

Financial Crisis and The Promised Land of Open Data

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Big data of all sorts seem to be playing a dominant role in the public discourse with regards to the unfolding of the financial crisis in Greece. Moreover, a series of legislative initiatives, mainly the Transparency Law (3861/2010), the PSI legislation (3448/2010) as well as the Geodata (3882/2010), eGov (3979/2011) and Regulatory Reform (4048/2012) Laws, have set an important legal framework for opening up data and hence making the promise of big data available to all at marginal cost a real prospect. Especially in terms of regulatory data (laws, ministerial and presidential decrees, administrative decisions), the amounts of data that have been amassed over the past two years is growing at a geometrical rate. Finally, the largest digital technology funding agency is explicitly conditioning funding of new projects on the principles of open data, standards, formats and interoperability. A substantial part of these efforts are also the result of relevant EU policies such as the PSI and INSPIRE Directives, the 2020 Digital Agenda as well as EC's open data and interoperability policies. This paper comes to explore the reasons both behind the almost unanimous consensus that big data openly available to everyone constitute a key component for economic development in Greece but also the biggest barriers in materialising such policies. Greece has concluded recently the largest debt restructuring deal in modern financial history. The aid package was accompanied by a series of measures aiming at effecting substantial structural changes and at introducing greater transparency in the management of fiscal policies. The implementation of open data policies finds substantial barriers that may be attributed to different factors ranging from organisational and structural inefficiencies, monopolistic tendencies, complacency, conflicting or legacy legislation, lack of instruments of implementation and technical expertise or sheer lack of understanding of the utility of big open data by the decision makers, particularly at the ministerial level. The paper concludes by indicating that the political, regulatory and infrastructural elements of big open data follow different life cycles that face different problems in their implementation and development in different jurisdictions. A strategy that takes into considerations local individualities and is sensitive to global trends is necessary in order to produce meaningful big and open data policies for the south.

1. Introduction

The emergence of Open Data (OD) policies is gradually maturing from a global trend to a key aspect of most national and regional information policies.ⁱ The proliferation of open public data initiatives, also known as Public Sector Information (PSI)ⁱⁱ in the European Union (EU) policy context, has been one of the major factors behind the emergence of a variety of Big Data projects in the countries that have been in the forefront of the OD movement. Among these pioneers we find the US and the UKⁱⁱⁱ that have been the first and most vocal supporters of OD policies. Other countries that have open data as an integral part of their information policy are the Netherlands, Spain, France and Germany but also New Zealand^{iv} and Australia. Italy has also done some important work at the regional level,^v whereas Open Data have also been an important part of the European Digital Agenda.^{vi} All these policies have some common elements that may be summarized as follows: (a) they focus on the importance of the economic and social consequences

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of opening up data. The economic impact of opening up data is both for the private and the public sector.^{vii} In the private sector, it is mainly related to the growth of the information economy and the subsequent creation of new jobs. In the public sector, the economic impact mainly relates to the reduction of costs in the provision of public services. In both cases the use of open data leads to substantial productivity gains and hence there is a reduction of costs. The social impact mainly refers to the increase in transparency in the operation of the public sector, allowing thus the citizen or citizen journalists to control in a more efficient way the operation of key public sector services and administrative actions. This greater degree of transparency may lead in greater participation to public life, further support civil society and increase the democratisation of society as a whole. Overall, most of the justification for open data policies at the national, regional and supranational level focus more on the economic rather than the social benefits from the use of Open Data. This may to a great extent be attributed to two factors: (a) open data policies are traditionally differentiated from freedom to information policies. The former are more likely to relate to economic growth, whereas the latter are more likely to be related to civil society issues. However, as access to information is increasingly meaningful only if the transformative use of data is to be allowed, the two types of data access are very likely to converge.

Big Data policies are in most of the cases differentiated by Open Data policies mainly for two reasons (a) they are traditionally linked to scientific or research data which are normally outside the scope of Public Sector Information in the EU context and related to open access in other jurisdictions (b) they involve not only public data but also private data, either in the form of personal data, user generated data or privately produced scientific data and do not necessary equate to open data. Big data, i.e. the access to large quantities of data, have recently become a focal point for public sector information and a pivotal aspect of open data as increasingly governments have to deal with large and continuously updated data sets that they still need to make available as open data for all the reasons mentioned above.^{viii}

In this paper we examine the degree of and the ways in which OD policies have been implemented in Greece, the reasons behind their partial application and the next steps in making them truly successful in the local context. The paper focuses mainly at the EU OD policies but also makes references to the OD policies in other countries, primarily New Zealand, as examples of a more holistic policy approach to OD. The main argument featured in this paper is that while OD policies emphasize the economic importance of OD, they primarily focus on the way in which OD contribute to the information rather than the real economy. The net result is that in countries with less developed information markets the benefits from opening up data and making use of big data strategies remain both difficult to communicate politically and to assess economically and as a result they are slower in the adoption of such policies. In addition, in terms of a theoretical framework, we are often confined in a law centred regulatory vision or our conceptualisations of a multi-centred regulatory environment remain rather naïve. What is suggested is to focus specifically in the way in which OD supports the real economy and develop metrics that could measure the success or failure of OD policies on that basis.

2. Drivers and Barriers to Open Data

As mentioned in the previous section, the key drivers behind the adoption of OD policies mainly relate to the positive impact such policies are expected to have upon the economy. Especially in the EU context the main assumption is that the public sector holds a wide variety of economically important data, that these data are fundamental for economic activity especially in the context of the information society and the knowledge economy and that by making these available with the minimum possible restrictions, economic growth is likely to be achieved. One of the fundamental

objectives of the EU is the creation of a single European market and this is a goal that is also extended to the information market. The use of open data is hence seen as a key factor contributing to the creation of such European data market. Opening up the data is considered as a significant step to open up markets to small and medium enterprises (SMEs) that wish to make the most out of the use of data in order to participate to the knowledge economy. It is important to note that in the EU policy context, the term data only appears in the 2011 policy documents.^{ix} Before that, the broad terms, document, content and information are being used.

The ten most important drivers^x for opening up data appear to be the following: (a) the example of the pioneer countries in devising strategies, employing tools and getting the benefits from an open data approach (b) political support at the highest level (c) open data initiatives not merely at the national but in the regional and supranational level as well (d) support by the civil society (e) market push for opening up data (f) lower costs for technology employing open data and easy of use of the resulting services (g) EU legislation and policies (h) open data champions (i) the ability of citizens to better monitor governmental activity (j) substantial reductions in the budget for public sector services. On the other hand, the ten most difficult barriers to overcome have as follows: (a) privacy and data protection regulations operate as a barrier not only with respect of the actual limitations they impose upon the opening up of data but also with regards to the perception they create as to whether certain data sets may be opened. The frequent uncertainty regarding the limitations data protection rules may create can often make public authorities extremely reluctant in opening data or even be used as an excuse for not opening such data (b) limited data quality and the subsequent implications that this low quality may have for the public sector body that makes them available (c) the lack of user friendliness of the way in which data are being available or the possibility of information overload have also been expressed as reasons why public sector bodies may either choose not to release data or when they release them, effectively they are of no use to the citizen (d) the absence of standardisation both in different public sector bodies and different policy sectors does not allow synchronisation of initiatives and interoperability of services (e) security concerns have also prevented policy makers from making certain data sets openly available (f) existing charging models may also constitute a barrier for the open publishing of data. For a number of Public Sector Bodies there is considerable income coming from the sales of certain data sets and hence there is a reluctance in making them open as this would lead to losses of income (g) similarly, the uncertain economic impact from opening up data makes it difficult for policy makers to further open up data (h) the digital divide is also a major stumbling block for the release of open data as it substantially reduces their utility (i) in the US in particular, limitations in network capacity may also lead to limited use of open data (j) finally, the biggest barrier is the government culture regarding the opening of data, where secrecy rather than openness is awarded.

As it has been noted in recent reports, it is interesting to note that most of the barriers lie within the government, whereas most of the drivers come from outside the government and this is likely to make the transition to open data possible only to the extent that public administrations are willing to embrace the external drivers and overcome the internal barriers. This

3. The economic impact of Open Data in particular.

Most of the existing drivers for the opening up of data are closely interlinked with the economic benefits this opening may have. While this is the dominant rhetoric related to the opening up of data, the actual and direct economic benefits are still to be seen. Recent reports indicate that open data do have a rather limited direct short term positive effect and that they operate mainly as stimulants for creativity and innovation as well as a key factors for supporting unanticipated innovation. For these reasons, an emergent trend in the production of open data portals is to keep the investment at reasonably low levels and then proceed incrementally to greater investments. This

could happen mainly by addressing the need for specific data sets and by forming synergies with other already funded initiatives. It is also important to work on the interoperability front so to be able to create a single open data market and make re-use of the technologies used by other data providers. In the same context the use of Free/ Open Source Software and Open Architecture is a key ingredient for lowering the costs and ensuring that any investments in the development of open data portals are going to have the maximum possible output with the minimum possible cost.

In terms of the range of benefits related to the use of Open Data by Public Sector Bodies, most of them are indirect and relate either to the reduction of service provision costs or to the provision of better services both by PSBs and the private sector. While these benefits are by and large of an economic nature, the reuse of PSI is also part of the public service obligations PSBs have. However, the differentiation between economic and non-economic benefits is to a large extent misleading. Even economic benefits allow the provision of better quality services to the citizen but they also underline the transforming nature of Public Service provision into one that focuses on the provision of data streams and a minimum set of services, while the main bulk of services are expected to be provided either by the private sector or through Public Private Partnerships (PPPs). In this kind of environment PSBs undertake the role of someone consistently providing high quality data and an essential range of services and as such its structure and operations are to be fundamentally reorganised.

Most of the existing studies with regards to the PSI market are estimations of the size of the information markets that are to be created as a result of the release of open data. One of the most widely cited reports, MEPSIR^{xi} concluded that the direct PSI re-use market in 2006 for EU25 plus Norway amounted to EUR 27 billion, whereas more recent studies estimate the size of the PSI market for EU27 at EUR 32 billion for 2010. The same study indicates that the assuming annual growth for the PSI market is at 7%. These studies focus primarily at the direct economic benefits from the re-use of PSI resulting from its use in information markets. Other studies^{xii} focus on the greater impact, direct and indirect, that PSI could have on the economy are in the range of EUR 200 billion (1.7% of GDP) for the EU27 in 2008. Other important outcomes are the reductions of cost that the opening of data could have. Improving information accessibility is estimated to reduce EU27 costs by 20% or around EUR 2 billion per year just with regards to Environmental Impact Assessments (EIA), whereas improving access to R&D is expected to give a EUR 6 billion per year gain. In addition, with regards to the direct revenue PSBs currently enjoy from selling PSI, it seems to cover only 1% of their budget and at the most one fifth of their budget in some exceptional cases. Even in cases where there is revenue loss from stopping the direct selling of data, this may be compensated either through direct funding or through a mixed model where there is payment for higher quality or updated data.

The most interesting study is perhaps the one commissioned by New Zealand,^{xiii} where the emphasis is on the real economy effect of the use of open geodata. This study illustrates a number of case studies in different sectors (i.e. government services, private services, manufacturing, trade services, construction, agriculture, food, fishing, forestry, transport, communication and utilities, minerals and mining and tourism). The study shows that there is a \$1.2 billion in productivity benefits to the New Zealand economy for 2008. This is only the effect of the use of open geo-data and it is the equivalent to slightly more than 0.6% of GDP/ GNP in 2008. This study is differentiated from other similar studies in the area of PSI reuse in the sense that it focuses on a specific type of PSI (geo-data) and then examines its impact upon real rather than the information economy. Again the causality between opening up the data and the benefits for the real economy are not always clear or easy to identify, however, this constitutes an important effort that marks a way in which openness and the impact of open data could be more clearly assessed.

4. Assessing the level and maturity of Open Data Initiatives (ODIs)

As the number of ODIs increases it is necessary that we have a good understanding of the level of openness per country and the degree of maturity of the different ODIs. There seems to be a growing debate whether the different metrics for the assessment of ODIs are able to capture both the developments with regards to open data and the degree of maturity in opening different data sets. The main instrument of assessment of ODI is still the 5 stars model by Tim Berners-Lee,^{xiv} which makes an assessment regarding the openness of a data set rather than an organisation or a country. The 5 stars system represents 5 different levels of maturity of open data. As a data set moves from star 1 to star 5, it means it acquires characteristics that allow it to be closer to the ideal of Linked Open Data. The five levels corresponding to the 5 stars are as follows: (a) the data are available on the web (whatever format) but with an open licence, to be Open Data (b) the data are available as machine-readable structured data (e.g. excel instead of image scan of a table) (c) the data are as (b) plus non-proprietary format (e.g. CSV instead of excel) (d) the data are all the above plus open standards from W3C (RDF and SPARQL) to identify things are used, so that third parties can point at the open data set (e) the data are all the above, plus the data are linked to other people's data to provide context.

While the 5 stars model is now the standard for assessing the openness of data at the technical level, this is not an adequate measure neither in realms other than the technical and for units of analysis other than the data set. There is still limited work with regards to the ways in which ODIs could be assessed with regards to their openness, however there seem to be three emergent approaches: (a) the Right to Information (RTI)^{xv} approach (b) the Open Knowledge Index^{xvi} and (c) the integrated approach.^{xvii}

The RTI approach focuses on the issue of access to information and approaches it on the basis of the legal and administrative capacity of a particular jurisdiction with regards to the right to information it provides to the citizen. The unit of analysis is that of the jurisdiction and it is essentially a legislation rating methodology. More specifically, it comprises of 7 parts that correspond to seven different

thematic areas that all together give a maximum score of 150 points with regards to the level providing an adequate level of RTI. These areas have as follows: (a) the Right of Access (6 points) (b) Scope (30 points) (c) Requesting Procedures (30 points) (d) Exceptions and Refusals (30 points) (e) Appeals (30 points) (f) Sanctions and Protections (8 points) and (g) Promotional Measures (16 points). The methodology gives the 4 main parts of a RTI system (i.e. Scope, Procedures, Exceptions and Appeals) an equal rating of 30 points, whereas the rest of the parts are given a lower maximum rating ranging from 6 to 16 points.

The Open Knowledge Index (OKI) is a more comprehensive approach that, as OKF acknowledges, follows the conventional literature on composite indicators. It is based on three key dimensions, each one of them is calculated on the basis of four already known and calculated indicators. The three dimensions are: (a) capability "measures whether individuals have the capability to access and process data and knowledge". Capability is measured on the basis of four sub-factors, namely: [I] fixed broadband Internet subscribers (per 100 people) ([OECD](#)) [II] Newspaper circulation rate ([World Bank](#)) [III] [Press freedom](#) (Reporters without Borders) [IV] Tertiary education rate ([World Bank](#)) (b) Open Public Administration that measures the degree of access to information that local legislation allows. Here four dimensions are measured: [I] Years since first Freedom of Information legislation ([OECD "Citizens as Partners"](#)) [II] Depth of Freedom of Information legislation ([OECD](#)) [III] Open Budget Index ([Open Budget Partnership](#)) [IV] Effective access to information ([World Bank](#)) (c) Open Knowledge Society (OKS). This dimension covers the degree

to which civil society initiatives have been developed in the country where open data initiatives are presented in order to make an assessment of the degree to which government led ODIs may be adopted by society. The following sub-factors are measured under this dimension: [I] Number of Wikipedia edits per 100.000 inhabitants ([Wikipedia](#)) [II] Open Source Index ([Red Hat](#)) [III] GI Civil Society Index ([World Bank](#)).

The OKI is a more comprehensive approach compared to the RTI approach as it encompasses both technical and legal perspectives but it is not as integrated as it could be in order to systematically cover different aspects of ODIs. The sketch of a more integrated approach has been suggested by some researchers (Davies 2011, Alonso 2011) that may be summarised in an approach taking the 5 star model further by suggesting what is called the “5 Star scales; 6 domains; at least 2 sides” model (5-2-6 model). According to this model the 5-star scale is seen as a maturity model for data sets following the pattern of an organisational change model that would correspond to “emerging”, “established” and “advanced” levels. In addition, the technical model should be enriched to include more variables such as the use of FOSS tools for ODI platforms and the ability of the networks to respond to the demand. The 6 domains would include legal, political, technical, organisational, social and economic aspects of an ODI. ODI should be assessed in all six domains using standards that may be picked and matched from different indexes in these areas, as demonstrated in the OKI approach. The two sides should be such that they include both the supply and the demand or use side and each one of them is to be evaluated accordingly (see e.g. the OKI approach on the role of civil society). This more integrated approach is based on assessing organisational change and aiming at tracking the maturity of the ODI. The unit of analysis seems to be an ODI, which does not necessarily equal an organisation or a jurisdiction. While the integrated approach constitutes the most systematic approach related to the evaluation of ODIs, it still needs to be further elaborated in order to provide results in the form of index and still to reflect the level of maturity of an ODI.

5. From PSI to Open Data and the issue of different types of national economies

As mentioned under sections 2 and 3, the growing trend towards open data is to a great extent the result of both an internal impetus to open up data in order to improve efficiency and foster growth of the information market, but also the result of external policy and competitive pressures. In the EU context in particular the gradual maturing of Open Data policies is to a great extent the result of the maturing of the EU Public Sector Information (PSI) Regulatory framework. The PSI Directive, which is the key document in the PSI EU policy, focuses on the reuse of documents, which are defined as “any content whatever its medium (written on paper or stored in electronic form or as a sound, visual or audio-visual recording);”⁴ The broader impetus for the PSI Directive is to ensure the proper functioning of the internal market and to support the free circulation of services.⁵ In the context of PSI reuse the objective is to establish a PSI internal market,⁶ provide EU wide services⁷ by eliminating barriers in the cross border use of PSI,⁸ to limit market distortions and to prevent disparities between EU Member States (MS). The idea is to allow the creation of new information products and services⁹, improve the transparency of the re-use conditions¹⁰ and increase the searchability of existing data sets¹¹. The proposal for an amended PSI Directive¹² adds a number of features in the existing PSI directive that bring it closer to the concept of Open Data. More

4 Art. 2(3)(a) Directive 2003/98/EC OJ L345/90

5 Art. 114 TFEU (95 TEC)

6 Rec.1 Directive 2003/98/EC OJ L345/90

7 Rec. 2 Directive 2003/98/EC OJ L345/90

8 Rec.5 Directive 2003/98/EC OJ L345/90

9 Rec.12 Directive 2003/98/EC OJ L345/90

10 Rec.15, Art.7 Directive 2003/98/EC OJ L345/90

11 Rec.23, Arts. 5 and 9 Directive 2003/98/EC OJ L345/90

12 COM(2011) 877, 12.12.2011

specifically, the public data should be released in a machine-readable format and be accompanied by meta-data¹³, whereas in the conditions of re-use there is explicit reference to “Open Government Licences”,¹⁴ a term that alludes to the UK's Open Government scheme for licensing public sector information. The entirety of the EU policy on Open Data, as supported also by the relevant sections in the Digital Agenda and the public interventions of the Vice-president of the European Commission for the Digital Agenda, Neelie Kroes, seems to focus primarily on the fostering of growth and the creation of jobs. However, similarly to the trends appearing in the relevant literature, this focus is almost entirely to the digital economy as such and little attention is paid in the short and medium term impact such initiatives could have had in the real economy. While focusing on the digital economy is undeniably the outer goal of any ODI and is of immediate concern for countries where the digital economy makes a great contribution to their Gross Domestic Product (GDP), it is questionable whether the same strategy should be followed by countries that have a different type of economy. More specifically, the problem lies at the fact that while the costs for opening up data are equal for all data producers and providers, the benefits may be enjoyed only by those that have the capacity to make the most of these data. The costs for setting up and running open data repositories, including their maintenance, the training of personnel and the re-structuring of operations of Public Sector Bodies (PSBs) supporting ODIs may only be reduced as the infrastructures, technologies and knowledge at the national level increases and matures. Similarly, in order to be able to build value added services on open data, it is necessary that both the infrastructures and market is in place. This is not self evident or uniform across the EU and despite the explicit commitment of the PSI Directive to reduce disparities between the Member States, applying the same type of policy instruments in different types of economies results in amplifying the very same disparities it seeks to eliminate. The case of Greece is illustrative of this trend.

6. The Greek (information) economy

The Greek economy is going through its most difficult times since the second world war having contracted by 6.3% over the last one year and facing a 24.4% unemployment.^{xviii} The main drivers for the Greek economy are commerce, transport and tourism, accounting for 23% of the GDP, health services and social security, accounting for 17% of the GDP^{xix} and finance, insurance and real estate that accounts for 16% of the GDP.^{xx} The information and communication section accounts only for 4% of the GDP^{xxi}, whereas Greece ranked 100th in the 2012 Ease of Doing Business Rank^{xxii}. In terms of individuals using the Internet Regularly, this amounts to 18% of the population compared to 43% of the EU27 average.^{xxiii} This reflects both on the percentage of enterprises that receive orders on-line (6% vs. 13% EU27) and the percentage of individuals using the Internet to interact with PSBs (27% vs. 41% EU27) or ordering services (7% vs. 10%). Similarly, the share of enterprises' turnover is fairly low (4% vs. 14%), however, the mobile subscriptions per 100 inhabitants is the greatest in the EU27 (180/100 vs 125/100). In terms of the Right to Information index, Greece has the second lowest rating, just above Austria and ranks 26 out of 38 in the Open Knowledge Index. These statistics confirm what is known from anecdotal evidence, i.e. that information society services still have some way to go before they become a driver for the Greek economy. The Greek economy seems to be under immense pressure due to its third consecutive year of shrinking and the two rating systems that we identified as the closest indicators of assessing the degree of success of ODIs provide consistently low figures. If the situation in the Greek information economy and society was less than ideal before the crisis, it has become even worse over the last three years.

7. ODIs in Greece

Greece is following the EU PSI policies ever since their emergence and has transposed the PSI

13 Rec.11 COM(2011) 877, 12.12.2011

14 Rec. 13 COM(2011) 877, 12.12.2011

Directive in 2006 with Law 3448/2006. There have been considerable efforts, especially over the past three years, to implement open data policies in Greece. In 2008 the National Interoperability and Standards Framework has been implemented with art. 28 of Law 3731/2008, though the statutory regulations necessary for the implementation of the law were only issued in mid 2012. The interoperability framework is of particular importance, as it sets not only technical but also legal standards as to how public sector information is to be disseminated and in that sense sets the use of the Creative Commons or other Open Government licences as the standard licence for PSI re-use. While the transposition of the PSI directive in the Greek Law with Law 3448/2006, it cannot be applied without the issuing of the relevant Ministerial Decrees, which are necessary for the licensing of PSI. In addition, the Presidential Decree required for the codification of all PSI related legislation has not been issued as yet.

The most important Open Data legislation is probably Law 3861/2010 which established the [Di@ygeia \(Tr@nsparency\)](#)^{xxiv} project under which no decision by any public authority is valid without it being published in a machine-readable form on the Internet, being stored and getting a unique identification number which allows people to search and access these data. Additional services have been created making use of [Di@ygeia](#) open API, such as Hyperdiaygeia and Greekspending.^{xxv} These services focus on economic data and mainly structure, enrich and make easier to comprehend the Big Data sets made available by the administration. There is an estimate of over 1.5 million decisions by PSBs being published every year with appropriate meta-data. The [Dia@ygeia](#) project has been criticised for not been able to provide data ready to be used by the end citizen or for information overload. However, civic initiatives such as XXXX have vastly improved [Dia@ygeia](#)'s effectiveness as a means of citizen's control, while it still remains the most consistent source of big data in the public administration.

Law 3882/2010, which implemented the INSPIRE Directive, has also played a key role in opening up public data. The main features of Law 3882/2010 are (a) that it views the whole of the public sector as a single pool of data both in terms of sharing (data may be freely and at no charge shared between public administration bodies) and in terms of acquisition, in the sense that all rights have to be cleared before geodata enter the public sector (b) that it contains specific provisions for charging geodata with a particular preference to marginal cost charging and (c) that it encourages free reuse of geodata mainly both for commercial and non-commercial uses. Law 3882/2010 also contains very detailed provisions with regards to the ways in which metadata are structured and the services that should be provided by PSBs. It also contains a specific regulatory structure setting up a national geospatial data committee that is to provide guidance as to how geodata are to be opened and re-used. The provisions regarding the licences still require the issuing of ministerial decrees, which have not been issued as yet. The technical infrastructure for the implementation of the open geodata policies is still being developed and funded through the Digital Convergence EU-Greece co-funded operational program. However, the Greek Cadastre and Cartography Organisation (OKXE) in collaboration with the research centre Athina have already created a first version of an open geodata portal (www.geodata.gov.gr), which has been used in order to accumulate and disseminate various data sets under a Creative Commons Attribution 3.0 licence.

Law 3979/2011, which is the Greek e-government framework law, contains a number of provisions that improve existing access to information (art. 5 of the Code of Administrative Procedure) and reuse of public sector information (Law 3448/2006) laws. The most important provisions are the ones stipulating (a) that Access to Information requests can now be electronically files (b) that reuse of public sector information allows the creation of derivative works (c) that public administration should take all appropriate measures for clearing or obtaining all necessary IPR on the information it acquires (d) the creation of licensing registries and oped data repositories (e) the preference to

free/ open source software for the public administration and (f) the adoption of a unified open data and IPR licensing, in general, policies. While Law 3979/2011 introduced a number of innovative provisions, it required 42 regulatory statutes in order to be in full operation and in that sense a great part of it is still inactive. The ministerial decrees issued in March 2012 by virtue of Law 3731/2008 with regards to standardisation and interoperability of public sector services contain some provisions that tackle a number of issues related to the not as yet issued ministerial decrees of Law 3979/2011, but there are still many pending question both with regards to the ways in which the ministerial decrees are to be implemented and what their legal status is in relation to Law 3979/2011.

The [Di@ygeia](#) project has also given rise to two additional laws: (a) Law 4013/2011, which introduced the Agora program, aiming at publishing all public sector contracts and (b) Law 4048/2012 introducing specific provisions with regards to better regulation and codification of legislation requiring the use of [Di@ygeia](#) for all Greek legislation. The Agora legislation still needs a ministerial decree to be issued in order to be fully implemented, whereas the better regulation law is of direct implementation. Finally, law 3966/2011 provides a specific framework for the publication of all reports being made for the public sector, ensuring they are made available under an open licence and that specific measures are taken in order to ensure both technical and legal interoperability.

8. Understanding the nature of the ODIs implementation problems in Greece

While there has been a very extensive legislative activity in Greece regarding open data, especially over the past three years, a number of issues still persist at a number of levels. First, while the legislative framework is there, there is great reluctance to have the relevant ministerial decrees to be issued, making thus the legislation ineffective. The lack of secondary regulations that implement the legislation also entails lack of processes for applying the relevant legislation, not clear understanding of open data licences, lack of licensing frameworks and absence of any kind of guidelines as to how all these legal instruments and administrative processes are to be put in place. The reluctance in issuing secondary legislation may be attributed to multiple factors, mainly the (a) resistance of the public administration to open their data, when it is responsible for actually issuing secondary regulations and (b) the lack of expertise and understanding both at the political level and the day-to-day administration.

Second, the infrastructure required for the actual operation of the regulatory framework is also not there. There is no Greek data.gov website, the geodata.gov website essentially runs by a research institute, there are no local or regional government data.gov sites and in science there are only open content web sites such as the openarchives.gr web site run by the National Documentation Centre. The lack of infrastructure does not equal to lack of technology. Open Data catalogue software such as CKAN or Open Content repositories such D-space are already in use by research institute and information providers, however, the actual infrastructure for making open data available is still missing. This is the result of multiple factors, such as (a) the still incomplete regulatory cycle that prevents the purchase or activation of open data infrastructures and the provision of the actual data sets (b) the lack of hands on experience with open data by the public sector both at the technological and legal levels and the subsequent lack of expertise.

Most importantly, the actual level of the implementation of ODIs in Greece has not as yet been consistently measured. While Greece features both at the RTI and Open Knowledge Index and while the five star model may be used in order to assess the maturity of Linked Open Data for specific data sets, all these ratings do not provide an accurate image of what the state of Open Data in Greece currently is. This is mainly due to the methodological shortcomings of the above rating

systems. RTI focuses mainly on legislative frameworks and covers only the right to information, whereas the more comprehensive Open Knowledge Index does not give the micro and meso level understanding of the open data problem, which could be of some use to the policy makers.

However, the problem with the ODIs in Greece is of a much deeper nature and relates to broader regulatory problems.

9. Regulation and ICT theory as means for understanding the technology regulation problem.

In order to go deeper into the issue of how to assess regulatory intervention in the context of ODIs it is necessary to appreciate the way in which regulatory and ICT theory operate.

Defining the scope of the regulatory phenomenon, as Brownsword notes^{xxvi}, is increasingly becoming a very difficult exercise as “[r]egulation has become an unwieldy concept”. There seems to be a variety of definitions of the regulatory phenomenon that follow a broader trend of moving away from a strict sense, state-centered regulation to what Black refers to as a more “decentred”^{xxvii} or what Baldwin calls “smarter” regulation^{xxviii} that is now positioned within what Scott calls a “post-regulatory state”^{xxix}. This trend closely follows the increasingly important role that technology plays in the social context. In this section we examine the changing nature of regulation, its close link to technology and present a first classification of regulatory instruments as derived from the relevant theory.

9.1 Setting the scene

Regulation is rarely perceived any more as the exclusive result of direct state action. As Black^{xxx} notes:

“As many have noted, “command and control” is more a caricature than an accurate description of the operation of any particular regulatory system, though some are close to the caricature than others. Essentially the term is used to denote all that can be bad about regulation: poorly targeted rules, rigidity, ossification, under- or over-enforcement, unintended consequences.”

Black equals CAC with what she refers to as “centred” regulation. CAC is a model which assumes (a) “the state to have the ability to command and control” (b) the state “to be the only commander and controller” (c) the state “to be potentially effective in commanding and controlling” (d) regulation “to be unilateral in its approach (governments telling, others doing)” (e) regulation “to be based on simple cause-effect relationships” and (f) “a linear progression from policy formation through to implementation”^{xxxi}.

The key difference between “centred” and “decentred” regulation is not only a matter of regulatory approach, but mostly an issue what ontologically constitutes regulation and –more importantly what is the nature of the society in which regulation is to be placed^{xxxii}. Black presents seven aspects of a “decentred” regulatory approach: (a) complexity, both in the sense of causal complexity and “complexity of interactions between actors in society” (b) fragmentation and construction of knowledge (c) fragmentation of the exercise of power and control (d) the recognition of the autonomy of the social actor (e) “the existence and complexity of interactions and interdependencies between social actors, and social actors and government in the process of regulation” (f) “the collapse of public/ private distinction in socio-political terms, and a rethinking of the role of formal authority in governance and regulation” (g) “the set of normative propositions as to the regulatory strategies that should be adopted”^{xxxiii}.

9.2 Lessig's four modalities of regulation and beyond – the complexity issue

Following Grabosky^{xxxiv} or Braithwaite and Drahos^{xxxv}, Black identifies complexity as one of the key factors that push towards a new regulatory model: With the term complexity Black refers both to the environment within which regulation is to operate and the interactions between the regulatory subject, the regulator and the regulatory content. A fragmented exercise of power and control emerges as a natural consequence of the aforementioned points. Black identifies more than one sources of regulatory power, the state being one only among many and not necessarily the most important in different contexts. This closely resembles Lessig's approach to the regulatory phenomenon. The model of the four modalities of regulation (law, technology, market and social norms) essentially echoes an understanding of the multi-source nature of the contemporary regulatory environment. Greatly influenced by Reidenberg's^{xxxvi} and Ellickson's^{xxxvii} work, Lessig has developed a model of describing regulation as comprising of four main modalities or "constraints", i.e. Law, Social Norms, Market and Architecture or Technology.

9.3 Elaborating on Regulatory variables: Indirection, substitution, plasticity, immediacy.

Different regulatory modalities may be assessed in accordance to three variables. These investigate (a) the way in which regulatory modalities interact with each other (indirection and substitution), (b) patterns of enforcement (immediacy) and (c) by whom and how easily does the formation of the modalities take place (plasticity).

Indirection is the essence of any multi-source regulatory space: "Regulation, in this view, always has two aspects--a direct and an indirect. In its direct aspect, the law uses its traditional means to direct an object of regulation (whether the individual regulated, norms, the market, or architecture); in its indirect aspect, it regulates these other regulators so that they regulate the individual differently. In this, the law uses or co-opts their regulatory power to law's own ends. Modern regulation is a mix of the two aspects. Thus, the question of what regulation is possible is always the question of how this mix can bring about the state's regulatory end; and the aim of any understanding of regulation must be to reckon the effect of any particular mix."^{xxxviii}

Substitution is the phenomenon where one regulatory modality is replaced by another, e.g. legal regulation is substituted by technological regulation. Theorists such as Lessig, Brownsword and Boyle investigate the implications the substitution mainly of law by technology both in relation to the regulatory effect but also with respect to the legitimization of different regulatory forms.

Different regulatory modalities have different features. Immediacy and plasticity are an illustrative case of this aspect of the regulatory phenomenon. As Lessig notes: "By immediacy, I mean the directness of a particular constraint-- whether other actors, or institutions, must intervene before the constraint is effective as a constraint. A constraint is immediate when its force is felt without discontinuity of time, or agency."^{xxxix}

Plasticity identifies both the ease with which a regulatory modality may be changed as well as the amount of people required to perform such a change: "Plasticity describes the ease with which a particular constraint can be changed. (...) Plasticity also describes by whom a constraint can be changed. A constraint can be either individually or collectively plastic."^{xl}

9.4 The changing role of the state

Indirection does not entail a reduction of the role of the state. Scott, following Rose^{xlii} and Parker^{xliii}, explains how the state is actually transformed and becomes one of the meta-Regulator rather than *the* single regulator. Foucault's work on governmentality^{xliiii} has played a very important role in this context. Scott applies some of these concepts to present the state as a meta-regulator in what constitutes an ecology of regulators of types and strength^{xliv}.

In agreement with the ideas presented by Baldwin^{xlv}, Black investigates how the tendency for multi-source regulation advocated by the "smart" regulation model^{xlvi} is closely linked to "better" regulation. While it appears self-contradictory, it is not: the need for a coherent and consolidated meta-regulator increases as regulation becomes more decentered. Black focuses on two simultaneous processes in regulation building:

"[W]hilst there may be institutional consolidation in one part of the regime, the regime as a whole may still display characteristics of polycentricity. Even though parts of a regulatory regime may look at the institutional level to have become more "centred", within that regime different actors can be enrolled within that regime in a way that a focus on formal institutional structures overlooks."^{xlvii}

Multi-source regulation amplifies the problem of how to coordinate and control not just the human agent but rather the operation of multiple control systems. Black seems to be greatly influenced by the Hampton report^{xlviii} and assumes that through a continuous evaluation of the regulatory intervention, control of the regulatory landscape is to be achieved. According to Black^{xlix}, in this context the key issues are the accountability of the regulator and the legitimization of the meta-regulatory control.

9.5 The issue of regulatory participation and legitimization

Following the previous analysis, multi-source regulation is reframed as a problem of participation and legitimization. Brownsword^l singles out the inability of the regulated subject to decide whether to obey or not to the technological regulation. In that sense, it is not only regulated but actually totally deprived of its agency. This regulatory effect of technology that –in Lessig's terminology– has a maximum degree of immediacy and individual plasticity^{li} is highly problematic for a democratic state. This seems to be the key point made by Lessig in Code^{lii} and Zones^{liii} even since the late 1990s.

Black, especially in her Proceduralising Regulation^{liv} and Regulatory Conversation^{lv} tries to approach the same problem. Strongly influenced by Teubner's autopoietic approach^{lvi}, Black gives an account of law's incapacity to follow or translate, in the Callonian sense,^{lvii} practices from different areas or "systems" of social action^{lviii}.

Black's suggestion is very close to what we would call *regulatory cultivation*: "to affect (irritate) the system in such a way that it moves from its current state to that which is required. It is 'social gardening' rather than 'social engineering'."^{lix}

Black's approach can be, thus, seen as very closely related to Lessig's four regulatory modalities and indirection model appearing in the New Chicago School paper^{lx}. Equally important for her work seem to be the concepts of autopoiesis as appearing in Dunshire's^{lxi} work. Black suggests a "decentered" regulatory strategy that is based (a) on taking advantage of existing regulatory

mechanisms and their interaction (b) on intervening only indirectly and often letting the inertia of the system creatively work in a beneficial way to the regulator^{lxii}.

Black's most important work, in that sense, are her two parts of the Proceduralising Regulation papers^{lxiii}. In these she explores the conditions that legitimize regulation and in that sense she is close to Lessig's effort to legitimize regulatory content in the face of constant and rapid contextual change. What is most interesting is that according to Black, regulatory power is placed at the ends of the network, where the regulated subject may be seen acting as a "mini self-regulator"^{lxiv}. In such a model we talk more about a mediator than about a regulator: "mediating between deliberants, mapping the discourse positions, regulating and facilitating their decision-making process, but leaving to them the ultimate decision of whether or not to make a decision, and if so what decision to make."^{lxv}

Black's approach to regulation as a discursive process directly influences her methodological approach^{lxvi}. She conceptualises regulation "in large part [as] a communicative process. Communications between all those involved in the regulatory process concerning that regulatory system are an important part of their operation. Understanding such regulatory conversations is thus central to understanding the 'inner life' of that process"^{lxvii}

10. A regulatory ecology perspective

If we follow a combination of Lessig's four modalities of regulation^{lxviii} and Latour's Actor Network Theory^{lxix} model as further elaborated by Callon's^{lxx} four translation moments and the work of theorists such as Brownsword^{lxxi} or Black^{lxxii}, we will see that the problems with ODIs in Greece are to a great extent a regulatory ecology problem.

According to Lessig's model^{lxxiii},^{lxxiv},^{lxxv} any regulatory strategy would have to address all four modalities of regulation, i.e. Law, Market, Technology and Social Norms. Tsiavos^{lxxvi} further elaborated this concept by introducing more levels in each modality on the basis of Lessig's proximity variable. That is, the closer you are to the regulated subject the more the regulatory strength increases. Hence, low level legal instruments like a licence or a circular have greater regulatory capacity than a high level regulatory instrument, such as a national law or a directive which have greater distance from the regulated subject. In addition to the concept of proximity, what our data indicate is that the regulatory model also needs to be complemented by the continuity variable. Lessig in his work refers to indirection, that is, the capacity of a regulatory modality, instead of regulating the subject, to regulate another modality and hence indirectly but more powerfully to achieve its ultimate regulatory objective. The continuity variable tells us that sometimes indirection or existence of the whole of the regulatory stack within one modality (e.g. from law to a circular in the legal modality) is not just amplifying the regulatory effect of different regulatory modalities but is an essential condition for them to work.

It is important to see how such an approach allows a better understanding of the way in which the Greek ODIs current state may be explained. More specifically, it may help us appreciate why, whereas the Open Data legal framework is in place, there is little progress with the actual opening of data.

In terms of the strength of the regulatory intervention this needs to be assessed in terms of:

- (a) the existence of all four modalities of regulation (i.e. law, technology, social norms, technology)
- (b) the need for completeness within each modality (i.e. the existence of high, medium and low level regulatory instruments)

- (c) the existence of indirection (i.e. the use of one modality to regulate the other)
- (d) the need for continuity (i.e. the need for one modality of regulation to be complemented by another in order to have a meaningful result of the regulatory intervention)
- (e) an assessment of the need for immediacy in order to implement the relevant policies
- (f) the existence of collective or individual plasticity for the production of a specific regulatory modality (i.e. whether a specific regulatory modality may be produced as a result of collective or individual action)
- (g) the source of plasticity (i.e. whether the regulatory intervention derives from the sovereign institution producing the regulation or not)

Each of these variables may be attributed a score in a table that would have as follows:

Regulatory Variable	Range	Notes
existence of all four modalities of regulation	1-4	
need for completeness within each modality	(Low – Middle – High)*4	You need to assess need for completeness by modality
indirection	Y/N	
continuity	Y/N	
Immediacy	(Low – Middle – High)*4	You need to assess immediacy at the level of each separate modality
Plasticity I	(Low – Middle – High)*4	You need to assess plasticity at the level of each separate modality
Plasticity II	(Collective/ Individual)*4	You need to assess plasticity at the level of each separate modality
Plasticity III	(Internal – External)*4	You need to assess plasticity at the level of each separate modality

Table I: 4 modalities of regulation based analytical system for assessing the nature of regulatory intervention

Any type of open data regulation is quite demanding as a regulatory intervention in order to be initiated, but once the regulatory ecology is in place it is much more effective to operate. On the contrary, if the regulatory ecology is not in place, it is extremely difficult to implement Open Data policies. This follows a pattern similar to most technology related human activity, where there is a degree of overlap between the regulatory instrument and the regulated subject.^{lxvii} In that sense Table I would have as follows for any type of Open Data related regulation:

Regulatory Variable	Range	Values for ODI regulation
existence of all four modalities of regulation	1-4	Required

need for completeness within each modality	(Low – Middle – High)*4	High at least for law and technology
indirection	Y/N	Y
continuity	Y/N	Depends on the jurisdiction and legal culture
Immediacy	(Low – Middle – High)*4	High both for Law and Technology
Plasticity I	(Low – Middle – High)*4	Varies
Plasticity II	(Collective/ Individual)*4	Varies
Plasticity III	(Internal – External)*4	Varies

Table II: a generic ODI regulatory assessment

In the case of the Greek ODI most of the values in the regulatory variables are not at the level they should be. More specifically:

(a) Whereas the law as a modality plays a key role, none of the other regulatory modalities is really in operation: The technological infrastructure does not exist and to a great extent it could only be there if the legal modality was complete. Similarly, there is no culture of openness to support the legal effort from the social norm side. Finally, and perhaps most importantly, the information society market is almost irrelevant in Greece accounting only for 4% of its GDP. What that practically means, is that the kind of regulatory intervention is weak compared to what is needed for a regulating technology approach

(b) the limited completion in the legal modality is the one that causes the most serious problems in the implementation of an Open Data policy in Greece. The reluctance of the public administration to issue the necessary secondary regulations in order to implemented the open data legislation does not allow the technological regulation to start operating and substantially reduces the ability of market forces based on open dat to develop. Again the interaction between the four modalities is important to understand how the lack of completion at the legal level is actually the result of the influence of regulatory modalities with a program of action opposing the state driven regulatory model.

(c) The fact that in heavy influenced by technology environments, indirection also becomes more intense has an adverse effect to the success of ODIs in Greece: the closed culture in the public sector that also constitutes the organisational context within which Open Data initiatives are to function impedes the completion of the legal modality and the development of any other modalities. It seems, hence, that the choice of the public sector as the single point for implementing ODIs is not necessarily the best strategy for a regulatory intervention. The regulator should look for domains where there is a favourable to open data culture and seek to start any initiative from there.

(d) The high continuity that is appears between legal and technology regulation in Greece is the result of both of the legal system that does not allow the public administration to operate beyond its statutory role and the fact that ODIs are currently focused mainly on either the public sector or appear as islands in different academic institutions. The absence of a vibrant civic society is evident here as well and it leaves very little space for any kind of intervention outside the realms of government. The role that the financial crisis is to play in this context still remains ambivalent: whether we will see less actors being interested in open data, the latter being regarded by society as irrelevant or a luxury they cannot afford or is the lack of financial resources going to lead to more aggressive open data policies is yet to be seen.

(e) The level of immediacy required for the success of such an initiative needs to be high, particularly in the context of law and technology. Licensing seems to be the most crucial instrument for supporting the release of open data and content and has been traditionally a driver for change of the legal regime ever since the advent of the first free/ open source licences. Similarly, technology needs first to reach the level of at least having the infrastructure to release open data, such as repositories and documentation systems necessary for making linked open data available and then the ecology of applications that will make the data relevant to the end user. In the Greek case, there are components of both the legal and technical instruments necessary to increase the level of immediacy but (I) in the case of the legal modality the different legal layers are missing, mainly the ministerial decrees and the circulars, whereas (II) in the case of technology the actual technologies are there but there is a lack of both an integrated approach at the policy level and the legal completion to give them the necessary legitimisation to appropriately operate. The role of the market's immediacy is very interesting, since while it is a regulatory modality that is of low immediacy, it exercises a great degree of influence to the social norms, especially in Greece under the current economic crisis: the lack of appreciation of how Open Data could contribute to the improvement of the economic situation substantially reduces the likelihood of its adoption as a really key priority by policy makers.

(f) In terms of the plasticity of different modalities of regulation, this relates both to the level and the type of modality. In the Open Data case, the plasticity of the legal regime at the EU level is to a great extent collective though there is much greater space for the civil society to operate there than in the national level, where because of the institutional structure of the EU, the plasticity is substantially reduced. While this situation gives some space of intervention to members of the Greek civil society that are aware of the situation and have access to the European civil society, it hinders the development of a genuinely Greek Open Data agenda and alienates members of the society that do not have access or knowledge to EU institutions from the civil society that does. Similarly, in the technological level, while key components of the infrastructure that are built in an open source fashion are collectively plastic, the actual shaping of the implemented technological infrastructure remains to a great extent the result of legal regulations and the market influences. Again here the operation of plasticity cannot be understood separate from that of indirection.

(g) The role of the EU institutions in the formation of the directives that set the regulatory framework in the PSI context, as well as Greece's situation that is very dependent on its policy decisions from the Troika programme exercises a great influence to the degree to which the administration can potentially influence the way in which open data policies are formed. The lack of policy initiatives in terms of ODIs at the national level in the case of Greece may, thus, be attributed to a number of factors: (a) Most of the actual decisions regarding the formation of the policy regarding Open Data actually take place at the EU rather than the national level. The ability of a Member State to meaningfully participate in such negotiations is directly related to its capacity all as an administration, as a civil society and as a national market to intervene at the EU level. Greece seems to be unable to be proactive in all three accounts: (I) the administration does not have the expertise to follow PSI issues and this is apparent from its lack of representation in all EU level discussions or its representation by research institutions (II) the civil society is still nascent in Greece and with the notable exception of the Greek Free Open Source Software Foundation, it also does not have the capacity to follow these developments. This has changed a lot over the past three years with GFOSS making a number of interventions regarding these issues, but it still remains to be seen whether this effort will manage to become sustainable (III) there are very limited commercial interests in opening up of data since commercial data-reusers are very limited and because of their size, they may even have an incentive to limit the opening up of data in order to reduce competition in their own sector. (b) The existence of “green light” regulation such as EU funding has frequently disorientated PSBs that in order to ensure access to such funding they lack a coherent and focused strategy. As a result the level of digital convergence required by the

commission and the transition from infrastructures to services and specifically data orientated services is difficult to be done (c) Troika, which is currently exercising the greatest influence upon the Greek economy, has not placed open data as one of the key performance indicators, despite the fact that it could be easily linked to a number of them (d) the coordination between EU institutions as to how Greece could be assisted in increasing its productivity could be substantially improved. The ISA interoperability initiatives could be synchronised with the DG INFSO PSI initiatives and the Troika measures to provide a coherent result.

Overall, the table of Open Data regulatory indicators after the aforementioned analysis has as follows:

Regulatory Variable	Range	Notes
existence of all four modalities of regulation	1	
completeness within each modality	Low * 4	
indirection	Y	The indirection is primarily coming from the social norms that have program of action with aims contrary to those of the an Open Data policy
continuity	N	
Immediacy	Low * 4	
Plasticity I	Medium at the EU level, Medium to Low at the Member State Level	
Plasticity II	Collective	
Plasticity III	Mostly External	

Table III: the Greek ODI regulatory assessment

11. The way forward

In the previous sections we have sought to explore two paradoxes in the case of the Greek Open Data policies: First, while the objectives of the Open Data and Public Sector Information policies in the EU are primarily related with growth and the creation of jobs and Greece is in great need of both, the link between the two is still not made. Second, while there has been substantial regulatory activity at the legislative level but fairly limited actual opening up of data.

The barriers that according to the literature prevent the opening of data also appear in the Greek case but to a great extent, key reasons such as privacy or confidentiality are rather excuses than reasons for not being able to open the data. The actual reasons behind these paradoxes mainly lie on the regulatory structure of any open data intervention that requires a strategy where all regulatory modalities are mobilized. In the Greek case the only area where there has been considerable intervention is that of the legal regulation, even though this is still incomplete. The problem with Greek Open Data problems is that precisely because a number of them are institutional, they are difficult to overcome.

However, the problem is not insoluble and there are some points that this paper suggests as key for the development of ODIs in Greece. More specifically:

(a) Learn from the successful cases. [Di@ygeia](#) is perhaps the most successful open data project in Greece. Its success gives us in a sense a few first ideas regarding how these elements could be successfully reused in another context. The key factors of success for [dia@geia](#) is that (a) it was a very quickly and well executed operation with limited budget and time of completion (b) it had political support at the top level and its main features were easy to grasp (c) the law did not require any further layers of regulatory instruments to be completed (d) the technological modality was almost immediately after the completion of the legal modality came about and (e) it addressed a real social and political issue.

(b) Create a two levels open data policy: at one level there should be continuous efforts to open all types of data. At another level, there should be a focus on particular data sets that contribute to the core services of the Greek economy, i.e. mainly tourism and local service provision.

(c) Cultivate the ecology as a whole and do not focus just on open data. One of the greatest problems in the greek information society economy is precisely that it is so small in Greece and hence whether data are made available or not is often not relevant to the business community. In order to drive the opening of data we need other services, mainly registries and access to them in order to create the economy that will demand the opening of data.

(d) Have better coordination at the EU level that should try to address the open data problem not as a single problem across the whole of the EU27. This would allow to have the benefits from open data remaining to the people that actually make this happen. There needs to be greater emphasis on the individualities of the MS and also the need to link open data with the real economy and not just with the information market. There is also need for roadmaps per country as well as of more accurate metrics (a) at the level of what is considered as a measure for opening up data (b) in terms of maturity and how to get to open data ecologies – both at the national and organisational levels and (c) at the level of linking the open data strategies with actual economic growth and job creation, i.e. developing open data economic efficiency metrics. In other words what is needed from the EU perspective is more tools, i.e.: metric tools as mentioned above but also (a) roadmaps (b) standards (technical ones and procedural ones) (c) tools (i.e. standard software, middleware, but also licences etc).

(e) Communicate the issue more accurately and eloquently to both the public and the policy makers so that they will provide support at the highest level.

The issue of opening up data has increasingly to mature and be framed as a broader information society services observing at the whole of the data life-cycle from the public administration to the end user and back. It should also make open data more open and more related to the real economy. It is only then that big data will give a solution to our big problems.

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