# Management Research: Who to Talk With, What to Say

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*This paper is a direct transcript of the key note presentation given by Professor Murray at the Conference*

There are not many opportunities for researchers in all fields of management in Ireland to meet and share their thoughts. Those who have championed the Academy are to be congratulated for creating such a venue. Those who have contributed to making this year's conference such a large and stimulating gathering are to be thanked for bringing so many of us together. Those who have joined us from other parts of the world are especially welcome for the diversity they bring to our dialogue and for the stimulation that they add.

I am taking advantage of your presence in this special forum to talk about some issues regarding management research in general, and management research in Ireland in particular, for which there are few other opportunities for expression. A great deal of management research is conducted in Ireland but there are few, if any, occasions on which the nature and impact of that research – patterns in its content and intent, the desirability of thematic priorities, its weight in shaping the market in ideas internationally or its influence on policy or organisational decision making – are considered by the research community. This may present a picture of appropriate intellectual anarchy or of subtle emergent order. But the fact is we seldom stop to think which or to consider whether the community of practice involved should give shape to an emergent order.

I wish to make a number of assertions about management research that are serious in their intent, but also intended as points of departure for continuing

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debate. I suggest, first, that we have to be more self-conscious about, and responsive to, the audience for our research. Second, I suggest we should be more coherent, collectively, in at least part of what we say.

Taking these general maxims in the context of this conference's theme – understanding, shaping, managing change – I suggest that those who do, or might, listen to us are not well served by what we typically have to say. Nonetheless, we do have important things to say: about creating better understanding through coherent, multi-level research that spans time and space and embraces diversity; about informing the judgements of those who shape change by developing evidence on causality and performance consequences; and about supporting those who initiate and manage change by constructing action research and action learning frameworks for managerial behaviour.

If we can do these things I suggest we can motivate students; talk to our peers across our beloved disciplinary silos; talk to policy makers about making better judgements; and talk to managers about learning by doing and through doing.

This, of course, has the sense of a grand rational, idealised, even utopian, vision. Having believed for many years in the superiority of the individual research voice as the best bet for creative insights, I have no desire to lessen or diminish that voice – just a desire to amplify it by harnessing the great energy that is now too often lost in isolated research and to try to bring to our work the scale of support and impact that has made such significant difference to progress in research on science and technology.

Management research activity will be better if it is, at least in part, constructed around a firm sense of who our research should address – 'who to talk with'; and if we have a sense of purpose about the conversation we wish to have – 'what to say?'

## Who to Talk With?

Business school research has four audiences. These are our students, who are best educated if teaching is research based and research informed; our peers, among whom we establish community and academic legitimacy through what we publish and on whose assessment rests career advancement; policy makers, who shape the context of business and economic change through their decisions, most typically without reference to the evidence base of management research; and managers – the practitioners around whose actions our discipline revolves – who are likely to ignore our research or find it inaccessible, contradictory and even unsupported.

The great tragedy of much research activity is that it is directed only at peers in the narrow pursuit of career advancement while ignoring our other audiences. We do this at our peril and the costs are many. We have students who find management, taught from textbooks, a trivial recitation of general principles without linkage to real inquiry – a turnoff for their inquiring minds and from engagement in a lifelong pursuit of understanding of organisations and management. We have policy makers who prefer macroeconomic analysis

to managerial- and firm-level analysis, but who are trapped into an 'environment determines all' model of causality while both we and they know that firms and managers truly matter[1]. We educate new generations of managers who ignore the academy because it cannot offer coherent evidence-based enlightenment when they ask 'but what should I do?' or because they cannot engage with the perceived practical irrelevance of research, or because they want research to be enmeshed in action and we resist this approach.

Legitimacy is a fundamental requirement of institutional effectiveness and for management research to build greater legitimacy in this country it has to build it in all four constituencies. These are our four audiences and we need an active research-related conversation with all if we are to prosper as business schools. We need a four-legged stool to secure legitimacy and support but, all too often, have fashioned a pogo stick.

These audiences are not just for talking to, but for talking *with*. The goal is dialogue, conversation, co-generation of knowledge, and that means we must engage with the interests and necessities of each audience.

## What To Say?

Since what we could talk about is as good as infinite, we need, through conversation with our audiences, to develop mutually shared focus and priorities – only then can we advance the conversation with those who give our enterprise legitimacy. In that sense our research should be co-generated whether in its conception, its conduct or its outcome.[2] Change, without doubt, is a subject of conversation that interests all – students find change natural and exciting and they will be the change agents of their generation; along with our peers, we are generally enthusiastic in the pursuit of theoretical and empirical understanding of change across all the management disciplines and do not lack for publication opportunities; policy makers are acutely aware that they, of necessity, often make poorly founded policy decisions; and managers live with change daily in complex, uncertain environments.

Yet, if we reflect on the story we tell about change, we address all audiences from the isolation of islands of disciplinary knowledge, telling a story that is disjointed and often contradictory, as likely to be driven by armchair theory as empirical evidence, with self-assured voices that deny the existence of an entire archipelago of islands of knowledge, as long as the other islands seem to be over the horizon or hidden in the fog of their own reasoning.

To mix metaphors, we have an archipelago or, if stacked vertically, a veritable tower of Babel. We babble and are ignored. We babble and add too little value when so much could be created. Our tower of Babel is often without stairs and elevators so that multi-level and multi-disciplinary research is rare, as reflected in the lack of connection between macro-, micro- and meso-level explanations of change, even though each one provides context for the next.

Despite the obvious reality that change can only be understood in the context of time, time plays a minor role in our research methods and designs.

The extent of discussion of longitudinal research is matched only by the extent of its neglect in practice. And we shy away from the exploration of diversity in a search dominated by concepts of the average and the generic.

Our four audiences, including our own local and international community of peers, are confronted with a babble of fragmented uni-disciplinary discourse which leaves us all impoverished – not because knowledge is diminished but because so much opportunity is lost.

### Building an Agenda

Well, enough of complaint. If we accept even some of what I have asserted, it is only we, as a community of practice, who can improve matters. So here is one view of what could emerge through common commitment to a vision of a management research community that has people to talk with and important things to say about the topic of change.

We can, in the spirit of the new competitive strategy, through cooperation and competition, fashion a research conversation that builds understanding of change by bringing coherence of explanation through multi-level, multi-disciplinary, longitudinal, comparative research that explains diversity, not just central tendency.

We can engage with the policy makers by emphasising causality and performance correlates, since their judgements are founded in assumptions about cause and effect and are driven by demands for higher performance, defined variously as national competitiveness, market efficiency, allocational effectiveness, regulatory or infrastructural impact, health or education gain etc. We can support management by building action research programmes that inform decision making, while guaranteeing us research access and the excitement of being as close to 'hands-on' as researchers get.

## Towards Better Understanding

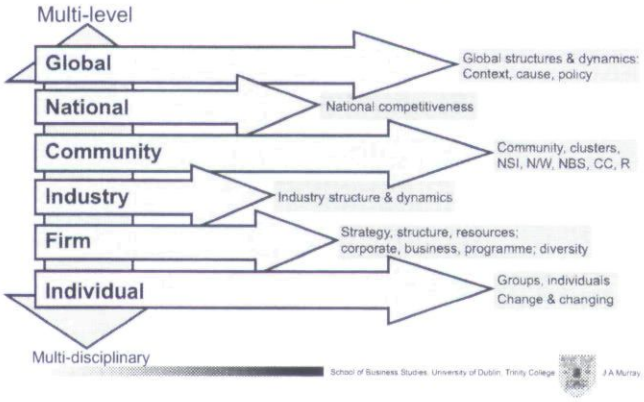
To generate a better understanding of change, I suggest we need to focus on issues of intellectual coherence, time and diversity. This better understanding is the foundation for a real conversation about change with all audiences and especially with our students and peers. Coherence is weakened by the poorly connected islands of understanding that most of us inhabit. The answer will never be a single unifying disciplinary understanding. It lies instead in connecting the islands within a shared framework that allows each disciplinary voice to reveal its insights within a larger context.

### Multi-Level, Multi-Disciplinary Research

Ireland presents a special opportunity, because of its small scale and economic dynamism, for multi-level, multi-disciplinary research programmes. The country works in a highly exposed global environment – with among the highest export and import proportions of GNP/GDP in the world. It is the largest per capita exporter of services in the world and one of the largest per

capita exporters of goods in the world[3]. So global-level dynamics are an essential part of the story of change. At national level, there is a continuous 80-year record of attempting to manage national competitiveness – of aligning with varying degrees of success, national policy, business behaviour and international forces. There is an emerging dialogue about community-level understanding, whether construed as community more generally[4], clusters[5], national systems of innovation[6], national business systems[7], cognitive communities[8] or regional analysis. Within the community level there are well developed conceptualisations of industry-level dynamics[9] and some record of industry-level investigation[10]. Within industry level there is the burgeoning tradition of research on networks[11] and then the more familiar base of management research at firm and individual levels.

**Figure 1.1: Conference: Multi-Level Research and 'The Irish Laboratory'**

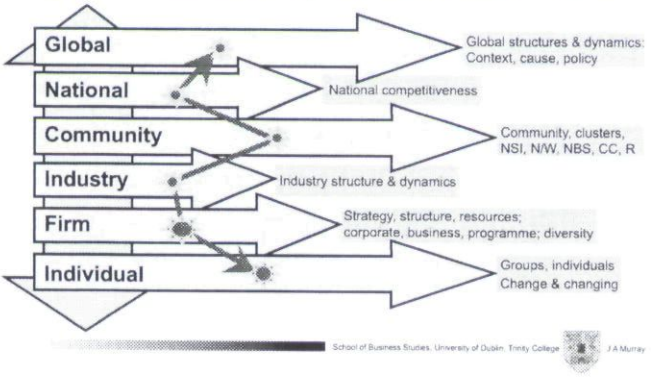



Traditionally this multi-level continuum of explanation (or nested system if you prefer a more systems-oriented metaphor) has been only partially populated by management researchers. One of the barriers to more coherent understanding of change has been the predominance of largely economics-based explanations at the more macro levels which cannot make connection with the role of firm and managerial behaviour and the opposite predominance of firm and individual explanations at the micro levels which cannot connect with the macro rationale. Reflecting on this general failure some time ago, Nelson[12] notes that 'the difference in viewpoint is due to differences in basic interests – the student of firm management concerned with the fate of individual firms, and the economist interested in general economic performance of an industry or nation'. Nonetheless, he notes success in bringing coherence across levels in the work of scholars such as Chandler[13] and Porter[14], who tackle multi-level explanation from the perspectives of the historian and the industrial economist respectively but with a deep interest in

explaining firm dynamics and behaviour in context – their impact has been the product of cross-disciplinary synergies. So the multi-level research ambition is not only needed but has a distinguished, if slim, multi-disciplinary tradition.

Research work need not all be multi-level and multi-disciplinary in order to contribute to a better understanding. Anyone excavating deeply on their own island of understanding can contribute fully as long as they appreciate how and where their work may contribute to the larger understanding and find themselves in a community of research practice that has such a framework as part of its mental map of the research enterprise.

**Figure 1.2: Research by Level and Across Levels**

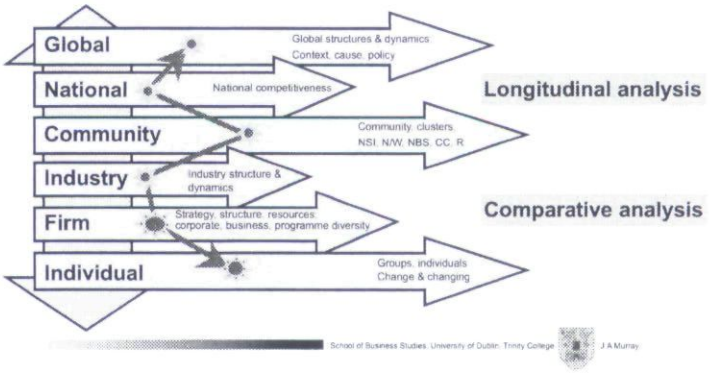



## Time and Space

Time is essential to any understanding of change, to state the obvious, yet its incorporation in our research is limited and methodologically underdeveloped. If we are to be serious about time we must major on longitudinal research. This may involve, at one limit, making observation in real time over extended periods or tracking repeated cross-sectional measures. But more commonly it involves learning and borrowing from historical research methods, exploiting archival resources, utilising available data series more fully and exploring the living record of memory and experience. It is only longitudinal research that ultimately reveals change that persists and change that fades, transformational and incremental change, change that 'succeeds' and change that 'fails', change that is deliberate and change that is emergent.

The ideal companion to time in our pursuit of a better understanding of change is change across space: comparative studies of patterns of change. In this context it is to be hoped that those from other countries attending today might find common cause with local researchers in pursuing explanations of change that are best revealed by comparative analysis, just as has been central to the contribution of Chandler's multi-country analysis or Porter's multi-country and multi-cluster investigations.

**Figure 1.3: Research Across Time and Space**




## Diversity

Understanding diversity should be at the very heart of much of management research, and especially of those under the influence of the resource-based view[15], yet there is surprisingly little attention devoted to it in the midst of exploratory studies with samples of one or more mainstream quantitative studies that focus on means and central tendency rather than variation and difference. I have argued elsewhere with colleagues in this audience for greater attention to diversity in the understanding of strategy[16] – since being profitably different seems to be the essence of strategy. But it is when we tackle a better understanding of change that diversity must surely be seen as a central construct. At the heart of any evolutionary explanation lies variation on which selection mechanisms can operate, leading to the possibility of new behaviour being retained. Nelson notes that 'from the perspective of evolutionary theory, firm diversity is an essential aspect of the processes that create economic progress'[17]. How is variation generated in a multi-level system; what selection mechanisms operate and how do the consequences of these processes travel within and between sub systems? In an economy such as Ireland's there are fascinating ecological sub-systems that, at times, appear to have features of a highly differentiated Galapagos environment. There is a vital 'FDI' sector with a long history of manufacturing prowess; a large-traded-firm indigenous sector that is surprisingly sparsely populated and located in superficially surprising industries such as cement products and packaging; a non-traded sector that is the butt of endless complaint about high costs and lack of competitiveness; an SME sector that has persistent difficulty in generating high-growth international firms; a newish hi-tech sector that has ridden the roller coaster of global boom and bust; and a traded services sector that is overtaking the manufacturing core of the traditional economy but for which we barely have summary descriptive statistics. If diversity is at the heart of change, could we have a better laboratory on our doorstep? Is the diversity contained by deep partitioning between isolated ecologies in the sectors noted? Does variation and evolution-

ary dynamics in one partially isolated ecology influence variation, selection mechanisms and retention routines in the next? Do networks span the apparent partitioning of organisational populations, transferring knowledge and routines? We really do not know, although some of the research reported at this conference may help to begin to formulate answers.

### Shaping Change: Contributing to the Policy Dialogue

The ambition to contribute directly to the policy process marks a significant departure from that of understanding change. To contribute to the policy dialogue, research has to deal especially with issues of causality and performance and timeliness. Policy makers proceed on the basis of assumptions about cause-and-effect and are driven by priorities that usually seek better performance. They are less interested in critique of past policy and, understandably, more focused on contemporary decision making. In the kind of multi-level, multi-disciplinary understanding discussed, how is causality (and contemporainety) to be addressed? Relevant achievements to date seem to point in several directions.

There is the possibility of developing and extending explanations of causation that are inherently multi-level/multi-disciplinary and that provide a framework within which level-specific causal models may be joined up. This is ambitious work, but there are some impressive shoulders to stand on in seeking to apply and improve what is already known. At a more micro or singular level, there is the necessity to move much of current research practice from description and exploration to model building, causal analysis, prediction and hypothesis testing. There is the necessity to comply, more often, with the demands of the international peer community in areas such as strategy to deal with the performance issue. This demands particular, and for some new, methodological discipline. And of course there are entrepreneurial opportunities for those who might choose to embrace the complexity of a multi-level, richly interconnected world that has to be studied by embracing time and comparison through new (at least newish) lenses such as may be found in theory on complex adaptive systems[18] or evolutionary dynamics[19].

But like the best research, this agenda should be a co-generated one. While management researchers may have to make the first move, policy makers also need to respond, invest and ensure that outcomes are appropriate to need.

## Managing Change

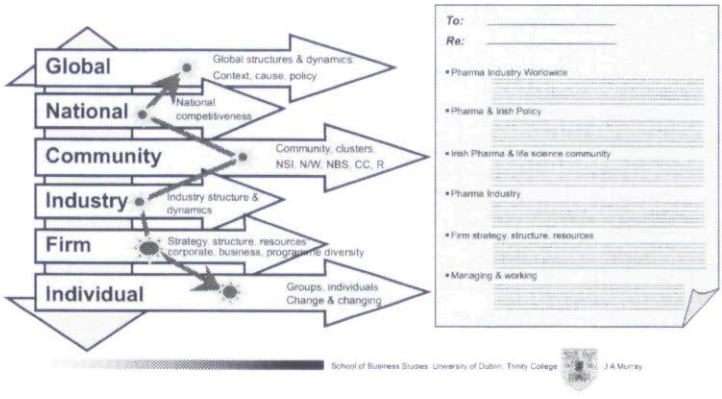
And so to the fourth audience: the practicing managers who make decisions, commit resources, drive organisational performance and, from the typical management researcher's perspective, shape the whole multi-level system from the bottom-up. It is always our intent that managers will be our graduates and that, by giving them a deep understanding of the nature of change, we will prepare them for a professional career in which they will be the essential agents, interpreters and implementers of change. That is our legacy to them when they graduate. In practice we can extend this relationship by engaging

with them in action research, in their real-world, real-time 'laboratory'. If we have educated them well, they know how to think about change and how, through continuous learning, to remain in touch with the world of ideas about change. But their professional challenge is to 'do it'. We can join with them in this action-oriented world through action research. We have a ready, but largely under-exploited, approach and set of methodologies associated with action research. We are lucky also to have some of action research's better known intellectual trustees here in this audience – people such as David Coghlan[20] – to guide initiative in the area. Barriers to investment in this area are not readily apparent and may reflect nothing more serious than suitable introductions from which the research conversation may grow.

### For Example

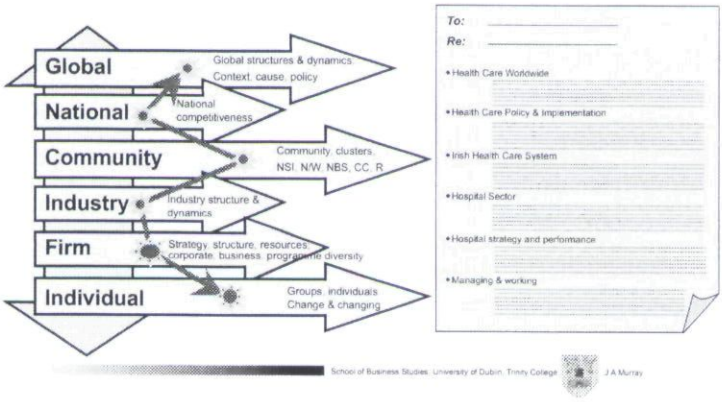
Two examples of potential multi-level, multi-disciplinary research on change that would seem to be of great interest to all audiences are illustrated in Figures 1.4 and 1.5, suggesting respectively the story of change that might be told about the pharmaceutical industry and the health care system – private and public sector multi-level systems of great importance economically and socially as well as to academic, student, policy maker and manager alike. In both instances a patchwork of evidence and research exists but no coherent story of change or its explanation.

**Figure 1.4: What to Say and to Whom**




In the case of pharmaceuticals, we have a truly global industry in which Ireland plays a role as a global centre of production. The global context is marked by significant industry restructuring through merger and acquisition and the relocation of research towards North America; traditional research activity is experiencing a persistent decline in productivity while the new life sciences are revolutionising the industry's scientific basis; global demographics and disease patterns are redefining health care needs and the cost and efficacy

**Figure 1.5: What to Say and to Whom**




of health care provision have brought government, regulators, insurance providers and consumers into the global market as active agents.

In this context of global change, Ireland, nationally, is the largest location in Europe for international pharma investment. It is the sixth largest national producer and exporter in Europe, with 81 companies in the sector including 13 of the top 15 companies globally. These have an investment base of €15 billion and exports of almost €40 billion. They form a unique pharmachem cluster with emerging features of a bio-pharm cluster (with the largest bio-pharm plant in the world commencing operations this year at Wyeth's second site in Ireland). This cluster appears to have acquired a gravitational pull with regard to international foreign direct investment worldwide, both pulling in new investment and deepening existing investment. This dynamic national-level picture portrays rapid and continuing growth and development and the emergence and evolution of a science and manufacturing intensive cluster of international consequence. Considering the cluster phenomenon, reminds us of community-level concerns because pharmachem and biopharm are embedded in a web of interrelated supporting service and manufacturing industries and institutions ranging from research institutes and university departments to specialised construction and manufacturing service suppliers. This is an entire pharmaceutical and life science community, as BioResearch Ireland would see it, that has emerged and evolved rapidly over the past 30 years without anyone quite understanding the causal processes involved or the forces driving its future shape[21].

Looked at with more focus at the pharma industry level, the dynamics of industry restructuring and changing competitive interaction is visible locally through predominantly manufacturing-related change, the development of supply chain management, changes in functional relationships between R&D, process design and innovation, manufacturing and logistics. At firm level, the fortunes of a diverse population of organisations engaged in the industry and

the wider community – ranging from subsidiaries of global corporations to indigenous start-ups – may be researched with regard to their strategies, functional activity and performance consequences. Within these organisations is the final nested system of individuals and their work and all the myriad issues in personal, group and organisational change that can drive the research enterprise on change[22].

Turning to the health care system, a vital national underpinning for health and social well-being, one may suggest a similar multi-level framework within which change may be better understood and without which it will be very difficult to master the task of managing policy and managing health care delivery. Any national health care system stands enmeshed in the dynamics of global health care – its politics, its demographics, its science and technology base, its institutional evolution, its educational infrastructure, its diverse national modes of operation and effectiveness.

At national level in Ireland we are poised on the crest of a planned transformational change in national health care structures, financing and delivery, fuelled by a series of publicly commissioned reports on the system. One of the more dramatic experiments in national-level systemic change management is in progress. This change process is conceptualised principally as one encompassing the hospitals, community care and support services sub-systems together with the governmental and allied governance mechanisms. While this describes an inner core of the health care community, the community also encompasses related professions, family, school and workplace, and an array of related supply and support industries. Effective transformational change will be a function of the interactions of the entire community and, insofar as this may be seen as a complex adaptive system with many non-linear feedback processes, we know that minor change in some subsystems may produce disproportionate impact on community dynamics and performance and vice versa.

Within the community, the hospital 'industry' is undergoing rapid, often pressurised, change and is set to face a continuing demand for change from the transformation of the larger system, from the technology of health care and the technology of hospital care and the reprofiling of professional and managerial competencies. These latter thoughts bring us to the story of change concerning individuals living in and through the health care system. Patients experiencing a journey through the system, professionals providing specialist inputs, managers trying to provide integrated effective care, all encounter change as an intimate reality – they are the subjects, objects, creators and implementers of change; those for whom transformational change is not a goal or a strategy but a personal experience.

In both these examples I suggest that change cannot be adequately understood at any one level without understanding it in a multi-level context which is only accessible through multi-disciplinary inquiry and that the contexted understanding is much more than the sum of the level-by-level understandings. Moreover, I suggest that if we cannot tell the full story our audiences will be less well served and may continue to tune-in to different channels.

## Our Challenge

Addressing change in the manner suggested is not an undertaking for the faint hearted. Yet the faint hearted can pick off a more modest, and perhaps more sensibly focused, research endeavour simply by choosing their level and deploying a particular disciplinary insight. But their ability to add significant value is constrained if they cannot do this within the framework of the grander undertaking. To deliver the grander vision requires networks of collaboration and significant funding. There are few if any business schools in the country that could mount such research, but networks of researchers across business schools with close ties to international networks of researchers with similar commitments and ambitions could. Creating such strategic networks is the kind of initiative about which we commonly talk to our students in the context of business strategy – but have we the imagination and dedication to take our own advice? If so, perhaps we can lift some of our research above its all too modest average. That is a challenge to building community and appropriate scale and scope in research. If it is possible, it has to be matched by funding of corresponding scale and ambition.

Funding for research has undergone a sea change in Ireland in recent years. From a position of negligible resourcing, significant research grants are now available for university research primarily through three mechanisms – the PRTLI, the SFI and the IRCHSS. However, the emphasis is predominantly on science research and, while funding for the social sciences including management is provided, it is still relatively modest and targeted mostly at individual work.

Large scale, programmatic research in management, however, has many of the attributes of major scientific research projects: team, not individual, based; capacity to amass and analyse large data bases; long time spans; international networking; and staffing through the attraction of leading researchers from major research centres around the world. None of these come cheap. If this is the direction that part of our research enterprise must take then we must be able to pitch our story of change to our audiences who provide or influence the funding – peers who evaluate publicly funded projects, policy makers who must be convinced that their decisions would be better informed as a result, and managers who can see the managerial and organisational effectiveness payoff from being both involved and better informed.

R&D spending across business, education and public research institutions increased three fold during the 1990s but is still below the EU average (1.4 per cent v 1.9 per cent GNP). Business expenditure on R&D is particularly low (0.9 per cent v EU average of 1.25 per cent GNP). Only 5 per cent of third-level R&D funding comes from the business sector. Of the PRTLI programme, 7 per cent of funding is allocated to the social sciences/humanities, SFI funding is for science and the IRCHSS awards are modest and targeted principally at individual researcher level. Funding for major, medium- to long-term management research is therefore very limited and unsupported by industry – by our managerial audience (who are also increasingly likely to be our business school alumni). The reasons behind this pattern are not docu-

mented as an allocation logic but one may surmise the assumptions involved: science and technology are the engines of economic and related social development, of national competitiveness and of national wealth creation, and investment in science research is an investment in the underlying knowledge base. The proportionality of investment in science versus social science research presumably rests on an assumption that having scientific knowledge is largely effective on its own in driving wealth creation. It attributes minor importance to the knowledge base that deals with choice of sciences and sectors in which to invest, with the commercialisation of scientific knowledge and with the creation of competitiveness on the basis of scientific knowledge. These latter are of course the domains of social science inquiry and management research in particular. While this reasoning suggests a dismissive logic at work in policy making, it is unlikely that most informed policy makers are so dismissive. So why does allocation and investment with regard to knowledge creation take on its observed pattern? I suggest it may be because of lack of 'supply' and therefore of opportunity for decisions to take a different form. There is a ready supply of scientific research with a determined and specific agenda of vital research to be done. There is a vision of opportunity in the form of new scientific research outcomes to associate with global trends and shifts in sectoral growth and national and firm competitiveness. On the management research side, there is no equivalent well-articulated sense of supply or opportunity. While we may appear to have a funding problem, I suggest we in fact have a supply problem.

So there may be no grounds for complaint about current funding levels. The complaint may be, rather, that our own ambition has been too meagre, our vision too limited, our conversation with our audiences too impoverished and our commitment to building networks and alliances too faint. Perhaps it is not so much that we cannot do this kind of research for lack of funding, as that we cannot support this kind of research for lack of vision communicated effectively to our audiences.

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1 See for example A.M. McGahan and M.E. Porter (1997) 'How Much Does Industry Matter, Really?', *Strategic Management Journal*, Special Issue, Vol. 18, pp. 15–30; and J.B. Barney and A.M. Arikan (2002) 'The Resource Based View: Origins and Implications', in Hitt et al. (eds) *Handbook of Strategic Management*, Oxford: Blackwell, pp. 124–88.

2 See C.K. Prahalad and V. Ramaswamy (2004) *The Future of Competition: Co-Creating Unique Value with Customers*, Boston: Harvard Business School Press.

3 See Forfas, *International Trade and Investment Report*, 2003, Dublin; Forfas, Enterprise Strategy Group Report: *Ahead of the Curve*, Dublin, July 2004.

4 H. Aldrich (1999) *Organisations Evolving*, Sage, London, pp. 298–330.

5 M.E. Porter (1990) *The Competitive Advantage of Nations*, NY: Free Press, 1990; and M.E. Porter (1998) *On Competition*, NY: Free Press.

6 B. Lundvall, B. Johnson, E.S. Andersen and B. Dalum (2002) 'National Systems of Production, Innovation and Competence Building', *Research Policy*, Amsterdam, February, Vol. 31, No. 2, p. 213.

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8 J.F. Porac, H. Thomas and C. Baden-Fuller ( 1989) 'Competitive Groups as Cognitive Communities: The Case of Scottish Knitwear Manufacturers', *The Journal of Management Studies*, Oxford, July, Vol. 26, No. 4, p. 397.

9 M. Porter (1980) *Competitive Strategy*, NY: Free Press; and G. Walker (2004) *Modern Competitive Strategy*, NY: McGraw Hill.

10 Many of the earlier public policy related government reports are industry and sectoral in focus and there has been sporadic application of Porter's 'five forces' framework.

11 See for example R. Gulati, N. Nohria and A. Zaheer, 'Strategic Networks', *Strategic Management Journal*, Vol. 21, No. 3, pp. 203–16, special issue, and many of the papers presented at this conference.

12 R.R. Nelson (1991) 'Why Do Firms Differ and How Does it Matter?' *Strategic Management Journal*, Vol. 12, Nos 61–74, p. 72.

13 A.D. Chandler (1966) *Strategy and Structure*, NY: Anchor Books; and A.D. Chandler (1990) *Scale and Scope: The Dynamics of Industrial Capitalism*, Cambridge: Harvard University Press.

14 M.E. Porter (1990) op.cit.

15 See for example special issue of the *Strategic Management Journal*, 24 October 2003.

16 A. O'Driscoll, J.A. Murray and A.Torres (2002) 'Discovering Diversity in Marketing Practice', *European Journal of Marketing*, Vol. 36, No. 3, pp. 373–90.

17 Op.cit., p. 72.

18 See for example B. McKelvey (1999) Complexity theory in organizational science, *Emergence*, Vol. 1, pp. 3–32.

19 See for example H. Aldrich, op.cit.

20 See for example D. Coghlan and T. Brannick (2005) *Doing Action Research in your Own Organization*, 2nd Edition, Sage: London.

21 Research by E. Kasabov at Trinity College, School of Business Studies, seeks to understand the nature of community as a level of organisational aggregation and to model some of its underlying characteristics for the Irish life science and biotechnology community.

22 See for example M.A. Keating and G.S. Martin (2004) *Managing Cross-Cultural Business Relations: The Irish–German Experience*, Dublin: Blackhall Publishing, for insight into some of the cross-cultural issues in management and leadership touching on this sector.