Ambiguity and conflict in the development of 'Third Mission' indicators

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This paper borrows analytical tools from the study of public policy, applying them to issues surrounding the development of universities' 'Third Mission' indicators. The 'Third Mission' refers to all activities concerned with the generation, use, application and exploitation of knowledge and other university capabilities outside academic environments. The paper analyses the generation and management of Third Mission indicators as an example of policy implementation. Using the cases of the UK and Spain, it finds a high level of ambiguity in the definition of policy goals accompanied by conflict among policy stakeholders. In these cases, policy analysts have suggested that policy implementation becomes 'symbolic', and depends on the strength of local stakeholder coalitions. We find that the development of Third Mission indicators fits this model, and conclude by discussing the policy implications of this finding.

THIS PAPER ANALYSES the development of 'Third Mission' indicators. We use the term 'Third Mission' to refer to all activities concerned with the generation, use, application and exploitation of knowledge and other university capabilities outside academic environments (Molas-Gallart *et al*, 2002). These activities add to the traditional 'first' and 'second' university missions: teaching and academic research. Third Mission activities have received substantial policy and academic attention (Polt *et al*, 2001; European Commission, 2003) . There is a perceived need for new indicators to support the management of Third Mission activities, guide policy action and support research on their nature and impact. Yet, despite the many initiatives, the development of Third Mission indicators has been anything but easy. Despite repeated and protracted efforts in several European countries and at European Union (EU) level to develop a common set of Third Mission indicators to assess the nature and impact of university activities on their socio-economic environment, and to enable longitudinal and cross-country studies, progress has been, at best, sluggish. We are confronted with a disorderly clutter of partial indicators stemming from questionnaires and data-gathering initiatives developed at international, national or regional level, with varying degrees of robustness and little, if any, comparability. Why is this the case?

The question is relevant from both an academic and a policy perspective. There is a need for robust analysis to support the development of new Third Mission policies, while there is understandable academic interest in the impact of business and social engagement initiatives on the character of university activity and publicly funded research. Yet, data limitations have constrained research to national and regional analysis or to international comparisons of narrowly defined sub-sets of Third Mission activity. Further, the scope of academic research is often confined to those areas where data are available: mainly on commercialisation activities (ie where universities attempt to generate revenues through the exploitation of their intellectual property – IP), on which organisations keep accounting records for administrative purposes.

The problem for those aiming at the systematic use of quantitative indicators for the analysis of Third Mission activities is that the areas on which

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information tends to exist are not necessarily the most important, and the importance of different activities varies across disciplines. For instance, available data on commercialisation activities are relevant for the analysis of fields such as biotechnology and information technologies, where important markets exist 'close' to university research and training, but they are not adequate for disciplines, such as philosophy or theoretical physics, where the commercial applications are more limited and impact occurs through other channels. Further, universities make contributions to government and civil society as well as to the private sector, assisting not only with economic performance but also helping to improve quality of life and the effectiveness of public services. In fact, it is increasingly recognised that focusing Third Mission activities on IP commercialisation strategies would likely lead to universities delivering less value to society (Florida, 1999). Consequently, any approach to data collection and analysis that focuses purely on university commercial activities is likely to miss large and important parts of the picture.

We will analyse the development of Third Mission indicators as part of the broader environment in which Third Mission policies are defined and implemented. Seeing indicator generation as part of the policy implementation process will help us assess the causes behind the slow progress in the definition and production of indicators. The first section of the paper applies concepts from the policy implementation literature to the issues at hand, and suggests that the generation of Third Mission indicators can be seen as a case of 'symbolic implementation'. We then analyse the British and Spanish experiences, and conclude with a discussion of how these experiences are consistent with the theoretical framework proposed in the first section. We will argue that the problems in the development of new and commonly accepted indicators can be explained by the existence of ambiguity and conflict in the area of Third Mission policies, and suggest some policy avenues that could be better suited to the future development of commonly accepted and comparable indicators. The authors of this article have participated directly in the processes and discussions we present and have derived some of the data presented below from their own experience.

Third Mission and its indicators as a policy implementation problem

For at least a couple of decades, governments in many European countries have been concerned by the way in which universities and public research establishments relate to society. Many different initiatives have been launched to increase the use outside academic environments of the capabilities residing within university organisations. There has been a broad agreement about the need to support these Third Mission activities, but much less clarity as to what the specific objectives and goals of these policies should be. Although it is broadly recognised that the term refers to the engagement of universities in non-academic activities, the same concept of 'Third Mission' is subject to different interpretations:

- As a stream of income. Burton Clark (1998) distinguishes three different streams of income accruing to universities. The First Stream is constituted by *public* core funds that universities receive to support their teaching responsibilities. The Second Stream refers to funds received from governmental research councils to support research. Finally, all other forms of funding constitute the 'Third Stream', including, for instance, income from philanthropic foundations, the European Union, student fees, the private sector, etc.

- As the activities seeking the commercial exploitation of university resources and research results, through licensing, research and consultancy activities, and the generation of spin-off companies. It is often assumed that universities control a broad array of capabilities that are not being adequately exploited for income generation. Through commercial exploitation these capabilities will be released and benefit, not only the universities themselves, but will also generate wealth for the regional and national economies.

- As social outreach. Different analysts and policy-makers will define slightly different sets of social objectives to be achieved by universities. For instance, it is common in Latin American universities to have an office for university 'extension' that supports the local communities, providing, for instance, engineering services for the design of water supply and irrigation systems, vaccination programmes, training programmes for local farmers, etc. In the UK, Ian Gibson, Chair of the House of Commons Select Committee on Science and Technology, has used the term 'community stream' to refer to the need for universities to reach out to their local communities by, for instance, providing *pro bono* services to community associations, and encouraging young people from deprived neighbourhoods to follow an academic career. Further, university researchers have often provided unpaid research and technical support in the aftermath of environmental disasters.[1] All these activities are not commercially led: they do not aim to generate funds, but rather to provide services to the community.

These are only examples of the different, and at times divergent, policy objectives that may be covered by the term 'Third Mission'. Further, policy theory has been changing, with the literature on the 'knowledge society' shifting the analytical focus from technology transfer to the broader concept of 'knowledge exchange'. The product of this situation is a dynamic ongoing policy debate, which translates

into disputes about policy objectives and goals. These debates, however, are seldom made explicit at the policy definition stage. Instead policy objectives are presented in general and broad terms: increasing the contribution of universities to the economy and society is a general objective repeated across countries. That this general objective may be interpreted in different or even divergent ways is left for the practical development and application of policy interventions: in other words, it is defined at what is commonly known as the policy implementation stage.

The core argument of this paper is that the development of Third Mission indicators, far from being a purely academic pursuit, has become a key component in the implementation of Third Mission policies. To help us understand the problems that indicator development in this area is facing, we will draw here on the literature on policy implementation.

The policy scholar R E Matland (1995) has developed a framework for the analysis of policy implementation to explain how different approaches to implementation will emerge in different contexts. He distinguishes policy contexts according to varying levels of ambiguity in the definition of policy objectives, and of conflict among policy stakeholders.[2]

For instance, when there is low ambiguity and low conflict across agencies and actors, 'administrative implementation' occurs. This is equivalent to the 'top-down' implementation model (Sabatier, 1986): the policy-maker will define clear policy objectives and devise tools to carry them out. 'Top-downers' assume that politicians in charge of departments will have the power and the time to define clear political objectives to be then implemented by the departmental bureaucracies. This is, however, seldom the case. The detailed knowledge needed to define and implement policies is often in the hands of front-line bureaucrats, who deal daily with social and economic problems in need of solution. In these contexts policy goals are usually defined in vague, ambiguous terms.

Yet, if there is no conflict regarding the specific definition of objectives, implementation can be left in the hands of the managers and experts in charge of day-to-day operations. This has traditionally been

defined as a 'bottom-up' implementation model. Those in charge of implementation at 'the street level' will define their policy objectives and needs (including the data they require to carry out their tasks) and the resources they need to get them delivered. These models need to assume that a consensus exists about the policy objectives between bureaucrats and political authorities: bottom-up approaches work when there is no societal conflict about policy or where a consensus has been achieved. In this case, Matland argues, policy outcomes will depend on which actors are most active and involved in policy delivery.

Unfortunately, the world of Third Mission policies does not respond to any of these models. The diversity of potential objectives has resulted in ambiguously defined policies. Without detailed knowledge of the processes of knowledge generation and diffusion, politicians tend to define the formal objective of Third Mission initiatives in broad, ambiguous terms that are interpreted in different ways by different stakeholders. There is a degree of conflict as regards objectives. Treasury departments will focus on revenue flows and implementation costs and will tend to favour policies that, on balance, can increase the income stream available to public universities. Community groups and some politicians are likely to support 'social outreach' policies; while technology transfer offices (TTOs) and other departments in charge of implementing Third Mission policies will often have a more nuanced view of their objectives and will be aware of the many different avenues through which the (ambiguously defined) Third Mission objectives can be achieved. Finally, and to make matters still more difficult, many academics are suspicious of the potential impact of Third Mission policies and strive to maintain the primacy of academic objectives within university work. Ambiguity in the definition of policy objectives is accompanied by a degree of conflict among stakeholders about how policies should be implemented.

Matland argues that when ambiguous policy objectives combine with conflicts among policy stakeholders we will encounter a situation that he defines as 'symbolic implementation': implementation will revolve around the deployment of highly visible social symbols. Ambiguity in the definition of objectives can play an important role as a tactic to avoid conflict when defining policy, but the conflict reemerges when the policy is implemented. Different groups of stakeholders interpret the policy in ways that suit their values. This allows them to avoid gridlock, but in the absence of clear objectives they need to back their actions by pursuing goals revolving around highly visible symbols. As a consequence, much policy effort and debate revolves around symbols, which, further, allow groups of stakeholders to institutionalise their own objectives and values (Berg, 2004). Finally, Matland argues that in symbolic implementation contexts, the outcome of the policy process will depend on the strength of

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local coalitions. In other words, the way policies are implemented will vary from one locale to another.

Our hypothesis in this paper is that the development of Third Mission indicators can be seen as an example of 'symbolic implementation'. Stakeholders responsible for policy implementation lack clear policy objectives and try to focus their activities by referring to, hopefully unambiguous, quantitative goals: thus policy implementation can be reduced to the pursuit of targets increasingly defined by limited sets of quantitative indicators. The debates on indicators are increasingly substituting for discussion on policy objectives. Instead, the indicators are the symbols around which policy implementation revolves. Such 'symbolic implementation' can be complemented by the search for instances of 'success' (however defined), which are then given as 'glossy' a presentation as possible to politicians and the broader policy community. Successful cases form the basis of policy reports and presentations, and are often offered to and picked by the press as part of an ongoing policy debate. Case studies of successful examples play also an important symbolic role in policy arguments although, in practice, when facing government departments holding the purse strings, policy managers often find that quantitative data pointing out the impact of a programme are a more convincing tool in the policy debate than a list of examples, no matter how glossy and professional their presentation is.

This paper will show how the development of indicators to show policy impact has become the main component of the 'symbolic implementation' of Third Stream policies. We will use the cases of Third Mission policy debates and indicator development in the UK and Spain and will show how these developments are consistent with the characteristics that Matland attributes to symbolic implementation environments.

The UK experience

The UK has had a long experience in the design and implementation of projects addressing different aspects of 'Third Mission' activities. Since 2001, the Higher Education Funding Council for England (HEFCE) has been carrying out an annual survey, initially known as the Higher Education–Business Interaction (HEBI) survey and later renamed Higher Education — Business and Community Interaction (HE-BCI). The survey collects data on a broad range of Third Mission activities reflecting the contributions of universities to economy and society. The survey is organised into several categories including collaborative research, intellectual property, consultancy activities, spin-off firms, training, personnel links and regeneration.

In parallel, the UK University Companies Association (UNICO), and the Association for University Research and Industry Links (AURIL), supported by the UK Economic and Social Research Council (ESRC), commissioned Nottingham University Business School (NUBS) to carry a survey to gather data on, mainly, the technology commercialisation activities of UK universities. The so-called UNICO-NUBS survey focused on commercial activities including the number of spin-offs created, the barriers to spin-off formation and the income generated from commercialisation activities and was carried out annually between 2001 and 2003 covering a large sample of over 100 UK universities. The structure of this survey built upon the survey instrument designed in the USA by the Association of University Technology Managers (AUTM).

The whirlwind of Third Mission activity that characterised the first years of this century in the UK can be attributed to two interrelated policy events. First, a White Paper on science and innovation published in 2000 by the Department of Trade and Industry saw the British universities as "dynamos of growth" and "major agents of economic growth" (DTI, 2000: 27). To implement this vision, British policies regarding Third Mission activities were reconsidered. Since 1999, HEFCE and DTI had allocated Third Stream resources to universities through discrete calls for tenders under a number of different schemes set up to support mainly knowledge transfer activities. These included the Higher Education Innovation Fund (HEIF), the Higher Education Reach-Out to Business and the Community (HEROBC) initiative, and the University Challenge and Science Enterprise Challenge schemes. Universities trying to access these funds had to bid, presenting specific project proposals. The project-based nature of the funding created long-term instability and therefore prevented the development of long-term Third Mission strategies. Consequently, the funding agencies and departments started considering the establishment of a stable stream of funding (the 'Third Stream') to support Third Mission activities in all UK universities. The objective of this permanent stream of funding would be the reduction of universities' dependence on project bids (and their associated uncertainty and inefficiencies), and the provision of core funding to promote knowledge transfer.

The problem then became the establishment of criteria to distribute these funds across British universities. The UK Treasury sought the establishment of a formula-based criterion that would take into consideration the past performance of universities in a selected set of activities that the funding stream was trying to encourage. The formula would have to be based on a common set of indicators. Establishing the types of indicators, defining them, and setting up and agreeing a formula became a very difficult problem that exercised, and will continue to exercise, the minds of academics, public servants and university administrators.

Administrators of university TTOs were afraid that a simple formula, using relatively easy-to-gather indicators of university patenting, licensing, spin-off

creation, and income generated by commercial activities would not reflect the variety of activities in which they were involved and would result in a disproportionately lopsided distribution of resources. As a result of this concern, in late 2001 the Russell Group of Universities, an informal grouping of UK leading research universities, invited tenders for a study to develop a system of indicators for Third Stream activities. The resulting study (Molas-Gallart *et al*, 2002) stressed the need for a comprehensive definition of Third Mission activities, which would necessarily result in a more complex system of indicators that was initially envisaged. It identified some 65 potential indicators organised under 12 different classes of Third Mission activity and suggested a roadmap towards the implementation of a system of indicators and the eventual development of a funding formula. The report underlined however the complexity of this task.

The different classes of Third Mission activity were based on a fundamental distinction between what universities have (capabilities) and what they do (activities). Universities have capabilities in two main areas: knowledge and physical facilities. Using the means at their disposal, universities carry out three main sets of activities; they teach, research and communicate the results of their work. Both capabilities and activities can be used and developed in support of non-academic socio-economic goals. Figure 1 summarises the different sets of Third Stream actions structured according to this framework. The 65 potential indicators we identified were structured into these 12 different classes.

The emphasis that the study placed in the development of social indicators was corroborated by the results of a stream of workshops and reports that followed. HEFCE tried to agree with stakeholders both the approach to data-gathering and to Third Mission funding. HEFCE and other governmental departments continued to favour the development of a stable stream of funding, and the formula provided the only clear avenue to develop such a system. The first attempt to base Third Mission funding on a formula has been HEFCE's decision to distribute 75% of its Higher Education Innovation Fund (HEIF) for the period 2006–2008 on a set of indicators derived from a variety of sources. The formula has three components (HEFCE, 2005):

- 'Potential and capacity building', reflecting basically the size of each university.
- 'External income', collecting indicators based on resources generated from Third Mission activities, including income from IP exploitation, 'regeneration and development' and from non-credit bearing courses.
- 'Activities not best measured' including data on student placements, engagement with non-commercial organisations and staff dedicated to Third Mission activities.

In total some 12 indicators are included in the formula, about half of them derived from the HE-BCI survey, and the rest from other higher education data sources. This is the first step in a process through which HEFCE wishes to revise and improve the formula through an intense and open process of consultation. The set of indicators that is being used in this first attempt is already very broad and covers activities other than the purely commercial. In part this
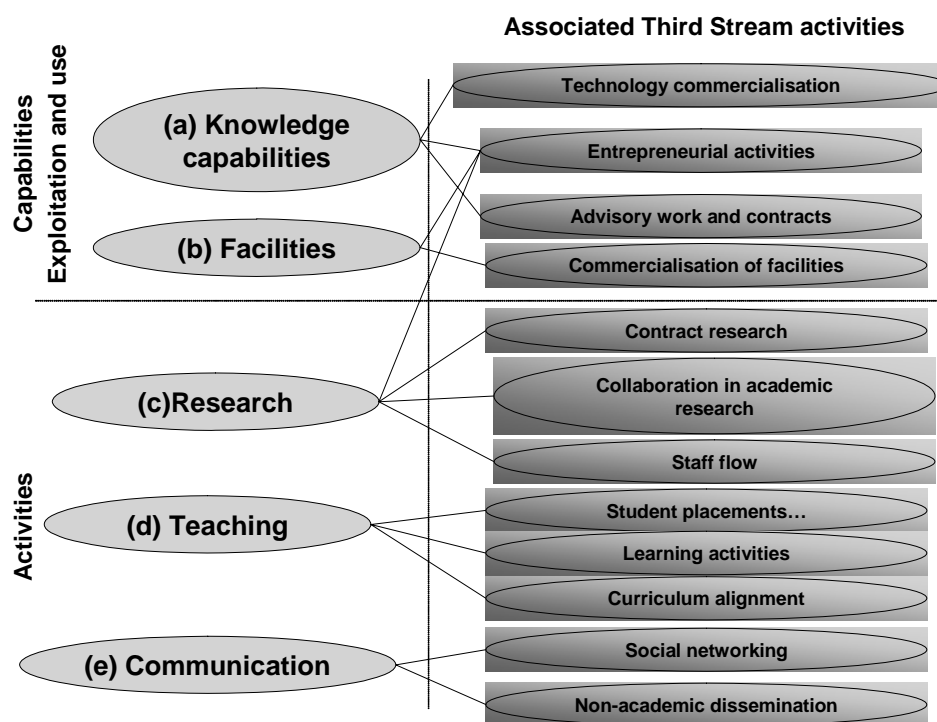

Figure 1. Classes of Third Stream Activity
Source: Molas-Gallart *et al*, 2002

approach has been made possible by the way in which HEFCE had previously broadened its own Third Mission data collection activities. The fourth survey, published in January 2005, added other forms of social exchange to the traditional business interaction indicators that focused earlier versions. Noticeably, the new survey referred to knowledge 'exchange' rather than 'transfer', and the exercise was renamed the Higher Education-Business and *Community* Interaction (HEBCI) survey.

Yet, the relationship between indicator collection and funding strategies is far from being solved. As the formula was being prepared, experts continued to question the wisdom of such an attempt, pointing out the danger that formula-based funding may focus policy on only a subset of Third Mission activities (Hatakenaka, 2005). Recently, HEFCE has commissioned exploratory work to try to determine, through a variation of the HEBCI survey, the impact of existing project-based funding of Third Stream activities. To sum up, progress in the development of new funding tools has been slow and, accordingly, the approach to indicator development remains under constant revision.

The Spanish experience

The first instance in which the issue of indicators for Third Mission activities emerged in Spain was in relation to the implementation of the National R&D Plan in 1988. This was the first time a national programme to support R&D across a broad variety of fields and disciplines had been implemented in Spain (Muñoz, 2001). From its inception the plan included initiatives to promote cooperation and knowledge transfer between universities and public research establishments on the one hand and industry on the other. The main tool the plan envisaged was the creation of technology transfer offices in universities and public research establishments (offices for the transfer of research results — OTRI). To gather information about the outcomes of this initiative became a policy need. In other words, the first attempt to gather Third Mission indicators was directly linked to the monitoring and evaluation of funding schemes. The plan funded the newly created OTRIs who had to report annually on their activities including R&D contracts (number, type, value, type of client), patent applications, licensing contracts, R&D projects and OTRI personnel.

This information was collected annually during the 1989–1995 period, while the OTRIs were all receiving core funding from the National Plan. The data provided a detailed perspective on the OTRIs activities and their evolution, and offered a good longitudinal perspective on the most important channel for Third Mission activities available to Spanish universities. However, this approach to data collection changed when the funding structure changed.

In 1996 this form of core funding was substituted by a new project-based approach to funding. The OTRIs applying for the new forms of funding had to submit, as part of their application, data on their activities over the previous three years. The data requested were much more exhaustive, including detailed information on the personnel structure of the applying OTRI, funding sources, and a number of 'management' indicators which included the number of projects managed, lists of 'clients', patents, licences and spin-offs 'managed', and 'other indicators' selected by the applicant. None of the categories used were defined, and it was therefore left to the applicants to interpret the categories in the way that suited them best. The gathering of a small number of well-defined indicators for reporting purposes across all OTRIs had been abandoned without any discussion, and the data gathered through the funding application process lacked the representativeness, robustness and reliability necessary for their use as an indicator. Nevertheless the data were still used in an aggregate form to provide 'indicators' of Spanish Third Mission activity in the annual National Plan reports.

Along with Third Stream funding available from the National Plan, many Spanish regional governments deployed their own initiatives in support of Third Mission activities as part of their own regional R&D plans. This has led regional governments to request information on these activities from universities and public research establishments, often referring to the economic resources obtained from patent licensing, and research contracts and research agreements with firms and other organisations.

Importantly, the Spanish universities launched two main data-gathering activities of their own. The Conference of Spanish University Rectors (CRUE) has published a biannual report since 1998 offering data on university sources of income including research grants. Unfortunately, the survey has been implemented in a way that does not fit with the conceptual conventions that have been used for decades in the analysis of science and technology policy. Respondents consider that all public grants, regardless of their objective and character, support 'basic research', and all the research stemming from research contracts to be 'applied', thus confusing the source of funds with the objective of the activity.

In 1997, CRUE set up a network of all university OTRIs to support the 'convergence and complementarity' between university research activities and the needs of their socio-economic environment. In 2000 the OTRI Network set up an 'R&D Indicators Working Group' to develop information and indicators that could help them in the management of their work, be used to generate an annual report of their activities, and provide a solution to the proliferation of surveys and reports on university R&D and knowledge transfer activities that were being requested by national, regional and European bodies.

As the departments in charge of responding to official questionnaires and surveys in many universities, the OTRIs found themselves under an increasing administrative burden to respond to the several questionnaires in circulation. The objectives of developing a common survey were twofold. First, to develop an efficient approach to data-gathering and management that could supply the data needs of public agencies and provide comparable data while reducing the substantial effort that was being invested in answering the proliferating requests for data. Second, it aimed to provide a reliable tool for benchmarking and self-assessment of the OTRI Network members.

The questionnaire was developed to be answered by OTRIs and assumed that they engaged in the management of a set of basic instruments. It distinguished between R&D contracts, government grants in support of collaborative R&D, assessment and protection of research results, licencing, and the creation of spin-offs based on research results or university capabilities. Yet, not all OTRIs engage in each and every one of these activities; besides it is common for them to change focus, abandoning at times a whole line of activity to enter or strengthen another. Therefore, it was difficult to agree a questionnaire format that would be equally relevant for a broad variety of institutional set-ups.

In practice, however, there is an even more complex difficulty: the experience with existing and previous data collection initiatives, pilots and co-ordinating discussions has shown that the same 'indicators' are interpreted by different stakeholders in different ways. For instance, when referring to 'contracts', some approaches measure the contracted amounts, others the annual invoicing, others the income accrued, and yet others the number of contracts. Similarly, using 'patents' as an indicator can be done in many different ways: some questionnaires ask for the number of patent applications (national, European or US), the number of patents renewed, the number of licences obtained in a single year or the total number of patents under licence, the income received from licences, and so on.

Not surprisingly then, existing survey instruments are long and cumbersome to answer. The annual survey that is now being distributed to the Spanish OTRIs has some 140 items, of which 127 require the supply of quantitative data, which has to be extracted from the OTRIs' own databases and management systems.

Alongside these initiatives, data continues to be gathered in the context of funding allocation processes, to assess institutes and research groups, and to provide benchmarking tools to managers. It is increasingly common that university, departments and research centres receive at least part of their funding on the basis of past activity or performance as reflected by sets of indicators. Yet the indicators being used vary across universities, public research establishments and regions.

Discussion

Comprehensive Third Mission data is complex and expensive to collect. Both the UK and the Spanish cases share an important aspect of the policy context in which the initiatives to develop indicators have taken place: data collection schemes have been related to the implementation of policy initiatives to support Third Mission activities. In the UK many of the initiatives that have taken place in recent years have been related to the attempt to set up a stable funding system that would not be based on project proposals, but would reward performance. In Spain, data on Third Mission activities was collected, initially, as a reporting requirement and, later, as part of the application process required to obtain funding to support Third Mission projects. The proliferation of agencies with an involvement in university and research policy led to the proliferation of data collection initiatives.

The connection between the development of indicators and the policies to support Third Mission activities has important implications. While the policy goals have remained ambiguously, if at all, defined, policy implementation has revolved around the definition of indicators and their establishment as policy targets. Within this context, characterised by a high level of *ambiguity*, the indicators that will be used to guide policy implementation are not clearly delimited and are the subject of debate and constant redefinition. Should, for instance, indicators of social outreach activities be included among those being collected? What should the balance be between indicators that refer to these activities and those that focus on IP commercialisation? Implicitly, the indicators that are ultimately selected will reflect different policy priorities, and different groups will favour different indicators or different combinations thereof.

The organisations directly involved in Third Mission activities are naturally participating in the discussion on the development of new indicators. TTOs, for instance, are usually responsible for the assembly of data requested by public agencies and, therefore, have a keen interest in setting up systems of indicators aligned with their administrative practices, and which, in their opinion, will adequately reflect the scope of their activities. Further, they are interested in developing indicators that may help them in the management of their organisations:

The proliferation of agencies with an involvement in university and research policy led to the proliferation of data collection initiatives

initiatives to generate comparable indicators for benchmarking purposes respond to this interest. Yet, the objectives and data needs of technology transfer managers are not necessarily the same as those of ministry officials. For instance, the type of data that can help in the efficient management of a TTO is likely to be different from the limited number of indicators that could be used in a funding formula.

Further, academic researchers may have different views on the desirability of Third Mission approaches, and may resist the additional reporting burden associated to indicator collection and centralised management of extra-academic activities. When academics have involved themselves in activities to develop and collect Third Mission data they have been guided by their research needs and have proved less sensitive to the organisational and administrative context within which data is generated and collected.[3]

In short, different groups have different objectives, different data requirements, and different attitudes toward indicator definition, data collection and the final use of such data. The debate on indicators reflects the existence of a *conflict* among the stakeholders in the development of Third Mission policies.

Through its focus on indicators, policy implementation has become *symbolic*, focused on indicators while the definition of clear policy goals and the establishment of explicit policy priorities is left unaddressed. Indicator development is part of the policy implementation process and, as Matland argues, the outcome of this process of symbolic implementation will depend on the strength of local coalitions. This characteristic of 'symbolic implementation' is confirmed by our analysis. There is a fragmentation of initiatives following different approaches to indicator definition and collection, and these differences can be linked to different local institutional structures.

In Spain the OTRIs concentrate many of the Third Mission activities of Spanish universities, and particularly those related to the relations between university and industry. Until today, the OTRIs are practically the only organisations in Spanish universities that take responsibility for commercial exploitation tasks and, naturally, they remain the main locus of activity regarding data collection. The data they collect about their own activities provides an adequate, but increasingly less complete,[4] approximation to Third Mission activities traditionally carried out at the university level (R&D contracts, patenting, licencing, spin-offs). Furthermore, in Spain there are multiple and evolving funding sources (some from central government, others from regional governments). The policy context is diverse and varies from region to region. There has been a multiplicity of initiatives, leading to different indicators being developed and applied in different regions and even in different universities within the same region.

In England, the central role of HEFCE as the funding organisation leading a long-drawn-out process towards the systematic use of indicators in funding formulas explains a process of convergence in data definition and gathering. A formula has now been developed in collaboration with the universities, but the shape of this formula and its component indicators are far from having been settled. The 12 indicators from different sources that are now being used are likely to be revised, and the data gathered through instruments like the HE-BCI survey will adapt itself to the evolving policy needs. Universities are playing an important role in these developments, together with the funding agency (HEFCE) and ministries (eg Treasury) and organisations. The final outcomes will again depend on the strength of the different groups interacting in this policy arena at the English level (Scotland and Wales develop their own funding systems).

Different institutional arrangements across countries and regions lead to the dominant local coalitions of stakeholders also being different. They may have different data collection needs, their management requirements will not be the same, and the use of indicators for policy implementation will also be at variance.[5] In this context it is not surprising then that the attempts to develop a European-wide single system of indicators have made scant progress.[6] It is, at best, very difficult to solve these differences through co-ordinating mechanisms. The implementation context in which indicator development takes place shapes the nature of indicator development. Therefore we are to expect further fragmented initiatives. From the detached perspective of the academic analyst, the datasets that will emerge from this process will be adequate for static analysis of specific countries or regions, but unable to provide the basis for longitudinal and comparative study.

We can conclude that, in the context of 'symbolic implementation', the data needs of analysts are not in the driving seat. The batteries of indicators on which future analyses will be built, and policy decisions taken, will not be provided spontaneously and freely, but will be the outcome of policy-making processes. In this situation, the quantitative analyst studying the relationships between university and society will need to rebuild and generate data sets constantly or end like the proverbial drunk: looking for his keys under the lamppost, where the light exists, rather than in the place where they are likely to have fallen.

This is a rather bleak view of the future. While indicator development continues linked to policy development and implementation, there is little room for improvement. To move away from this environment is extremely difficult. Data collection must be supported by adequate administrative processes and TTO managers will play a key role as data gatekeepers. The type of indicators that is becoming available is shaped more by existing managerial processes and group interests (both of which are highly variable within and across countries) than by the plans or desires of policy analysts.[7]

The independent analyst will therefore be interested in the following question: Is it possible to

break the link between indicator definition and policy implementation? We are not optimistic. A possible avenue to 'disconnect' them, while maintaining the involvement of the institutions and groups in charge of running Third Mission activities, is to move data generation initiatives to a supra-national level. There are some examples already of supra-national initiatives to develop comparable indicators in areas related to Third Mission activities. In the last years both the OECD and the European Commission have been involved in studies aimed at benchmarking industry-science interactions.[8] These initiatives aim to undertake international comparisons by using aggregate country-level data on a limited number of indicators of industry–science interactions. They have had, however, the traits of a co-ordinating activity and suffered from the same difficulties as we have explored in this paper.

To be successful moving data generation to a supra-national level would require, instead, the assignment to an organisation like the OECD of the responsibility for data development and management, in a similar way to what is already being done with other science and technology indicators, including R&D. Yet our analysis does not suggest that this will be easy to achieve. Which policy groups at the national level would be interested in pursuing such a strategy? Even if a consensus was reached on the institutional leadership to launch a process of indicator definition and collection, technical problems would require a long-term effort. The way in which R&D and innovation indicators have been identified and collected by the OECD provides a good example of the difficulties that will be encountered. It took a long time to define, agree and implement the R&D indicators that are currently used worldwide. The *Frascati Manual* was revised and several annexes issued. It then took several years to broaden these indicators to cover other, increasingly relevant, innovative activities and to produce the *Oslo Manual* in 1995. This was then revised in 2005 and we are still far from obtaining reliable and comparable innovation indicators.

In the meantime international comparisons and benchmarking data must be consumed with caution. An awareness of the institutional context in which data is defined and generated is a prerequisite to quantitative comparative analysis. By the same token, academic analysts must be realistic about the demands they may place on stakeholder communities when attempting to define new indicators. The scope for academic analysis of Third Mission data is dependent on the way in which data generation has become an element of the policy process and the focus of a symbolic approach to policy implementation.

Notes

1. Two Spanish examples are the oil spill caused by the sinking of the tanker *Prestige* in north-east Spain, or the massive release of toxic waste from a zinc mine into the Guadalquivir River and the Doñana National Park.
2. These are, at times, interrelated: often public policies will be worded in ambiguous terms to avoid conflict.
3. For instance, the ProTon network has received proposals to collect indicators, which TTO managers within the network deemed virtually impossible to collect.
4. The data provide a very poor estimate of activities (like social outreach activities) that are carried out independently by university researchers and groups and other types of university units.
5. It must also be noted that a similar indicator will have different meanings in different contexts. While in Spain most formal Third Mission activities are channelled through the OTRIs, in the UK there is a wider diversity of organisations involved. Traditional TTOs are accompanied by industry liaison offices, university departments in charge of IP management, etc. Therefore, in the UK an estimate of university–industry relations cannot be carried out through a survey of TTOs, but must done at university level.
6. An example of the difficulties encountered can be found in the work of the ProTon Europe network. This is an initiative funded by the European Commission bringing together 54 TTOs from different European countries. One of its working groups focused on the development of indicators that could provide the base for benchmarking across institutions. The network was set up in 2002, and carried out two pilot surveys in 2004 and 2006. The latter included 107 questions and gathered information from 392 organisations from a total of 505 initially targeted. The questionnaire was very difficult to agree, and then many of the responses obtained were incomplete. At the root of the problems were the different organisational models and sets of activities carried out by TTOs in different countries (Conesa *et al*, 2007).
7. The only areas in which abundant data exist and cross-country comparisons are possible are those where due process requires the filing of public data, such as patenting and patent-related income flows. These are, however, only one small part of the very broad field of Third Mission activities.
8. The OECD devoted the third phase of the National Innovation Systems Project to the relations between science and industry. Within this framework, the OECD and the German Federal Ministry of Education and Research jointly organised an international conference, Benchmarking Industry and Science Relationships, in Berlin, on 16–17 October 2000. Further, in 2001 OECD organised a high-level workshop on the role and significance of intellectual property rights emanating from public sector research organisations. One of its objectives was to examine the extent to which various OECD countries are gathering data on aspects like the number of TTOs and technology liaison offices per research university, the funds committed to IP management, number of patents and licensing revenues, number and size of research contracts, etc. The goal was to suggest a standardised methodology and some core questions to be included in future questionnaires so that this type of data could be internationally comparable. The European Commission has launched several studies and workshops, followed by the publication of the resulting reports (Polt *et al*, 2001).

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