n} \lambda_j x_{ij} \le \theta x_{io} \qquad i = 1, \ldots, m$$

$$\sum_{j=1}^{n} \lambda_j y_{rj} \ge y_{ro} \qquad r = 1, \ldots, s$$

$$\sum_{j=1}^{n} \lambda_j \left| z_{tj} - w_t \right| \le \theta \left| z_{to} - w_t \right| \qquad t = 1, \ldots, h$$

$$\sum_{j=1}^{n} \lambda_j = 1$$

$$\lambda_j \geq 0 \qquad j = 1, \ldots, n \tag{2}$$

where θ represents efficiency, x_{ij} and y_{rj} express the *i*th input and the *r*th output, respectively, of the *j*th unit, z_{tj} stands for the *t*th factor of the *j*th unit, and w_t denotes the targeted level for the *t*th factor.

3.3. Stochastic DEA

Stochastic DEA (Charnes and Cooper, 1963; Land et al., 1993; Olesen and Petersen, 1995; Dyson and Shale, 2010) deals with measurement and specification errors by introducing stochastic inputs and outputs in DEA. The uncertainty that is present both to the input and output data, which raises doubts about their accuracy, and to the economic environment inside which the units operate, leads to the utilisation of a stochastic DEA programme to capture this uncertainty. The application of traditional (i.e. non-stochastic) DEA programmes in cases where uncertainty is possible leads to biases in the measurement of efficiency.

In the present study, Stochastic DEA was applied in order to test an alternative scenario of evaluating the efficiency of the 19 CGDs, which takes into account possible 'noise' in data. The Stochastic DEA programme applied here is as follows:

$$\min \theta$$

$$s.t. \quad \sum_{j=1}^{n} \lambda_j x_{ij} + \sum_{j=1}^{n} \lambda_j \left(E(x_{ij}) - x_{ij} \right) + \zeta \left(\sum_{j=1}^{n} \sum_{l=1}^{n} \lambda_j \lambda_l \operatorname{cov}(x_{ij}, x_{pl}) \right)^{1/2} \leq \theta x_{io} \quad i = 1, \ldots, m$$

$$\sum_{j=1}^{n} \lambda_j y_{rj} + \sum_{j=1}^{n} \lambda_j \left(E(y_{rj}) - y_{rj} \right) - \zeta \left(\sum_{j=1}^{n} \sum_{l=1}^{n} \lambda_j \lambda_l \operatorname{cov}(y_{rj}, y_{ql}) \right)^{1/2} \geq y_{ro} \quad r = 1, \ldots, s$$

$$\lambda_j \geq 0 \qquad j = 1, \ldots, n \tag{3}$$

where θ expresses efficiency, x_{ij} and y_{rj} represent the *i*th input and the *r*th output, respectively, of the *j*th unit, $\zeta = \Phi^{-1}(\alpha)$ denotes the normal distribution function, α is the level of significance (e.g. $\alpha = .05$), and λ_j are non-negative scalars. In addition, $E(x_{ij})$ and $E(y_{rj})$ are the means of

x_{ij} and y_{rj}, and $\mathrm{cov}(x_{ij}, x_{pl})$ and $\mathrm{cov}(y_{rj}, y_{ql})$ stand for the covariance of $x_{ip,j}$ and $y_{rq,l}$, respectively.

3.4. Quality-driven Efficiency-adjusted DEA

The Quality-driven Efficiency-adjusted DEA (QE-DEA) method (Zervopoulos and Palaskas, 2011; Brissimis and Zervopoulos, 2012; Zervopoulos, 2014) introduces exogenous variables in DEA, such as users' satisfaction. Exogenous variables are those that are either non-controlled or partially controlled by the unit. The exogenous variables should be equal to or greater than a threshold value set by decision makers. The measurement of efficiency is constrained by this threshold value for the exogenous variables. In other words, the minimum inputs defined by the QE-DEA method cannot violate the threshold value. In the case that the exogenous variables are inversely related to efficiency, which means that the former are directly related to inputs, the optimal (minimal) inputs should not cause the optimal levels of the exogenous variables to drop lower than a minimum acceptable value.

In this analysis, use is being made of one exogenous variable (i.e. employees' satisfaction) inversely related to efficiency. The threshold value set for employees' satisfaction is 0.800, which is the percentage transformation of a rating of four on the five-point Likert scale (i.e. 1 – very dissatisfied, 2 – dissatisfied, 3 – neither satisfied nor dissatisfied, 4 – satisfied and 5 – very satisfied). The QE-DEA method defines the minimum inputs that simultaneously satisfy the threshold value of the exogenous variable. Consequently, the minimum inputs defined by the QE-DEA model are expected to be greater than those obtained from the VRS DEA. The lower the satisfaction scores assigned by employees to the CGDs, the lower the reductions that are expected to apply to the inputs as the priority of the QE-DEA method is to satisfy the threshold value, which is set to the exogenous variable.

The QE-DEA model draws on an algorithm comprised of four-steps:

Step 1: Apply VRS DEA (i.e. model (1)) to define the efficiency scores of the units.

Step 2: The efficient units that are assigned employees' satisfaction scores lower than the threshold value (e.g. 0.800) are put through an adjustment process. This leads the employees' satisfaction score at least to the threshold value while proportionally decreasing the efficiency score according to the inverse relationship between employees' satisfaction and efficiency. The adjustment process is expressed by the following formula:

$$\theta^{'} = \theta_o + \left(\frac{\left[(s - s_o)^2 (\theta_o - 1)^2 \right] (s^{'} - s_o)^2}{\left[(s - s_o)^2 + (\theta_o - 1)^2 \right] (s^{'} - s_o)^2 - (s - s_o)^2 (\theta_o - 1)^2} \right)^{1/2} \quad (4)$$

where $\theta^{'}$ stands for the adjusted efficiency score, θ_o is a user-defined cut-off level for the efficiency score (e.g. 0.200), s denotes the employees' satisfaction score, s_o stands for a user-defined cut-off level for the satisfaction score (e.g. 0.200), and $s^{'}$ is the adjusted employees' satisfaction score, which should be equal to or greater than the threshold value (e.g. 0.800).

The adjustment of the efficiency score (i.e. $\theta^{'}$) requires modification of the inputs:

$$x_i^{'} = (\theta^{'})^{-1} x_i \qquad i = 1, \ldots, m \quad (5)$$

where $x_i^{'}$ denotes the modified inputs, and x_i the original inputs. From expression (5), it is straightforward that $x_i^{'} > x_i$ as $\theta^{'} < 1$.

Step 3: The adjusted inputs ($x_i^{'}$) replace the original ones in the dataset, and VRS DEA is re-applied.

The QE-DEA model ensures that the benchmarks both are efficient and are assigned employees' satisfaction scores equal to or greater than a threshold value.[6]

3.5. Evaluating AR2013

The following analysis is focusing on the government composition (government departments) and the basic internal units (general directorates, directorates, sections), the size of the staff, the elements of the budget and the legal enactments: *Refer to Table 1 in Appendix*

Regarding Table 1, we have taken account of the following:

A government reshuffle took place in June 2013, as a result of which a new ministerial structure emerged (ante, pages 13-14), whereby two ministries were divided and the total number of CGDs rose to eighteen (from sixteen); in that number has to be added the distinct Secretary General of Information and Communication along with that with Mass Media responsibility.

The evaluation of the internal structure of the Ministries of Foreign Affairs, National Defence, Public Order and Citizen's Protection has not led so far to any significant reorganisation; for that reason the data referring to the years 2013 and 2014 do not present any difference whatsoever.

The number of organisational units (Directorates, etc.) refers exclusively to those at the central services of the ministries (i.e. they are not inclusive of the decentralised ones). It is worth mentioning that, as it was emphasised within the OECD Review concerning the Central Government in the country (2011: 57), it is not unlikely that administrative practice may not reflect the legal provisions regarding ministries' competences, whereas the organisational charts which are presented in the website of each one have many differences from the legal and the actual administrative structures (OECD, 2011: 57).

In the overall number of Directorates General there have been included the Secretariats General, which comprise of Directorates only.

As far as the number of permanent civil servants is concerned, the respective data have been searched in the Public Employees Record

[6] More details on the QE-DEA model are provided in Zervopoulos and Palaskas (2011).

(*www.apografi.gov.gr*), which however presents the total number of civil servants in the ministries including those employed in central services, in decentralised units and in public bodies and agencies. The Record is constantly being revised, taking account of the personnel transfer and mobility, so that certain variations may be seen in the passage of time.

A special case is that of the Ministry of Justice, Transparency and Human Rights, since in the personnel there are included the judicial functionaries, who are nevertheless not considered as civil servants in the strict sense of the term; similar is the case of the Ministry of Shipping and the Aegean, in the personnel of which there are included civil and military staff.

With regard to the budgetary documents we took into account resources referring to the central services of the ministries, solely, excluding decentralised units, public bodies and agencies supervised by the ministries, as well as the related independent authorities.

Nonetheless, in certain cases that was not attainable. For instance, in the Ministry of Culture and Sports, because in the central government budget reference is being made to culture services only (which is most likely inclusive of the decentralised units, as well). Similar are the cases of the Ministry of the Environment, Energy and Climate Change, the Ministry of Tourism, etc.

We signify with an asterisk those ministries with regard to which the above-mentioned variations may occur.

We have based our research and cross-reference regarding the promulgating legal documents on the websites of Hellenic Parliament as well as the Government Printing Office.

4. Findings and results of the research

4.1. Efficiency measurement tool

The aforementioned methods and programmes were applied to Central Government Departments to measure their efficiency and effectiveness, and define their optimal input levels. These input levels, holding the output (i.e. laws) fixed (input-oriented analysis), ensure the attainment

of efficiency (i.e. efficiency score equal to unity) and effectiveness (i.e. effectiveness score equal to unity) for every CGD. In addition, the optimal inputs obtained from the application of the methods and programmes (1) - (5) are compared against the inputs defined by the AR2013 for the nineteen CGDs. The reason for this comparative analysis is to examine whether the AR2013 leads the CGDs to efficiency and effectiveness or only aims to reduce public spending.

The methods and programmes (i.e. VRS DEA, Targeted DEA, Stochastic DEA and QE-DEA) were applied to both the nineteen CGDs, which comprise the complete sample under reform, and a subsample of twelve CGDs. The CGDs excluded from the second sample (ante, pages 24-25) are presented with an asterisk (*) following their name in the Tables that include nineteen CGDs (i.e. Tables 1, 2, 4, 6, 8, 10, 12, 16 and 18-21).

The efficiency scores of the nineteen CGDs and the twelve CGDs are displayed in Tables 2 and 3, respectively. In particular, in both Tables, columns 3, 4 and 5 present the efficiency scores defined by the application of the VRS DEA, the Targeted DEA and the Stochastic DEA programmes, respectively. Column 6 illustrates the effectiveness scores determined by QE-DEA, which balance efficiency and civil servants' perception of quality of their work environment.

The calculation of the VRS DEA efficiency scores drew on the five inputs and one output of our dataset (see Table 1). To determine the Targeted DEA efficiency scores, a target was set for the input variable 'Budget 2013', which is the input variable 'Budget 2014'. According to the AR2013, no CGD should spend more than the amount determined in 'Budget 2014'. The Stochastic DEA programme yields efficiency scores, which take into account the possibility of 'noise' in the data. The presence of 'noise', which is not unlikely in data from public organisations, is responsible for significant distortion of the results. Such flaws are particularly associated with non-parametric techniques (e.g. DEA), which are sensitive to sampling variations.

Unlike the previous three DEA programmes which only take into account endogenous variables (i.e. inputs and outputs), the QE-DEA method yields scores that incorporate exogenous variables, such as employees' satisfaction, in addition to input and output variables. The QE-DEA scores are associated with effectiveness since they express a balance between the operational perspective (i.e. efficiency) and the environmental perspective (i.e. employees' satisfaction). Employees'

satisfaction is regarded as an environmental variable since it cannot be directly or fully controlled by the management of the unit (i.e. CGD). However, employees' satisfaction affects the quantity and quality of the outputs of the unit (i.e. CGD).

In Tables 2 and 3, the efficient CGDs are assigned efficiency scores equal to unity, which is equivalent to 100% of efficiency. CGDs with efficiency scores lower than unity are regarded as inefficient and in need of operational reform. In other words, taking into account the orientation of AR2013 and of this research, the inefficient CGDs should reduce their inputs to a certain level to become efficient. *Refer to Table 2 in Appendix*

According to Table 2, the four DEA programmes (i.e. VRS, Targeted, Stochastic and QE-DEA) recognise as efficient and effective the Ministries of Foreign Affairs (ID #1), National Defence (ID #3), Health (ID #9), Infrastructure, Transport & Networks (ID #12), Environment, Energy & Climate Change (ID #13), Justice, Transparency & Human Rights (ID #14), Public Order & Citizen's Protection (ID # 15), Tourism (ID #16), and Macedonia & Thrace (ID #18). Accordingly, the Ministries that need significant reform are those assigned the lowest scores, such as the Ministries of Education & Religion (ID #6), Culture & Sports (ID #7), and Labour, Social Security & Welfare (ID #10). However, it should be noted that the first and third Ministries cannot be directly compared with the other Ministries that have no asterisk indication following their name, since a significant number of their tenured staff is employed in decentralised departments and public entities supervised by the Ministries (e.g. primary and secondary schools, social security offices). *Refer to Table 3 in Appendix*

In Table 3, the CGDs that are regarded as efficient and effective, according to the four DEA programmes are the same as in Table 2. The scores presented in Table 3 are expected to be higher than these in Table 2. This expected upward movement is due not to a true efficiency and effectiveness change but to the decrease of the sample size while the dimensions of the input-output set remain unchanged. However, there may be some exceptions, such as the Targeted DEA efficiency score assigned to the Ministry of Rural Development & Food (ID #7). This score is significantly lower (i.e. 0.2947) compared to the corresponding efficiency score assigned to the same Ministry (i.e. 0.9992) when the sample consisted of nineteen CGDs. The decline of this particular efficiency score is explained by the change of the benchmark CGDs for

the Ministry of Rural Development & Food (Tables 4 and 5). In particular, in the case of the nineteen-CGD sample, the production process of the Ministry of Rural Development & Food was dominated by the production process of the Ministry of Tourism (ID #16) and the Ministry of Macedonia & Thrace (ID #18). In other words, the latter two Ministries were regarded as benchmarks for the Ministry of Rural Development & Food. In the case of the twelve-CGD sample, four Ministries are defined as benchmarks for the Ministry of Rural Development & Food, which are the Ministry of Foreign Affairs (ID #1), the Ministry of Environment, Energy & Climate Change (ID #9), the Ministry of Tourism (ID #10), and the Ministry of Macedonia & Thrace (ID #11).

Tables 4 and 5, particularly columns 3-6, illustrate the benchmark CGD(s) for every dominated CGD presented in column 2. It should be noted that the production process of the benchmark CGDs does not have the same impact on all of the dominated CGDs, which are inefficient. The efficient CGDs are self-dominated. For instance, there is a single benchmark CGD for the Ministry of Foreign Affairs, which is efficient according to the VRS, Targeted and Stochastic DEA programmes (Tables 2 and 3), and effective according to the QE-DEA method, that is the same Ministry (Tables 4 and 5). *Refer to Table 4 in Appendix*

In Table 4, drawing on the VRS DEA, Targeted DEA and QE-DEA results, the CGD that appears most frequently as a benchmark is the Macedonia & Thrace (ID #18). In particular, VRS DEA, Targeted DEA and QE-DEA identify this Ministry as a benchmark nine times, eight times and six times, respectively. In the VRS DEA context, the second most dominant production process is that of the Ministry of Tourism (ID #16), which appears seven times as a benchmark for the inefficient CGDs. In the case of the Targeted DEA and QE-DEA, the Ministry of Tourism and the Ministry of Infrastructure, Transport & Networks (ID #12) are benchmarks for three inefficient CGDs. According to the Stochastic DEA results, the two most dominant CGDs are the Ministry of Tourism (ID #16) and the Ministry of Justice, Transparency & Human Rights (ID #14), which are identified as benchmarks nine times and seven times, respectively. *Refer to Table 5 in Appendix*

In the case of the reduced sample, the Ministries of Macedonia and Thrace, and Tourism remain the most dominant for the inefficient CGDs (Table 5). The Ministry of Macedonia and Thrace is also identified as the most dominant for the ineffective CGDs. In particular, the Ministry of

Macedonia and Thrace is identified as a benchmark six times and five times by the VRS DEA programme and the Targeted DEA programme, respectively. The same Ministry is regarded as a benchmark three times by the QE-DEA method since it is efficient and reports a high level of employees' satisfaction. According to the VRS DEA and Stochastic DEA programmes, the Ministry of Tourism dominates the production process of four inefficient CGDs and six inefficient CGDs, respectively. In addition to these two Ministries, the Ministry of Environment, Energy and Climate Change is identified many times as benchmark by the three DEA programmes (i.e. VRS, Targeted and Stochastic).

The following Tables (i.e. Tables 6-13) present the actual input levels before the implementation of the AR2013 (column 3), the input levels suggested by AR2013 programme, and the change in the input levels before and after the implementation of the AR2013. In addition, in Tables 6-13, columns 6-14 illustrate the optimal input levels as defined by the VRS DEA, Targeted DEA and Stochastic DEA programmes. On the right-hand side of the columns with the optimal inputs, the change between the actual and optimal input levels, and the one between the AR2013 input levels and optimal input levels is displayed. *Refer to Table 6 in Appendix*

Focusing on the number of general directorates for every CGD, the AR2013 programme suggested a decrease between 0.07 (or 7%), which applies to the Ministry of Development and Competitiveness, and 0.44 (or 44%), which applies to the Ministry of Administrative Reform and E-Governance. In addition, there are four CGDs that do not need to limit the number of their general directorates, namely, the Ministry of Foreign Affairs, the Ministry of National Defence, the Ministry of Public Order and Citizen's Protection, and the Ministry of Tourism.

The three DEA programmes regard as optimal the actual number of general directorates for the four CGDs mentioned above. In particular, VRS DEA and Stochastic DEA programmes hold unchanged the number of general directorates of ten CGDs (e.g. Ministry of Foreign Affairs, Ministry of National Defence, Ministry of Health). The number of general directorates that was optimal in 2013 increases to eleven, according to the Targeted DEA programme.

According to Table 6, the most significant decrease in the number of general directorates should be introduced in the Ministries of Education and Religion, and Culture and Sports. Only the VRS DEA programme

suggests the same significant decrease in the number of general directorates for the Ministry of the Interior. It is clear from Table 6 that the levels of adjustment that should be applied to the number of general directorates vary depending on which DEA programme is used for the evaluation of the activity of the CGDs. The Targeted DEA and Stochastic DEA programmes are better at expressing either a fundamental target of the Greek public administration, which is control over the spending of the CGDs, or the 'noise' that the data of the CGDs is likely to contain.

Through the DEA-based evaluation that was applied in this paper and the associated research that was conducted, it can be identified how the optimal number of general directorates deviates from the level introduced by AR2013, which applies to most of the CGDs in Table 6. It is noteworthy that the deviations are not only negative but also positive. Negative deviations of the optimal number of general directorates, or, in general, of the optimal input levels, from the level of the corresponding input as defined by AR2013 imply the need for an additional decrease in this input to ensure the attainment of efficiency by the CGD. In the case of positive deviations, an increase in the level of input, compared to that determined by AR2013, is required to ensure the efficiency of the CGD. *Refer to Table 7 in Appendix*

The Ministry of the Interior and the Ministry of Culture and Sports remain among those that need the greatest adjustment to the number of their general directorates, even when the sample size is reduced to twelve CGDs (Table 7). In particular, based on the VRS DEA programme, the optimal number of general directorates for the Ministry of the Interior is one, whereas it was six before the AR2013 and dropped to five after the implementation of the AR2013. When the Targeted DEA and Stochastic DEA programmes are taken into account, the optimal number of general directorates for the same Ministry is two. Nevertheless, generally speaking, taking account of the fact that the optimised span of control is defined by the ratio 1/5-7, the above-mentioned provides evidence for the need that the Ministry should not be a distinct department but it should be merged with other service units. On the contrary, the three DEA programmes define as optimal the twelve general directorates for the Ministry of Environment, Energy and Climate Change, which were operating before the implementation of the AR2013.

Deviations between optimal levels of resources and the corresponding levels defined by the AR2013 are present in most CGDs. However, there is consensus between the AR2013 and the programmes about the number of general directorates of the three Ministries (i.e. Ministry of Foreign Affairs, Ministry of Tourism, and Ministry of Macedonia and Thrace). This consensus appears only in cases where there is no need for adjustment. *Refer to Table 8 in Appendix*

Focusing on the number of directorates, when nineteen CGDs are under evaluation (Table 8), the most significant adjustment is required by the Ministries of Education and Religion; Culture and Sports; and Labour, Social Security and Welfare. In most cases, adjustments aimed toward the attainment of efficiency lead to a significant decrease in both the number of directorates as defined before and after the implementation of the AR2013. The significance of the adjustment depends on the priorities set by policy makers and consequently by the particular DEA programme being applied.

According to the three DEA programmes (i.e. VRS, Targeted and Stochastic), the majority of the CGDs should keep the same number of directorates, as they were defined before the implementation of the AR2013. *Refer to Table 9 in Appendix*

In a reduced sample of twelve CGDs (Table 9), drawing on the results of the three DEA programmes, the Ministries that should considerably decrease their number of directorates are the Interior, and the Rural Development and Food. Significant downward adjustment of the number of directorates should also be applied to the Ministry of Culture and Sports, the Ministry of Development and Competitiveness, and the Ministry of Administrative Reform and E-Governance. *Refer to Table 10 in Appendix*

Table 10 presents the number of sections for the nineteen CGDs before and after the implementation of the AR2013. In addition, Table 10 illustrates the optimal number of sections obtained by the VRS DEA, Targeted DEA and Stochastic DEA programmes. According to these programmes, the most significant reductions to the number of sections should be made to the Ministries of Education and Religion, and Culture and Sports. Drawing on the results obtained by the VRS DEA and Stochastic DEA programmes, the Ministries of Labour, Social Security and Welfare, and Rural Development and Food also need to significantly adjust their number of sections to achieve efficiency.

It should be noted that the Targeted DEA programme identifies less restrictive optimal levels for the number of sections of the nineteen CGDs compared to the VRS DEA and Stochastic DEA programmes. This is because the target budget for the CGDs, as determined by the AR2013 and established as a constraint to the optimisation problem of the Targeted DEA programme, is not optimal (minimal). On the contrary, the VRS DEA and Stochastic DEA programme define unconstrained optimal (minimal) budgets for the CGDs. Further discussion on the effect of introducing a target (constraint) in the evaluation follows in Tables 14 and 15. *Refer to Table 11 in Appendix*

In the case of the twelve-CGD sample, the Ministries that need the most significant adjustment to their number of sections are the Rural Development and Food, the Administrative Reform and E-Governance, and the Interior. In addition, the Ministries of Development and Competitiveness, and Culture and Sports should also significantly reduce the number of their sections. However, there is no consensus among the three DEA programmes on such significant reduction for these two Ministries. In particular, if a priority for the policy makers is control over the spending of the Ministries to the level defined by the AR2013, then the Ministry of Development and Competitiveness should reduce its sections to 78 from 132, which was the number of sections after the implementation of the AR2013. If policy makers admit a possible presence of 'noise' in the data of the CGDs, then the Ministry of Development and Competitiveness should increase the number of its sections from 132 to the amount that existed before the implementation of the AR2013 (i.e. 257). A similar analysis of the optimal number of sections applies to the Ministry of Culture and Sports.

It should not be ignored that for the majority of the twelve CGDs, the number of sections that were operating before the AR2013 is currently regarded by the three DEA programmes as the optimal amount. However, if the goal of the CGDs is the attainment of efficiency that is not restricted at the local level (sample-based efficiency measurement) but takes into account a global perspective (population-based efficiency estimation), then downward adjustments to the number of sections, compared to the number of sections operating before the AR2013, are needed. For the CGDs that were assigned the optimal number of sections equal to those before the implementation of the AR2013, such adjustments will not cause the former levels to be lower than the levels

determined after the implementation of the AR2013. *Refer to Table 12 in Appendix*

In Tables 12 and 13, adjustments are being examined which were made to the number of tenured staff employed in the nineteen- and twelve-CGDs samples, respectively, towards the attainment of efficiency.

Drawing on the results displayed in Table 12, the Ministries that should considerably reduce their staff are the Education and Religion, Labour, Social Security and Welfare, Culture and Sports, Administrative Reform and E-Governance, and the Interior. These significant reductions are supported by all three DEA programmes. The Ministry of Rural Development and Food should also decrease its number of tenured staff. However, this adjustment is supported by the VRS DEA and Stochastic DEA programmes while the Targeted DEA programme regards as optimal the number of tenured staff in this Ministry before the implementation of the AR2013 (i.e. 2155). The most noticeable adjustments for the tenured staff, which are directed to the Ministry of Education and Religion, and the Ministry of Labour, Social Security and Welfare, should not be taken into account since the number of staff introduced in the DEA programmes included employees who are appointed in decentralised offices or distinct public legal entities of the two Ministries. As already mentioned (ante, page 25), quite distinct is the case of the Ministry of Shipping and the Aegean. *Refer to Table 13 in Appendix*

Focusing on the reduced sample of twelve CGDs (Table 13), the Ministries that should make the most significant modifications to their number of staff are the Culture and Sports, Development and Competitiveness, Rural Development and Food, Administrative Reform and E-Governance, and the Interior. The only Ministry for which there is no consensus among the three DEA programmes about the need for a decrease in staff is Development and Competitiveness. The remaining CGDs, with the exception of the Secretariat General of Information and Communication/Secretariat General of Mass Media, which should make minor adjustments to its number of employees, should increase their number of staff to the levels that were in place before the implementation of the AR2013.

The average reduction of staff in the twelve CGDs that was realised by the AR2013 was 4% (Table 14). Based on the VRS DEA, Targeted DEA and Stochastic DEA programmes, the optimal number of staff would be much

lower than the number of staff before the implementation of the AR2013.

Concerning the issue of further reduction of the size of the personnel of civil service, it ought to be noted that it results and originates from the fact of the primacy and preponderance of financial indicators in the assessment of efficiency and effectiveness of public services. If, however, a shift of emphasis was attempted —for instance, in the reshaping of administrative structures— it is likely that other considerations would deserve attention, especially those contributing to greater effectiveness, and not simply efficiency or cost reduction (infra, pages 35 ff.). Thus, the total size of the civil service personnel, and especially its better allocation along the administrative space, might be positively affected by transfers and a radical policy of replacements, rather than outright dismissals and disbandments. The latter as such can hardly be seen as a measure of creative reconstruction of administrative performance.

Nevertheless, the above-mentioned significant inconsistency between the AR2013 level and the optimal levels for the number of staff of the twelve CGDs is not found in other input variables (i.e. general directorates, directorates, sections, and budget). It should also be pointed out that the 4% cut of the number of staff, which was implemented by the AR2013, differs greatly from the reductions in the number of general directorates (i.e. -14%), the number of directorates (i.e. -36%), the number of sections (i.e. -34%), and the budget (i.e. -15%), which were also applied by the AR2013. *Refer to Table 14 in Appendix*

Results similar to those in Table 14 are presented in Table 15, which refers to the sample of nineteen CGDs. *Refer to Table 15 in Appendix*

According to the results presented in Table 16 regarding the optimal budget allocated to the nineteen CGDs, the VRS DEA and Stochastic DEA programmes identify significant reductions to the budget of the Ministries of Rural Development and Food, Culture and Sports, Education and Religion, and Labour, Social Security and Welfare. In contrast, the VRS DEA programme assigns a higher optimal budget than that defined by the AR2013 to eleven of the nineteen CGDs in the sample. According to the VRS DEA programme, a significantly higher budget than that defined by the AR2013 should be allocated to the Ministry of Justice, Transparency and Human Rights, the Ministry of Infrastructure, Transport and Networks, and the Ministry of Macedonia

and Thrace. For these three Ministries, the 2014 budget should have remained the same as that of the previous year (i.e. actual budget displayed in column 3 of Table 16). It should also be noted that the VRS DEA regards the 2013 budget as optimal for 2014 for the Ministry of Health. Consequently, the budget reduction introduced by the AR2013 for this Ministry was unnecessary from the perspective of efficiency.

The Stochastic DEA programme identifies ten out of the nineteen CGDs in the sample that can be allocated a higher budget than that defined by the AR2013. The most significant budget increase beyond that defined by the AR2013 was found in the Ministry of Justice, Transparency and Human Rights, the Ministry of Infrastructure, Transport and Networks, and the Ministry of Macedonia and Thrace. As in the VRS DEA programme, the budget of the Ministry of Health should not have been reduced from the 2013 level, since this Ministry was already efficient. The Ministry of Health was mentioned due to its crucial role in public health and society. In this context, unnecessary budget reductions and public health reforms in general are likely to have a significant impact on society. *Refer to Table 16 in Appendix*

Focusing on the sample of twelve CGDs (Table 17), in order to attain efficiency, the Ministries of Rural Development and Food, Culture and Sports, and Administrative Reform and E-Governance should significantly reduce their budget from the level defined by the AR2013 and also from the actual level (i.e. 2013 budget). Respecting the criterion of efficiency, the VRS DEA programme identifies unnecessary budget cuts for half of the sample CGDs, which were decided by the AR2013. According to the Stochastic DEA programme, unnecessary budget cuts were implemented in seven of the twelve CGDs in the sample (e.g. Ministry of Infrastructure, Transport and Networks, Ministry of Macedonia and Thrace, Ministry of Tourism). *Refer to Table 17 in Appendix*

4.2. Measurement of effectiveness

The VRS DEA, Targeted DEA and Stochastic DEA programmes measure efficiency while taking into account only operational variables (i.e. inputs and outputs). In the case of implementing an input-oriented strategy (i.e. minimisation of resources), the attainment of efficiency is associated with control over spending (i.e. economy).

The QE-DEA method incorporated both efficiency and users' perspective about the operation of the units under evaluation (e.g. CGDs). Users' perspective is measured by questionnaires. In the case of the CGDs, the users who participated in the satisfaction survey were only civil servants. There was conducted one independent satisfaction survey for each CGD. The surveys were solely directed to civil servants since citizens interact not often directly with the ministries, but primarily with their decentralised units, and with public bodies and legal entities supervised by them (e.g. tax offices, police stations, citizen service centres, hospitals), or with local agencies and authorities.

The determinants of satisfaction that were incorporated in the survey were as follows: (i) workload, (ii) professional development, (iii) team spirit, (iv) organizational structure, and (v) infrastructure. Users' responses were measured on a five-point Likert scale, which stands for: 1 – very dissatisfied, 2 – dissatisfied, 3 – neither satisfied nor dissatisfied, 4 – satisfied and 5 – very satisfied.

According to the results of the users' satisfaction survey (Table 18), the civil servants of any CGD are not satisfied. In particular, there is no average satisfaction score at least equal to 4 that denotes satisfaction in the five-point Likert scale. The highest satisfaction scores were assigned to the Ministry of Health (3.5333), the Ministry of Public Order and Citizen's Protection (3.4667), and the Ministry of Administrative Reform and E-Governance (3.2250). The CGDs that were assigned the lowest satisfaction scores were the Secretariat General of Information and Communication/Secretariat General of Mass Media (1.7500), the Ministry of Environment, Energy and Climate Change (2.2083), and the Ministry of Culture and Sports (2.5500). *Refer to Table 18 in Appendix*

The incorporation of users' perspective in the evaluation of the units is crucial for the overall performance of units. The input-oriented VRS DEA, Targeted DEA and Stochastic DEA programmes regard the outputs (i.e. laws) produced by every CGD as fixed. However, focusing on the minimisation of inputs while neglecting employees' morale and perception of the work environment may lead to violation of the assumption of fixed outputs. In service units, such as the CGDs, employees are a fundamental resource for the production process. Therefore, omitting employees' perspective from the evaluation of CGDs may lead to infeasible results in practice. It should also be noted that users' perspective is inversely related to efficiency, and thus to economy

(De Bruijn, 2007; Sherman and Zhu, 2006a, 2006b; Athanassopoulos, 1997; Anderson and Fornell, 1994). In this context, the QE-DEA method yields 'balanced' results, which are regarded as an equilibrium between the attainment of efficiency through an input-oriented perspective and users' satisfaction. The levels of inputs defined by the QE-DEA method are expected to be less restrictive than those obtained by the VRS DEA, Targeted DEA and Stochastic DEA programmes. In addition, the levels of inputs obtained by the QE-DEA may violate the criterion of economy.

According to the results of the QE-DEA method, seven out of nineteen CGDs need further downward adjustment to their inputs compared to those determined by the AR2013 (Tables 19-21). Significant adjustments should be made to the Ministry of Education and Religion, the Ministry of Culture and Sports, the Ministry of Labour, Social Security and Welfare, the Ministry of Administrative Reform and E-Governance, the Ministry of the Interior, and the Ministry of Rural Development and Food. When the users' perspective is introduced in the evaluation, a significant increase in inputs is needed for several CGDs (e.g. Ministry of Infrastructure, Transport and Networks, Ministry of Tourism, Ministry of Finance) to attain the optimal state, which balances efficiency and employees' satisfaction. *Refer to Tables 19, 20, 21 in Appendix*

In the case of the reduced sample of twelve CGDs (Tables 22-24), four CGDs should decrease their inputs from the levels determined by AR2013 (i.e. Ministry of Culture and Sports, Ministry of Administrative Reform and E-Governance, Ministry of Rural Development and Food, and Ministry of the Interior). On the contrary, the remaining eight CGDs should significantly increase their resources to attain the optimal balance between efficiency and employees' satisfaction. *Refer to Tables 22, 23, 24 in Appendix*

Unlike the VRS DEA, Targeted DEA and Stochastic DEA programmes, the QE-DEA method identifies positive average adjustments to the inputs of the nineteen and twelve CGDs (Tables 25 and 26). *Refer to Tables 25, 26 in Appendix*

The results of the QE-DEA method, which express a balance between efficiency and users' satisfaction, satisfy the criterion of effectiveness and also the mid- to long-run operability of the CGDs. However, the results obtained by the QE-DEA methods are not considered to be appropriate for short-run strategies, which focus on the attainment of efficiency and economy.

The attainment of efficiency and effectiveness is a fundamental objective of modern public administration (Wisniewski and Olafsson, 2004; Brignall and Modell, 2000; Kloot and Martin, 2000; OECD, 2003). Every DEA method used in this study expresses a different perspective of efficiency and effectiveness. The reason behind the multi-perspective evaluation process with the application of the different DEA models is the cross-check of the reforms suggested and the development of a robust plan for the improvement of the operations and structure of the nineteen CGDs.

The DEA methods used for the evaluation of the nineteen Greek CGDs differ in scope. The VRS DEA assumes that variable returns to scale prevail to the production process of the DMUs. The Targeted DEA assumes that for every DMU there is a target value set for one of the variables (e.g. budget). The Stochastic DEA assumes the presence of 'noise' in the dataset. The QE-DEA, which is the only one among the four DEA methods that measures effectiveness, introduces threshold values for exogenous variables (e.g. users' satisfaction) and considers as benchmarks only the DMUs that are simultaneously efficient and meet at least the threshold values for the exogenous variables.

Comparing the results of all of the DEA-based approaches with those of the AR2013, it is clear that deviations are present, which reveal the difficulty of the AR2013 to lead the CGDs to either efficiency or effectiveness. That concurs to the fact that the AR2013 objectives have not been fully achieved. It is explicit that the AR2013 is oriented towards efficiency and economy rather than effectiveness. However, the AR2013 fails to attain the goal of efficiency and optimal economy since there is room for further adjustments to the resources engaged by the CGDs. As a result, the AR2013 could be regarded as a step towards the attainment of efficiency and optimal economy, which would be followed by further administrative reform frameworks.

5. Concluding remarks

The expansion of the organisational layout of ministries could be explained, among others, through the gradual increase of citizens' needs during the years or through the effort of the Greek central government to respond to funding opportunities. However it was not accompanied with the respective reduction of other structures (OECD, 2011: 57).

In various parts of this paper an effort was made to study and analyse the implications of the CGDs' reform as far as the capacity and the efficiency of the administrative machinery as a whole is concerned. That point which was raised by the Memorandum of Understanding, has also been a locus classicus among reports of experts in Greek administrative literature, as explained in Section 2. In the context of this paper, the focus has been placed on the extent that CGDs' structural configuration may affect positively or negatively actual policy design and implementation as well as the coordination of CGDs, and improve the cohesion and quality of policy making in central government.

As it was seen in the preceding analysis, the structural reform of CGDs that took place by recent reform effort (i.e. AR2013) did indeed produce certain results, especially in the reduction of the overall size of central ministerial units. The downsizing of the CGDs suggested by the AR2013 mainly affected the number of directorates and sections, which should be reduced by 33% and 29%, respectively. A significantly lower reduction of 13% was suggested for the number of general directorates and budget of the CGDs. Drawing on the AR2013, the number of staff employed at the CGDs should be limited by 3%. The development and implementation of the AR2013 needs to serve two of the key objectives of the Greek National Reforms Programme (2014): the attainment of efficiency and of effectiveness of the Greek public administration. The results presented here reveal that the AR2013 leaves much to be desired in terms of efficiency and effectiveness of central government administration units.

This study provided answers to the research questions presented in the first Section (i.e. Introduction). By applying three distinct DEA programmes, which express three different perspectives of efficiency, and a DEA programme for measuring a particular perspective of effectiveness (i.e. employees' perspective of effectiveness), we concluded that the AR2013 is regarded as a step toward the achievement of efficiency and effectiveness, but can hardly lead the Greek CGDs to the attainment of efficiency and effectiveness. For instance, drawing on the results obtained by the three DEA programmes, the Greek CGDs need to limit the number of their general directorates between 23% and 35%, the number of directorates between 22% and 32%, and the number of sections between 21% and 34%.

However, unlike the recommendations of the AR2013 for downsizing all of the CGDs, the three DEA programmes identify the need for expansion of the organisational structure of some CGDs, such as the Ministry of Health, the Ministry of Infrastructure, Transport and Networks, and the Ministry of Environment, Energy and Climate Change. Expansion of the organisational structure and the budget of the CGDs is also suggested by the QE-DEA programme, which takes into account the employees' perspective in addition to endogenous operational variables such as inputs and outputs. This approach, however, is not likely to be considered, as the contraction of the budget of the CGDs is a priority for the Greek public administration.

It comes as no surprise that the recent government change, i.e. the succession of the Government of Mr. Ant. Samaras by that of Mr. Al. Tsipras, as a result of the general election of 25th January 2015, affected seriously the ministerial landscape of central government. The reduction of the size, or rather of number of CGDs to ten[7] was brought about mainly through the formation of respective 'giant' departments by means of the formal merging of previously independent ministerial structures and units of public services in respective areas of public policy.

That option raised in turn once again the issue of the restructuring of the ministerial domains in the newly expanded policy areas, which has certainly to be reflected in new organisational charts. It can be envisaged that this process will be in need of some period of time to be realised and finalised. It remains to be seen, however, whether this kind of purely formal delimitation of the number of government departments is reflected in the necessary adaptation of the corresponding organisational structuring (i.e. the composition and reshaping of directorates general, directorates, etc.) shown in organisational charts.

[7] 1. Ministry of the Interior & Administrative Reconstruction (with three alternate ministers and one deputy minister)
2. Ministry of Economy, Infrastructure, Shipping & Tourism (with three alternate ministers)
3. Ministry of National Defence (with one alternate minister and one deputy minister)
4. Ministry of Culture, Education & Religious Affairs (with three alternate ministers and one deputy minister)
5. Ministry of Productive Reconstruction, Environment & Energy (with two alternate ministers and one deputy minister)
6. Ministry of Justice, Transparency & Human Rights (with one deputy minister)
7. Ministry of Foreign Affairs (with two alternate ministers)
8. Ministry of Finance (with two alternate ministers)
9. Ministry of Labour, Social Security & Social Solidarity (with three alternate ministers)
10. Ministry of Health (with one alternate minister).

The fact that, alongside the head of each large department, alternate ministers were also appointed in almost all government departments is evidence of a formalistic rather than substantial reduction of the overall size of the government machinery. Following the subsequent 20 September elections, however, the new Tsipras government has been organised in fourteen CGDs,[8] seemingly representing something closer to the optimal size obtaining in most European countries (Makrydemetres and Pravita, 2012: 302 ff.), and respecting more faithfully the tradition of Greek politics and governance.

Despite this reorganisation, however, Law 4336/2015, referring to the ratification of the Draft Agreement on the Financial Assistance by the European Stability Mechanism regarding the implementation of the Financing Agreement, still emphasises the reorganisation of administrative structures as one of the basic elements in the strategy for reforms in public administration.

For the reorganisation to take place in more substantial terms in the internal environment of the CGDs, attention ought to be paid not only to the suggestions of the present analysis, but also to standard rules, techniques and principles of applied administrative and management science (some of which have been already taken into account). The aforementioned general principles of administrative practice do not only find support in various textbooks of management science, but they have also been identified as necessary standards of administrative organisation by repeated rulings of the Supreme Administrative Court

[8] 1. Ministry of the Interior & Administrative Reconstruction (with three alternate ministers and two deputy ministers)
2. Ministry of Economy, Development & Tourism (with one alternate minister and two deputy ministers)
3. Ministry of National Defence (with one alternate minister)
4. Ministry of Education, Research & Religious Affairs (with two alternate ministers and one deputy minister)
5. Ministry of Foreign Affairs (with one alternate minister and two deputy ministers)
6. Ministry of Justice, Transparency & Human Rights (with one alternate minister)
7. Ministry of Labour, Social Security & Social Solidarity (with two alternate ministers and one deputy minister)
8. Ministry of Health (with one alternate minister)
9. Ministry of Culture & Sports (with one deputy minister)
10. Ministry of Finance (with two alternate ministers)
11. Ministry of Environment & Energy (with one alternate minister)
12. Ministry of Infrastructure, Transport & Networks (with one deputy minister)
13. Ministry of Shipping & Island Policy
14. Ministry of Rural Development & Food (with one alternate minister).
The structuring of the government machinery is complemented by the Secretariat General of Information and Communication.

(the Conseil d'Etat) of the country (Pravita, 2011). It is, therefore, very likely that sooner or later drafts of central government structural reform reflected in respective organisational charts will be reviewed by the Council of State and perhaps be declared void, if and to the extent they depart from or violate the above standards and principles of good administrative practice.

Taking account of the above, consideration should be taken in particular to the following organisational signposts and criteria, presented here indicatively and only for practical purposes, namely, to assist reformers who will perhaps be willing to take advantage of them:

(a) In the novel redrafting of the organisational structure of CGDs emphasis should be placed especially on:

the mission statement concerning the particular ministry in strategic and operational terms

the internal differentiation of administrative services, which ought to take place on the basis of standard and vertically integrated units

the allocation of competences and jurisdictions for the implementation of respective areas of public policy that ought to take place in the above standard administrative units within the government departments, and not outside or alongside them, as it has been usually the practice in the past

similarly, the assignment of personnel posts and positions within the above structural cells of central administration ought to reflect and take stock of structural management 'tools', such as the requisite span of control, the unity of direction and unity of command (to name and specify just a few of them)

the qualification and specialism of personnel in terms of job description and most certainly specification duties of the heads of section, at least, would also need to be reflected and included in the new organisational charts of each department of State.

(b) In the process of allocating functions and jurisdictions between central and decentralised ministerial units attention ought to be paid especially to the following issues:

staff units of central government departments would be advised to contain themselves mainly to matters of policy design, strategic orientation, coordination, control and evaluation

subsequently, executive or simply operational activities and responsibilities ought to be delegated to decentralised units and independent agencies and authorities

economy and efficiency in central government structural reform entails the drastic merger of similar or indistinguishable services and units that serve overlapping purposes in the same manner across the administrative landscape of central government

equally necessary is the containment, if not the abolishment, of consultative committees and councils, so that the dispersal of responsibility is avoided

the treatment of administrative staff on an equal and objective manner regardless of political preferences and affiliations can be stressed as a sine qua non condition to move beyond clientelism to a new era of more meritocratic management and administration in the central government of the State.

(c) A number of more concrete and specific indications of structural reform in central government would perhaps include the following:

merger of directorates without any staff or with minimal staff

merger of sections without any staff or with a small number of staff (two or three persons)

merger or abolishment of the multitude of separate or semi-autonomous units (sections or offices) that are excluded from the standard vertical hierarchy of the department and are put under immediate control of the political élite of the ministries; they ought, on the contrary, to be assimilated in the command structure of the line administration of the ministry

any section and directorate in the new ministerial structuring would have to exhibit unity and specificity of direction and orientation (management by objectives and qualitative results), so that dispersal and overlapping of authority and responsibility is avoided as much as possible; in that spirit, no sectional unit would be staffed with less than

five to seven persons (civil servants), and no directorate of central administration of the government would be comprised of with less than five sections

in each department of central government needs to be set up an organisation and methods special unit with staff responsibility to assist and encourage line units in the job description and mission statement for each post of responsibility; the Ministry of the Interior has to support the rest of the ministries in this process, providing them with technical support, manuals and material

the design of a system of amalgamation of the multitude of branches and pseudo-specialisms of central government personnel is highly advisable as a precondition of breaking up the practice and tradition of excessive fragmentation within central government administration of the country, also useful in the promoting process of civil servants.

In conclusion, this study tried to meet the research hypotheses that were specified in the first Section of the paper. It has also provided enough evidence that there is still scope for further reform efforts to improve the organisational landscape in the central government along the lines suggested in the preceding analysis of the paper. Whether that is going to take place in practice, will have to be seen through future research and evaluation.

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Appendix

Table 1. Configuration of the General Government structure

ID	CGDs	Inputs										Output
		General Directorates		Directorates		Sections		Tenured Staff		Budget		Laws
		2013	2014	2013	2014	2013	2014	2013	2014	2013	2014	2013
1	FOREIGN AFFAIRS	8	8	56	56	175	175	2,004	1,969	308,759,655.00	292,808,000.00	13
2	FINANCE	16	13	119	73	410	285	15,836	15,156	613,304,369.37	585,185,000.00	22
3	NATIONAL DEFENCE*	4	4	15	15	60	60	88,347	87,073	3,321,263,557.79	3,067,296,000.00	14
4	INTERIOR	6	5	22	14	75	48	654	642	25,783,721.00	30,181,000.00	1
5	DEVELOPMENT & COMPETITIVENESS	14	13	78	36	257	132	1,685	1,683	23,650,714.00	19,387,000.00	4
6	EDUCATION & RELIGION*	11	10	57	31	209	115	177,547	171,946	3,885,112,754.78	3,682,781,000.00	4
7	CULTURE & SPORTS	7	6	41	32	177	99	7,563	7,254	334,617,635.87	297,950,000.00	1
8	ADMINISTRATIVE REFORM & E-GOVERNANCE	9	5	35	22	139	88	822	803	81,603,046.32	32,998,000.00	2
9	HEALTH*	5	4	27	19	92	63	86,063	80,833	23,403,726.16	20,841,000.00	6
10	LABOUR, SOCIAL SECURITY & WELFARE*	8	7	53	21	161	79	17,150	16,757	512,313,541.14	536,940,000.00	3
11	RURAL DEVELOPMENT & FOOD	9	6	49	29	270	105	2,155	2,073	722,813,921.04	506,317,000.00	4
12	INFRASTRUCTURE, TRANSPORT & NETWORKS	10	9	60	36	160	134	4,597	4,472	774,554,245.30	560,737,000.00	16
13	ENVIRONMENT, ENERGY & CLIMATE CHANGE	12	9	58	30	208	110	830	787	70,393,146.00	70,230,000.00	13

14	JUSTICE, TRANSPARENCY & HUMAN RIGHTS*	4	3	13	9	31	31	15,233	15,726	36,781,173.60	25,965,000.00	9
15	PUBLIC ORDER & CITIZEN'S PROTECTION*	1	1	6	6	25	25	62,722	63,003	1,789,703,384.70	1,742,378,000.00	0
16	TOURISM	2	2	10	8	30	30	831	778	32,804,872.35	26,966,000.00	4
17	SHIPPING & THE AEGEAN*	5	4	27	19	100	71	8,124	8,012	317,228,294.00	295,243,000.00	4
18	MACEDONIA & THRACE	1	1	8	4	34	19	132	123	7,038,063.00	5,597,000.00	1
19	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION / SECRETARIAT GENERAL OF MASS MEDIA	2	2	10	5	33	20	449	435	42,952,755.57	41,570,000.00	1
	Total	134	112	744	465	2,646	1,689	492,744	479,525	12,924,082,576.99	11,841,370,000.00	122
	OECD average per Ministry	10		60		240						

Table 2. Efficiency and effectiveness scores (19 Central Government Departments)

ID	CGDs	Efficiency & Effectiveness scores			
		VRS	Targeted	Stochastic	QE-DEA
1	FOREIGN AFFAIRS	1.0000	1.0000	1.0000	1.0000
2	FINANCE	1.0000	1.0000	0.8914	1.0000
3	NATIONAL DEFENCE*	1.0000	1.0000	1.0000	1.0000
4	INTERIOR	0.4442	0.4597	0.3807	0.6688
5	DEVELOPMENT & COMPETITIVENESS	0.9223	0.6579	1.0000	1.0000
6	EDUCATION & RELIGION*	0.1689	0.1678	0.1803	0.2846
7	CULTURE & SPORTS	0.1944	0.4999	0.1643	0.2656
8	ADMINISTRATIVE REFORM & E-GOVERNMENT	0.3104	0.3734	0.3357	0.5400
9	HEALTH*	1.0000	1.0000	1.0000	1.0000
10	LABOUR, SOCIAL SECURITY & WELFARE*	0.2042	0.5097	0.2761	0.3808
11	RURAL DEVELOPMENT & FOOD	0.2947	0.9992	0.3807	0.5545
12	INFRASTRUCTURE, TRANSPORT & NETWORKS	1.0000	1.0000	1.0000	1.0000
13	ENVIRONMENT, ENERGY & CLIMATE CHANGE	1.0000	1.0000	1.0000	1.0000
14	JUSTICE, TRANSPARENCY & HUMAN RIGHTS*	1.0000	1.0000	1.0000	1.0000
15	PUBLIC ORDER & CITIZEN'S PROTECTION*	1.0000	1.0000	1.0000	1.0000
16	TOURISM	1.0000	1.0000	1.0000	1.0000
17	SHIPPING & THE AEGEAN*	0.3926	0.6419	0.6057	0.7934
18	MACEDONIA & THRACE	1.0000	1.0000	1.0000	1.0000
19	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION / SECRETARIAT GENERAL OF MASS MEDIA	0.9771	1.0000	0.8849	1.0000

Table 3. Efficiency and effectiveness scores (12 Central Government Departments)

ID	CGDs	Efficiency & Effectiveness scores			
		VRS	Targeted	Stochastic	QE-DEA
1	FOREIGN AFFAIRS	1.0000	1.0000	1.0000	1.0000
2	FINANSE	1.0000	1.0000	0.9736	1.0000
3	INTERIOR	0.4442	0.4597	0.3896	0.6688
4	DEVELOPMENT & COMPETITIVENESS	0.9673	0.8185	1.0000	1.0000
5	CULTURE & SPORTS	0.1951	0.6645	0.1805	0.2663
6	ADMINISTRATIVE REFORM & E-GOVERNANCE	0.3104	0.3735	0.3357	0.5400
7	RURAL DEVELOPMENT & FOOD	0.2947	0.2947	0.3807	0.5545
8	INFRASTRUCTURE, TRANSPORT & NETWORKS	1.0000	1.0000	1.0000	1.0000
9	ENVIRONMENT, ENERGY & CLIMATE CHANGE	1.0000	1.0000	1.0000	1.0000
10	TOURISM	1.0000	1.0000	1.0000	1.0000
11	MACEDONIA & THRACE	1.0000	1.0000	1.0000	1.0000
12	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/SECRETARIAT GENERAL OF MASS MEDIA	0.9771	1.0000	0.8880	1.0000

Table 4. Benchmarking (19 Central Government Departments)

ID	CGDs	Benchmarks (IDs)			
		VRS	Targeted	Stochastic	QE-DEA
1	FOREIGN AFFAIRS	1	1	1	1
2	FINANCE	2	2	1, 12, 14, 16	2
3	NATIONAL DEFENCE*	3	3	3	3
4	INTERIOR	16, 18	18, 19	13, 14, 16	18, 19
5	DEVELOPMENT & COMPETITIVENESS	13, 14, 18	13, 14, 18	5	5
6	EDUCATION & RELIGION*	14, 15, 16, 18, 3	3, 15, 16, 18	3, 14, 16	3, 14, 18, 19
7	CULTURE & SPORTS	14, 15, 18	3, 12, 18, 19	1, 14, 16	3, 15, 18, 19
8	ADMINISTRATIVE REFORM & E-GOVERNANCE	13, 16, 18	1, 13, 18	13, 16	1, 13, 16, 18
9	HEALTH*	9	9	9	9
10	LABOUR, SOCIAL SECURITY & WELFARE*	16, 18, 3	3, 12 18	1, 14, 16	1, 14, 18
11	RURAL DEVELOPMENT & FOOD	1, 13, 16, 18	16, 18	1, 13, 16	1, 16, 19
12	INFRASTRUCTURE, TRANSPORT & NETWORKS	12	12	12	12
13	ENVIRONMENT, ENERGY & CLIMATE CHANGE	13	13	13	13
14	JUSTICE, TRANSPARENCY & HUMAN RIGHTS*	14	14	14	14
15	PUBLIC ORDER & CITIZEN'S PROTECTION*	15	15	15	15
16	TOURISM	16	16	16	16
17	SHIPPING & THE AEGEAN*	16, 18, 3	3, 12, 16, 18, 19	1, 14, 16	1, 14, 16, 18
18	MACEDONIA & THRACE	18	18	18	18
19	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/SECRETARIAT GENERAL OF MASS MEDIA	16, 18	19	1, 14, 16	19

Table 5. Benchmarking (12 Central Government Departments)

ID	CGDs	Benchmarks (IDs)			
		VRS	Targeted	Stochastic	QE-DEA
1	FOREIGN AFFAIRS	1	1	1	1
2	FINANCE	2	2	1, 8, 10	2
3	INTERIOR	10, 11	11, 12	9, 10	11, 12
4	DEVELOPMENT & COMPETITIVENESS	11, 9	9, 11	4	4
5	CULTURE & SPORTS	11	8, 11, 12	1, 8, 10	11, 12
6	ADMINISTRATIVE REFORM & E-GOVERNANCE	10, 11, 9	1, 9, 11	9, 10	1, 9, 10, 11
7	RURAL DEVELOPMENT & FOOD	1, 10, 11, 9	1, 9, 10, 11	1, 9, 10	1, 10, 12
8	INFRASTRUCTURE, TRANSPORT & NETWORKS	8	8	8	8
9	ENVIRONMENT, ENERGY & CLIMATE CHANGE	9	9	9	9
10	TOURISM	10	10	10	10

11	MACEDONIA & THRACE	11	11	11	11
12	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/SECRETARIAT GENERAL OF MASS MEDIA	10, 11	12	1, 10	12

Table 6. Optimal number of General Directorates (19 Central Government Departments)

ID	CGDs	General Directorates											
		Actual	AR2013	Change	VRS	Change		Targeted	Change		Stochastic	Change	
				Actual		Actual	AR2013		Actual	AR2013		Actual	AR2013
1	FOREIGN AFFAIRS	8	8	0.00	8	0.00	0.00	8	0.00	0.00	8	0.00	0.00
2	FINANCE	16	13	-0.19	16	0.00	0.23	16	0.00	0.23	13	-0.19	0.00
3	NATIONAL DEFENCE*	4	4	0.00	4	0.00	0.00	4	0.00	0.00	4	0.00	0.00
4	INTERIOR	6	5	-0.17	1	-0.83	-0.80	2	-0.67	-0.60	2	-0.67	-0.60
5	DEVELOPMENT & COMPETITIVENESS	14	13	-0.07	3	-0.79	-0.77	4	-0.71	-0.69	14	0.00	0.08
6	EDUCATION & RELIGION*	11	10	-0.09	2	-0.82	-0.80	2	-0.82	-0.80	2	-0.82	-0.80
7	CULTURE & SPORTS	7	6	-0.14	1	-0.86	-0.83	3	-0.57	-0.50	1	-0.86	-0.83
8	ADMINISTRATIVE REFORM & E-GOVERNANCE	9	5	-0.44	2	-0.78	-0.60	2	-0.78	-0.60	2	-0.78	-0.60
9	HEALTH*	5	4	-0.20	5	0.00	0.25	5	0.00	0.25	5	0.00	0.25
10	LABOUR, SOCIAL SECURITY & WELFARE*	8	7	-0.13	2	-0.75	-0.71	4	-0.50	-0.43	2	-0.75	-0.71
11	RURAL DEVELOPMENT & FOOD	9	6	-0.33	3	-0.67	-0.50	9	0.00	0.50	3	-0.67	-0.50
12	INFRASTRUCTURE, TRANSPORT & NETWORKS	10	9	-0.10	10	0.00	0.11	10	0.00	0.11	10	0.00	0.11
13	ENVIRONMENT, ENERGY & CLIMATE CHANGE	12	9	-0.25	12	0.00	0.33	12	0.00	0.33	12	0.00	0.33
14	JUSTICE, TRANSPARENCY & HUMAN RIGHTS*	4	3	-0.25	4	0.00	0.33	4	0.00	0.33	4	0.00	0.33
15	PUBLIC ORDER & CITIZEN'S PROTECTION*	1	1	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00
16	TOURISM	2	2	0.00	2	0.00	0.00	2	0.00	0.00	2	0.00	0.00
17	SHIPPING & THE AEGEAN*	5	4	-0.20	2	-0.60	-0.50	3	-0.40	-0.25	2	-0.60	-0.50
18	MACEDONIA & THRACE	1	1	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00
19	SECRETARIAT GENERAL OF	2	2	0.00	1	-0.50	-0.50	2	0.00	0.00	1	-0.50	-0.50

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Table 7. Optimal number of General Directorates (12 Central Government Departments)

ID	CGDs	General Directorates											
		Actual	AR2013	Change	VRS	Change		Targeted	Change		Stochastic	Change	
				Actual		Actual	AR2013		Actual	AR2013		Actual	AR2013
1	FOREIGN AFFAIRS	8	8	0.00	8	0.00	0.00	8	0.00	0.00	8	0.00	0.00
2	FINANCE	16	13	-0.19	16	0.00	0.23	16	0.00	0.23	14	-0.13	0.08
3	INTERIOR	6	5	-0.17	1	-0.83	-0.80	2	-0.67	-0.60	2	-0.67	-0.60
4	DEVELOPMENT & COMPETITIVENESS	14	13	-0.07	4	-0.71	-0.69	4	-0.71	-0.69	14	0.00	0.08
5	CULTURE & SPORTS	7	6	-0.14	1	-0.86	-0.83	5	-0.29	-0.17	1	-0.86	-0.83
6	ADMINISTRATIVE REFORM & E-GOVERNANCE	9	5	-0.44	2	-0.78	-0.60	2	-0.78	-0.60	2	-0.78	-0.60
7	RURAL DEVELOPMENT & FOOD	9	6	-0.33	3	-0.67	-0.50	3	-0.67	-0.50	3	-0.67	-0.50
8	INFRASTRUCTURE, TRANSPORT & NETWORKS	10	9	-0.10	10	0.00	0.11	10	0.00	0.11	10	0.00	0.11
9	ENVIRONMENT, ENERGY & CLIMATE CHANGE	12	9	-0.25	12	0.00	0.33	12	0.00	0.33	12	0.00	0.33
10	TOURISM	2	2	0.00	2	0.00	0.00	2	0.00	0.00	2	0.00	0.00
11	MACEDONIA & THRACE	1	1	0.00	1	0.00	0.00	1	0.00	0.00	1	0.00	0.00
12	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/SECRETARIAT GENERAL OF MASS MEDIA	2	2	0.00	1	-0.50	-0.50	2	0.00	0.00	1	-0.50	-0.50

Table 8. Optimal number of Directorates (19 Central Government Departments)

ID	CGDs	Directorates											
		Actual	AR2013	Change	VRS	Change		Targeted	Change		Stochastic	Change	
				Actual		Actual	AR2013		Actual	AR2013		Actual	AR2013
1	FOREIGN AFFAIRS	56	56	0.00	56	0.00	0.00	56	0.00	0.00	56	0.00	0.00
2	FINANCE	119	73	-0.39	119	0.00	0.63	119	0.00	0.63	74	-0.38	0.01
3	NATIONAL DEFENCE*	15	15	0.00	15	0.00	0.00	15	0.00	0.00	15	0.00	0.00
4	INTERIOR	22	14	-0.36	8	-0.64	-0.43	9	-0.59	-0.36	8	-0.64	-0.43
5	DEVELOPMENT & COMPETITIVENESS	78	36	-0.54	18	-0.77	-0.50	19	-0.76	-0.47	78	0.00	1.17
6	EDUCATION & RELIGION*	57	31	-0.46	10	-0.82	-0.68	10	-0.82	-0.68	6	-0.89	-0.81
7	CULTURE & SPORTS	41	32	-0.22	8	-0.80	-0.75	20	-0.51	-0.38	5	-0.88	-0.84
8	ADMINISTRATIVE REFORM & E-GOVERNANCE	35	22	-0.37	11	-0.69	-0.50	13	-0.63	-0.41	11	-0.69	-0.50
9	HEALTH*	27	19	-0.30	27	0.00	0.42	27	0.00	0.42	27	0.00	0.42
10	LABOUR, SOCIAL SECURITY & WELFARE*	53	21	-0.60	9	-0.83	-0.57	25	-0.53	0.19	8	-0.85	-0.62
11	RURAL DEVELOPMENT & FOOD	49	29	-0.41	14	-0.71	-0.52	49	0.00	0.69	18	-0.63	-0.38
12	INFRASTRUCTURE, TRANSPORT & NETWORKS	60	36	-0.40	60	0.00	0.67	60	0.00	0.67	60	0.00	0.67
13	ENVIRONMENT, ENERGY & CLIMATE CHANGE	58	30	-0.48	58	0.00	0.93	58	0.00	0.93	58	0.00	0.93
14	JUSTICE, TRANSPARENCY & HUMAN RIGHTS*	13	9	-0.31	13	0.00	0.44	13	0.00	0.44	13	0.00	0.44
15	PUBLIC ORDER & CITIZEN'S PROTECTION*	6	6	0.00	6	0.00	0.00	6	0.00	0.00	6	0.00	0.00
16	TOURISM	10	8	-0.20	10	0.00	0.25	10	0.00	0.25	10	0.00	0.25
17	SHIPPING & THE AEGEAN*	27	19	-0.30	10	-0.63	-0.47	17	-0.37	-0.11	11	-0.59	-0.42

18	MACEDONIA & THRACE	8	4	-0.50	8	0.00	1.00	8	0.00	1.00	8	0.00	1.00
19	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/SECRETARIAT GENERAL OF MASS MEDIA	10	5	-0.50	9	-0.10	0.80	10	0.00	1.00	6	-0.40	0.20

Table 9. Optimal number of Directorates (12 Central Government Departments)

ID	CGDs	Directorates											
		Actual	AR2013	Change	VRS	Change		Targeted	Change		Stochastic	Change	
				Actual		Actual	AR2013		Actual	AR2013		Actual	AR2013
1	FOREIGN AFFAIRS	56	56	0.00	56	0.00	0.00	56	0.00	0.00	56	0.00	0.00
2	FINANCE	119	73	-0.39	119	0.00	0.63	119	0.00	0.63	91	-0.24	0.25
3	INTERIOR	22	14	-0.36	8	-0.64	-0.43	9	-0.59	-0.36	8	-0.64	-0.43
4	DEVELOPMENT & COMPETITIVENESS	78	36	-0.54	21	-0.73	-0.42	21	-0.73	-0.42	78	0.00	1.17
5	CULTURE & SPORTS	41	32	-0.22	8	-0.80	-0.75	27	-0.34	-0.16	7	-0.83	-0.78
6	ADMINISTRATIVE REFORM & E-GOVERNANCE	35	22	-0.37	11	-0.69	-0.50	13	-0.63	-0.41	11	-0.69	-0.50
7	RURAL DEVELOPMENT & FOOD	49	29	-0.41	14	-0.71	-0.52	14	-0.71	-0.52	18	-0.63	-0.38
8	INFRASTRUCTURE, TRANSPORT & NETWORKS	60	36	-0.40	60	0.00	0.67	60	0.00	0.67	60	0.00	0.67

9	ENVIRONMENT, ENERGY & CLIMATE CHANGE	58	30	-0.48	58	0.00	0.93	58	0.00	0.93	58	0.00	0.93
10	TOURISM	10	8	-0.20	10	0.00	0.25	10	0.00	0.25	10	0.00	0.25
11	MACEDONIA & THRACE	8	4	-0.50	8	0.00	1.00	8	0.00	1.00	8	0.00	1.00
12	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/ SECRETARIAT GENERAL OF MASS MEDIA	10	5	-0.50	9	-0.10	0.80	10	0.00	1.00	5	-0.50	0.00

Table 10. Optimal number of Sections (19 Central Government Departments)

ID	CGDs	Sections											
		Actual	AR2013	Change	VRS	Change		Targeted	Change		Stochastic	Change	
				Actual		Actual	AR2013		Actual	AR2013		Actual	AR2013
1	FOREIGN AFFAIRS	175	175	0.00	175	0.00	0.00	175	0.00	0.00	175	0.00	0.00
2	FINANCE	410	285	-0.30	410	0.00	0.44	410	0.00	0.44	214	-0.48	-0.25
3	NATIONAL DEFENCE*	60	60	0.00	60	0.00	0.00	60	0.00	0.00	60	0.00	0.00
4	INTERIOR	75	48	-0.36	33	-0.56	-0.31	34	-0.55	-0.29	28	-0.63	-0.42
5	DEVELOPMENT & COMPETITIVENESS	257	132	-0.49	67	-0.74	-0.49	71	-0.72	-0.46	257	0.00	0.95
6	EDUCATION & RELIGION*	209	115	-0.45	35	-0.83	-0.70	35	-0.83	-0.70	19	-0.91	-0.83
7	CULTURE & SPORTS	177	99	-0.44	34	-0.81	-0.66	88	-0.50	-0.11	16	-0.91	-0.84
8	ADMINISTRATIVE REFORM & E-GOVERNANCE	139	88	-0.37	43	-0.69	-0.51	52	-0.63	-0.41	40	-0.71	-0.55
9	HEALTH*	92	63	-0.32	92	0.00	0.46	92	0.00	0.46	92	0.00	0.46
10	LABOUR, SOCIAL SECURITY & WELFARE*	161	79	-0.51	32	-0.80	-0.59	82	-0.49	0.04	21	-0.87	-0.73
11	RURAL DEVELOPMENT & FOOD	270	105	-0.61	50	-0.81	-0.52	270	0.00	1.57	57	-0.79	-0.46
12	INFRASTRUCTURE, TRANSPORT & NETWORKS	160	134	-0.16	160	0.00	0.19	160	0.00	0.19	160	0.00	0.19
13	ENVIRONMENT, ENERGY & CLIMATE CHANGE	208	110	-0.47	208	0.00	0.89	208	0.00	0.89	208	0.00	0.89
14	JUSTICE, TRANSPARENCY & HUMAN RIGHTS*	31	31	0.00	31	0.00	0.00	31	0.00	0.00	31	0.00	0.00
15	PUBLIC ORDER & CITIZEN'S PROTECTION*	25	25	0.00	25	0.00	0.00	25	0.00	0.00	25	0.00	0.00
16	TOURISM	30	30	0.00	30	0.00	0.00	30	0.00	0.00	30	0.00	0.00
17	SHIPPING & THE AEGEAN*	100	71	-0.29	31	-0.69	-0.56	64	-0.36	-0.10	32	-0.68	-0.55
18	MACEDONIA & THRACE	34	19	-0.44	34	0.00	0.79	34	0.00	0.79	34	0.00	0.79

19	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/SECRETARIAT GENERAL OF MASS MEDIA	33	20	-0.39	32	-0.03	0.60	33	0.00	0.65	17	-0.48	-0.15

Table 11. Optimal number of Sections (12 Central Government Departments)

ID	CGDs	Sections											
		Actual	AR2013	Change	VRS	Change		Targeted	Change		Stochastic	Change	
				Actual		Actual	AR2013		Actual	AR2013		Actual	AR2013
1	FOREIGN AFFAIRS	175	175	0.00	175	0.00	0.00	175	0.00	0.00	175	0.00	0.00
2	FINANCE	410	285	-0.30	410	0.00	0.44	410	0.00	0.44	276	-0.33	-0.03
3	INTERIOR	75	48	-0.36	33	-0.56	-0.31	34	-0.55	-0.29	29	-0.61	-0.40
4	DEVELOPMENT & COMPETITIVENESS	257	132	-0.49	78	-0.70	-0.41	78	-0.70	-0.41	257	0.00	0.95
5	CULTURE & SPORTS	177	99	-0.44	34	-0.81	-0.66	118	-0.33	0.19	20	-0.89	-0.80
6	ADMINISTRATIVE REFORM & E-GOVERNANCE	139	88	-0.37	43	-0.69	-0.51	52	-0.63	-0.41	40	-0.71	-0.55
7	RURAL DEVELOPMENT & FOOD	270	105	-0.61	50	-0.81	-0.52	50	-0.81	-0.52	57	-0.79	-0.46
8	INFRASTRUCTURE, TRANSPORT & NETWORKS	160	134	-0.16	160	0.00	0.19	160	0.00	0.19	160	0.00	0.19

9	ENVIRONMENT, ENERGY & CLIMATE CHANGE	208	110	-0.47	208	0.00	0.89	208	0.00	0.89	208	0.00	0.89
10	TOURISM	30	30	0.00	30	0.00	0.00	30	0.00	0.00	30	0.00	0.00
11	MACEDONIA & THRACE	34	19	-0.44	34	0.00	0.79	34	0.00	0.79	34	0.00	0.79
12	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/ SECRETARIAT GENERAL OF MASS MEDIA	33	20	-0.39	32	-0.03	0.60	33	0.00	0.65	17	-0.48	-0.15

Table 12. Optimal number of Staff (19 Central Government Departments)

ID	CGDs	Staff											
		Actual	AR2013	Change	VRS	Change		Targeted	Change		Stochastic	Change	
				Actual		Actual	AR2013		Actual	AR2013		Actual	AR2013
1	FOREIGN AFFAIRS	2004	1969	-0.02	2004	0.00	0.02	2004	0.00	0.02	2004	0.00	0.02
2	FINANCE	15836	15156	-0.04	15836	0.00	0.04	15836	0.00	0.04	14114	-0.11	-0.07
3	NATIONAL DEFENCE*	88347	87073	-0.01	88347	0.00	0.01	88347	0.00	0.01	88347	0.00	0.01
4	INTERIOR	654	642	-0.02	252	-0.61	-0.61	301	-0.54	-0.53	249	-0.62	-0.61
5	DEVELOPMENT & COMPETITIVENESS	1685	1683	0.00	1554	-0.08	-0.08	1109	-0.34	-0.34	1685	0.00	0.00
6	EDUCATION & RELIGION*	177547	171946	-0.03	19372	-0.89	-0.89	22297	-0.87	-0.87	21649	-0.88	-0.87
7	CULTURE & SPORTS	7563	7254	-0.04	1470	-0.81	-0.80	3781	-0.50	-0.48	1243	-0.84	-0.83
8	ADMINISTRATIVE REFORM & E-GOVERNANCE	822	803	-0.02	255	-0.69	-0.68	307	-0.63	-0.62	276	-0.66	-0.66
9	HEALTH*	86063	80833	-0.06	86063	0.00	0.06	86063	0.00	0.06	86063	0.00	0.06
10	LABOUR, SOCIAL SECURITY & WELFARE*	17150	16757	-0.02	2736	-0.84	-0.84	8741	-0.49	-0.48	4734	-0.72	-0.72
11	RURAL DEVELOPMENT & FOOD	2155	2073	-0.04	635	-0.71	-0.69	2153	0.00	0.04	820	-0.62	-0.60
12	INFRASTRUCTURE, TRANSPORT & NETWORKS	4597	4472	-0.03	4597	0.00	0.03	4597	0.00	0.03	4597	0.00	0.03
13	ENVIRONMENT, ENERGY & CLIMATE CHANGE	830	787	-0.05	830	0.00	0.05	830	0.00	0.05	830	0.00	0.05
14	JUSTICE, TRANSPARENCY & HUMAN RIGHTS*	15233	15726	0.03	15233	0.00	-0.03	15233	0.00	-0.03	15233	0.00	-0.03
15	PUBLIC ORDER &	62722	63003	0.00	62722	0.00	0.00	62722	0.00	0.00	62722	0.00	0.00

	CITIZEN'S PROTECTION*												
16	TOURISM	831	778	-0.06	831	0.00	0.07	831	0.00	0.07	831	0.00	0.07
17	SHIPPING & THE AEGEAN*	8124	8012	-0.01	3190	-0.61	-0.60	5215	-0.36	-0.35	4920	-0.39	-0.39
18	MACEDONIA & THRACE	132	123	-0.07	132	0.00	0.07	132	0.00	0.07	132	0.00	0.07
19	SECRETARIAT GENERAL OF INFORMATION & COM-MUNICATION/SECRETARIAT GENERAL OF MASS MEDIA	449	435	-0.03	439	-0.02	0.01	449	0.00	0.03	397	-0.12	-0.09

Table 13. Optimal number of Staff (12 Central Government Departments)

ID	CGDs	Staff											
		Actual	AR2013	Change	VRS	Change		Targeted	Change		Stochastic	Change	
				Actual		Actual	AR2013		Actual	AR2013		Actual	AR2013
1	FOREIGN AFFAIRS	2004	1969	-0.02	2004	0.00	0.02	2004	0.00	0.02	2004	0.00	0.02
2	FINANCE	15836	15156	-0.04	15836	0.00	0.04	15836	0.00	0.04	4446	-0.72	-0.71
3	INTERIOR	654	642	-0.02	252	-0.61	-0.61	301	-0.54	-0.53	124	-0.81	-0.81
4	DEVELOPMENT & COMPETITIVENESS	1685	1683	0.00	307	-0.82	-0.82	307	-0.82	-0.82	1685	0.00	0.00
5	CULTURE & SPORTS	7563	7254	-0.04	132	-0.98	-0.98	1388	-0.82	-0.81	383	-0.95	-0.95
6	ADMINISTRATIVE REFORM & E-GOVERNANCE	822	803	-0.02	255	-0.69	-0.68	307	-0.63	-0.62	276	-0.66	-0.66
7	RURAL DEVELOPMENT & FOOD	2155	2073	-0.04	635	-0.71	-0.69	635	-0.71	-0.69	820	-0.62	-0.60
8	INFRASTRUCTURE, TRANSPORT & NETWORKS	4597	4472	-0.03	4597	0.00	0.03	4597	0.00	0.03	4597	0.00	0.03
9	ENVIRONMENT, ENERGY & CLIMATE CHANGE	830	787	-0.05	830	0.00	0.05	830	0.00	0.05	830	0.00	0.05
10	TOURISM	831	778	-0.06	831	0.00	0.07	831	0.00	0.07	831	0.00	0.07
11	MACEDONIA & THRACE	132	123	-0.07	132	0.00	0.07	132	0.00	0.07	132	0.00	0.07
12	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/ SECRETARIAT GENERAL OF MASS MEDIA	449	435	-0.03	439	-0.02	0.01	449	0.00	0.03	365	-0.19	-0.16

Table 14. Average change of inputs before and after the adjustments (12 Central Government Departments)

Inputs	Change			
	AR2013	VRS	Targeted	Stochastic
General Directorates	-0.14	-0.36	-0.26	-0.30
Directorates	-0.36	-0.31	-0.25	-0.29
Sections	-0.34	-0.30	-0.25	-0.32
Staff	-0.04	-0.32	-0.29	-0.33
Budget	-0.15	-0.33	-0.15	-0.30

Table 15. Average change of inputs before and after the adjustments (19 Central Government Departments)

Inputs	Change			
	AR2013	VRS	Targeted	Stochastic
General Directorates	-0.13	-0.35	-0.23	-0.31
Directorates	-0.33	-0.32	-0.22	-0.31
Sections	-0.29	-0.31	-0.21	-0.34
Staff	-0.03	-0.28	-0.20	-0.26
Budget	-0.13	-0.32	-0.13	-0.34

Table 16. Optimal Budget (19 Central Government Departments)

ID	CGDs	Budget											
		Actual	AR2013	Change	VRS	Change		Targeted	Change		Stochastic	Change	
				Actual		Actual	AR2013		Actual	AR2013		Actual	AR2013
1	FOREIGN AFFAIRS	308759655	292808000	-0.05	308759655	0.00	0.05	292808000	-0.05	0.00	308759655	0.00	0.05
2	FINANCE	613304369	585185000	-0.05	613304369	0.00	0.05	585185000	-0.05	0.00	538733747	-0.12	-0.08
3	NATIONAL DEFENCE*	3321263558	3067296000	-0.08	3321263558	0.00	0.08	3067296000	-0.08	0.00	3321263556	0.00	0.08
4	INTERIOR	25783721	30181000	0.17	11453002	-0.56	-0.62	30181000	0.17	0.00	9816658	-0.62	-0.67
5	DEVELOPMENT & COMPETITIVENESS	23650714	19387000	-0.18	21811921	-0.08	0.13	19387000	-0.18	0.00	23650714	0.00	0.22
6	EDUCATION & RELIGION*	3885112755	3682781000	-0.05	656002291	-0.83	-0.82	3682781000	-0.05	0.00	700595199	-0.82	-0.81
7	CULTURE & SPORTS	334617636	297950000	-0.11	44121179	-0.87	-0.85	297950000	-0.11	0.00	24002146	-0.93	-0.92
8	ADMINISTRATIVE REFORM & E-GOVERNANCE	81603046.3	32998000	-0.60	13548212	-0.83	-0.59	32998000	-0.60	0.00	17223636	-0.79	-0.48
9	HEALTH*	23403726.2	20841000	-0.11	23403726	0.00	0.12	20841000	-0.11	0.00	23403726	0.00	0.12
10	LABOUR, SOCIAL SECURITY & WELFARE*	512313541	536940000	0.05	104589111	-0.80	-0.81	536940000	0.05	0.00	27006497	-0.95	-0.95
11	RURAL DEVELOPMENT & FOOD	722813921	506317000	-0.30	34269389	-0.95	-0.93	506317000	-0.30	0.00	84693214	-0.88	-0.83
12	INFRASTRUCTURE, TRANSPORT & NETWORKS	774554245	560737000	-0.28	774554245	0.00	0.38	560737000	-0.28	0.00	774554244	0.00	0.38
13	ENVIRONMENT, ENERGY & CLIMATE CHANGE	70393146	70230000	0.00	70393146	0.00	0.00	70230000	0.00	0.00	70393146	0.00	0.00
14	JUSTICE, TRANSPARENCY & HUMAN RIGHTS*	36781173.6	25965000	-0.29	36781174	0.00	0.42	25965000	-0.29	0.00	36781174	0.00	0.42
15	PUBLIC ORDER & CITIZEN'S PROTECTION*	1789703385	1742378000	-0.03	1789703385	0.00	0.03	1742378000	-0.03	0.00	1789703383	0.00	0.03
16	TOURISM	32804872.4	26966000	-0.18	32804872	0.00	0.22	26966000	-0.18	0.00	32804872	0.00	0.22
17	SHIPPING & THE AEGEAN*	317228294	295243000	-0.07	121477126	-0.62	-0.59	295243000	-0.07	0.00	44990368	-0.86	-0.85
18	MACEDONIA & THRACE	7038063	5597000	-0.20	7038063	0.00	0.26	5597000	-0.20	0.00	7038063	0.00	0.26
19	SECRETARIAT GENERAL OF	42952755.6	41570000	-0.03	18344659	-0.57	-0.56	41570000	-0.03	0.00	23213683	-0.46	-0.44

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Table 17. Optimal Budget (12 Central Government Departments)

ID	CGDs	Budget											
		Actual	AR2013	Change	VRS	Change		Targeted	Change		Stochastic	Change	
				Actual		Actual	AR2013		Actual	AR2013		Actual	AR2013
1	FOREIGN AFFAIRS	308759655	292808000	-0.05	308759655	0.00	0.05	292808000	-0.05	0.00	308759655	0.00	0.05
2	FINANCE	613304369	585185000	-0.05	613304369	0.00	0.05	585185000	-0.05	0.00	597115698	-0.03	0.02
3	INTERIOR	25783721	30181000	0.17	11453002	-0.56	-0.62	30181000	0.17	0.00	10044113	-0.61	-0.67
4	DEVELOPMENT & COMPETITIVENESS	23650714	19387000	-0.18	22876834	-0.03	0.18	19387000	-0.18	0.00	23650714	0.00	0.22
5	CULTURE & SPORTS	334617636	297950000	-0.11	7038063	-0.98	-0.98	297950000	-0.11	0.00	48611514	-0.85	-0.84
6	ADMINISTRATIVE REFORM & E-GOVERNANCE	81603046	32998000	-0.60	13548212	-0.83	-0.59	32998000	-0.60	0.00	17223636	-0.79	-0.48
7	RURAL DEVELOPMENT & FOOD	722813921	506317000	-0.30	34269389	-0.95	-0.93	506317000	-0.30	0.00	84693214	-0.88	-0.83
8	INFRASTRUCTURE, TRANSPORT & NETWORKS	774554245	560737000	-0.28	774554245	0.00	0.38	560737000	-0.28	0.00	774554244	0.00	0.38
9	ENVIRONMENT, ENERGY & CLIMATE CHANGE	70393146	70230000	0.00	70393146	0.00	0.00	70230000	0.00	0.00	70393146	0.00	0.00
10	TOURISM	32804872	26966000	-0.18	32804872	0.00	0.22	26966000	-0.18	0.00	32804872	0.00	0.22
11	MACEDONIA & THRACE	7038063	5597000	-0.20	7038063	0.00	0.26	5597000	-0.20	0.00	7038063	0.00	0.26
12	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/SECRETARIAT GENERAL OF MASS MEDIA	42952756	41570000	-0.03	18344659	-0.57	-0.56	41570000	-0.03	0.00	22386450	-0.48	-0.46

Table 18. Employees' satisfaction scores

ID	CGDs	Satisfaction determinants					Average
		Workload	Professional development	Team spirit	Organisational structure	Infrastructure	
1	FOREIGN AFFAIRS	3.4444	2.6667	3.3333	2.6667	3.5000	3.1222
2	FINANCE	3.3590	1.9615	3.1731	2.6154	2.8846	2.7987
3	NATIONAL DEFENCE*	3.0000	1.7500	3.3333	2.5000	2.8333	2.6833
4	INTERIOR	3.3030	1.9773	3.4318	2.7727	2.5909	2.8152
5	DEVELOPMENT & COMPETITIVENESS	2.7500	2.3125	3.7500	2.6250	3.5000	2.9875
6	EDUCATION & RELIGION*	3.2500	2.0417	3.2917	2.2083	3.2500	2.8083
7	CULTURE & SPORTS	2.5000	1.7500	3.0000	2.7500	2.7500	2.5500
8	ADMINISTRATIVE REFORM & E-GOVERNANCE	3.5000	2.2500	3.3750	2.9167	4.0833	3.2250
9	HEALTH*	4.6667	1.7500	4.2500	3.0000	4.0000	3.5333
10	LABOUR, SOCIAL SECURITY & WELFARE*	3.3333	2.2500	3.4167	3.1667	2.5000	2.9333
11	RURAL DEVELOPMENT & FOOD	3.6667	2.6250	3.5000	2.7500	3.5000	3.2083
12	INFRASTRUCTURE, TRANSPORT & NETWORKS	3.3333	1.6667	3.2500	3.3333	3.8333	3.0833
13	ENVIRONMENT, ENERGY & CLIMATE CHANGE	2.1667	1.2500	3.6250	1.0000	3.0000	2.2083
14	JUSTICE, TRANSPARENCY & HUMAN RIGHTS*	2.7778	1.5000	3.6667	2.1667	3.0000	2.6222
15	PUBLIC ORDER & CITIZEN'S PROTECTION*	3.8333	2.8750	4.1250	3.0000	3.5000	3.4667
16	TOURISM	3.0000	1.5000	3.0000	2.5000	1.0000	2.2000
17	SHIPPING & THE AEGEAN*	3.6667	2.3333	2.8333	2.6667	3.5000	3.0000
18	MACEDONIA & THRACE	3.6667	1.5000	3.5000	1.0000	5.0000	2.9333
19	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/SECRETARIAT GENERAL OF MASS MEDIA	3.0000	2.7500	1.0000	1.0000	1.0000	1.7500

Table 19. QE-DEA optimal number of General Directorates and Directorates (19 Central Government Departments)

ID	CGDs	General Directorates						Directorates					
		Actual	AR2013	Change	QE-DEA	Change		Actual	AR2013	Change	QE-DEA	Change	
				Actual		Actual	AR2013			Actual		Actual	AR2013
1	FOREIGN AFFAIRS	8	8	0.00	12	0.50	0.50	56	56	0.00	82	0.46	0.46
2	FINANCE	16	13	-0.19	27	0.69	1.08	119	73	-0.39	201	0.69	1.75
3	NATIONAL DEFENCE*	4	4	0.00	7	0.75	0.75	15	15	0.00	27	0.80	0.80
4	INTERIOR	6	5	-0.17	2	-0.67	-0.60	22	14	-0.36	12	-0.45	-0.14
5	DEVELOPMENT & COMPETITIVENESS	14	13	-0.07	14	0.00	0.08	78	36	-0.54	78	0.00	1.17
6	EDUCATION & RELIGION*	11	10	-0.09	3	-0.73	-0.70	57	31	-0.46	16	-0.72	-0.48
7	CULTURE & SPORTS	7	6	-0.14	2	-0.71	-0.67	41	32	-0.22	11	-0.73	-0.66
8	ADMINISTRATIVE REFORM & E-GOVERNANCE	9	5	-0.44	3	-0.67	-0.40	35	22	-0.37	19	-0.46	-0.14
9	HEALTH*	5	4	-0.20	6	0.20	0.50	27	19	-0.30	33	0.22	0.74
10	LABOUR, SOCIAL SECURITY & WELFARE*	8	7	-0.13	3	-0.63	-0.57	53	21	-0.60	16	-0.70	-0.24
11	RURAL DEVELOPMENT & FOOD	9	6	-0.33	4	-0.56	-0.33	49	29	-0.41	27	-0.45	-0.07
12	INFRASTRUCTURE, TRANSPORT & NETWORKS	10	9	-0.10	15	0.50	0.67	60	36	-0.40	90	0.50	1.50
13	ENVIRONMENT, ENERGY & CLIMATE CHANGE	12	9	-0.25	27	1.25	2.00	58	30	-0.48	129	1.22	3.30
14	JUSTICE, TRANSPARENCY & HUMAN RIGHTS*	4	3	-0.25	7	0.75	1.33	13	9	-0.31	24	0.85	1.67
15	PUBLIC ORDER & CITIZEN'S PROTECTION*	1	1	0.00	1	0.00	0.00	6	6	0.00	8	0.33	0.33
16	TOURISM	2	2	0.00	4	1.00	1.00	10	8	-0.20	22	1.20	1.75
17	SHIPPING & THE AEGEAN*	5	4	-0.20	4	-0.20	0.00	27	19	-0.30	21	-0.22	0.11
18	MACEDONIA & THRACE	1	1	0.00	2	1.00	1.00	8	4	-0.50	13	0.63	2.25
19	SECRETARIAT GENERAL OF INFORMATION &	2	2	0.00	2	0.00	0.00	10	5	-0.50	10	0.00	1.00

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Table 20. QE-DEA optimal number of Sections and Staff (19 Central Government Departments)

ID	CGDs	Sections						Staff					
		Actual	AR2013	Change	QE-DEA	Change		Actual	AR2013	Change	QE-DEA	Change	
				Actual		Actual	AR2013			Actual		Actual	AR2013
1	FOREIGN AFFAIRS	175	175	0.00	257	0.47	0.47	2004	1969	-0.02	2946	0.47	0.50
2	FINANCE	410	285	-0.30	693	0.69	1.43	15836	15156	-0.04	26756	0.69	0.77
3	NATIONAL DEFENCE*	60	60	0.00	107	0.78	0.78	88347	87073	-0.01	157044	0.78	0.80
4	INTERIOR	75	48	-0.36	50	-0.33	0.04	654	642	-0.02	256	-0.61	-0.60
5	DEVELOPMENT & COMPETITIVENESS	257	132	-0.49	257	0.00	0.95	1685	1683	0.00	1685	0.00	0.00
6	EDUCATION & RELIGION*	209	115	-0.45	59	-0.72	-0.49	177547	171946	-0.03	31202	-0.82	-0.82
7	CULTURE & SPORTS	177	99	-0.44	40	-0.77	-0.60	7563	7254	-0.04	2009	-0.73	-0.72
8	ADMINISTRATIVE REFORM & E-GOVERNANCE	139	88	-0.37	73	-0.47	-0.17	822	803	-0.02	444	-0.46	-0.45
9	HEALTH*	92	63	-0.32	113	0.23	0.79	86063	80833	-0.06	106142	0.23	0.31
10	LABOUR, SOCIAL SECURITY & WELFARE*	161	79	-0.51	58	-0.64	-0.27	17150	16757	-0.02	6530	-0.62	-0.61
11	RURAL DEVELOPMENT & FOOD	270	105	-0.61	86	-0.68	-0.18	2155	2073	-0.04	1195	-0.45	-0.42
12	INFRASTRUCTURE, TRANSPORT & NETWORKS	160	134	-0.16	239	0.49	0.78	4597	4472	-0.03	6871	0.49	0.54
13	ENVIRONMENT, ENERGY & CLIMATE CHANGE	208	110	-0.47	461	1.22	3.19	830	787	-0.05	1841	1.22	1.34

14	JUSTICE, TRANSPARENCY & HUMAN RIGHTS*	31	31	0.00	57	0.84	0.84	15233	15726	0.03	27827	0.83	0.77
15	PUBLIC ORDER & CITIZEN'S PROTECTION*	25	25	0.00	32	0.28	0.28	62722	63003	0.00	79609	0.27	0.26
16	TOURISM	30	30	0.00	67	1.23	1.23	831	778	-0.06	1851	1.23	1.38
17	SHIPPING & THE AEGEAN*	100	71	-0.29	71	-0.29	0.00	8124	8012	-0.01	6446	-0.21	-0.20
18	MACEDONIA & THRACE	34	19	-0.44	54	0.59	1.84	132	123	-0.07	210	0.59	0.71
19	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/SECRETARIAT GENERAL OF MASS MEDIA	33	20	-0.39	33	0.00	0.65	449	435	-0.03	449	0.00	0.03

Table 21. QE-DEA optimal Budget (19 Central Government Departments)

ID	CGDs	Budget					
		Actual	AR2013	Change	QE-DEA	Change	
				Actual		Actual	AR2013
1	FOREIGN AFFAIRS	308759655	292808000	-0.05	453883932.2	0.47	0.55
2	FINANCE	613304369	585185000	-0.05	1036201555	0.69	0.77
3	NATIONAL DEFENCE*	3321263558	3067296000	-0.08	5903818073	0.78	0.92
4	INTERIOR	25783721	30181000	0.17	17245299.43	-0.33	-0.43
5	DEVELOPMENT & COMPETITIVENESS	23650714	19387000	-0.18	23650714	0.00	0.22
6	EDUCATION & RELIGION*	3885112755	3682781000	-0.05	1105695473	-0.72	-0.70
7	CULTURE & SPORTS	334617636	297950000	-0.11	80591940.58	-0.76	-0.73
8	ADMINISTRATIVE REFORM & E-GOVERNANCE	81603046.3	32998000	-0.60	44062582.65	-0.46	0.34
9	HEALTH*	23403726.2	20841000	-0.11	28863914.36	0.23	0.38
10	LABOUR, SOCIAL SECURITY & WELFARE*	512313541	536940000	0.05	30626639.68	-0.94	-0.94
11	RURAL DEVELOPMENT & FOOD	722813921	506317000	-0.30	134321651.1	-0.81	-0.73
12	INFRASTRUCTURE, TRANSPORT & NETWORKS	774554245	560737000	-0.28	1157641808	0.49	1.06
13	ENVIRONMENT, ENERGY & CLIMATE CHANGE	70393146	70230000	0.00	156176483.4	1.22	1.22
14	JUSTICE, TRANSPARENCY & HUMAN RIGHTS*	36781173.6	25965000	-0.29	67189192.44	0.83	1.59
15	PUBLIC ORDER & CITIZEN'S PROTECTION*	1789703385	1742378000	-0.03	2271562587	0.27	0.30
16	TOURISM	32804872.4	26966000	-0.18	73083495.87	1.23	1.71
17	SHIPPING & THE AEGEAN*	317228294	295243000	-0.07	63676031.57	-0.80	-0.78
18	MACEDONIA & THRACE	7038063	5597000	-0.20	11217027.52	0.59	1.00
19	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/SECRETARIAT GENERAL OF MASS MEDIA	42952755.6	41570000	-0.03	42952755.57	0.00	0.03

Table 22. QE-DEA optimal number of General Directorates and Directorates (12 Central Government Departments)

ID	CGDs	General Directorates						Directorates					
		Actual	AR2013	Change	QE-DEA	Change		Actual	AR2013	Change	QE-DEA	Change	
				Actual		Actual	AR2013			Actual		Actual	AR2013
1	FOREIGN AFFAIRS	8	8	0.00	12	0.50	0.50	56	56	0.00	82	0.46	0.46
2	FINANCE	16	13	-0.19	27	0.69	1.08	119	73	-0.39	201	0.69	1.75
3	INTERIOR	6	5	-0.17	2	-0.67	-0.60	22	14	-0.36	12	-0.45	-0.14
4	DEVELOPMENT & COMPETITIVENESS	14	13	-0.07	14	0.00	0.08	78	36	-0.54	78	0.00	1.17
5	CULTURE & SPORTS	7	6	-0.14	2	-0.71	-0.67	41	32	-0.22	11	-0.73	-0.66
6	ADMINISTRATIVE REFORM & E-GOVERNANCE	9	5	-0.44	3	-0.67	-0.40	35	22	-0.37	19	-0.46	-0.14
7	RURAL DEVELOPMENT & FOOD	9	6	-0.33	4	-0.56	-0.33	49	29	-0.41	27	-0.45	-0.07
8	INFRASTRUCTURE, TRANSPORT & NETWORKS	10	9	-0.10	15	0.50	0.67	60	36	-0.40	90	0.50	1.50
9	ENVIRONMENT, ENERGY & CLIMATE CHANGE	12	9	-0.25	27	1.25	2.00	58	30	-0.48	129	1.22	3.30
10	TOURISM	2	2	0.00	4	1.00	1.00	10	8	-0.20	22	1.20	1.75
11	MACEDONIA & THRACE	1	1	0.00	2	1.00	1.00	8	4	-0.50	13	0.63	2.25
12	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/ SECRETARIAT GENERAL OF MASS MEDIA	2	2	0.00	2	0.00	0.00	10	5	-0.50	10	0.00	1.00

Table 23. QE-DEA optimal number of Sections and Staff (12 Central Government Departments)

ID	CGDs	Sections						Staff					
		Actual	AR2013	Change	QE-DEA	Change		Actual	AR2013	Change	QE-DEA	Change	
				Actual		Actual	AR2013			Actual		Actual	AR2013
1	FOREIGN AFFAIRS	175	175	0.00	257	0.47	0.47	2004	1969	-0.02	2946	0.47	0.50
2	FINANCE	410	285	-0.30	693	0.69	1.43	15836	15156	-0.04	26756	0.69	0.77
3	INTERIOR	75	48	-0.36	50	-0.33	0.04	654	642	-0.02	256	-0.61	-0.60
4	DEVELOPMENT & COMPETITIVENESS	257	132	-0.49	257	0.00	0.95	1685	1683	0.00	1685	0.00	0.00
5	CULTURE & SPORTS	177	99	-0.44	40	-0.77	-0.60	7563	7254	-0.04	2009	-0.73	-0.72
6	ADMINISTRATIVE REFORM & E-GOVERNANCE	139	88	-0.37	73	-0.47	-0.17	822	803	-0.02	444	-0.46	-0.45
7	RURAL DEVELOPMENT & FOOD	270	105	-0.61	86	-0.68	-0.18	2155	2073	-0.04	1195	-0.45	-0.42
8	INFRASTRUCTURE, TRANSPORT & NETWORKS	160	134	-0.16	239	0.49	0.78	4597	4472	-0.03	6871	0.49	0.54
9	ENVIRONMENT, ENERGY & CLIMATE CHANGE	208	110	-0.47	461	1.22	3.19	830	787	-0.05	1841	1.22	1.34
10	TOURISM	30	30	0.00	67	1.23	1.23	831	778	-0.06	1851	1.23	1.38
11	MACEDONIA & THRACE	34	19	-0.44	54	0.59	1.84	132	123	-0.07	210	0.59	0.71
12	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/ SECRETARIAT GENERAL OF MASS MEDIA	33	20	-0.39	33	0.00	0.65	449	435	-0.03	449	0.00	0.03

Table 24. QE-DEA optimal Budget (12 Central Government Departments)

ID	CGDs	Budget					
		Actual	AR2013	Change	QE-DEA	Change	
				Actual		Actual	AR2013
1	FOREIGN AFFAIRS	308759655	292808000	-0.05	453883932	0.47	0.55
2	FINANCE	613304369	585185000	-0.05	1036201555	0.69	0.77
3	INTERIOR	25783721	30181000	0.17	17245299.4	-0.33	-0.43
4	DEVELOPMENT & COMPETITIVENESS	23650714	19387000	-0.18	23650714	0.00	0.22
5	CULTURE & SPORTS	334617636	297950000	-0.11	80591940.6	-0.76	-0.73
6	ADMINISTRATIVE REFORM & E-GOVERNANCE	81603046	32998000	-0.60	44062582.7	-0.46	0.34
7	RURAL DEVELOPMENT & FOOD	722813921	506317000	-0.30	134321651	-0.81	-0.73
8	INFRASTRUCTURE, TRANSPORT & NETWORKS	774554245	560737000	-0.28	1157641808	0.49	1.06
9	ENVIRONMENT, ENERGY & CLIMATE CHANGE	70393146	70230000	0.00	156176483	1.22	1.22
10	TOURISM	32804872	26966000	-0.18	73083495.9	1.23	1.71
11	MACEDONIA & THRACE	7038063	5597000	-0.20	11217027.5	0.59	1.00
12	SECRETARIAT GENERAL OF INFORMATION & COMMUNICATION/SECRETARIAT GENERAL OF MASS MEDIA	42952756	41570000	-0.03	42952755.6	0.00	0.03

Table 25. Average change of inputs for the attainment of efficiency and effectiveness (19 Central Government Departments)

Inputs	Change				
	AR2013	VRS	Targeted	Stochastic	QE-DEA
General Directorates	-0.13	-0.35	-0.23	-0.31	0.13
Directorates	-0.33	-0.32	-0.22	-0.31	0.17
Sections	-0.29	-0.31	-0.21	-0.34	0.15
Staff	-0.03	-0.28	-0.20	-0.26	0.15
Budget	-0.13	-0.32	-0.13	-0.34	0.10

Table 26. Average change of inputs for the attainment of efficiency and effectiveness (12 Central Government Departments)

Inputs	Change				
	AR2013	VRS	Targeted	Stochastic	QE-DEA
General Directorates	-0.14	-0.36	-0.26	-0.30	0.19
Directorates	-0.36	-0.31	-0.25	-0.29	0.22
Sections	-0.34	-0.30	-0.25	-0.32	0.20
Staff	-0.04	-0.32	-0.29	-0.33	0.20
Budget	-0.15	-0.33	-0.15	-0.30	0.19

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