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One and two equals three? The third mission of higher education institutions

Rómulo Pinheiro[a]*, Patricio V. Langa[b,c] and Attila Pausits[d]

[a]Department of Political Science and Management, Faculty of Social Sciences, University of Agder, Kristiansand, Norway; [b]Faculty of Education, University of the Western Cape, Cape Town, South Africa; [c]Faculty of Education, Eduardo Mondlane University, Maputo, Mozambique; [d]Department for Continuing Education Research and Educational Management, Danube University, Krems, Austria

In modern, knowledge-based societies, universities play an increasingly important role in achieving economic growth and social progress. Their traditional roles and missions are being broadened as to accommodate activities that facilitate engagement with various stakeholder groups. Universities do not want to be regarded as isolated and separated islands from their surrounding communities and have therefore developed internal mechanisms to bridge their activities with the needs and expectations of external actors. In this paper, we take stock of recent scholarly work and ongoing debates surrounding universities' third mission (TM). Broadly speaking, TM refers to the changing roles and functions of universities which, despite recent developments, have always been a matter of debate amongst academics and society at large.

Keywords: higher education; third mission; engagement; institutionalization; universities

1. Introduction

In modern, knowledge-based societies, universities play an increasingly important role in achieving economic growth and social progress. Their traditional roles and missions are being broadened as to accommodate activities that facilitate engagement with various stakeholder groups. Universities do not want to be regarded as isolated and separated islands from their surrounding communities and have therefore developed internal mechanisms to bridge their activities with the needs and expectations of external actors.

In this paper, we take stock of recent scholarly work and ongoing debates surrounding universities' third mission (TM). Broadly speaking, TM refers to the changing roles and functions of universities which, as demonstrated in the following section, have always been a matter of debate amongst academics and society at large (Castells 2001).

The paper is organized into six distinct but complementary sections. In Section 2, and following the Introduction, we sketch out the global debates (existing literature) on the TM. We then move on to illuminate on the different, existing conceptual and analytical approaches and perspectives. Section 4 briefly presents recent efforts aimed at measuring TM. In Section 5 we zoom in on the structural and cultural manifestations of TM

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*Corresponding author. Email: romulo.m.pinheiro@uia.no

institutionalization across three distinct levels of analysis: macro (policy), meso (organizational) and micro (sub-unit and individuals). The paper concludes by suggesting new avenues for future research.

2. The ambiguity and ambivalence surrounding the TM

Implicit to the notion of a TM is the fact that, historically, there has been a first and second mission performed by universities[1] (Ridder-Symoens 2003). The primary mission of the medieval European university (circa late eleventh to the early sixteenth century) was the conservation and transmission of knowledge, through teaching (Cooper 2011). The nineteenth century Humboldtian reforms (Rüegg 2004) initiated what some have termed the 'first academic revolution', by institutionalizing research as a core university mission alongside teaching (Etzkowitz and Webster 1998). According to Etzkowitz (2001), a 'second academic revolution' has been under way since the late 1980s. Building upon the first wave, which brought research to the core of academe, this second phase is substantiated on two key elements, namely, the translation of research findings into intellectual property or the 'commodification of knowledge' (Naidoo and Jamieson 2005) and the direct contribution of university activities to economic development or 'societal impact' (O'Carroll, Harmon, and Farrell 2006).

Notwithstanding, the origins of this so-called 'second revolution' can, historically, be traced back to the late nineteenth century, with the passing of the Land-Grant College Acts (1862 and 1890) by the US Congress, which led to the establishment of land-grant colleges across the country (Christy and Williamson 1992). Their core mission, as set forth in the 1862 Act, aimed at providing practical instruction in the fields of agriculture, engineering, military science and science, as a response to the challenges brought by the industrial revolution and, consequently, substantial changes in social and economic structures at the local and national levels, e.g. as a result of urbanization. This more pragmatic orientation contrasts with the historical emphasis put on abstract, liberal arts education provided by the well-established universities like Harvard (1636) and Princeton (1746), which focused primarily on the transmission of 'high culture' and the socialization of future social elites (for similar discussions see Castells 2001). Similarly, in England, the establishment (the second half of the nineteenth century) of a set of 'civic universities' signalled a move away from the traditional focus on the study of the classics and mathematics offered by Oxford and Cambridge (Jones 1988). As in the USA, this shift was linked to rising industrialization and the various challenges it posed to society and the local economy. That said, in contrast to Europe where the TM has resulted in considerable contestation by academics, particularly amongst the well-established research-intensive universities, US-based universities (and the ideological pragmatism characterizing their surrounding localities/society), have over the years, been much more willing to collaborate with external parties and adapt their core activities in light of external events and expectations.

One of the inherent difficulties with the TM concept is that it has traditionally been much more broadly defined – also taken into account contextual circumstances – when compared to teaching and research (see next section), thus resulting into considerably ambiguity as well as ambivalence by university stakeholders. Yet, over time, internal (university) conceptions of what the TM entails (roles and functions) have gradually evolved from being approached as a 'necessary evil' (Neave 1979) or a 'nice to have'

towards becoming a 'moral responsibility' (Chatterton and Goddard 2000; Belshaw and Thomas 1984).

More recently, and in the context of a much fiercer competitive higher education landscape, both nationally and globally, TM has come to represent a 'strategic opportunity' for generating additional income and securing public support (external legitimacy) towards universities' core tasks and functions (Clark 1998; Mahrl and Pausits 2011; Pinheiro, Benneworth, and Jones 2012). All in all, from the side of external stakeholders like the state, there is a general concern that the traditional roles (the first two missions) of universities might not be sufficient for the successful achievement of socio-economic objectives (Karlsen 2005). From the perspective of universities' central administration, the absence of an active framework for societal engagement, articulated around TM strategies and goals, is often perceived as resulting in a loss of external legitimacy, thus contributing to institutional marginalization (Brulin 2001).

The 2005 *Talloires Declaration*,[2] on 'the Civic Roles and Social Responsibilities of Higher Education', exemplifies the emphasis being put on the need for a more societally engaged university (cf. Watson et al. 2011), in contrast to the more inner-oriented 'ivory-tower'. The Russell Group, an association of leading UK-based research-intensive universities, has defined TM as 'the generation, use, application and exploitation of knowledge and other university capabilities outside academic environments' (Molas-Gallart et al. 2002, 3). A growing number of social scientists have, in the past decade or so, insisted that TM-related tasks, such as 'applied research', 'regional development', 'innovation', 'outreach', etc., should be conceived as an integral element of universities' core activities, i.e. that they should be embedded in, and/or tightly coupled with, teaching and research endeavours (Chatterton and Goddard 2000; Duke 2008; Nedeva 2007; Vorley and Nelles 2008; Schwartzman 2010). A primary rationale for this increasing emphasis on more tightly coupled structures and activities pertains to the notion that, in a globalized network society (Castells 2010), universities are increasingly *interconnected* and *interdependent* with a variety of external constituencies at the local, national and international levels (Jongbloed, Enders, and Salerno 2008; Pinheiro 2015a).

The notion of TM (its purpose and content) has, in recent years, been shaped against the backdrop of an ongoing fierce debate regarding the changing role and function of universities on the one hand (Harding et al. 2007; Temple 2011), and the importance of science and knowledge to society/economy on the other (Nowotny, Scott, and Gibbons 2002; Johnsen, Torjesen, and Ennals 2015). According to Laredo (2007), the TM is a highly ambiguous concept that is dependent upon *three* interrelated aspects: (1) the configuration of the specific activities of a given university; (2) its degree of territorial or geographic embeddedness; and (3) the national (and we would add regional and global, e.g. Nordics and EU) institutional framework(s) in which it operates. Turning back to the pressures facing universities in the context of a knowledge-centred society and economy (cf. Pinheiro 2015b), not only are universities expected to excel when it comes to education, research and knowledge transfers, but also, it is argued, they ought to do so in 'ways, volumes and forms that are relevant to the productive process and to shaping the knowledge society' (Jongbloed, Enders, and Salerno 2008, 41).

3. Conceptual and analytical perspectives on TM

Laredo (2007) suggests a re-categorization of TM along *three* core functions: (1) educating the masses; (2) professional training and/or specialized research; and (3)

academic training and basic research. According to the author, universities do *not* structure their activities along these three distinct missions per se, but articulate differently those missions depending on the functions they fulfil instead. For example, it is argued that (comprehensive) universities witness very different mixes of the types of activities/functions mentioned above (cf. Pinheiro 2012a), and that this factor alone is a key explanatory variable regarding their competitive standing in various world-rankings (Hazelkorn 2009; Cremonini et al. 2014). Furthermore, following similar arguments like those advanced by Krücken, Kosmützky, and Torka (2007) and Pinheiro and Stensaker (2014a, 2014b), Laredo (2007) highlights the importance of *path-dependencies* and *strategic choices*:

> All universities are thus a specific and probably unique mix of these three functions [...] The choice of this positioning [institutional profile] is often mostly the result of contingent historical factors. Making it evolve, and turning it into a 'constructed' [strategic] choice is key to the articulation of the university with its environment. In such an approach, the activities gathered under the third mission become the outcome of this positioning …
> (Laredo 2007, 454)

Laredo (2007, 451–452) links (strategic) 'positioning' to the notion of university models or categorizations, by contrasting two basic templates: 'universal/generalized', commonly known as a research-intensive comprehensive model vs. 'vertical/horizontal, specialization' characterizing a more locally embedded model of the university. The author proposes an operational model to assess TM activities on the basis of *eight* dimensions, of which four are *social* and four are *economic* (Table 1).

Nedeva (2007) argues that TM should be defined in *relational* rather than functional terms, i.e. in the context of the reproduction of existing functions rather than the emergence of new ones. The author conceptualizes TM as pertaining to a different set of university responsibilities, namely wider participation, social engagement and direct contributions to society/economy. According to her, defining TM as a demand for interacting externally or establishing relationships with non-academic domains reveals that this process is not about the gradual absorption of new functions into the core of the university but about reproducing it. This perspective is aligned with the view of the university as a fiduciary and relatively autonomous institution (Olsen 2007) and its levels of persistence (stability) and resilience over time (Karlsen and Prichard 2013), regardless of changing external circumstances. For Nedeva (2007) what is 'new' here is the re-framing of the aforementioned activities as TM, moving them 'from the institutional periphery to the very core of the universities' (Nedeva 2007, 86). It is argued that this shift results in the redesign or reproduction of core functions (teaching and research)

Table 1. TM activities: social vs. economic.

Social	Economic
Public contracts	Human resources
Participation in policy-making	Intellectual property
Involvement in social and cultural life	Spin-offs
The public understanding of science	Industry contracts

Source: Based on Laredo (2007).

along two key dimensions: *external relations*, with focus on linkages and interdependencies; and *relevancy*, emphasizing outcomes and societal usefulness. Academic reactions towards closer engagement with external, non-academic domains (i.e. 'the rules of engagement') are likely to be determined by the interplay between *three* factors: (1) the nature of the domain, e.g. industry vs. community; (2) the current position of the university, i.e. its market status or external legitimacy and its resource dependencies; and (3) the nature of the exchange between the parties involved: short vs. long term; public vs. for profit, etc. (Nedeva 2007, 96).

Nedeva (2007) proposes two 'ideal types' (models) of universities in regards to TM. There is the *private, for-profit university* type modelled on Stanford University, characterized by: high academic standards/scientific reputation in the realms of teaching and research; strong links with global industry; and financial flexibility. In contrast, there is the *service provider*, known by its established reputation as a regional player, its vast linkages with the local community, industry included, and its financial dependency on the public purse (for an example from the Nordic region consult Pinheiro 2013). According to Nedeva, the first 'university-type' is in a privileged position to internally develop the TM, particularly around the 'new sciences', like biotechnology. The 'service-university', however, runs the risk of further marginalization given its susceptibility to shifting external events and stakeholder demands (government included), and the consequent impact on universities' institutional profile, inner dynamics and core structures and functions.

Jongbloed, Enders, and Salerno (2008) contend that a major challenge facing modern universities lies on the need to critically assess and evaluate the relationships with various external constituencies, stakeholders and communities. According to them, a major methodological dilemma facing researchers whilst analysing TM pertains to the phenomenon known as 'mission overlap' (see also Enders and Boer 2009; Krücken, Kosmützky, and Torka 2007). Jongbloed and colleagues content that, rather than conceptualizing TM as a separate function or mission, the former should best be conceived as 'a reflection of the unique stakeholders that fall outside the traditional purview' (2008, 46). They propose instead that TM be defined around the term 'community engagement', i.e. the set of activities consisting of a *community* and a *knowledge transfer* function, 'through which the institution can demonstrate its relevance to the wider society and be held accountable' for its actions (Jongbloed, Enders, and Salerno 2008). In this sense, and in contrast to Nedeva and Laredo, the above authors argue that TM is thus less about relationships and more about mutual beneficial *partnerships*, with consequences when it comes to matters pertaining to university governance and accountability (see Vukasovic et al. 2012).

Vorley and Nelles (2008, 2012) advance the concept of 'entrepreneurial architectures' (EAs) to investigate the ways in which the TM positively reinforces universities' core activities.[3] Drawing on the 'enterprise' or 'entrepreneurial' university (Etzkowitz et al. 2000), the authors' main argument is substantiated around the notion that not only is the TM built upon internal capabilities around teaching and research, but also more importantly, TM-related activities have the potential for contributing to the further development of core capabilities. On the basis of empirical evidence, from Europe and the USA, on the positive effect between university–industry relations and scientific performance, they argue that:

> While the Third Mission is often thought to privilege research-intensive universities, it has the capacity to develop the research base of all [types of] institutions … [it] also has a potentially positive recursive impact on teaching and training missions … Just as the involvement of faculty in their own research agendas enhances the value of teaching (Etzkowitz et al. 2001), enterprising academics with links to industry, collaborative research experience and/or commercial experience, can also deepen the scope of the learning experience. (Nelles and Vorley 2008, 7, 8)

The authors emphasize the importance of institutional contexts in predicting the impacts of third-stream activities on teaching and research missions, by highlighting that 'much depends on how universities choose to adapt these activities and the relative development of their entrepreneurial architectures' (Nelles and Vorley 2008, 11). In doing so, they draw one's attention towards the critical role played by central leadership structures in both leveraging and consolidating the TM as an institutional-wide strategy. In this respect, university management is referred to as 'entrepreneurial architects', i.e. the key social agents driving internal processes of *integration*, *design* and *evolution* (change or renewal), including the institutionalization of the socio-economic role of universities (Nelles and Vorley 2008, 11–12; see also Pinheiro 2012a, 2012b). Finally, the authors are keen to stress the importance of internal linkages or the degree of coupling amongst tasks:

> Positive feedback beyond the third stream [non-core tasks] is only effective where the Third Mission is integrated into broader institutional strategy – where inner connections link functions and goals through consolidated entrepreneurial architectures. Where the third stream remains isolated it is more likely that *tensions*[4] will develop between missions and there will be less scope for mutual reinforcement.(Nelles and Vorley 2008, 12; emphasis added)

4. Assessing TM activities

According to some scholars, it is important not only to label TM-related tasks for the purpose of better visibility, but also to enhance their measurability via the development of proper metrics or indicators (Mahrl and Pausits 2011).

Molas-Gallart et al. (2002), on behalf of the Russell Group of (research-intensive) UK universities, have suggested a model (Figure 1) for both identifying and assessing TM activities that is based on two key dimensions: *capabilities* (what universities have) and *activities* (what universities do). Their point of departure is 'impact', i.e. the manifold ways in which university activities, particularly research, affect economic performance and society in general. The authors acknowledge that these 'effects are not linear, but are often based on iterative, organic and self-reinforcing processes' (Molas-Gallart et al. 2002, 5). They identify 12 TM-related categories shaping the relationship between universities and the surrounding society (see also Stachowiak et al. 2013).

Following the efforts by the Russell Report, a group of European experts under the umbrella name of 'Prime Network', working on behalf of the *Observatory of the European University*, developed an evaluation (Radar) model (Figure 2) to detect and rate TM activities. A total of eight dimensions (some social, others economic) and their associated indicators were identified. A major limitation of this approach, in our view, is that it narrowly conceives of the economic dimensions of the TM around the traditional functions associated with Technology Transfer Offices (TTOs) and/or Knowledge
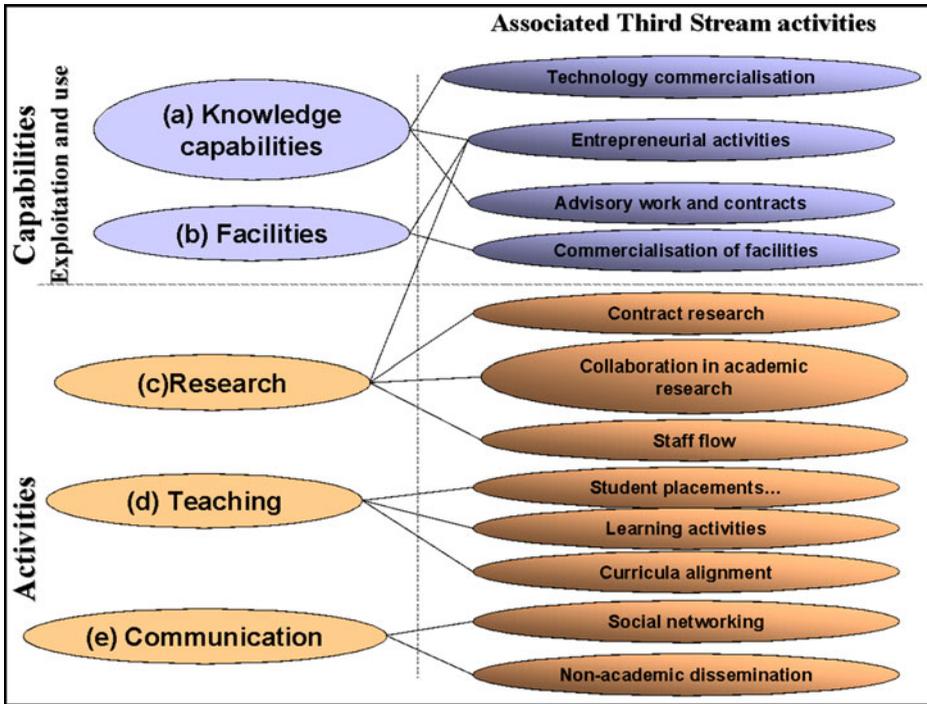
Figure 1. Conceptual framework for analysing third stream activities.
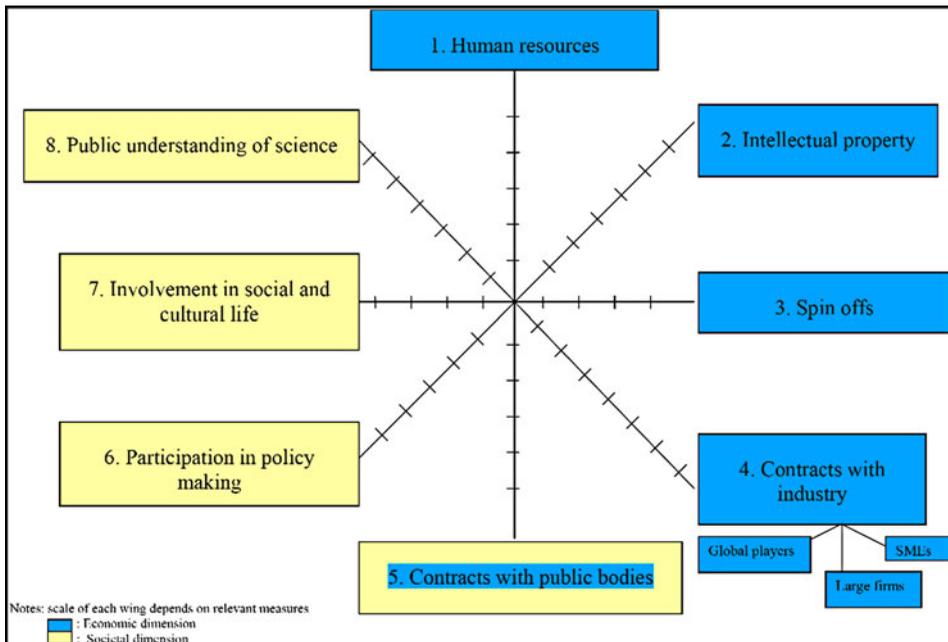Source: Molas-Gallart et al. (2002, 6).

Figure 2. Functions of the TM mission (Radar).
Source: PRIME Network (2006, 130).

Management Centres, i.e. it primarily focuses on the exploitation of research findings in the context of industrial innovation (cf. Cai and Liu 2015).

Finally, across Europe a group of scholars ('E3M'[5]) has been working on the development of comparative TM indicators with the aim of fostering an international debate aligned with the rise of world university rankings, which for the most part, largely neglect third-stream activities (E3M-Project 2012a; Mahrl and Pausits 2011). According to this group, TM activities are gradually being seen, by many internal (e.g. central administration) and external (e.g. the state) stakeholders, as an integral part of university functions and activities, and thus ought to be included in rankings criteria. Following the Delphi methodology, i.e. an interactive forecasting method which relies on a panel of (30) experts (from Europe), three core dimensions were identified and further elaborated: *continuing education*, *technology transfer and innovation* and *social engagement*. Each dimension, in turn, was divided and further described, resulting in the identification of no less than 54 individual indicators (E3M-Project 2012b). That said, preliminary tests indicate that the above indicators can only be used in a very limited way since relevant data are either inexistent or unavailable in a comparable format (Mahrl and Pausits 2011).

5. The TM in action: macro, meso and micro levels

In this section of the paper we illuminate how the TM manifests itself in real terms, by providing a holistic account (based on recent empirical investigations) of the structural and cultural adaptations at the *macro* (policy), *meso* (institutional policy and strategies) and *micro* (academic groups and individuals) levels.

5.1. Macro level

The conceptual frameworks presented above have mainly resorted to the institutional perspective as a point of departure, thus emphasizing the meso or organizational level. In our view, however, this needs to be complemented by shedding light on the importance attributed to the national (domestic) and (increasingly) supranational frameworks in which the institutions operate. Below, we provide a description of the key macro-level dimensions affecting the institutionalization – diffusion and adaptation – of TM.

In Europe, policy formation has, in the last 15 years or so, been dominated by an ambitious modernization of domestic higher education systems (Maassen 2009). These reform processes have significantly influenced the core missions of institutions (research and teaching), but have also shed attention on their direct contribution to economic development and innovation by bringing 'social impact' to the fore (Pinheiro 2015b). Comprehensive system reforms, which are often expressed and propagated with headings like 'from government to governance' (Kickert 1995), 'from teaching to learning' (Nygaard and Holtham 2008) or 'from research to innovation' (Etzkowitz and Leydesdorff 2000) have led to a new discourse regarding the social and economic role of higher education activities (O'Carroll, Harmon, and Farrell 2006). Politicians, decision-makers and university administrators are currently in the search for a new 'foundational pact' (Maassen 2014), substantiated around a diversified identity and a new strategic anchoring of institutions in society (Molas-Gallart et al. 2002). In such an environment, articulating the social contract through TM activity has become a common feature for both governments (policy) and institutions alike. For example, in Norway, societal engagement or outreach (*formidling*) is now an official mission (mandate by law) for all higher education institutions. In the context of knowledge transfers and innovation,

most European governments have devised a series of policy instruments geared towards stimulating the interaction between academics and external actors like industry (for a recent review see Pinheiro 2015a).

National policy frameworks differ from country to country, reflecting a variety of developmental stages and historical trajectories (cf. Neave and Amaral 2011). Higher education systems are always embedded into a given national context (Clark 1983). Their purpose or socio-economic function is determined by policy-makers, governments and political parties. More often than not, national development plans refer to higher education (its mission and goals) as the 'vehicle of change' or the 'engine of (societal and economic) development' (cf. Castells 1993). Thus, universities in one country might have different strategic goals then in another country. The importance of these missions may vary over time and in the light of specific national developmental stages.

Within Europe, but also elsewhere, one finds different conceptualizations (structural models) of higher education systems (cf. Kyvik 2009). Some, like the UK since 1992, are *unified systems*, with universities as the only organizational archetype. Others, like Norway, are *binary systems* composed of universities and more vocational, non-university institutions such as university-colleges, yet both are regulated under a common legal framework. There are also cases (e.g. in Austria), where different legal frameworks exist for different types of institutions, a characteristic feature of *dual systems*. Generally speaking, the core mission of non-university institutions is teaching, but they are increasingly becoming involved with (applied) research activities as well (Kyvik and Lepori 2010). The TM has, traditionally, played a vital role as a rationale for the establishment of new higher education institutions (some of them of a more vocational type) in more peripheral geographies as to serve local actors across the public and private sectors (Arbo and Eskelinen 2003; Pinheiro 2013).

As a result of the transition from governance to steering at a distance (Maassen and Stensaker 2003), legal frameworks provide more and more responsibility (institutional autonomy) to institutions, not only with respect to strategic (e.g. profiling) but also in regards to operational issues like staffing and budgeting. In the context of an operational environment characterized by increasing competition for students and staff (Kehm and Stensaker 2009), resource dependencies (Jongbloed 2010) and stakeholder management (Jongbloed, Enders, and Salerno 2008), the TM is increasingly becoming part and parcel of contractual arrangements between governments and institutions and as a means of gradually reducing the dependency on the public purse (Pinheiro 2012a, 2012b).

5.2. Meso level

Recent studies have shed light on *three* key dimensions that play an important role when it comes to the institutionalization of TM across the board, and within a given university, namely: (1) institutional policies and strategies; (2) structures and mechanisms; and (3) value systems or culture.

5.2.1. Policies and strategies

A major, significant change since the turn of the twenty-first century pertains to the way in which the TM manifests itself internally within universities. Traditional accounts of societal engagement stressed the importance played by individual actors, meaning that TM was primarily a 'bottom-up' and ad hoc (largely informal) endeavour at the level of the *academic heartland* (Clark 1998). The emphasis here was on the informal networks,

based on trust, between internal and external actors, and the good will of both to collaborate on behalf of their respective organizations. This is still an important element of TM (see below), yet it has been supplemented by more formalized and rationalized arrangements at the level of the central administration, covering the university as a whole. As governments and other external constituencies increased their pressures on universities to become more socially engaged and responsive, universities' leadership structures responded accordingly by including TM-related tasks as part of internal policy and strategic frameworks (Pinheiro 2013; Benneworth, Pinheiro, and Karlsten 2014; Fumasoli, Pinheiro, and Stensaker, in press). This phenomenon is part and parcel of the rise of *strategic science regimes* in higher education (Pinheiro and Stensaker 2014a) on the one hand, and the modernization of universities' structures and activities, in the form of enhanced *professionalization* (Gornitzka and Larsen 2004) and rationalization (Ramirez 2010), on the other. The main drivers are threefold: First, universities' leadership structures wish to signal to external stakeholders, the state included, that they are both willing and able to directly engage with external actors across the public and private sectors. This posture, in the eyes of institutional scholars, aims primarily at securing external support or *legitimacy* (Deephouse and Suchman 2008) towards university goals and activities. Second, the operational (market) conditions under which universities operate have changed rather dramatically in the last 15 years or so. Not only has domestic competition – for students, funding, staff and prestige – intensified, but also this was accompanied by a rise in global competition as well (Kehm and Stensaker 2009). Resorting to TM is thus a strategic avenue to reduce resource dependencies on the one hand, and to enhance market recognition (branding) and competitiveness on the other. Third, TM is a means of enabling new internal (*coupling*) and external (*bridging*) arrangements with the aim of strengthening existing assets and capabilities (*exploitation*) as well as developing new ones (*exploration*) (see March 1991). An example is the case of online learning, more recently in the form of Massive Open Online Courses.

5.2.2. Structures and mechanisms

Universities have, over the years, devised a series of new structural arrangements in order to more systematically engage with the surrounding society. Examples include, but are not limited to, TTOs (see above), business incubators, science parks in the campus vicinity, green houses, applied centres of research and innovation, continue education units, etc. (for a recent review see Pinheiro, Benneworth, and Jones 2012). What is more, the central steering core of universities has, in addition, been devising a set of 'new rules of engagement' aimed at standardizing the ways in which academics engage with the outside world. Examples include, the formalization of HR policies putting limits on the amount of time spend on third-stream activities (e.g. consultancy), rather sophisticated intellectual property rights procedures, etc. There have also been efforts to enhance the degree of oversight and control, based on a regular mapping and reporting of TM activities (and results) by academics. This, in turn, has not only meant that the TM has become increasingly bureaucratized, but also that, in the eyes of some academic communities, what once was a voluntary activity has now become an obligation, adding to the daily pressures and heavy workload of academic professionals (cf. Pinheiro 2012a). That said, various studies reveal that current incentive and reward structures are either non-existent or largely inadequate, thus creating major structural barriers for academic

engagement to occur (Schwartzman 2008; Pinheiro 2012a; Pinheiro, Normann, and Johnsen 2012; Benneworth 2013).

5.2.3. Value systems (culture)

Several studies point to the importance of the *symbolic*, value-laden dimensions of academic life when it comes to efforts aimed at institutionalizing TM across the board (Gunasekara 2006; Pinheiro 2012a, 2012b; Pinheiro, Benneworth, and Jones 2012; Goddard and Vallance 2013). Three distinct yet interrelated aspects play an important role in this respect. The first pertains to path-dependencies (Krücken 2003) intrinsically associated with the 'history' and 'prior experiences' of engagement. The second is linked to the institutional profile of the universities (e.g. research vs. vocational institutions), and whether the dominant ethos amongst academics is that of a *local* (outer-) or *global* (inner-) orientation (Goldberg 1976). The former tends to focus on *relevance* whereas the latter on *excellence* (see Perry 2012). Finally, disciplinary considerations are not unimportant since TM and its various manifestations (engagement, innovation, outreach, etc.) represent 'different things to different people' in the light of their respective knowledge domains (Pinheiro 2012a; Pinheiro, Normann, and Johnsen 2012).

5.3. Micro level

While incentive mechanisms and programmes by governments and other funding agencies attempt to inspire institutions to engage more with external constituencies (above), less is known about how individual disciplines and academics respond to this call. Studies on university TM or other forms of engagement with external constituencies tend to focus on the structural and institutional features at the expense of the individual behaviour across the academic heartland (Clark 1998). One way of tracking academics' engagement with TM is through analysing the scope and nature of their professional networks (Langa 2010; Bozeman and Corley 2004). Drawing on Bourdieu's (1986) theory of field and capital, Langa (2010) has examined the disciplinary differences in the social sciences concerning the possession of scientific capital and levels of engagement with academic and non-academic constituencies across three African universities. In contrast to approaches that regard disciplinary fields as homogeneous epistemic social spaces on the grounds of the principles of the stratification of scientific fields (cf. Becher and Trowler 2001), Langa investigates the relationship between the hierarchical position of selected disciplines and the levels of engagement with both internal and external constituencies. In other words, how academics from different disciplines in the social sciences engage with peers both in the realms of teaching (first mission) and research (second mission) activities and with external constituencies (third mission).

The above study revealed that levels of possession of scientific capital have a significant weight on the differentiation of the disciplinary fields, both within and across institutions, and on the levels of engagement with (internal) academic and (external) non-academic entities. The analysis shows that scientific capital does not determine directly the level and forms of engagement with different constituencies. The differences across disciplines at institutional level as well as individual academics reflect the engagement with academic rather than with non-academic constituencies. This means that the level of engagement (first and second mission activities) varies more between different disciplines when the engagement is related to academic entities than is the case for non-academic (TM activities) entities.

Therefore, engagement is not hitherto a major discriminator amongst institutions and individual academics, as compared to research in particular. Scientific capital as measured through teaching and research indicators is still what gives individual academics prestige and provides institutions with needed 'symbolic capital'. However, as discussed earlier, things are changing, and TM is on the rise; itself becoming increasingly differentiated as well as the basis for institutional differentiation in a competitive marketplace. External calls for institutions and academics to actively engage with TM are starting to impact on the academic profiles of institutions and sub-units, as demonstrated in recent studies from across the globe (Pinheiro 2012a, 2013; Pinheiro, Benneworth, and Jones 2012; Pinheiro, Ouma, and Pillay 2012).

The significance of these findings is that academics from different disciplines have different experiences of engagement with different TM activities and external constituencies. Thus, the growing strategic importance that TM has for the institution as a whole needs to take into account the complex and multifaceted characteristics of disciplinary, institutional fields and individual academic profiles. Studies indicate that academics from different disciplines and fields of specialization engage with different constituencies differently (Schwartzman 2008; Langa 2010; Pinheiro, Normann, and Johnsen 2012).

What is more, academics form interpersonal networks of different kinds for a variety of purposes. In so doing, a number of core principles are at work, namely: (1) self-organizing networks emerge through intellectual curiosity and mutual research interests; (2) disciplinary traditions shape network structures, swaying which research outcomes are valued by peers; (3) policy, especially research performance frameworks, impacts on the formation and functioning of academic networks; (4) disciplinary traditions vary in their congruence with research performance frameworks, generating a set of either reinforcing or conflicting signals about the value of making connections of different types (Langa 2010, 2011; Lewis 2011). In the era of TM discourse, practice and incentive schemes for outreach with society, academics make strategic decisions on whom to engage with. According to Lewis (2011), each of these organizing principles and values (e.g. curiosity, disciplinary traditions, performance frameworks, etc.) have an impact on academic networks, thus influencing (enabling/constraining) their formation, use and the outcomes they produce. Langa's studies (2010, 2011) across the African continent have shown that academics and institutions possessing higher 'scientific capital' are not only more versatile but also more able to invest in: (1) the development of their individual capital; and (2) their institutions' scientific capital, by actively engaging with external and non-academic (TM) constituencies without jeopardizing their levels of scientific productivity (for similar findings elsewhere consult Schwartzman 2008; and Pinheiro 2012a).

6. Conclusion

The TM is part and parcel of the changing dynamics facing higher education systems and beyond. Its multifaceted nature has led to increasing ambiguity as regards the content and ways of assessing it. Recent studies suggest a move from the periphery to academic core of higher education institutions, which in turn is leading to renewed external and internal efforts to secure its institutionalization across the board. That said, major tensions and dilemmas remain unresolved, not least when it comes to the role played by academics from different disciplinary fields or knowledge domains, as well as the interplay between legal frameworks, policy instruments (incentives or the lack thereof) and the strategic

imperatives of the various actors involved. Future qualitative and quantitative studies could cast critical, empirical light on the complex interplay between mechanisms and dynamics surrounding TM at the macro, meso and micro levels, both within Europe and beyond. Of special importance to the field are longitudinal, mixed-method studies – preferably of a comparative nature – that investigate the degree of TM institutionalization over periods of time and across different levels of the organization, in addition to key drivers and actors enabling/constraining such processes.

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Notes

1. We use the term 'university' here in its broader sense, pertaining to all types of higher education institutions, research-intensive or not.
2. Composed in 1990 at an international conference in Talloires, France, this was the first official statement made by university administrators of a commitment to environmental sustainability in higher education. The Talloires Declaration is a 10-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations and outreach at colleges and universities. It was signed by over 350 university presidents and chancellors in over 40 countries (ULSF 1999).
3. EAs are conceptualized as consisting of the 'institutional, communicative, co-coordinating and cultural elements of an organisation oriented towards innovation' (Nelles and Vorley 2008, 10). They consist of *five* interrelated and overlapping university elements: structures, systems, strategies, leadership and culture.
4. For a comparative analysis (across five continents) of such tensions see Pinheiro, Benneworth, and Jones (2012).
5. Online at: http://www.e3mproject.eu/.

Notes on contributors

Rómulo Pinheiro is an Associate Professor in Public Policy and Management at the University of Agder, Norway. He is also senior associate researcher at Agderforskning, and visiting professor at the Universities of Tampere, Finland and Danube Krems, Austria. Rómulo's research interests are located at the intersection of the fields of public policy and administration, organizational studies, regional science and innovation studies and higher education studies.

Patricio V. Langa is an Associate Professor at the Faculty of Education at the University of Western Cape (UWC), South Africa and Eduardo Mondlane University (UEM), Maputo. He is a visiting research fellow at Danube University Krems in Austria. He is also an adviser to UEM Rector on strategic planning. Since 2011 has been the Executive Director of the HE Quality Council of Mozambique (CNAQ). Patricio is also the President of the Mozambican Sociological Association and founder of an NGO focusing on higher education studies in Mozambique.

Attila Pausits is head of the Centre for Educational Management and Higher Education Development at Danube University Krems in Austria and academic director of the Erasmus Mundus Master Programme 'Research and Innovation in Higher Education'. Attila is vice-chairman of 'EAIR – The European Higher Education Society' and an expert for higher education

management and change management. He has participated in numerous international research and developments projects related to the modernization and development of European higher education.

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