The role of inter-regional benchmarking in the policy-making process: experiences in the field of information society

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"Studies of competitiveness and economic development have tended to focus on the nation as the unit of analysis, and on national attributes and policies as the drivers. As regional scientists and economic geographers have long understood, however, there are substantial differences in economic performance across regions in virtually every nation. This suggests that many of the essential determinants of economic performance are to be found at the regional level."

Michael E. Porter, 2003

1.Introduction

Benchmarking has recently achieved a major importance as a support tool for policy-making, in particular at the EU level and in the context of the Lisbon process. Benchmarking has become a common tool in policy support, especially in the most innovative policy fields where institutional learning is of outstanding importance.

In the field of Information Society, policy-makers need data to measure the impact of the very significant investments in ICT infrastructure and applications which have become the norm across Europe. At the regional level, huge investments are common place but there are hardly any statistical data to evaluate them in the required depth.

This paper illustrates the results from the experience of two European projects aimed at building the framework for, and kick-starting on the ground, the collection of harmonised, reliable cross-country regional data. The BISER project (www.biser-eu.com) is a recently finished research project supported by the European Commission's IST Programme which developed and piloted indicators for measuring Information Society developments at the regional level. The UNDERSTAND project (2004-2006) is a bottom-up initiative by 10 EU regions to define common indicators, collect data and compare regional performances in the field of broadband infrastructure, e-government, e-business and Internet usage by citizens. In this paper we describe some major methodological issues and implications for regional development stemming from this research and practical experience.

The first chapter addresses the role of regional benchmarking in the policy making process, in order to outline the correct usage of benchmarking in different regional contexts and in relation to the policy framework. The objective is to take maximum advantage of benchmarking, but at the same time to avoid inappropriate or even dawnright false usage of statistical data. The second chapter builds on the results of the BISER project, which provides regional data for 28 regions chosen to represent the variety of types of regions across the EU15. Finally, the authors address the issue of the feasibility of indicators to measure the impact of ICT, which is arguably the main question posed by policy-makers.

While the three chapters are not part of a single structured research approach, they address three issues which are very topical in the policy debate:

- How to adequately use common, harmonised (pan-European) statistics given the fragmented nature of policy-making at the regional level;
- How to interpret the empirical finding that the variation in rates of ICT uptake follows national patterns - regional disparities inside of countries seem to play a comparatively minor role. Does this mean that the promotion of ICT usage should be devoted to the national policy level, rather than regional?
- How to achieve progress with regard to the measurement of impacts of ICT usage at the regional level.

2.The role of benchmarking in policy-making

Benchmarking can have a very different meaning according to the institutional and political set-up where it is applied.

When used in relation to target-related policies, such as the Lisbon strategy, benchmarking can be used to measure the success of policies towards developing the Information Society. On the other hand, where there are no quantitative targets defined by policy-makers, the role of benchmarking is much more fuzzy.

Furthermore, it makes much difference if benchmarking is a result of a top-down or a bottom-up effort. Benchmarking eEurope is coordinated by the European Commission as an “open method of coordination” to measure and stimulate activities of member states. In this case, benchmarking acts within the political scope of the eEurope action plan and in order to measure (and stimulate) eEurope policy objectives. Benchmarking eEurope does not address the relevance of the objectives of the eEurope action plan, but rather accepts them as given. This means that here, benchmarking is not a tool to evaluate the policy design but the policy implementation and the attainment of its objectives. Benchmarking in this case acts after policy vision and challenges have been developed, according to which indicators relevant to the policy are defined and agreed upon.

A different situation applies if regional benchmarking is devised through a bottom-up approach, where regions get together to agree between themselves on sets of common indicators. In the UNDERSTAND initiative, partner regions have no common policy framework, so benchmarking is not applied in the way of an operationalisation of specific policy objectives. The choice of indicators are a result of a compromise among different regions without any coordination from top down. This approach also reflects the fact that EU regions have different powers in different domains, which is mostly a result of different national policy systems: Some regions can act on the education or health system where others cannot. That means that measurement of, for example, the availability of PCs in schools or the usage by citizens of e-health services can be highly relevant for policy-making in one region, while it is of little direct value in others. This also implies that the same indicator can measure different things in different regions: It can be a measure of policy output, results, and impacts, or it can be a simple framework / readiness indicator only. The fibre optics network’s length is an output policy indicator for Emilia-Romagna, which has a projects to put down new fibre, but a framework condition indicator for another region which has no such powers.

It is therefore necessary to accurately analyse every indicator. The well established OECD model (which distinguishes between readiness, usage and impact/outcome indicators) tells us something about the relation between the individual/organisation and ICT. This model is somewhat similar to the evaluation model of the European Structural Funds, which is based on indicators categorized as Output-Result-Impact. These categories address the relation between the public money spent and the effects they have in practice.

The same ICT indicator can therefore mean very different things in different regions. For example, if we consider the indicator “fibre optic kilometres”, it can have different meaning depending on the policy context in the region where it is utilised (see Table 1).

Table 1: The different meaning of indicators in different policy contexts

>>> Weaker relation of observed phenomena with policy >>>

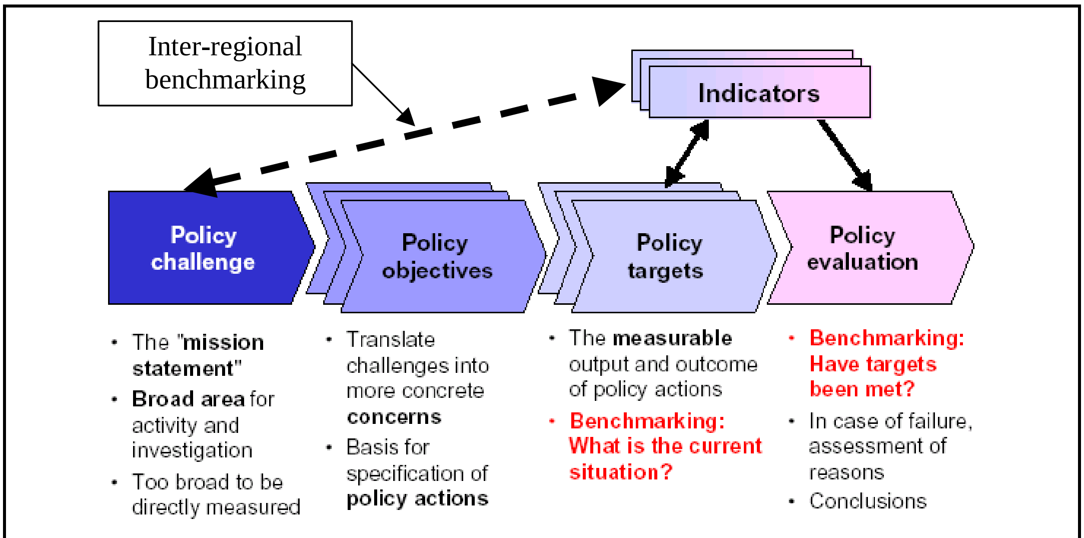
<<< Weaker relation of policy <<< <<< with broadband supply <<<

Indicator / Policy	Output indicator	Result indicator	Impact indicator	Framework condition indicator
The region finances the cabling of the territory	**Growth of fibre optics coverage in km**	% of territory reached by DSL	Take-up of broadband among private companies	Enhanced competitiveness of enterprises
The region pursue an active marketing policy to encourage investment by telecom providers	Number of telecom companies reached	**Growth of fibre optics coverage in km**	% of territory reached by DSL	Take-up of broadband among private companies
The region encourages broadband take-up by subsidising demand	Number of subsidies conceded	Take-up of broadband among private companies	**Growth of fibre optics coverage in km**	% of territory reached by DSL
The region has no specific policy on broadband	//	//	//	**Growth of fibre optics coverage in km**

Source: UNDERSTAND 2005

This drives us to consider the position of indicators into the policy-making process. Where in the approach applied for eEurope benchmarking (see Figure 1) indicators act only after policy targets are set, in the UNDERSTAND case and in any inter-regional cooperation it can come into play in earlier parts of the process already. In particular, it could influence the definition of policy challenges themselves.

Figure 1: The different roles of benchmarking in policy-making



Source: Adapted from Selhofer (2003)

This means that the role of benchmarking at the regional level is not simply to measure the attainment of policy objectives (policy evaluation), but it can also have a direct impact on the policy design (prescription). Ultimately, and paradoxically, it could lead partner regions to have not only common indicators, but similar policies as well! For example, if a region with no policy priority on broadband finds out that it has much less fibre optics coverage than other EU regions, it might find it necessary to introduce it as a new political priority.

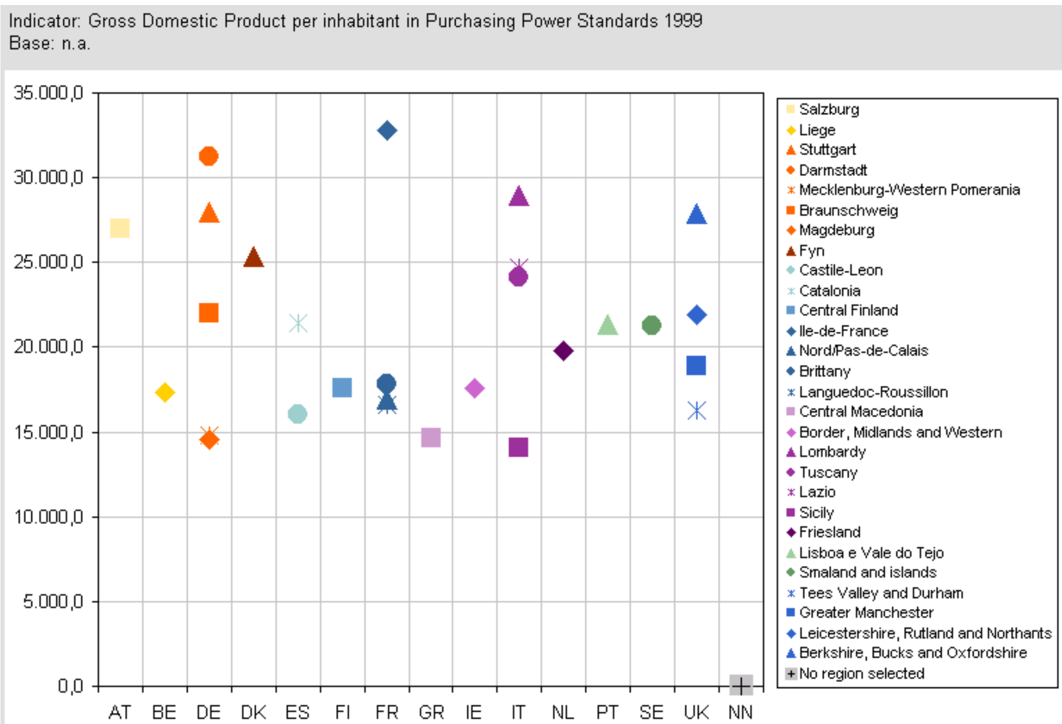
3.Competitiveness, innovation and ICT indicators

Data can be used not only to provide input for policy-making, but also to define the political role of different institutional levels. As reflected in the quote opening this paper, indicators relating to competitiveness, such as Gross Domestic Product per inhabitant, show significant variations at the regional level. The observation of such variation has produced a surge in attention being given to the regional level; in academic research, this has been reflected in the phenomenon known under the name of “new regionalism”; partially as a consequence, at the policy level, a growing set of policy fields, especially related to economic development, have been devolved to the regional level.

We here use the data collected in the context of the BISER project in order to explore data patterns across regions in terms of GDP, innovation and ICT, and to assess differences and correlations.

Figure 2 shows this variation, and it shows (for those countries, for which more than one region is included in the sample: Germany, France, Italy, Spain and the U.K.) how regional performance inside of the European Union is not much related to the country the regions belongs to: For example, Ile de France (F) appears to be more similar to Darmstadt (D) than it does to Brittany (F) when it comes to regional income per head.

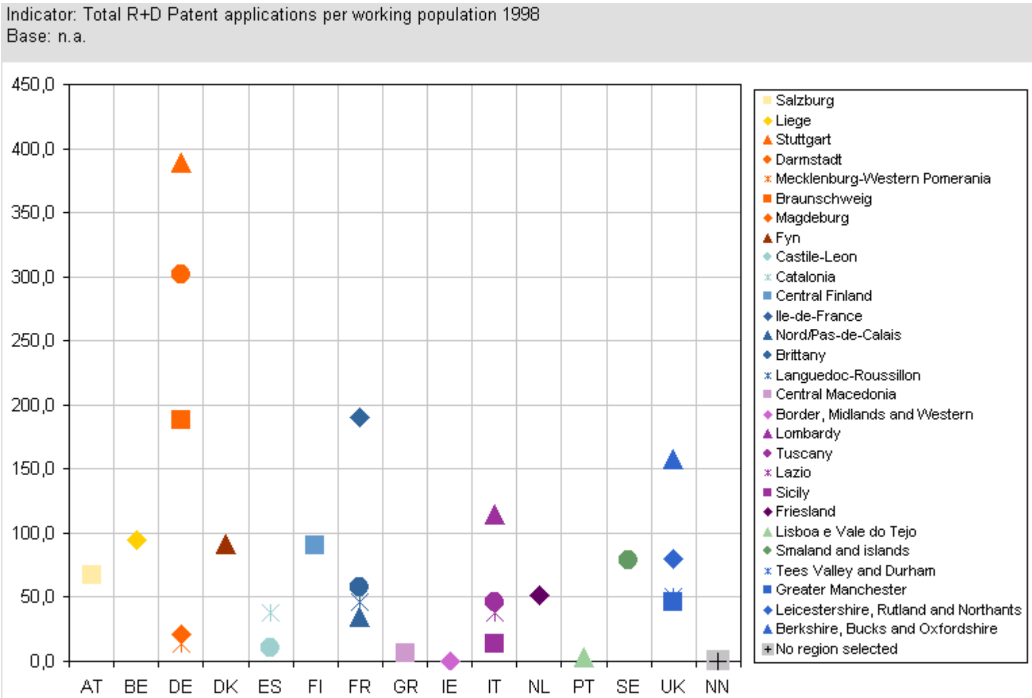
Figure 2: Variation in GDP per head across 28 selected EU regions



Source: BISER 2004

One of the key factors of regional competitiveness is innovation. Innovation indicators, in fact, show very differentiated patterns across regions. If we consider one of the most established indicator of innovation, such as R&D patents per working population, we find that similar to the situation with regard to GDP, regions belonging to the same country differ hugely from each other, again suggesting that the proper level of observation, and – by implication – maybe also for policy definition and making – is the region rather than the country (see Figure 3).

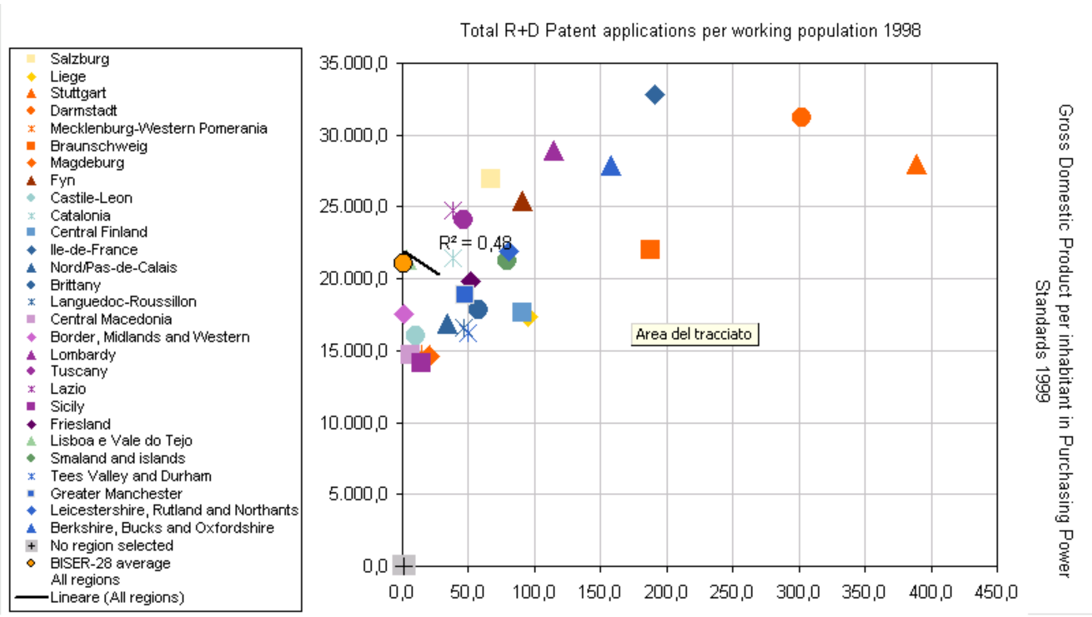
Figure 3: Variation in total R+D patent applications per working population across 28 selected EU regions



Source: BISER 2004

Also, there is a correlation, albeit not a very strong one (R^2=0.49), between regional GDP and regional innovation indicators (see Figure 4). This can be interpreted as justification for the strong role of Regional Governments in defining and investing in innovation policies.

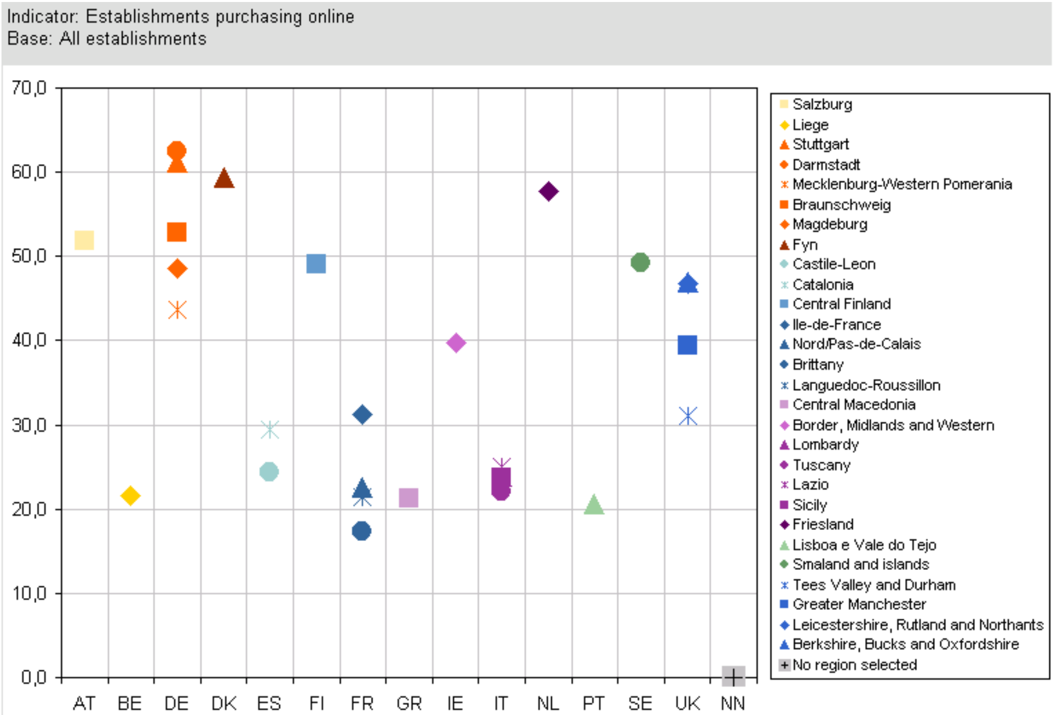
Figure 4: Correlation between R+D patent applications and GDP per head across 28 selected EU regions



Source: BISER 2004

When we then consider ICT indicators, evidence suggests a different situation. One of the most common ICT indicator is the percentage of enterprises buying on line. Regional variation of this indicators appears to be strongly related to the country the regions belong to (see Figure 5). This becomes obvious when considering, for example, the relative values of German, French and Italian regions.

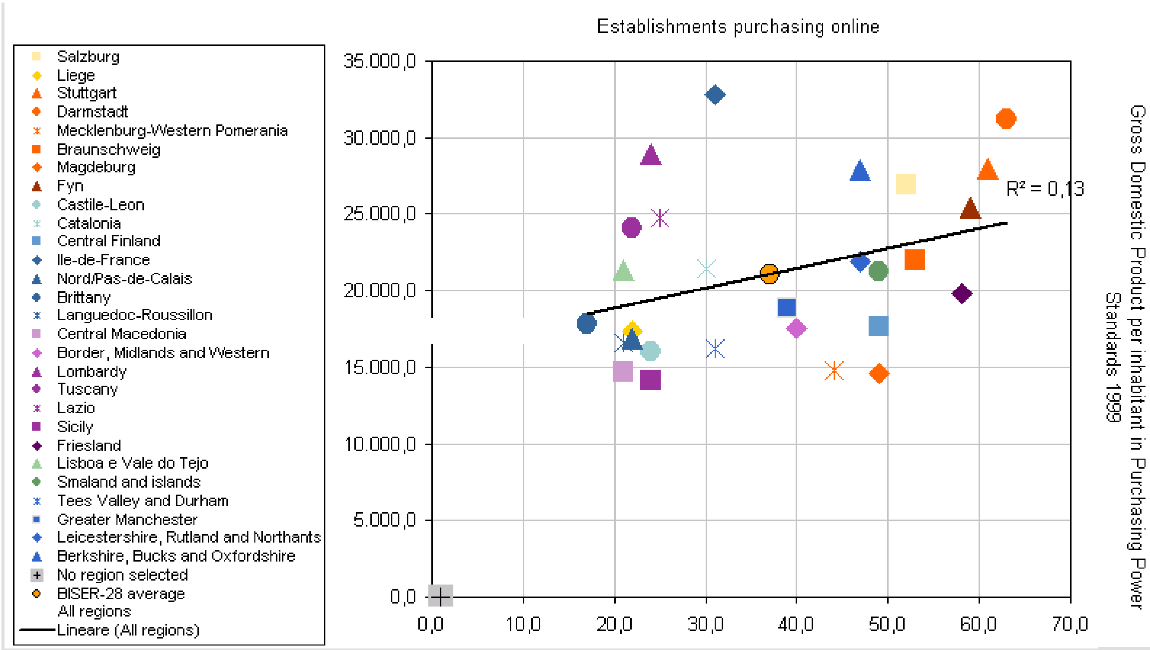
Figure 5: Variation in the share of establishments purchasing online across 28 selected EU regions



Source: BISER 2004

If we correlate the ICT indicator with GDP (see Figure 6), we can detect no significant correlation whatsoever, in obvious contrast to the interrelation between innovation and GDP discussed above.

Figure 6: Correlation between share of establishments purchasing online and GDP per head across 28 selected EU regions



Source: BISER 2004

The results are very much the same when using other ICT indicators, such as enterprises selling on line, citizens using the Internet, households with Internet connection.

This pattern is quite striking. Data show that ICT usage in each region is heavily influenced by the national context (i.e. the country it belongs to), much more than it is the case with traditional R&D

indicators. Poor regions of Sweden such as Smaland show higher ICT uptake than rich and innovative regions of France and Italy such as Ile de France or Lombardy. However, at the national level, ICT usage seem to be related to GDP and innovation, because the most intensive ICT using regions are in Nordic countries.

This leads to some possible explanations, each of which could be extremely relevant for policy. The first explanation for these statistical findings would be that ICT usage by enterprise and citizens is not so much a regional issue, as differences are more pronounced between countries than between regions. National issues such as, for example, the regulative framework, telecommunication costs and national "culture" (i.e. attitudes towards technology), could be more influential in this respect than regional "forces". If ICT usage is strategic for economic competitiveness, than the main actor in this policy issue should be the level the nation state, which can manage the main determinants of ICT uptake. If this explanation applies, the findings would therefore suggest that it would be of limited value for Regional Governments to invest heavily in promoting ICT uptake by enterprises or private households. Regions should instead focus on other fields where regional policies could be more effective: fields where regional differences appear more significant, such as R&D and innovation policy, or where regions can have a more direct impact, such as ICT usage by local public administrations (e-government).

Another explanation would point to the characteristics – in particular, to the limitations – of statistical indicators on ICT-related phenomena. The percentage of enterprise buying on line does not fully reflect the real impact of such ICT applications on the economy, because as an uptake measure the indicator does not take account of the relative significance of online channels for the companies in question. A more appropriate indicator, taking into account this difference, would be an indicator measuring the total volume of electronic transactions in a region. Innovation indicators, in fact, such as patents per capita and R&D expenditure, take into account this difference – there is no innovation indicator such as "percentage of enterprise who register a patent". At the same time, no data are available yet on ICT expenditure at the regional level, but we do have data on R&D expenditure. Further research is needed in this direction, to assess if different indicators (taking into account the different weight of big and small enterprise) could show a stronger correlation with GDP growth and/or regional variation. eBusiness W@tch, an initiative of the European Commission's Directorate Generale Enterprise, provides data on company's ICT usage which are broken down by the share of online sales and purchases as percentages of total spendings/sales. The UNDERSTAND project has adopted this methodology, but the sample of participating regions is not big enough to measure differences. It is a matter of future analysis if and how ICT indicators which are "weighted" to account for differences in the intensity of uptake have stronger regional variations and stronger correlation to competitiveness that "non-weighted" ICT indicators.

Furthermore, another methodological question arises with regard to indicators such as "percentage of business that use...": which is the correct base for this type of indicators? Traditionally, question addressing aims and intensity of Internet usage are only asked to people and business actually using the Internet, and the base for reported indicator values is often business or citizens "Internet users". However, especially with regard to citizens, the basis is very different from country to country, and therefore the same percentage of Internet users buying on line often corresponds to different actual percentages on all population. What is the correct basis for the indicators on types of Internet usage? If we use the total population, usage indicators will be highly influenced by the main indicator (% of Internet users) and will therefore hide the different patterns of usage between the regions. If we use the percentage of Internet users, we risk comparing "apple with pears", as the 50% of on line buyers in Stockholm will be 40% of the population, where 50% of on line buyers in Bologna will mean 20% of the population, because of the different basis (percentage of Internet users). It is worth also mentioning that when it comes to technology diffusion, normally a small percentage of Internet users corresponds to higher percentage of on line buyers, because only the expert people ("geeks") use the Internet. For these reasons, it could be better to use the total population as the basis. While this discussion does not directly affect the results above described, as the basis of business using the Internet is very similar from country to country, it is worth marking this as an item for discussion if and when consistent regional data on ICT usage over time will become available.

Thirdly, for analysis at sub-national level, regional reference units have to be selected – these may be regions, counties, municipalities, boroughs etc, depending on the country's geographical structure, the national administrative system and, unfortunately most often, availability of data. The choice of reference unit can be expected to have a strong influence on the extent to which disparities are being identified in the data. The fact that differences between NUTS2 regions (as used in BISER due to comparability to Eurostat indicators and for reasons of sample frame availability) are smaller than expected when comparing with traditional innovation indicators might be explained by too coarse-grained reference units. Differences may be much more prominent when conducting the analysis at the NUTS3 level – or even further below at the level of municipalities. For example, the difference observed in innovation rates between the Italian regions Emilia-Romagna and Lombardy can be expected to derive mainly from differences in the development of the Milano and Bologna agglomerations, which would become much more evident in the data if the NUTS3 or LAU1 level was used for the analysis.

Finally, it could also be argued that the "new regionalism" argument is weak, insofar as statistical variation is not in itself a proof of region-level decision-making influencing these differences, and therefore cannot be considered a justification for regions to claim an institutional role. It could be that regional differences are largely the result of decisions taken at the national, rather than the regional, level, such as in the case that the national government decides to locate a big research centre in a specific region or in the case that national funding is or is not provided for fighting regional disparities in infrastructure availability.

4. Indicators for measuring the impact of ICT

In addition to these observations about the use of indicators for Information Society benchmarking at the regional level, and our tentative conclusions about the implications of benchmarking results so far, a further point needs to be emphasised here. This relates to the extent to which the indicators generally used for benchmarking give a representative picture of the different ways in which ICT is used by companies and the general population for deriving added value. For some time already, the scientific debate about indicators has been dominated by frustration with the fact that what is usually measured are only readiness and intensity of usage, but that the extent to which real impacts /outcomes are achieved is not being captured at all. Unless regional policy-makers can be convinced that investing in the Information Society is not an end in itself, but a promising option for achieving long-term regional development goals, policy-making will remain to be patchy and subject to short-term fluctuations in what is on the political agenda and in what is regarded as "fashionable" and "nice-to-have" and what not.

The response to such criticism has been to define a set of variables about perceived impacts of ICT use by the general population and, in particular, by companies. Such an approach was selected, for example, by Eurostat when it set out – driven by the requirements of the eEurope benchmarking process – to coordinate data collection about ICT across the European Union. It appears debatable, however, how reliable statistics about outcomes are if they are based on self-reported perceptions of impacts. For example, statements from IT decision makers in companies about the effect of ICT investments on profitability must be treated with much care, as they do not necessarily reflect the reality but (also) the attitudes, preferences and wishes of interviewees. Such data should not be interpreted as reflecting the reality so much as capturing company's degree of satisfaction with their ICT investments. As such, they are comparable to statistics on the general population's satisfaction with elements of their life. Such statistics are not without value, but need to be taken for what they are, i.e. a reflection of current moods and perceptions, rather than considered as a proof of the positive impacts of ICT on economic and/or social development.

For informing policy-making, indicators on perceptions of impacts must be supplemented by indicators on "real" impacts. For this purpose, time series data on the main readiness and intensity indicators are needed, together with the more established indicators on regional economic and social development, plus contextual information (socio-demographics etc.). All these indicators can then be fed into multivariate analyses resulting into valid statements about which factors (e.g. ICT investments in specific areas) are related to which outcomes (e.g. employment in certain sectors, civic participation, etc). One condition, however, for this to become feasible is time-series data for a larger number of regions. Because of the costs involved and the requirement for close coordination to allow for comparability, such analysis is not yet possible. However, the basis for an indicator system including measures of "real" impacts has to be put into place as soon as possible in order to obtain time-series data in the not too distant future.

Conclusions

This paper has not addressed a specific issue of analysis but rather outlined a few significant results stemming out of benchmarking projects which could be of use to other researchers and regions.

The main conclusion is that benchmarking could prove a very useful tool provided it is adequately implemented. The main caution points addressed by the paper are:

- Indicators have different meaning in different regional context, and the data analysis should be "regionalized" in order to put the data in the correct perspective. Data are not neutral, and are to be analysed in relation with qualitative information on regional structures and developments in policy-making. There is the risk that scarcity of data leads to some areas receiving higher attention than others, simply because data are available in this field; or that policy priorities are shaped by data without distinguishing between causes and effects but simply trying to "climb up the rankings".
- Available data show that ICT uptake by citizens and business follows very much national patterns rather than regional. This appears to undermine the relevance of regional policy to promote ICT uptake, as key factors are national. It is too early, however, to confirm whether this explanation is valid. More research, using data that is more fine-grained with regard to the regional reference unit, is needed.
- Impact is not to be measured directly through "impact indicators" but rather by cross-analysing ICT data and structural data, through time. No impact measurement is possible without time series.

However, we are still in early days for regional data on ICT uptake, and the main recommendation is for better data and time series. In addition, progress in the design of new, more adequate indicators is needed, such as a measure for ICT expenditure at the regional level, in order to get the full picture.

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