

REGULATORY FRAMEWORK FOR UNIVERSAL SERVICE IN INDIA—CAN WE LEARN FROM EU?

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Universal Service Funds (USF) are considered to be amongst the relatively less distortionary interventions that may be used to bridge the access gap in telecommunications. At least in theory, they are not inconsistent with competition and competitive neutrality. However, in practice this has always not been the case. It is the author's contention that this difficulty arises more from the manner in which USFs are implemented, which in turn depends partly on their regulatory frameworks, rather than from an inherent problem with the concept of USFs. Particularly, in developing countries like India with less than perfectly efficient institutions, appropriate ex ante regulatory frameworks assume importance. To explore if India could take a leaf from the European Commission's (EC) book as far as universal service regulation is concerned, a comparative study of the impact of the legal frameworks for universal service in India and the European Union has been carried out with the resultant indication being that India could usefully emulate elements of EC's ex ante regulation.

PART I—BACKGROUND

UNIVERSAL SERVICE as a concept and funding mechanism is generally used as a part of the policy of “promoting or maintaining “universal” availability of connections by individual households to the public telecommunications networks.” The progress of the telecom sector in the past few decades has proven that technological advances and market mechanisms supported by enabling regulatory and institutional mechanisms can greatly facilitate access even without public intervention (Eliassen, 2009). However, in spite of efficient market conditions, an access gap may persist on account of reasons such as uneconomic regions or populations which markets will not normally serve at affordable prices (Saabterl,

Dymond & Juntunen, 2002). Universal Service Funds (USF) are tools that governments utilise to fund closure of this gap. Thus, universal service interventions address market failures and are not meant to harm effective competition which is an important element of efficient markets.

Universal Service and Competition

The evolution of explicit universal service regulation is itself closely tied to the introduction and growth of competition. Thus, the original notion of universal service evolved from the regulation of monopoly fixed line service providers and imposition of an obligation on them to provide below cost access to local telephone services, especially to underserved regions and populations, while allowing them to fund this activity through cross-subsidies by way of the higher charges for urban/long distance services/premium rate services. With the onset of competition, this cross subsidisation was no longer sustainable as competitors would easily undercut the erstwhile monopolist in liberalised markets where the latter was charging higher tariffs (Hoernig & Valetti, 2002). Thus tariff rebalancing became essential and other means of achieving universal service such as mandatory roll out obligations (as a part of licensing) and Access Deficit Charges (ADC) were resorted to.¹ All these methods are considered ineffective/inefficient /introduce market distortions (Infodev, 2000). This has also been the experience in India where mandatory roll out obligations have been circumvented in various ways (Jain, 2001; Prasad, Singh *et al*, 2005) and ADCs have progressively been phased out by the Telecom Regulatory Authority of India (TRAI) in recognition of their relative inefficiency in comparison to USFs. USFs at least in theory represent a minimalist, transparent, targeted and theoretically less distortionary form of intervention. USFs are not intended as a substitute for private market incentives and investments and should not interfere with competitive market forces. Nor are they inconsistent with other market-based measures (privatisation, liberalisation, regulation) to improve universal service/access which may be implemented in parallel with other such measures (ITU, 2002a). It is in fact widely recognised that competition can bring about greater penetration of telecommunication services (Young, 2005). Affordable access to incumbent operators' infrastructure (such as local loop) and other forms of service or inter-platform competition have been major contributors to especially broadband penetration in developed

¹An ADC regime is like a traditional cross subsidization regime, but modified to fit a competitive market..... In an ADC regime, other operators pay subsidies to finance the total local access deficit incurred by the incumbent in providing local services that are priced below cost. ADCs have been criticized for being inefficient and potentially anti competitive.' Telecommunications Regulation Handbook 2000, Infodev.

countries. Existing literature on impact of pro-competitive policies in OECD countries indicates that these are positively related to broadband adoption. (e.g., Ford & Spiwak, 2004; Distaso, (Lupi & Manenti, 2006).

India's draft National Competition Policy 2011 (NCP) defines competition as follows, "Competition refers to a situation in a market place in which firms/entities or sellers independently strive for the patronage of buyers in order to achieve a particular business objective, such as profits, sales, market share, etc. By responding to demand for goods and services with lower prices and higher quality, competing businesses are pressured to reduce costs, innovate, invest in technology and better managerial practices and increase productivity. This process leads to achievement of static, dynamic as also allocative efficiencies and increased choices and lower prices for consumers". Minimising competition distortions regardless of public policy objectives has been recognised as one of the important tenets of India's proposed competition policy which also accepts that "competition is not automatic, and requires to be promoted, protected and nurtured through appropriate regulatory mechanisms, by minimising market restrictions and distortions and access to related productive inputs as markets, capital, technology, infrastructure services, human capital, etc". (NCP, 2011). The NCP defines competitive neutrality in terms of establishment of a level playing field where government business compete with private sector and vice versa. This is especially important because "... governments [as owners of public sector entities] also have to play a third [apart from policy maker] role of regulator, balancing the need for financial viability with customer protection through ensuring affordable and reliable services." (Eberhard, 2006). The focus of this article is *ex ante* regulatory neutrality in the approach towards US interventions to ensure that these subsidies do not benefit one private/public market player or group of players over another. The ultimate aim is economic efficiency which promotes consumer interest as highlighted by draft NCP.

Importance of ex ante Regulation

In theory, USFs are preferred over roll out obligations, cross subsidies and access deficit charges as being a more transparent, competition neutral and effective mechanism to achieve the aim of universal access to telecommunications facilities. In practice, the working of USFs has often been criticised for being inefficient and not always transparent or competition neutral to the required degree. The design of universal service interventions apart from the manner of funding universal service can in fact potentially "affect the very nature of competition that can be sustained in the sector. It can affect the viability of the existing operators as well as the entry process in the industry." (Malik & de Silva, 2005). However, it

could also be argued that most of these demerits arise from the manner in which universal service is defined and applied rather than the notion of universal service. A comparison of the related legal framework of India and European Union (EU) is made in this context.

PART II-BENCHMARKING INDIAN US REGULATION
AGAINST THAT OF THE EUROPEANS UNION

Legal Framework of USOF

The legal framework of India's Universal Service Obligation Fund (USOF) is the sum of legislation and the institutional set up to implement the same. USOF is governed by The Indian Telegraph (Amendment) Act 2003 (Act)² under which the Fund was created retrospectively with effect from April 1, 2002 and the Indian Telegraph (Amendment) Rules 2004 (Rules)³. The Act lays down the definition of Universal Service Obligation (USO) and manner of funding of USOF activities. The Rules govern the scope of activities; type of subsidy support and the choice of the implementing agency or the Universal Service Provider (USP) were notified on March 26, 2004. USOF was established with the fundamental objective of providing access to 'basic'⁴ telegraph services. The Act and Rules were subsequently amended in 2006 (when the word "basic" was removed from the definition of USO in the Act) in order to enable support for mobile services, broadband connectivity and general infrastructure in rural and remote areas of the country. The Rules were again amended in 2008 for providing subsidy support to eligible operators for operational sustainability of Rural Wire line Household Connections (RDELs) installed prior to April 1, 2002. As per the Rules, the following services shall be supported by the Fund, namely:

- Stream I: Provision of Public Telecom and Information Services
- Stream II: Provision of rural household telephones (RDELs) as may be determined by the Central Government from time to time:
- Stream-III: Creation of infrastructure for provision of Mobile Services in rural and remote areas
- Stream-IV: Provision of Broadband connectivity to villages in a phased manner:

²The Indian Telegraph Act 1885 is the basic telecommunications law for India.

³Secondary legislation.

⁴Implying fixed (non-mobile) telecommunications.

- Stream-V: Creation of general infrastructure in rural and remote areas for development of telecommunication facilities:
- Stream-VI: Induction of new technological developments in the telecom sector in rural and remote areas:

The only part of the legal framework where the issue of competition is overtly addressed is the provisions in the Rules governing selection of USPs. Rule 526, states that the selection of the USP shall be made by a bidding process from amongst the eligible operators. There are two exceptions to this tenet. One being the support for rural household telephones installed before April 1, 2002 and the second being the Stream VI pilot projects. Here the USP may be selected by means other than bidding. There is a sound rationale for both. The former would logically consist of rural telephones provided entirely by the public sector incumbent operator Bharat Sanchar Nigam Ltd. (BSNL) making bidding pointless and the latter is expected to deal with unique projects where qualitative rather than quantitative factors would govern choice. Other protections available in the legal framework include the scrutiny exercised by the Parliament and by the Finance Ministry as a part of the budgetary process. Stakeholder consultation takes place by way of pre-bid meetings with service providers. Further, an inter-ministerial Advisory Committee advises the USOF on its schemes. USOF functions within the Government of India's framework of rules and regulations including those on financial propriety and procurement procedures as embodied in the General Financial Rules. Its activities and performance are subject to regular audits by the Controller and Auditor General of India.

Institutional set-up of USOF India

It has been said that "Institutions are formal rules and informal constraints based on principled ideas, which produce a certain kind of behaviour. For example, formal rules, informal conventions, or a combination of formal and informal conventions, could secure property rights for private individuals". (Mukherjee, 2000). The USOF Administration functions as an attached office of the Department of Telecommunications. The institutional set up and system of command and control has important implications on design and implementation of USOF schemes and consequently on their competitive impact. It is significantly noted that TRAI's recommendations had envisaged the creation of an independent and empowered USF Administration Board with the administrator as its Chairperson. Apart from the administrator, the other six members were to be drawn from the fields of economics, finance, telecom engineering and administration, management, law, and consumer

welfare. The expenses of the administration were to be met from the USL (TRAI, 2001 pp. 39, 40). As the role of TRAI in this matter is recommendatory and the final decision was to be taken by the government, the Telecom Commission took a view that the DoT should control the USOF as fulfilment of telecom policy and social obligations is the direct responsibility of the government, which is also responsible to the Parliament. Thus, as approved by the government, the office of the Administrator USOF was created as an attached office of DoT.

Impact of Present Legal/Institutional Framework

It would appear that USOF's present legal and regulatory structure may have failed to prevent potentially harmful, anti-competitive interventions and their negative impact on the rural telecommunications sector. USOF's avowed purpose is affordable rural telecommunications. USOF has disbursed Rs 175.73 billion up to September 30, 2013. However, in spite of the fact that rural fixed line telephony and broadband based schemes account for 98.59 per cent of USOF subsidy disbursement as on January 31, 2013 (USOF Website), the rural teledensity at 39.85 per cent is made of almost entirely of wireless connections⁵ and rural broadband penetration continues to be negligible. BSNL's monopoly in the wire line segment has meant that most of this support (focused disproportionately on fixed lines) has been given to BSNL on nomination basis. Thus it is not USOF interventions that have really driven the growth accomplished in voice penetration and nor has USOF succeeded in increasing data connections in rural India.

Outcomes expected from USOF

Rural telephony and broadband access are high on the Government's agenda with targets of 70 per cent rural teledensity by 2017 and 100 per cent by 2020 and the intention to connect every village *panchayat*⁶ to a thorough Optical Fibre within three years. The National Telecom Policy 2012 (NTP 2012) states that it has, "the vision Broadband on Demand and envisages leveraging telecom infrastructure to enable all citizens and businesses, both in rural and urban areas, to participate in the Internet and web economy thereby ensuring equitable and inclusive development across the nation". It lists as one of its objectives, the aim to "[p]rovide high speed and high quality broadband access to all village panchayats through a combination of technologies by the year 2014 and progressively to all villages and habitations by 2020". The Policy recognises broadband connectivity as a basic necessity like education and health and commits to

⁵Rural wireless teledensity is 39.04 and wire line teledensity is 0.82%. (TRAI, 2012).

⁶Rural local self-government office.

work towards “Right to Broadband”. It is clear that broadband is a national priority and that USOF has its work cut out.

Explaining Poor Results

The possibility that the reasons for USOF’s poor performance in terms of desired outcomes, can be traced to its legal framework is evident from the fact that its scheme design and implementation have been criticised by experts. It has been observed that while the rules favour bidding which is theoretically competitive, USOF’s “auction process has generally favoured BSNL and is probably not the most effective mechanism for either minimising the state subsidy or identifying the most efficient provider.” (Noll & Wallsten, 2006, p. 255). This is substantiated by facts as the USOF website indicates that cumulatively BSNL has received more than 87 per cent of USOF subsidy. Clearly BSNL’s monopoly⁷ in the rural wire line segment has harmed rather than helped penetration. “Global experience” with subsidy auctions “has revealed that ‘the subsidies required are generally less than incumbents had previously led policy makers to believe’. Further, “[t]he role of the incumbent in the design of these [subsidy] auctions”, experienced elsewhere and problems thereof occur in the case of USOF too. (Wallsten, 2008, pp. 381-381) It is observed that at least for the initial auctions “the cost data” used for calculation of benchmarks rather than being based on industry standards of incremental cost were based on BSNL data which suffers from lack of appropriate disaggregation. Further, these very (rural fixed line) costs also affected the quantum of BSNL’s subsidies by way of ADC, further encouraging overstatement. Also the pre-existence BSNL’s infrastructure in the bidding areas gave BSNL a cost advantage (Wallsten, 2008, p. 387). Malik has commented that “these costs were not linked to optimal network design....but were based on the incumbent’s norms of network design” though TRAI had recommended development of “proxy cost model(s)” to avoid overestimation of “cost figures” by operators. It has been said that “overspecification [of technology] in [USOF’s] law...have yielded large rents for the incumbent.” (Malik, 2007, pp.17-18). It has also been commented that the outcome of a single operator receiving subsidy across national markets also constitutes an “impossible” barrier to entry for other firms (Noll and Wallsten, 2011, p.52). Notably, there has been however no attempt to systematically relate the shortcomings of USOF interventions directly to its legal framework or to make specific recommendations in this regard. This article attempts to explore this aspect.

Various authors have also criticised the less than perfect regulatory

⁷BSNL owns 99.9 per cent of rural wire lines.

independence of TRAI and the lack of competition orientation in telecom policy. It has been lamented for example that, “the development of strong competition in telecommunications requires the concerted efforts of the competition authority, the sectoral regulator, the governmental telecommunications policy body, the Department of Telecommunications, the legal apparatus of the country and other governmental agencies and ministries.....It would help if all these bodies used some clearly defined principles and rules to reach decisions. It would help if these rules were based on competition principles...” (Gupta, 2007). With this background, *ex ante* legal frameworks like a national competition policy and specific incorporation of competitive neutrality requirements in USOF’s own legal and regulatory framework become imperative. Thus, while India urgently needs to utilise its sizable USOF effectively to bridge its digital divide and hasten the spread of rural broadband; we also need to learn from the experiences of the developed world and avoid the pitfalls of hasty, ill-considered interventions which may harm competition, distort the telecommunications market and hence threaten the sustained growth of the telecommunications sector. The state of implementation of the present USOF rules is thus a reflection of the overall regulatory environment wherein competitive neutrality is not explicitly laid down as a criterion for policy formulation and implementation or regulation. It is in this context that an attempt is made to benchmark India’s US Regulation against that of EU.

EU’s Legal Framework

Universal Service Directive

The EU’s New Regulatory Framework (NRF)⁸ came into being in 2003. In a liberalised and increasingly converging communications sector, the NRF hoped to create the ideal regulatory environment for e-communications “where fierce and fair competition would yield lower prices, better quality and innovative services” (Eliassen & From, 2009) Yet in keeping with its historical ideology and recognised objectives of ensuring US, as enumerated in various preceding directives, EU’s NRF too contains as an integral component, the Directive 2002/2/EC (USD). The USD is deliberately and specifically designed to promote these objectives without hindering competition or the healthy growth of the internal e-communications market. It studiously aims to avoid market distortions which would be discriminatory and harmful to effective competition in the e-communications sector and

⁸The NRF consists of the Framework Directive (2002/21/EC) and four other Directives including the US Directive.

hence its healthy development. Restrictions are therefore placed on the choice of activities to be supported (“minimum set”), methods of implementation adopted (regulated tariffs, choice of service providers, transparency, non-discrimination and technological neutrality) and manner of funding (minimising competitive distortions and unfair burdens on any party). The scope of universal service is relatively modest and can be enlarged only under very specific conditions. Universal service as defined in EU, complements rather than hampers competition and caters to requirements which markets may fail to deliver.

State aid Guidelines

In the recent past the issue of including broadband in the scope of universal service has been hotly debated and this formed the subject matter of several of the mandated reviews from 2005 onwards. While acknowledging the importance of broadband as a powerful tool for socio-economic progress, the EU primarily relies on competition and effective regulation to achieve its widespread growth. However in recognition of the possibility of markets failing to adequately address this need, the EU officially encourages Member States (MS) to adopt “national broadband strategies” which aim to use “public policy” to address demand and supply side constraints (Memo 06/132). The structural and rural development funds are available to bring broadband to sparsely-populated rural and remote areas, where the market is failing to invest in adequate infrastructure, as long as the schemes are well-justified and proportionate to remedy a well-defined market failure, as well as to meet cohesion objectives, and are in compliance with requirements for open access and technological neutrality and with competition, including State aid rules. In order to help MS to accelerate and extend broadband deployment, the Commission adopted the State Aid Guidelines in 2009, by outlining its policy and past practice on individual cases of public support for “traditional broadband” as well as addressing public financing of very high speed, next generation access networks. The Body of European Regulators (BEREC) has pointed out that the benefits of enforcing Universal Service to Broadband (greater demand leading to an impetus to greater supply) must be weighed against the harmful impact on competition through artificial strengthening of position of USPs and deterrent to ‘voluntary’ participation by other operators who may ‘suspend’/‘abandon’ their plans (BEREC, 2010).

Significance of overall Legal Framework and Delineation of Important Elements

Regulation may be broadly understood as an effort by the state to “address social risk, market failure or equity concerns through rule-based

direction of social and individual action". Particularly, in the case of a developing country, apart from law and regulations per se, the role of the regulatory environment and institutions has to be factored if competition neutrality is to be ensured. It can be said that "there are two major aspects of government-business relations—(a) the "rules of the game" with regard to market competition, and (b) the regulatory institutions that define and maintain these rules". (Sen & Suraj, 2009). Developing countries are known to face challenges in the area of regulation and India is no exception. The World Bank has stressed that "regulation, particularly in developing countries, must be designed with an appreciation of both information asymmetries and difficulties of enforcement." (Scherf, 2006, p. 8).

It has been observed that "Government's political role in relation to utility services should be made explicit through transparent policies and public funding streams" and that, "[r]egulatory risk may be mitigated through regulatory governance systems that constrain regulatory discretion." (Ebenhard, 2006, p.10; p. 27). Similarly, research has pointed to the positive relationship between sector performances and restrains on arbitrary decisions making in regulation; Also that established processes or predictability of regulation (through rules and procedures) enhances investment (Heller & McCubbins,1996;). Clearly reducing discretion and increasing predictability and transparency of regulation are important for the health of the sector (Levy & Spiller, 1994; OECD, 2001). This points to need for precise *ex ante* regulation. Further authors like Levy & Spiller (1994), Stern & Cubbin (2005) and Gasmi, Nounba & Virto (2010) bring out the importance of overall institutional factors that impact implementation of regulation. It emerges that apart from the efficacy of laws or regulations which comprise the instruments of the legal framework, independence of judiciary, dispute resolution and transparency of government would be good measures of 'overall institutional strength which is the second component of the legal framework. Where these are strong, one should expect good results in terms of investments in telecommunications and the resultant deeper penetration of telecommunications facilities in terms of population and geographic coverage, for a given set of rules. In the empirical analysis that follows, the institutional strength of a nation is taken as the input while telecom penetration is taken as the output for a given set of regulations.

Performance of EU 27 in Implementation of Specific Elements of USD

Even with the same regulatory framework there are observed differences in implementation of specific elements of USD which can be

exploited for the purpose of this study to analyse the impact of the overall legal framework on performance. To gauge the effectiveness of implementation of regulation in the EU, research has been carried out using official reports and it has been seen that infringement proceedings relating to implementation of the USD have been initiated against Luxembourg, France, Denmark, Finland, Spain, Poland, Belgium, Portugal, Germany, Netherlands, Lithuania, Portugal, Bulgaria, Slovakia, Greece, Italy, Spain, Bulgaria and Romania.

In this article, an attempt is made to validate the efficacy of underlying regulations by arguing that nations which have faithfully followed these rules are performing better relative to their institutional strength. Further, India's universal service performance relative to its institutional strength is benchmarked against similar EU nations to throw light on the comparative efficacy of the Indian regulatory framework for universal service.

Methodology

“Data Envelopment Analysis (DEA) is a linear programming based technique for measuring the performance efficiency of organisational units which are termed decision-making units (DMUs) (Ramanathan, 2003). In this study DEA is used for benchmark the EU 27 nations amongst themselves after classifying them into two clusters using Statistical Product and Service Solutions (SPSS). Similarly India is benchmarked against similar EU nations. The idea of the first type of benchmarking is to gain understanding of the relative efficiency of EU nations that have faithfully implemented the legal framework for USD as compared to those that have not, relative to their institutional strengths. The second type of benchmarking including India should reveal the relative performance of EU and India's legal frameworks on desired US outcomes given the institutional strengths of nations involved. The idea is to gauge the effectiveness of the legal framework in achieving desired outputs of higher internet/broadband penetration in a nation relative to its given institutional strength. One of the important requirements of DEA is that it should be used to compare DMUs operating in a similar environment. Hence the countries have been arranged in two clusters based on GDP per capita and population density. It is presumed that GDP per capita captures many characteristics such as degree of urbanisation, purchasing power, etc. which would affect outcomes other than the legal framework and population density would logically affect the ease of universal telecommunications penetration. In fact existing literature supports the strong two way correlation between GDP per capita and telecommunications penetration. (Allerman, Michaels, Mueller, Rappoport & Taylor, 1994). Keeping this in view, Cluster Analysis using SPSS software has been carried out to

cluster nations in terms of per capita GDP and population density (Figures A1 & A2, Appendix A).⁹ The selection of specific inputs (efficiency of legal framework in settling disputes, transparency in policy making & judicial independence) has already been explained. The outputs selected for the present study are internet penetration, fixed broadband penetration and mobile broadband penetration as these are the most relevant objectives of US in today's telecommunications scenario. These outputs may be said to subsume intermediate outputs such as level of investment, efficiency and competition in the sector as they would logically be positively correlated to all these variables. (Tables B1 & B2, Appendix B)

PART III-RESULTS AND DISCUSSION

Interpretation of Results

It was seen that even with the same legal framework and in a cluster of nations classified on the basis of per capita GDP and population density among the EU 27, most of the nations that have been less than diligent in their implementation of the legal framework demonstrate less than optimum output efficiency relative to their institutional strength. In Cluster 1 these nations are Denmark, Italy, Spain, Finland, Belgium, France and Netherlands. (Table B3, Appendix B). It may be recalled that all these nations have been subjected to infringement proceedings under US. In Cluster 2 which includes India, the inefficient EU nations are Greece, Bulgaria, Romania and Estonia. (Table B4, Appendix B). India with a different legal framework is found to be comparatively very inefficient relative to its institutional strength.

These results could broadly be taken as a positive indication of the practical soundness of the legal framework of EU with its strong emphasis on *ex ante* analysis of interventions to ensure efficiency, objectivity, non-discrimination and competitive neutrality. India, with its slightly below average institutional strength is seen to be very poorly relative to EU nations in its cluster. The descriptive analysis above has already revealed that the present set of USOF regulations are unsatisfactory in terms of positively influencing outcomes of universal service interventions especially vis-à-vis guaranteeing competitive neutrality. India could perhaps achieve better penetration, given its institutional strength, by adopting the above mentioned elements of *ex ante* regulation, taking a leaf out of the European Commission's book.

⁹It is seen that Luxembourg with its exceptionally high per capita income is falling outside the two clusters and has hence been excluded from analysis.

Disclaimer

Views are personal.

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APPENDIX A

<i>Code Country</i>	<i>GDP per capita</i>	<i>Population Density (people per sq km)</i>
LU Luxembourg	113533	165.92
DK Denmark	59928	126.36
SE Sweden	56956	21.69
NL The Netherlands	50355	216.49
AT Austria	49809	98.37
Finland	49350	16.89
IE Ireland	47513	52.74
BE Belgium	46878	336.82
FR France	44008	108.09
DE Germany*	43742	234.86
UK The United Kingdom	38592	244.69
IT Italy	36267	192.96
ES Spain	32360	78.43
CY Republic of Cyprus	30571	81.61
EL Greece	27073	81.86
SI Slovenia	24533	97.28
PT Portugal	22413	107.86
MT Malta	21028	1192.51
CZ Czech Republic	20444	130.72
SK Slovakia	17644	110.58
EE Estonia	16583	32.6
HU Hungary	14050	110.31
PL Poland	13540	126.79
LT Lithuania	13075	54.98
LV Latvia	12671	36.44
RO Romania	8863	96.96
BG Bulgaria	7202	74.13
India	1389	336.62

FIG. A1: DATA USED FOR CLUSTER ANALYSIS

APPENDIX A

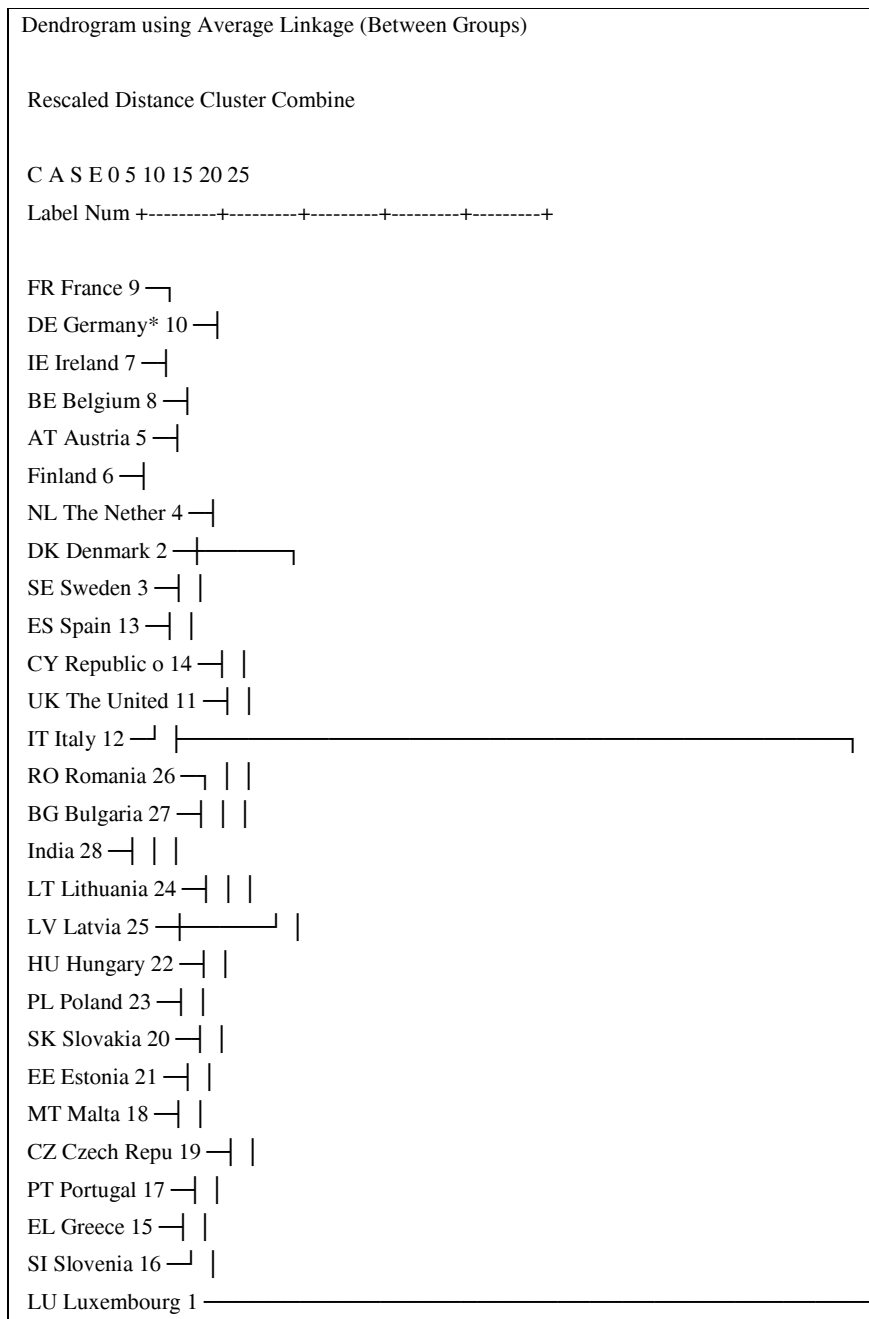


FIG. A2: RESULTS OF CLUSTER ANALYSIS

APPENDIX B

TABLE B1¹²: CLUSTER 1 INPUT/OUTPUT DATA

Code	(I)Efficiency of legal framework in settling disputes	(I)Judicial independence	(I)Transparency of government policymaking	(O)Internet users(% in 2011 or most recent available)	(O)Fixed broadband internet subscriptions/100 population-2011/most recent	(O)Mobile broadband subscriptions/100 pop. 2010/2011
DK	4.2	5.2	4.4	78.0	33.0	19.4
SE	2.8	2.9	3.6	51.0	15.5	14.5
NL	4.6	4.8	4.9	57.7	18.1	24.1
AT	3.0	3.7	4.0	73.0	15.7	43.1
Fi	4.9	6.2	5.0	83.0	32.5	34.8
IE	5.1	6.0	4.7	90.0	38.2	80.2
BE	4.3	5.5	5.1	76.5	27.1	42.0
FR	4.6	6.3	5.0	76.8	22.1	59.4
DE	2.5	3.1	3.7	53.0	21.6	31.8
UK	4.4	4.9	4.6	79.6	36.1	44.0
IT	3.7	4.0	4.2	67.6	23.5	40.9
ES	3.0	3.7	3.8	59.0	22.2	13.2
CY	2.5	3.8	3.1	56.8	22.8	31.3

TABLE B2¹³: CLUSTER 2 INPUT/ OUTPUT DATA

Code	(I)Efficiency of legal framework in settling disputes	(I)Judicial independence	(I)Transparency of government policymaking	(O)Internet users(% in 2011 or most recent available)	(O)Fixed broadband internet subscriptions/100 population-2011/most recent	(O)Mobile broadband subscriptions/100 pop. 2010/2011
EL	3.3	3.5	4.6	65.1	22.1	17.2
SI	5.2	5.8	5.5	90.9	32.9	66.7
PT	3.2	4.0	4.2	71.7	20.4	37.6
MT	3.9	5.0	4.4	69.2	30.0	32.6
CZ	5.6	6.4	5.3	92.3	38.7	49.2
SK	3.1	4.2	3.8	64.9	14.4	48.4
EE	2.9	3.9	4.3	55.3	21.0	27.4
HU	2.6	2.7	3.3	44.0	15.4	14.1
PL	5.6	6.2	5.5	91.0	31.8	91.5
LT	2.7	3.8	4.7	72.0	24.8	29.3
LV	2.4	2.7	4.2	74.4	13.6	31.9
RO	5.4	6.2	5.3	82.0	32.7	62.3
BG	6.0	6.5	6.1	89.4	29.5	87.1
IN	3.8	4.5	4.3	10.1	1.0	1.9

APPENDIX B

TABLE B3: DEA RESULTS CLUSTER 1 (IN RANK ORDER)

<i>Rank</i>	<i>DMU</i>	<i>Score</i>	<i>RTS</i>
1	CY	1	Constant
1	UK	1	Constant
1	SE	1	Increasing
1	DE	1	Constant
1	AT	1	Constant
1	IE	1	Constant
7	DK	0.993646	Constant
8	IT	0.963928	Constant
9	ES	0.943515	Constant
10	Fi	0.939116	Constant
11	BE	0.915906	Constant
12	FR	0.893518	Constant
13	NL	0.7112	Constant

TABLE B4: DEA RESULTS CLUSTER 2 (IN RANK ORDER)

<i>Rank</i>	<i>DMU</i>	<i>Score</i>	<i>RTS</i>
1	LV	1	Constant
1	LT	1	Constant
1	SI	1	Constant
1	PT	1	Increasing
1	MT	1	Constant
1	CZ	1	Constant
1	SK	1	Constant
1	PL	1	Constant
1	HU	1	Increasing
10	EL	0.996439	Increasing
11	BG	0.981503	Constant
12	RO	0.943533	Constant
13	EE	0.929957	Increasing
14	IN	0.132847	Constant