

Development of third stream activity Lessons from international experience

Higher Education Policy Institute

Sachi Hatakenaka¹

November 2005

¹ This report was generously funded by HEFCE, but the views expressed are those of the author

Table of contents

	Para
Executive summary	
1. Introduction	1-17
2. Policy goals and objectives	18-50
3. Rationale for government funding	51-79
4. Short term options for funding	80-105
5. Longer term options for funding	106-111
6. Expected changes in the contexts	112-126
7. Concluding remarks	127-128

Development of third stream activity

Lessons from international experience

Sachi Hatakenaka

Executive summary

1. ‘Third stream’ activities in the UK universities have come a long way. Significant cultural change is beginning to take place. And yet, everyone in the sector thinks that cultural change has only begun – and that it has some way to go. The third stream still deserves some protected status – and in that sense, it has not yet reached a steady state. This means that the next phase has to be another one of dynamic change, with another and further transition in the longer term expected before it reaches a steady state.
2. HEFCE and OST are proposing to create a permanent funding stream based on a formula to provide a sustained incentive and support for third stream activities. This is a welcome change, as most observers (both inside and outside the sector) see the need for stable funding for further development of third stream activities.
3. However, public funding support for third stream activities is not easy to design. ‘Third stream activities’ need to remain very diverse as each university should respond to external needs in its own way, and so it is vital that government support should not lead to straight jacketing or even to narrowing its focus. Many third stream activities can also lead to additional income for universities, and it is not obvious how public funding should support such activities. Policy objectives in the short term may be different from those in the long term – leading to different rationales for funding.
4. The purpose of this report is to provide a framework for thinking about the purpose of third stream funding, to help generate debate and to reach a clarity of understanding, both about the short and the longer term.
5. This report argues that the policy goal for third stream activities for universities should remain broad: to enhance the economic and the social impact of universities. It is not just to promote scientific innovations to help develop new technologies or industries; nor is it just to ensure universities are helpful to the existing industries; nor even just to assist specific regions with economic development agenda. The goals – and so the incentives - have to be broad enough to encompass all three.
6. The report therefore argues that **the overarching policy objective should be to instil economic and social impact as ‘values’ within universities**, rather than more crudely just to promote a specific set of third stream activities. This is because economic and social impacts take a long time to materialize. The level of impact also depends critically upon **how** the so called third stream activities are undertaken and how well linked they are to universities’ teaching

and research agenda. It is critically important that universities make qualitative judgements about the effectiveness of all their activities in terms of economic and social impact, and develop a capacity to do so.

7. The first step in this respect must be to internalise economic and social impact as end goals in the institutional, and individual, thinking. Without that, third stream activities risk being seen as no more than income generating opportunities and institutions would simply maximize their own revenues rather than worry about the wider economic and social impacts. In contrast, some of the best US universities have a culture that means they would choose 'openness' over patenting if that was a more effective route for generating public benefits.
8. It is a critical point that these third stream values are part of the fabric of the operations of prestigious US universities such as MIT or Stanford, but it will require a culture change in the approach of many UK universities.
9. The most important consequence of integrating third stream values is that many third stream activities would then be naturally embedded into the activities of teaching and research, and become natural extensions of them. For universities that are concerned about economic and social impact (such as MIT), neither the institution nor its academics consider it good enough for their research results to be academically valued; they care that their research has an impact on the society. Similarly for teaching, institutions that embrace the goal of social and economic impact automatically include questions of relevance in their reviews of teaching – and other third stream activities can also provide a critical feedback for teaching.
10. There are three implications of having such a policy goal at the institutional level:
 - a. **Integration of third stream values.** It is not enough that a small group of academics or administrators are engaged in specific third stream activities. Institutions must internalize the values so that institutional judgements can infuse all activities and influence decisions about what activities to pursue and why.
 - b. **Differentiation.** Institutions should develop a diverse set of third stream activities to reflect not only the diverse needs of their respective environments, but also their core strengths; and
 - c. **Sustaining third stream through diverse funding sources.** Institutions should seek funding from diverse sources to support their third stream activities, such funding being both a key driver for their engagements but also an indicator of the relevance of their activities.
11. Integration of third stream activities into the whole university is also important because one significant benefit is the difference they can make to the educational experience of students. Student learning can be more relevant to the needs of the society when taught by academics who are themselves working with real world issues. Ph.D. students who are trained through industrially relevant research will know how to take into account industrial needs in their future research and are likely to be more employable for

industry. Experience of observing the impact of science on technology at close quarters, or of working on community projects as part of their social science programs are likely to help develop such relevant skills in their students. The students are one of the most direct mechanisms through which universities can influence the future society.

12. It is important to recognize that different institutions will embrace third stream values in different ways and to different degrees, and that different disciplines would interpret such values differently. Diversity of response will be important for the society whose needs are also diverse.
13. This report argues that **to inculcate the cultural change to internalise third stream values** is a vital rationale for providing third stream public funds to institutions. At the institutional level, one way of helping to bring about the change would be for institutions to have internal dedicated funds for experimentation so that more academics can participate in and experience third stream activities first hand.
14. There are two additional reasons for providing public funds for third stream activities. The first is to provide **demand-side funding in areas where ‘markets’ do not work**, to promote economically and socially important activities, such as support to SMEs or local communities, which are unlikely to be paid for by user communities. The second is to provide **pump-priming** for starting and experimenting with new activities; public funding is needed to enable institutions to jump start activities including some for which the user communities are unlikely to pay; in turn, this should also help to implement cultural change.
15. The report argues that in the short term, HEFCE/OST’s block grants to institutions can be justified in terms of all three rationales.
16. In the medium term, however, the public sector more generally (i.e. not just HEFCE) ought to develop a wider range of **demand-side funding** involving other agencies so that different activities can be supported through specific evaluation criteria developed to reflect particular user needs. This might take two forms: diverse funding programmes targeting specific user communities such as SMEs or local communities to work with universities; and multiple government bodies may engage in research funding to meet future needs related to their respective fields.
17. In the longer term, once the cultural change has been achieved, the rationale for ‘centralized’ HEFCE funding would become limited to one of pump-priming brand new activities.
18. The current HEFCE/OST proposal is to introduce formula-based funding for third stream activities that would be based both on a capacity related component as well as on performance metrics such as external income. This report **cautions against the simplistic use of such performance metrics** in a formula. The most fundamental reason for not using such simple metrics at this stage in the development of third stream activities is that the approach

would not be likely to help inculcate the culture change that needs to pervade the institution. In fact there is a risk of the very reverse: encouraging the establishment of separate ‘third stream’ units focused on meeting the metrics, which would shield the academic community from the very culture changes that need to be made.

19. There are also three more practical reasons for not using simplistic metrics at this stage in the development of a third stream culture:
 - Third stream activities are still at an early stage of development; best practices have not yet been established and the real impacts are poorly understood. It is too early to begin to reward some types of activities, but not others, on the basis of simple quantitative metrics.
 - Third stream activities are meant to be diverse and so the HEFCE/OST should not reward a certain subset of activities over the others.
 - Most performance metrics are too crude to reflect true impact and cannot function effectively as incentives for institutions. For instance, the volume of external income is likely to vary widely depending on the kind of user communities: large international companies are likely to be able to pay larger sums than small local firms or communities.
20. One alternative would be to determine an initial level of funding solely on the basis of potential capacity (such as x% of core funding for research (QR in the English context), y% of contract research, and z% of funds obtained for teaching, to reflect the third stream potential through fundamental research, applied research and teaching), and to conduct performance evaluation through light touch qualitative reviews. Performance metrics – particularly to reward successes in cultural change (such as proportions of academics engaged in third stream activities) – could then be introduced gradually over time.
21. Such qualitative reviews would be both light touch – to avoid an onerous process which could become a burden to the sector - but also effective in ensuring accountability to the public. For example, qualitative desk top reviews could be undertaken on annual reports submitted from all institutions, with a small number of site visits conducted to recommend corrective actions in problem cases and to learn lessons from the best performers. The required documentation would be an institution’s plans and reports reflecting its own values, plans and strengths on third stream activities: these would be reports of the kind that institutions would wish to develop in any case, with or without government support.
22. It is clear that the sector is going through an important transition in third stream activities. The initial period of experimentation is over. In the new phase, institutions should become increasingly strategic about third stream activities. Institutions will need to make decisions in the future about how to allocate resources for third stream activities; and they will make different decisions depending on their own policy intentions and expectations. It is critically important that any changes in funding by HEFCE recognise the extent of the culture change needed and so are introduced with a collective

understanding about the end goals and with clarity about the transitions expected in the future. This report suggests that the goals should be concerned with achieving a change of culture, and embedding third steam activity, throughout the institution and in all that the institution does.

1. Introduction²

1. 'Third stream' activities in UK universities have come a long way since their development was first supported by HEFCE through the HEROBAC program, in 1999. Significant cultural change is beginning to take place, albeit at different speeds and depths in different institutions. The Lambert Review in 2003 was positive about the level of effort and progress that had been made by universities so far.
2. And yet, everyone in the sector thinks that cultural change has only begun – and it has some way to go. The third stream still deserves some protected status – and in that sense, it has not yet reached a steady state. This means that the next phase of development has to be another dynamic change, with a further transition in the long term before reaching a steady state.
3. Following the Lambert review's recommendations, HEFCE and OST are proposing to create a permanent funding stream, based on a formula, to provide a sustained incentive and support for third stream activities. This change is welcomed, as most observers (both inside and outside the sector) see a need for stable funding for further development of third stream activities.
4. However, public funding for third stream activities is not easy to design. This is because 'third stream activities' are complex both in their diversity as well as in their changing conditions. Policy objectives in the short term may be different from those in the long term – leading to different rationales for funding.
5. Part of the complexity arises from the fact that it is not easy to define third stream activities. A cursory look at initiatives supported under HEIF shows that it covers a wide array of activities, including licensing, spinouts, awareness raising, extension services to local communities, work based placement, and enterprise education. There is no fixed recipe or 'right answer' as to what comprises third stream activities - and indeed there is an expectation that each university can and should respond differently. Different approaches may be needed by different institutions for building institutional capacity for a range of various third stream activities.
6. Another complication arises from the fact that many third stream activities lead to additional income for universities. Income generating can become an explicit goal for institutions in their third stream activities. The question is, if institutions can generate income from such activities, why and to what extent should the government provide funding for them?
7. A related question is whether the proposed formulaic funding should be designed for routine costs of continuous activities or for pump priming of new

² This paper was written as a think piece based on a literature review complemented by interviews with 25 national and international key informants, including academics, administrators, industrialists, policy makers as well as researchers of third stream activities. Special efforts were made to take account of views from a diverse set of universities within the UK.

activities. If the funding is simply used for the salaries of a cadre of professionals, how would that lead to innovative and new activities?

8. Whether 'third stream activities' should be promoted separate from teaching and research is also an issue. At the beginning, the 'third stream' was simply defined as anything other than universities' core businesses of teaching and research; that made sense because most institutions focussed on the objective of promoting new functions such as technology licensing or spinouts. However, as institutions delve further into these activities, it has become clear that most third stream activities have (and should have) strong linkages with teaching and/or research, and that it is important to emphasize synergy and integration sooner rather than later. The issue is gradually shifting from how to start such new activities to how best to nest or embed them within the university culture so that they become sustained. The question is how can such synergies be emphasized with separate funding?
9. There is also an issue about the use of metrics. From the government perspective, there is a critical need to measure and reward performance – both to encourage success and to ensure accountability for the use of public funds. But there is concern that any metrics used in a formula can lead to game playing and straight jacketing. It is widely known within the sector that most metrics for the third stream are imperfect measures of economic impact. Why should universities be rewarded or penalized for not doing well on one imperfect metric rather than another? It is also difficult to identify a consistent set of metrics that can cover the wide terrain of third stream activities. Again, why should universities be measured against a fixed (and limited) set of metrics, when their third stream activities are supposed to be diverse?
10. Finally, third stream funding has often been regarded as a counterweight to RAE. This was because in the past, RAE was perceived to emphasize fundamental research with little attention paid to application oriented research. For the RAE in 2008, however, concerted efforts are being made to try to emphasize interdisciplinary research and also practice based research, which could significantly change the evaluative environment for research in the UK. If it is implemented as planned, then the need for a 'counterweight' could diminish. The question is how long might that take?
11. It is clear that the sector is going through an important transition in its third stream activities. The initial period of experimentation is over. In the new phase, institutions are expected to become increasingly strategic. It is at this critical juncture that HEFCE and OST are proposing a major change in its funding. Whereas in the past, grants were given for specific time limited activities, in the future, grants could be used at institutions' discretion. Decisions will need to be made by institutions in the future about how to allocate these resources along with others, and different institutions would make different decisions depending on their policy intentions and expectations. To make such decisions, institutions need to know the intentions behind the proposed change – so that they understand with clarity at least the public funding side of the environment to which they are responding.

12. The purpose of this report is to provide a framework for thinking about the purposes of third stream funding – to help generate debate and to develop clarity in understanding. More specifically, there are four objectives:
 - a. to clarify policy goals and their implications at the institutional level;
 - b. to identify the rationale(s) for public funding;
 - c. to explore options for public funding both in the short to medium term and in the longer term; and
 - d. to examine the changing contexts both within institutions and at the sector level.
13. To fulfil these objectives, the report makes an extensive use of international experience, particularly in the US but also in other countries. This is not to imply that the UK should simply mimic/import best practices from abroad, nor that the UK is behind other countries. Institutions and their contexts are too different for such simplistic mimicry to make sense. Nonetheless, every OECD country has been grappling with the rise of the global knowledge economy, and with the changing expectations for their higher education systems. The UK is not unique in its quest for fostering much greater levels of interaction between universities and the external world. As such, there are lessons that the UK can learn from the others, as others will from the UK too.
14. The use of US cases is more extensive, mainly because most OECD policy makers have strong images of a handful of US research universities as their model. And it is important to learn any relevant lessons both about the enabling environment in which they developed as well as how they learned to interact with the external world.
15. The usual response to the US examples in the UK is that they are irrelevant because their circumstances are so different: the US universities are fortunate to have enlightened industry which is willing to work with universities. But, insofar as the success of US universities was the result of their benevolent context, then the UK universities also deserve a better environment. The question is how to develop such a benevolent environment.
16. It is interesting to learn that even at MIT, academics once faced myopic industrialists who were principally interested in short-term contract research. US industry has come a long way in learning to work with universities – and here, federal and state government funding appears to have played a critical role. At the same time, US universities also had to learn to work better with industry. The question is, can the UK learn anything from this experience – and the answer is certainly yes.
17. The rest of the report is structured as follows. In the second section, long term policy goals and objectives are discussed – to develop the images of desirable institutional responses. In the third section, the rationale for public funding is discussed, including how it might change over time. Fourth, options for public funding are examined both for the short to medium term as well as the longer term. The fifth section discusses three contextual changes that are expected in the medium term, which, in turn, would influence the future of third stream funding.

2. Policy goals and objectives

18. OECD countries are reasonably consistent in articulating their ultimate goal for third mission activities in universities. It is to enhance innovations and productivity as a base for the knowledge economy. The policy goal for higher education is to enhance the economic role of universities to such an end.
19. A closer examination reveals that OECD policy makers harbour three different images of the economic role of universities³. First, there is the simple image that new scientific discoveries could lead to innovations and ultimately to the creation of new industries, as demonstrated by spectacular growth in biotechnology or information technology. This was the original image upheld by many policy makers which led to the promotion of technology transfer, most notably through licensing and spinouts.
20. The second image is that universities could assist existing industries to remain competitive. This may be achieved either through continued and incremental innovations within the same industry or through productivity increases brought about by a better trained workforce.
21. The third image is that universities could help alleviate the pains associated with economic backwardness, or help create the cultural background sufficient to attract creative human resources into the more backward regions. Universities may play a critical role in community development or in the regeneration of a region. Alternatively, they can offer facilities and cultural events which make a locality attractive for high end knowledge workers⁴.
22. Increasingly, the OECD agenda on the role of universities has been shifting from one narrowly focussed on scientific innovation to a more complex one that includes the multiple roles captured by these three images. The implication is that the policy goal has come to embrace a more broadly defined role for universities. The goal is increasingly to **enhance the social as well as the economic impact of universities**.
23. Does it make sense to combine all three images within a single policy? Why not keep to the narrowly focussed goal of scientific innovation for instance? The answer is that it makes sense to combine them all in the context of HEIF – for two reasons. First, there is certain synergy in pushing for **economic AND social impact as ‘values’** within non-profit bodies such as universities. Each represents values which broaden university attention away from purely internal academic matters toward the needs of the external world, and shifts their attention more to longer term benefits for the society at large.
24. This is NOT to suggest that it would be in the public interest to turn universities into ‘commercial’ entities competing against private enterprises.

³ For a detailed discussion of multiple roles of universities, see Richard K. Lester, Universities, Innovations, Competitiveness of Local Economies, MIT IPC Working Paper 05-010 (2005).

⁴ OECD, The response of Higher Education Institutions to Regional Needs (2000). Richard Florida, The Rise of the Creative Class, Basic Books (2002). David Murrasse, Beyond the Campus: How colleges and universities form partnerships with their communities, Routledge (2001).

Rather, the policy goal is that universities play a key public role in contributing to the development of commercial and other sectors within the society. This will require universities to develop a commercial awareness and a better capacity for working with the external world – but not because they should turn into profit-seeking bodies.

25. The second reason that it makes sense to combine the images is that the policy goal for the sector must be sufficiently broad to embrace a wide range of relevant images for the sector at large. It is not enough to provide images suitable only for research intensive universities; it must embrace the diversity both across institutions and across disciplines.
26. What are the implications at the institutional level for this wider policy goal? There are three:
- integration of third mission values within institutions;
 - diversification of third mission strategies across institutions;
 - sustaining activities through additional external revenues.
- These are each described below.

2-1: Integration of third mission values within institutions.

27. If universities are to have a key social and economic impact, then the required values must be internalized at the institutional level. It is not enough that they are upheld by a small group of professional administrators, nor is it enough for a small number of academics to be engaged. Institutions themselves must internalize such values so that they are reflected in institutional judgements about what activities to pursue and why.
28. This is important because social and economic impacts take a long time to materialize and are hard to measure. It is critically important that qualitative judgements take these values into account at all levels and continuously, especially near where the action is.
29. The past third mission emphasis on specific activities such as spinouts and licensing was an important starting point – and indeed this is the path taken by most OECD countries. However, it is important to go beyond such activities. For example, patenting may not be the only way for technology transfer in a world of open innovations: instilling third mission values would result in judgements being made as to whether it was patenting or open access to innovations that would provide the greater benefit to the society. The next stage of third stream development should be to instil third stream values in universities so that such judgements would be made in the future.
30. What might be the consequences of embracing such values? Third stream activities would be more embedded into teaching and research, and become natural extensions of them. If universities truly valued the economic impact of their research, it would be natural for them to seek to engage in collaborative research with industry, and/or to ensure the diffusion of their technological breakthroughs through licensing. For research universities truly concerned about their economic impact, as exemplified by universities such as Stanford

or MIT, the culture within the university does not consider it good enough for research results to be academically valued; they care that their research results have a real impact on the society.

31. Similarly for teaching, when institutions embrace the goal of having a social and economic impact, many third stream activities become obvious extensions to the teaching agenda. For example, it would become natural constantly to review and improve work based placement and/or to consider options for internships – which would be nothing new to many of the new universities in the UK, precisely because they have historically embraced such values. Another example is that enterprise education would be undertaken as part of the normal agenda for improving teaching. Widening participation would also be a logical consequence of a broad range of community facing activities as was developed in San Francisco State University.⁵
32. **One of the most strongly perceived benefits of university-industry relationships in the US is seen in education.** In one flagship program of university-industry collaboration centres in the US, companies rated the recruitment of the centres' graduates as the most critical benefit arising from the program⁶. At MIT, academics see up-to-date education of their students as one of the most important benefits of their collaboration with industry. Consulting activities or executive education undertaken by faculty help them update their teaching portfolio and so maintain their relevance to workforce.
33. American universities' responsiveness to changing educational needs in industry was found to be one key difference in the economic role of universities in the US compared with Japan. While Stanford was found to be constantly renewing its curricula, the Japanese equivalent only did so infrequently⁷. The skills mismatch that the Japanese found in fast-changing fields such as semiconductors⁸ or information technology in the 1980s is likely to have been a result of such institutional differences. Updating the curriculum is much easier if key academics are well networked with industry through research and consulting and so are informed of technical developments. PhDs trained in interdisciplinary fields can in turn help the future development of new scientific fields. **One very effective mechanism for impacting the future economy is through students.**
34. There will be third stream activities, such as consulting, or short term contracted courses, which may look less directly related to either research or teaching. Even here, there would be synergy in the expertise of the teaching

⁵ Maurrasse 2001.

⁶ Linda Parker, The Engineering Research Centers (ERC) Program: An assessment of benefits and outcomes, National Science Foundation, December 1997.

⁷ The literature is available in Japanese only. Yuko Harayama, Silicon Valley no sangyo hatten to Stanford daibaku no curriculum hensen, as well as Shinichi Kobayashi, Daigaku kyoiku no shokugyoteki relevance to daigaku no soshiki sekkei, in Masahiko Aoki et al ed. Daigaku kaikaku: kadai to soten. Toyo Keizai. 2001. Yu Hoshino, Yuko Harayama et al, Daigaku no gaibu henka heno taiousei. in Yuko Harayama ed. Sangaku renkei. Toyokeizai Shinposha 2003.

⁸ Shinichi Kobayashi, Daigaku kyoiku no shokugyoteki relevance to daigaku no soshiki sekkei, in Masahiko Aoki et al ed. Daigaku kaikaku: kadai to soten. Toyo Keizai. 2001.

staff. In MIT, insights and experience gained through such activities by academics are fed directly back to activities in research and in teaching.

35. As an example of teaching being a direct support for industrial upgrading, Tampere Institute of Technology in Finland played a significant role in supplying the local mechanical engineering companies with well-trained graduates. Timely supply of well-educated engineers with knowledge relevant to the evolving needs helped the industry keep abreast of global developments – and student projects in industry served as a key instrument for the university to remain informed about the changing industrial needs⁹
36. When third stream values are internalized at the institutional level, many third stream activities would become naturally embedded into universities' core agenda. There would also be selectivity about third stream activities that would reflect the institution's strengths and capabilities.
37. Of course, different institutions will embrace such values to different degrees, and different disciplines would interpret such values differently. While it may be in the interest of the country for all universities to assimilate such values, it is not necessary that they all do so to the same extent. It is also not possible for different disciplines to interpret such values in the same way. It is likely that there will be significant differences between professionally oriented subjects such as engineering and academically oriented disciplines such as physics. Economic and social impact for history must mean something different from that for engineering.

2-2: Diversification of third stream activities across institutions

38. The above discussion leads to the second implication of the stated policy goal of economic and social impact. Institutions should develop a diverse set of third stream activities not only to meet the diverse needs of their respective environments but also to reflect their core strengths. Activities will vary across institutions because the institutions cater to different needs, and because they have different strengths.
39. Institutions with strong scientific research are likely to have greater capabilities for licensing or spinouts based on cutting edge technology which derives directly from fundamental science. In the US, it is the universities with the strongest scientific research that are also the most successful in licensing or spinouts. This is because new scientific discoveries, when translated into applications, have the potential to remain competitive for a longer period of time. Of course, strong science in itself is not enough to lead to successful commercialization – and the successful institutions in the US, as well as in the UK, have developed a continuum of research from fundamental science to application-oriented research. Increasingly, academics in such universities recognize that there is a symbiotic relationship between basic and

⁹ Carlos Martinez –Vela and Kimmo Viljamaa. Becoming high tech: reinvention of the mechanical engineering industry in Tampere. MIT LIS IPC Working Paper 04.-01 February 2004.

applied research; insight gained from applied research can push new frontiers in basic research and vice versa¹⁰.

40. Institutions with more of a tradition in application-oriented research can play a different kind of role with respect to industry. They are usually better linked with industry and are capable of meeting a wide range of industrial needs, particularly by filling the gap in strategic pre-competitive research. They are better than science-oriented universities in understanding the practical realities faced by existing industry, and can play a key role in helping them maintain competitiveness.
41. For example, in Germany, applied research institutions (Fraunhofer) play a significant role in working closely with small and medium sized companies. It is their application-orientation and subsidized assistance that help bridge the gap with SMEs, for whom 'collaborations' are usually too expensive and burdensome both in terms of money and time.
42. For teaching focussed universities, the most important contribution to the economy may be the injection of key skills into the labour force to meet the changing economic needs. There would be much less emphasis on licensing or spinouts – given their more limited research emphasis. Instead, activities such as CPD and consulting may be dominant. Such 'third stream activities' would have a direct feedback into their regular undergraduate teaching, as they will help academics keep abreast of changing industry needs. There may be differences in the kinds of clients served: some institutions would focus on CPD for large global companies; others would cater to the continuing education needs of individual professionals living in the vicinity. Such characteristics are likely to be related directly to where their regular students come from and where they end up upon graduation.
43. However, it is dangerous to stereotype by type of institution. For instance, interactions with local communities may be undertaken by many different types of institutions. There are examples of research universities engaged in significant community oriented activities. These include service teaching, service provision, applied research and staff/student volunteering for community activities. Often, universities initiate these activities recognizing that if their surrounding communities are suffering from socio economic problems, university communities are bound to be affected. The University of Pennsylvania provides a pioneering example of a research university which embraced its community outreach functions as part of its institutional mission¹¹. Teaching intensive universities located in deprived areas may engage in a similar set of activities. In both cases, there is a real potential for synergy between a set of community related third stream activities and a widening participation agenda in teaching.

¹⁰ The fact that there may be symbiotic relationships between basic and applied research does not mean that hosting both is easy. For instance, applied research contracts often come with tighter requirements about confidentiality. It is often necessary for institutions to develop conflict of interest and other institutional-wide policies to set an appropriate framework for externally funded activities within universities.

¹¹ See Maurasse 2001.

44. Again, it would be unrealistic to expect the same degree of third stream orientation across all institutions. Indeed, it would be valuable to have diversity within the sector in this respect. In the US, different levels of commitment about application oriented research, for instance, has given both the government and industry some choice about the types of collaboration and partnerships they could have with universities¹². For example, Georgia Institute of Technology was well known for its applied research capacity, stood apart from other universities in their willingness and ability to undertake application oriented government contracts, and this was critical in their work with local industry¹³.

2-3: Sustaining third stream activities through additional external incomes

45. The third implication of the policy goal is that universities would be able to sustain many of their third stream activities based on incomes earned from them. External demand for services can be a key driver and an indicator of success for third stream activities.

46. However, there are some serious caveats. The volume of external income may, for instance, reflect the kind of clientele the university serves rather than the intensity of demand or the success of the university: different users come with different abilities to pay. Large research intensive companies are likely to be able to pay for large collaborative research projects, while small and medium scale companies or voluntary organizations find it difficult to pay much for their relationships with universities.

47. Some services would explicitly require public subsidy, given the inability of their user communities to pay. For instance, small and medium scale businesses are often targets of public subsidies - as in the case of Knowledge Transfer Partnerships. Training of Health professionals would be paid for by the National Health Services and many of the community related activities may need to be paid for by local governments.

48. For other services, institutions would need significant time for institutional development before they could break even. There is an increasing awareness in the UK that it is not easy to break even in licensing, in the sense of licensing revenues accruing to the institutions (rather than to inventors) exceeding the patenting costs, including salaries. A recent study estimated that only about 50% of US universities have been breaking even since 1992¹⁴. The same

¹² For instance, Georgia Tech dominated applied contracts from the government, which helped the institution develop its core strengths. See Roger Geiger, 1993. Also Roger Geiger, *Money and Knowledge*, Stanford University Press, 2004.

¹³ Roger Geiger, *American Research Universities since World War II: Research and Relevant Knowledge*, Oxford University Press, 1993.

¹⁴ Karrie D. Brandt, Eric J. Stevenson, Janine B. Anderson, Catherine L. Ives, Michael J. Pratt, and Ashley J. Stevens. "Do most academic institutions lose money in technology transfer?" a study by the office of technology development in Boston University presented at AUTM 2005. They estimated that 60%, 50% and 30% of AUTM surveyed universities in the US were breaking even financially, in terms of total incomes (including incomes distributed to inventors); total institutional incomes (excluding

study also showed that the size of total research expenditures, as well as the size and experience of technology licensing offices, appeared to have significant impact on the likelihood of institutions to break even. Three quarters of institutions with more than 250 million dollars per year of research expenditures managed to break even, while for those with less than 50 million dollars, the proportion was about 20%. Over 80% of technology licensing offices with more than 10 FTE staff managed to break even, while for those with less than 5 FTE staff, the proportion was only about 30%. In general, only mature technology licensing offices with over 15 years of experience could expect a positive net contribution.

49. Finally, there are third stream activities which will not lead to additional incomes. For instance, many institutions are developing enterprise education modules for their students; these will not lead to additional incomes as they are offered to existing students as extra curricular activities or existing courses. On the other hand, many of these activities could simply be regarded as an integral part of curriculum innovation and basic services to students.
50. In the long term, once institutions had internalized the values of third stream activities, individual universities would then be in a position to make judgements about the appropriate level of effort for them. They would make qualitative judgements based on their own strengths, on the observed and expected impact as well as on the incomes expected to be generated. However, without public funding in key areas, the result could well be a concentration of third stream activities targeted towards users with the ability to pay.

inventor incomes but including incomes to departments); and total central administration incomes respectively.

3. Rationale for public funding

51. There are three types of rationale for public funding for third stream activities in the UK. These are:
- to achieve cultural change;
 - to overcome market failure;
 - to provide pump priming.
- These are each examined below.

3-1. Cultural change

52. There is a one time need to encourage cultural change within institutions so that they can integrate and internalize third stream values. This is because the need to think about the economic and social impact of what they do is relatively new to many universities in the UK.
53. Cultural change is likely to entail two types of changes. First, it would lead to the development of a critical mass of academics, including those in leadership positions, who had internalized the values – through experience. Professional administrators may play a critical role in such a change – but their presence is not a good enough indicator of cultural change. Second, these values would be reflected in key institutional policies, practices and organizational structures.
54. Until such a state is reached, in the short to medium term, ‘promotion’ and ear-marked support of third stream activities are likely to be critical. Academics would need incentives or greater access to opportunities to experiment with third stream activities, so that they can see the professional benefit such activities can bring to their other activities in teaching and research. Training and awareness raising activities would also be important.
55. In many new universities, the concept of economic impact is less foreign than in many older universities, because of their tradition in professional education. However, this does not mean that they need any less adjustment today. Some have been actively developing their research capacity, seeking to become more like old universities (often with pressures coming from RAE). Others face the issue of strategic capacity building in applied research, for which it has been hard to obtain public funding. For them, the transition is not to assimilate new values, but to find the means for acting on these values through developing and maintaining their professional capacity in a rapidly changing world.
56. Why is the injection of public money important for cultural change? Without public money, all that universities can do is to undertake third stream activities which can be paid for by external stakeholders. Third stream activities are then equated with income generating activities for the institutions – and little room is left for instilling the higher order values about achieving an impact on the economy and on society. There is a difference between licensing to maximize institutional revenues and licensing to maximize public benefits. In the late 19th century, when American land grant universities were established,

‘land grants’ and funding support were provided by the federal government in exchange for university commitment to practical education and extension services to serve the public. A number of institutions such as Purdue as well as MIT and Cornell were thus developed with internal values about their socioeconomic impact.

57. In the UK, HEROBC and HEIF have provided key opportunities and incentives for an increasing number of academics to have experience of third stream activities, and for institutions to develop better capacities for developing and maintaining relationships with the external world. But for most institutions, the third stream is still at the margin, in the hands of a small minority of academics and a handful of administrators. Institutions need to be given the means to promote the process of cultural change so that more academics are ‘converted’ and internalize these values in their thinking - alongside those of teaching and research. Capacity building should not end with the creation of enclaves of business development officers in charge of third stream activities.
58. There is a widely agreed need for stability in funding in the sector for the future of the third stream. The underlying concern is that the lack of funding stability leads to job insecurity of professional administrators and results in the sector not being able to retain the best talent in these jobs. This has been accepted as the rationale for a permanent stream of public sector funding. Instability in funding is a real issue for the sector, but that is not in itself a good rationale for a permanent stream of public funds to cover all the costs. In institutions with turnovers of tens (or even hundreds) of millions of pounds, if there is sufficient conviction about the importance of an activity, it should be possible for the management to provide the small amounts of resources that are required to keep it going.
59. The real underlying issues are twofold. First, there is still insufficient conviction on the part of many university managements to sustain these activities because they are themselves uncertain about their benefits to their institutions – and they have not internalised the point about the wider value to the economy and society. Even for spinouts, when universities started experimenting with them, there was a mix of unrealistic expectations about potential revenues as well as scepticism about their congruence with the academic community. Today people directly engaged in spinouts have a much more realistic understanding about the kind of expertise needed for their success as well as about their expected benefits and financial returns. Thus in general, it is only when university management develops a realistic understanding of the benefits and costs – both to the institution and more widely - that they can take steps to normalize their resource commitment. There is therefore a need for continued experimentation so that institutional leaders as well as a growing number of academics are convinced of the value of these activities. Second, certain third stream activities are financially ‘unviable’ because the user communities are unable or unwilling to pay the ‘full costs’ of the services, even when there are obvious public benefits. This leads to the second rationale for government intervention as follows.

3-2: Market failure

60. There is a need for demand-side funding in areas where ‘markets’ do not work. The Lambert review made the important point that much more work was needed on the part of UK industry to become willing partners of universities. The need for cultural change is not limited to universities – indeed more change may be needed on the industry side.
61. The US is often regarded as fortunate in having a significant number of industrialists, large and small, who are willing to invest in universities. However, to help get to this position, the US has had an extensive array of ‘demand-side’ funding programs at federal as well as state levels targeted to promote university services to industry and to the community. Public funding has been playing a critical role in promoting interest among user communities to work with universities.
62. Here the term ‘**demand-side funding**’ is loosely used to cover all public funds that are intended to instigate demand from user communities who are unable or unwilling to pay. More specifically, there are two types of demand-side public funding:
- public funds that enhance demand by subsidizing collaboration;
 - public funds that seek to predict future demand for science.
- These are described below.

3-2-1: Enhancing demand by subsidizing collaboration.

63. The public sector can fund programmes to subsidize university collaboration with specific user communities. Link, KTP and Faraday Partnerships are all examples of such within the UK. However, to become more active, British industry and communities may need more than they have so far been offered.
64. In the 19th century US, it was the extensive government funding for agricultural extension that helped universities and agricultural communities to work together. The modern day equivalent in the US, as well as in other OECD countries, is a range of competitive funding schemes available to firms, to communities as well as to universities for collaborative activities that neither the users nor the universities can be expected to pay for.
65. There are **three types** of demand-side funding for subsidizing collaboration which have been important in the US but which may be missing in the UK. **First**, the National Science Foundation has provided funding for programmatic support under its flagship programmes for establishing centres for university-industry collaborative research since the late 1970s¹⁵. Many States complemented and replicated such programs with their own funds. This led to a rapid proliferation of university-industry research centres such that by 1990 there were over a thousand such centres¹⁶. Four key features of these

¹⁵ Industry-University Collaborative Research Centers, Engineering Research Centers or Science and Technology Centers.

¹⁶ Wesley Cohen, Richard Florida, Lucien Randazzese and John Walsh, Industry the and Academy: uneasy partners in the cause of technological advance, in Roger Noll ed, Challenges to Research

grant programmes are the long-term nature of support – often over 5 years, with the longest ones being for up to 11 years¹⁷; the programmatic nature of support given to a field of research, rather than to specific research projects; the participation of multiple companies; and their focus on research training¹⁸.

66. The last point about research training is worth elaborating. Programmatic support for interdisciplinary research centres helped create a cadre of research trained postgraduates (masters and PhDs) in new fields, many of whom were subsequently recruited into private companies. S&T researchers have long argued that, for industry to make effective use of science, companies needed to have a critical mass of scientific researchers internally, and referred to this as their ‘absorptive capacity’ for scientific knowledge¹⁹. The abundant supply of research-trained scientists in relevant research fields is likely to have facilitated the formation of such absorptive capacity within industry. Similar programmatic support for collaboration has been experimented in several other countries, for example in Australia²⁰.
67. One German scholar noted that there was a real difference in the orientation of collaborative research in the US compared with German universities – as exemplified by the research occurring at these centres. The former was open-ended and tended to cover a longer period (e.g. 5 years), while the latter tended to be more contractual, short term (e.g. 2 years) and had clearly defined deliverables²¹. The framework and matching funds provided by the research grants from the National Science Foundation or State bodies enabled universities to offer open-ended research rather than contracted research - which is what they are good at - as a contribution to industry. At a subsidized price, access to research was interesting enough to participating industry²². The principle of subsidized collaboration is similar to the LINK awards, but these centre grants support research themes rather than individual research projects, and therefore have a greater flexibility over time.
68. In the 1970s, many American businesses were also only interested in short term contract research. In one of the earliest research consortia at MIT, which served as a model for NSF’s university-industry collaborative research centre programme, the leading academic remembers having to persuade industry to move from small contracts for solving specific problems to shared/leveraged support for programmatic research. Since then, MIT has been making systematic and concerted efforts to engage industry through mechanisms that

Universities, Brookings Institution Press, 1998. Roger Geiger, Knowledge and Money: Research universities and the paradox of the market place, Stanford 2004.

¹⁷ Their Engineering Research Center Program having the longest support period, in which university centers can receive funding up to 11 years contingent upon a satisfactory performance.

¹⁸ Linda Parker, 1997.

¹⁹ There are significant research findings which emphasize the importance of ‘absorptive capacity’ or scientific capability within firms, as a critical determinant for industry’s ability to use science. See Cohen, Wesley and Daniel A. Levinthal, Absorptive Capacity: A new perspective on learning and innovation in *Administrative Science Quarterly* 35 (1990): 128-152

²⁰ OECD, Science, Technology and Industry Outlook 2004.

²¹ Ulrich Schmoch, Interaction of Universities and industrial enterprises in Germany and the United States--a comparison, Industry and Innovation, June 1999.

²² Geiger. 2004.

make sense to the academic community²³. Two surveys conducted in 1983 and 1994 vividly show the significant and positive change in the industry's evaluation of university research²⁴. Federal and state level co-financing is likely to have had a significant impact on the change of industry attitude towards universities.

69. The **second** type of demand side funding in the US are the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) grants which were established in 1982 and 1992 respectively to promote research activities in small businesses²⁵. STTR has a specific emphasis on collaboration with research institutions, including universities. These programs are implemented through a diverse group of federal science and technology funding agencies, which have legal obligations to reserve small proportions of their funding for these programs.
70. **Third**, the similar pattern of demand side funding exists in university-community partnerships, albeit on a smaller scale. In addition to private foundations which often provide key support in new activities, the Department of Housing and Urban Development has had a Community Outreach Partnership Center program to provide four years of financial support to community partnerships at higher education institutions since 1994²⁶. Local and state government also provide critical funding for community oriented activities.
71. The UK does not have the range of such demand side funding programmes designed to bring various user communities closer to universities. EPSRC launched the Innovative Manufacturing Centre Programme in 2001, but programmatic support in other fields remains limited. There is only limited support to small businesses through SMART awards or KTP. Regional Development Agencies are still at an early stage of development and it may well take several more years before they can become established partners or funders of university related activities.
72. There are European research programmes which support collaboration with industry. However, they are problematic as they do not provide anywhere near the full costs of the research, and tend to require too extensive collaboration with partners across Europe. Unfortunately, this means that the UK institutions cannot rely much upon European funding for achieving their third stream ambitions.
73. Funding programmes to encourage collaboration should be considered in addition to – and not instead of - conventional research funding of science. They have the distinctive purpose of promoting interaction, and it is critically important that efforts to encourage collaboration SHOULD NOT undermine the vigour of UK science.

²³ Sachi Hatakenaka, *University-industry partnerships in MIT, Cambridge and Tokyo: storytelling across boundaries*, Routledge 2004.

²⁴ Cohen et al., 1998.

²⁵ See <http://www.sba.gov/sbir/indexsbir-sttr.html>

²⁶ See Maurasse 2003 but also HUD's website.

3-2-2: Seeking to predict the future demand for science.

74. Governments can play a key role in scientific development as a procurer of technology for the future. Foresight is a well established mechanism in Britain for doing this. However, there is an alternative model – as in the US - which is that various government agencies with their respective and specific technological needs fund scientific work with a view to its future applications.
75. The US research funding is also characterized by another feature which is different from the UK; **a diversity of government funding bodies, including those that are motivated by specific applications of science.** The Department of Defence, the Department of Energy as well as the National Institute of Health provide more research resources than the National Science Foundation. They also support a wide range of research covering both fundamental and application oriented research²⁷. These government agencies are representing the interests of future user communities in specific fields, and in this sense, they are another category of demand-side funding.
76. The overall lack of demand side funding in the UK in the short term provides an adequate rationale for an intervention from HEFCE in the form of a multi-purpose grant for institutions to initiate these types of relationships. This is because the lack of public capacity to fund such work is not a trivial issue that can be dealt with overnight. However, in the longer term, it would be desirable for various public bodies to develop their own demand-side funding programs. Diverse funding agencies would introduce diversity both in the types of support as well as in their evaluation criteria – which could also be critical in promoting diversity of excellence.

3-3: Pump priming for capacity building

77. The third rationale for public funding is the need for pump priming to promote capacity building whenever institutions engage in new activities with newly discovered needs for services. Before institutions can turn to external funding bodies, there is usually a need for some start up activities and experimentation on a small scale.
78. This may sound like trivial funding needs. However, in UK universities, which have been strapped for cash through decades of expansion without matching increases in funding, there is simply no ‘fat’ from which to allocate funds for such pump priming. The situation is very different for US institutions which have both a greater ability to recover full costs from teaching and larger endowments than UK institutions.
79. The need for pump priming is not limited to the short term. Even in the longer term, there will be a need for these kinds of resources, albeit at a reduced scale – similar in function to QR funding for research. In the short term, there appears to be no viable alternative to providing a separate funding stream for such activities. However, in the longer term, such funding could be provided

²⁷ Roger Geiger 1993.

either as a separate third stream funding or as possibly as an integrated part of QR and T funding (see the next section).

4. Short term options for funding

80. From the above discussion, the three types of rationale for HEFCE to provide third stream funding in the short term are clear:
- to encourage continued cultural change;
 - to allow universities to work with all user communities irrespective of their ability to pay (until other subsidy mechanisms are developed);
 - to enable universities to start up and build capacity for new activities.
- The next question concerns the mechanism for such funding. There are two main approaches: competitive funding or formulaic funding. These are discussed below.

4-1: Competitive funding

81. The most obvious funding method for third stream activities, used internationally, is through competitive funding. This has been the route taken so far by HEFCE in conjunction with OST and the Home Office. The advantages are that it forces bottom up innovation and allocates funds for time-limited activities, leaving sustainability issues squarely in the hands of institutions themselves.
82. The disadvantages of competitive funding are four-fold. First, it is not easy to establish a review mechanism that is perceived to be fair. Activities supported under HEIF were extremely diverse, but they were also proposed as institutional packages with limited detailed descriptions to justify individual activities, and were assembled by a well networked community of third stream professionals. It is not surprising that evaluators faced a difficult task of making high stake judgements between proposals.
83. Second, in an evaluation process in which a large number of similar proposals are to be evaluated, much can depend on individual writers' ability to write proposals that meet the evaluator expectations - rather than on the quality of the actual content.
84. Third, time-limited support can also be problematic as it is difficult to recruit and develop a cadre of professionals under such a regime. For some tasks, it is desirable for institutions to hire high calibre individuals to undertake them professionally, and yet such individuals are unlikely to be retainable unless institutions can provide job security. In theory, if institutions were committed to such activities, the problems would be resolved by them recruiting professionals out of their own internal resources, with an eye to incomes to be earned in the future. However, in an environment where funding has to be given as an inducement for new activities, it is perhaps unrealistic to expect such commitment – especially when significant revenue streams could not be expected in the near future.
85. Fourth, while HEIF has been successful in fostering collaboration, competitive funding cannot address serious cases of scale economies, where sector-level interventions make sense. One such example is training and awareness raising – particularly when targeted to academics. There have been positive

developments for training professional administrators, particularly for activities related to licensing, perhaps prompted by the natural network that emerged among such professionals. However, equivalent training opportunities for ordinary academics still seem scarce – possibly because of their more diverse needs.

4-2: Formula-based funding

86. The alternative method that HEFCE is contemplating, formula-based funding with some use of performance metrics, is still relatively unusual internationally, with Scotland and England making early moves. Advantages of formula funding are that:
- it can provide predictability for which institutions can plan;
 - its administrative simplicity makes it cost effective for HEFCE to operate;
 - it can reward and encourage performance through metrics.
87. However, there are also serious disadvantages. **First**, performance metrics used by the funding body in their formulae can lead to game playing by institutions, and/or lead to the straight-jacketing of activities by emphasizing some activities over others. Third stream activities are still at an early stage of development where best practices are not yet established and their impacts are poorly understood. It is too early to begin to reward certain activities on the basis of simple quantitative metrics. Third stream activities are also meant to be diverse and so it would not be right to reward one subset of such activities over another. Unfortunately, most performance metrics are also too crude to reflect true impact and cannot function effectively as incentives for institutions in terms of final objectives. For instance, the volume of external income will vary widely depending on the kind of user communities: large international companies will be able to pay larger sums than small local firms or communities.
88. **Second**, unlike competitive funding, formula funding can provide no emphasis on innovation or time limited activities; one possible consequence is that funding becomes used for the recurrent costs of ongoing activities, particularly administrative salaries. This is, of course, good from the perspective of enabling institutions to hire specialized staff, but if such hiring is made prematurely, without the institution making a deliberate decision as to the long term value of third stream activities, the effect could simply be to shield the academics from developing the culture change needed.
89. **Third**, formula funding is unlikely to foster collaboration among institutions or sector-wide initiatives such as training. The emphasis given to collaboration under previous HEIF rounds has led to many collaborative projects that are still at an experimental stage. It is already clear that there is good scope for achieving effective joint learning and/or scale economies, for instance in staff training or areas which are hard for individual institutions to afford - such as licensing and spinouts.
90. Given these disadvantages, it is worth considering whether there might be a **variation on formula funding** that would build on its strengths, but could

minimise its weaknesses. One option would be to determine the level of funding, not by reference to performance metrics, but by indicators of institutional potential for third stream activities. The simplest way to do this might be to allocate an amount for third stream funding equivalent to x% of QR, plus y% of contract research, plus z% of T funds – designed to reflect the third stream potential in fundamental research, application-oriented research and teaching.

91. Formula funding based on potential would have the advantage of reflecting the most significant short term rationales for government funding discussed above: cultural change, market failure and pump priming. It would also reflect the fact that, unlike undergraduate teaching for which HEFCE ‘buys’ a portion of the services, the expectation for third stream activities is that they should be ‘bought’ by the users (or their proxies) of the services, not by HEFCE.
92. Such an approach would clearly remove the first two disadvantages of formula funding (paras 87 and 88) in that it would avoid the risk of limiting potential third stream activities to those that would have an impact on a pre-determined set of performance metrics. It would thus be better at encouraging innovation and diversity than a formula based on performance metrics, and would also avoid skewing reward to activities that could attract rich clients. Its effect on the third disadvantage (on collaboration – para 89) would be no worse than a formula based on performance metrics – and could be reduced by encouraging institutions to operate their own internal HEIF approach.
93. By overcoming these disadvantages of formula funding, such an approach would not be rewarding performance – by design because of the shortcomings of the metrics as discussed above. It would however retain the other two advantages of formula funding, those of predictability and simplicity.
94. However, there would be a legitimate concern that good performance ought to be rewarded – and that institutions should not get funding automatically irrespective of their achievements. It would certainly make sense to shift the basis of the formula funding over time from one determined principally by potential to one determined principally by performance – but on a wide range of metrics to reflect the great diversity that was being sought. This shift would need to be based on a better understanding within the sector and the funding bodies about what would constitute an appropriate set of metrics (see para 100).
95. In developing such performance metrics, it will be important to avoid proxies of economic impacts, which are typically inaccurate, but rather to use measures of cultural change. For instance, the number of invention disclosures might be a better measure of academics’ commitment to third stream activities than licensing incomes (which typically have a long time lag and depend critically on the performance of licensees). The proportion of academics engaged in consulting or other types of public service may also be a better measure than the amount of money earned.

96. Until there has been sufficient experience to develop and use performance metrics, there will need to be some mechanism to provide accountability for the use of public funds. One way to do this would be to introduce a qualitative and strategically focussed performance evaluation. This could be done by a qualitative review of institutional strategies, plans and reports for their third stream activities. Such a strategic plan could be submitted on a 3-5 year rolling basis. The review would be very light-touch in that for most institutions it would only entail a desk top review and the documentation requirements would not be onerous as institutions should be developing such plans and reports in any case. Each year, a very small number of institutions would probably need a more 'hands on' review involving a site visit. There would also be a clear expectation that, once the cultural change had been achieved, such a review mechanism would be disbanded.
97. Since the objectives of funding are principally those of institutional capacity building and providing a medium term proxy for market failure, the above review could work like a process audit which would consider the extent to which:
- the range of activities makes sense in the light of the institution's strengths;
 - the institution's choice of metrics and targets makes sense and progress towards them is reasonable;
 - there is evidence that the institution is making a specific effort for cultural change and capacity building; and
 - there is evidence that the institution is taking steps to embed piloted activities and to sustain successful ones.
98. In their institutional plan, universities might be expected to outline:
- their plan for building a set of third stream activities, clarifying:
 - how the proposed third stream activities made sense in light of their institutional strengths and perceived needs, identified in their own specific environments;
 - how they are promoting cultural change and institutional capacity building; and
 - how they are ensuring sustainability through a process of embedding or graduating pilot third stream activities into a permanent activity
 - their own performance metrics, showing both the current status and targets and chosen to reflect their own specific third stream objectives (which may be selected from a longer list developed by HEFCE/OST).
99. The review would consist of a first desk top sift by HEFCE/OST staff, with the aim of selecting a small number of weak cases (and perhaps a couple of excellent ones) for further review by a Standing Panel of perhaps about 10 expert reviewers. A small number of site visits could be conducted to recommend corrective actions in problem cases and, in any cases of repeated non-improvement, to recommend cuts in funding. For the best performers, the purpose of a visit would be to learn lessons for others.
100. The Standing Panel could comprise a mix of academics, administrators, industrialists and outside experts selected on the basis of their individual

expertise or proven track record in working with third stream activities. The overall time commitments for a panel member might be no more than about 5-10 days a year – similar to time commitments expected of lay governors. In addition to conducting the reviews, the Standing Panel would also help HEFCE develop a better understanding about third stream activities and to develop a better evaluation capacity over time, including the development of a wide range of performance metrics based on actual experience of universities.

A complementary role for competitive funding

101. HEFCE/OST's current intentions are to complement formula funding with more specialized competitive funding. This makes sense if programmes could be designed to fund specific types of innovations that are unlikely to be achieved through formula funding. Target activities could include:
 - those that require significant scale economies outside of institutions – such as training or awareness raising activities to be accessible to the sector at large;
 - specific collaborative activities among a group of institutions agreeing to exploit scale economies;
 - merit based grants for highly innovative activities that are unusual in the sector.
102. Most successful competitive funding programs in the US are fairly narrowly defined so that evaluators do not have to compare apples and oranges. Narrowing target activities would enable proposals to be more specific, comparable to each other in the objectives, with clearer differences in approaches, which in turn can be the subject of evaluation.
103. One of the issues in the past has been that a large number of competitive submissions has made the evaluation process difficult. A way to avoid this would be to restrict eligibility to institutions either in terms of their proven track record (e.g. in collaboration), or in terms of their resource commitments both by themselves and by collaborating institutions. Another effective way to limit applications – and to reward performance – would be to limit eligibility to those institutions which had attained a certain level of cultural change.
104. It would be also important to develop a better evaluation capacity over time to consistently implement these funding programmes. The Standing Panel could also play a strategic role in helping build such a capacity (see para. 100).
105. One lesson to be learned from the US is the value of having a longer duration for grants – for instance up to 5 years. This would increase the stake in any competition – and make proposal writing a more meaningful process. But more importantly, a longer duration would also provide institutions with a better opportunity to complete any experimentation and to learn from the experience.

5. Long term funding options

106. In the longer term, institutions should have gone through the necessary phase of cultural change. Once cultural change was completed, there would be no further need for institutions to receive earmarked funding for third stream activities. The remaining rationales for government funding would then be market failure and pump priming for new activities.
107. As argued above, market failure associated with different types of user communities is best addressed by those public bodies with the requisite expertise on these communities.
108. The US experience indicates that there are three areas which would be potential candidates for such demand-side programmes: multiple company collaborative research; high tech research in small businesses; and community development related activities. The first two could be targeted through focussed competitive programmes, but administered by multiple government agencies to create diversity in evaluation. For the third area, it would be desirable to promote funding by RDAs and local governments for specific activities.
109. On the other hand, HEFCE would be best placed to provide pump priming funds through block grants to institutions – rather like QR funds for research. The level of such funding could be based purely on performance. The performance metric used by HEFCE could reflect those areas in which there had been inadequate developments in demand side funding.
110. There are two options for arranging the small block grants for pump priming: either as separate third stream funding or rolled into other block grants. In theory, this choice should not matter, since institutions should, by then, have sufficient momentum and commitment to sustain a level of third stream agenda of their choice, irrespective of the label under which their funding arrived. In practice, there are advantages and disadvantages for each option. For instance, it may be important to retain a notional label of ‘third stream’ to keep the emphasis alive. On the other hand, it may be administratively simpler to roll it into other block grants, given that its size is likely to be small.
111. It would be important for institutions to know in advance which option is likely to be chosen. This is because internal allocation mechanisms within institutions would probably be changed significantly, given the expected changes such as full economic costs and top up fees. It would be helpful if institutions could develop planning and budgeting systems for third stream activities at the same time – which would need a clear understanding about the expected future funding method.

6. Expected changes in the contexts

112. There are three expected developments which need to be monitored closely as they are pertinent to the future of HEFCE/OST's role in third stream funding. These are:
- cultural change in institutions;
 - the revised RAE;
 - the development of demand-side funding by other public bodies.

Cultural change

113. It is neither realistic nor necessary to expect change in the hearts and minds of every academic. Commitment from institutions' leadership would be important, but it is not easy to gauge this, as even today many vice chancellors might claim that they are committed to the third stream. So, what could be good indicators of cultural change? Cultural change may be characterized by at least three elements:
- buy-in from institutional leaders. A majority of senior academics (e.g. vice chancellors, pro vice chancellors, deans, department heads) should have internalized the third stream values to the extent that they are ready to reward good performance and are actively seeking opportunities to institutionalise third stream success;
 - buy in from a critical mass of academics. There should be a critical mass of academics who are committed to third stream values – so that third stream activities are viewed as key to enhancing their general effectiveness, and perhaps even their career;
 - adequate resources are committed to third stream activities of institutional choice. Institutions should be recruiting a critical mass of professionals to provide specialized expertise in house.
114. How long it will take each institution to get to that level clearly depends on its initial position, and the degree to which it made relevant commitments. Indeed, estimates from interviewees (from those who were willing to give an estimate) ranged from 5 years to 10 years. Specifically in technology transfer, US universities have found that their administrative capacity needed at least 15 years of experience before they could hope to break even (see para 48). In the UK, about a third of institutions have had a dedicated unit for managing external interactions since before 1995, with another third setting them up between 1996 and 2000. In ten years' time, two thirds of universities would have had 15 years of experience – which is a reasonable estimate for achieving culture change, albeit based on simplistic comparisons.
115. Ten years from now would probably be a realistic estimate of what it takes for a majority of institutions to have accomplished significant cultural change. However, it would be advisable to take stock – perhaps in 5 years – to review to the accomplishment to date, to identify remaining key constraints and hence to re-calibrate funding strategies accordingly. The main decisions would be to reassess the overall level of further funding, but also the initiation of graduation mechanisms - explained below.

116. It would be important at such a juncture to allow institutions to ‘graduate’ from the initial ‘nurtured’ status. If institutions had made sufficient progress in their institutional strategies, they could make the case that they needed no further explicit monitoring. They would thereafter receive pump priming support (which would be at a reduced level compared with the initial funding which also covered for ‘cultural change/market failure’), which could even be folded into their QR and T funds.

The revised RAE

117. The indications coming from preparatory teams working on the RAE revision are positive and they seem confident that changes will be made to remove the currently perceived disincentives for practice-based research. However, how a new set of principles are interpreted ultimately depends on a much wider community of academics than the designers. Indeed, past experience has been that the practical realities of evaluation changed little in spite of explicit changes in the guidelines. There remains a reasonable risk that little change will take place in spite of the efforts being made. Some would even argue that a broader cultural change among all academics may be a prerequisite before the overall RAE can change.
118. Another issue related to the RAE is that the stakes are too high for academics or institutions not to respond to it. The most dominant reaction of the sector at appears to be one of waiting until 2008 to see – with the belief that it is better to err on the side of conservatism than to take speculative steps. This would imply that the RAE ‘aura’ would continue to be an impediment to cultural change until 2008.
119. Finally, even if the RAE begins to reward practice-based research, its overriding effects are unlikely to change, that is that it would continue to push most academics to devote more time and energy to increasing the number and quality of whatever outputs that are recognized by the RAE. Invention disclosures, consulting associated with licensing or spinouts and many other research related third stream activities, each of which requires considerable time commitment from academics, may continue to have problems attracting their interest.
120. There is a real question as to whether HEIF is big enough as a counterweight to RAE, particularly in the short term before the proposed changes in RAE take effect in the sector. It would be critically important to monitor developments around RAE in 2008, as there may be a real need to rethink the third stream funding strategy or RAE/QR funding - or possibly both.

Demand-side funding by other public bodies

121. For demand-side funding by other government bodies, the decisions about new programmes as well as their implementation clearly fall outside HEFCE’s jurisdiction. However, HEFCE is in a position to see which

activities are making reasonable transitions into sustainability through other sources of public funding, and thus to identify gaps which would be in the interest of the country to fill.

122. HEFCE could work with other public bodies (e.g. RDAs, the Home Office or DTI) as it has done in the past, to develop jointly funded competitive programmes. The main difference from the past would be HEFCE's main interest to join in a programme of funding so that it would be sustained by other agencies into the future. HEFCE's role might be to help other public bodies get started in learning to work with universities. It is important that each of these other bodies should develop their own evaluation criteria, independent of others, based on their own perceived needs.
123. The need to develop distinct capacities to fund universities is particularly relevant for RDAs, which have the potential to become key bodies for supporting universities to work with local businesses and community groups, as suggested by the Lambert Review. Unfortunately, some RDAs are seen to be using performance metrics in a way that is unhelpful. While the communication between RDAs and universities at the leadership level is often open and forward-looking, at the working level, perhaps some RDA staff do not yet have sufficient understanding of universities to collaborate effectively with them. It is critically important that RDAs should develop an internal capacity to make qualitative judgements about university contributions and understand that the significant impact of university contributions is unlikely to be visible in the short term. Without such basic understanding in RDAs, the benefit of their 'proximity' may be reduced considerably. Equally, it is likely that there is a similar lack of understanding on the part of university staff who may see RDAs as simply another funding source. RDAs' role in the third stream is an area that deserves further analysis and development. An obvious starting point would be a detailed case study to explore options for improvements.
124. One potentially useful example is that of Georgia in the US, in which State government support was channelled through an innovative alliance between universities and industry, the Georgia Research Alliance. A key feature of the State support was that it enabled universities to recruit the best and the brightest and to build research infrastructure in strategic fields – accepting that this would take some time²⁸. The critical point is that the State representatives worked in a close dialogue both with the universities and with industry – it was not a case of sceptical and remote State authorities monitoring universities through performance metrics (as may be a tendency in some RDAs).
125. There is considerable concern in the sector about 'fairness' in funding – meaning equitable distribution of opportunities. Those in poorer regions would claim that it is unfair for their performance (for instance in collaboration with industry) to be compared with those in economically

²⁸ Geiger 2004. Roger Geiger and Creso Sa, Beyond Technology Transfer: US state policies to harness university research for economic development, *Minerva* (2005), 43: 1-21.

vibrant regions, where it may be easier to forge collaborations with industry. Conversely, others would claim that it is unfair that RDAs (which could become key partners for universities) should have such different levels of central funding. Clearly, it is impossible to equalize economic conditions for all universities – in that sense, it would never be ‘fair.’ Perhaps, the only route to counter claims of ‘unfairness’ is to have a diversity of public support – that are rewarding different types of successes.

126. If HEFCE is to take a more proactive role in promoting university-government relationships, then it would be important for it to develop better qualitative insights about these issues that are being faced by the sector. The principal role for HEFCE should be to ensure that the environment is right for universities, both within the sector but also in terms of broader public funding, so that the universities can deliver their maximum potential in third stream activities.

7. Concluding remarks

127. It is clear that the higher education sector is going through an important transition in terms of its third stream activities. The initial period of experimentation is over. In this new phase, institutions should be expected to become increasingly strategic. Decisions will need to be made by institutions in the future about how to allocate resources for such activities, with different decisions depending on their policy intentions and expectations.
128. If there is a clear expectation that the **long term** funding from HEFCE will be limited to pump-priming, and that institutions are to 'earn' additional funding from other sources including government ones, both the government and institutions could take the time to prepare for such a future. It is critically important that any changes in funding by HEFCE are introduced with a collective understanding about end goals and with clarity about the kinds of transitions expected in the future.