

INNOVATION AND
PUBLIC POLICY:
THE CHALLENGE OF
AN EMERGING PARADIGM

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**Innovation and Public Policy:
The Challenge of an Emerging Paradigm**

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Innovation is an issue with implications that cross the research community, business, public policy and politics. This paper explores two basic paradigms through which these might be assessed, one based on neo-classical assumptions and the other on systemic and institutional perspectives. The former is now at the epicentre of public policy, whilst the latter occupies its margins. Yet, the institutional framing has considerable implications both for the substance of the policy agenda and for the processes that mediate policy choice. The paper explores these issues through a variety of disciplinary and practical domains. It concludes with a brief review of some specific implications for public policy. The paper provides an overview of a broad agenda rather than detailed assessments of specific matters. Its purpose is to open up discussion. Specialised literatures in a number of disciplines surround each of the issues that are covered and the ideas sketched here need to be considered in that light.

As the *Oxford English Dictionary* definition implies, innovation is an exceedingly broad theme: 'bring in novelties, make changes'. Jan Fagerberg in the *Oxford Handbook of Innovation* offers a more specific definition, which reflects its special significance in economic activity and which distinguishes between invention and innovation:

Invention is the first occurrence of an idea for a new product or process, while innovation is the first attempt to carry it out in practice... While inventions may be carried out anywhere, for example in universities, innovations mostly occur in firms, though they may also occur in other types of organisation such as public hospitals..... To be able to turn an invention into an innovation a firm normally needs to be able to combine several different types of knowledge, capabilities, skills and resources (2005, p. 5).

Paralleling its rise as a practical concern, innovation has attracted increasing attention in a wide range of disciplines, including economics, sociology, law, political science, and organisation studies (see entries on innovation in *New Palgrave Dictionary of Economics*, the *Annual Review of Sociology* etc). Further,

concepts drawn from literatures based on innovation in business settings have been translated to other domains. These include public policy, public management and community development. Other literatures explore the relationship between national institutional settings and capacities for innovation (e.g. Hall and Soskice, 2001).

At a theoretical level, innovation began as a preoccupation of economics. Technological development has long been recognised as a key source of economic growth. Neo-classical theory offers one framing of this process. More recently, more specialised branches of the economics literature, which adopt institutional perspectives, have developed.¹ One models innovation as an endogenous process, while another focuses on systems, organisations and locations. The boundaries of systems depend on such factors as technology, industry structure and linkage patterns. The concept of location ranges from regions to whole nations and on to global production systems. Tacit knowledge and social exchange underwrite the importance of 'local' structures and these can be complemented and reinforced by appropriate linkages at other levels.

Innovation has also figured in business and public policy literatures. In the former case, the causes of a rise in interest include the globalisation of production and the need continuously to develop competitive advantages. The means to encourage innovation include fostering inter and intra organisational creativity and upgrading products, processes and product-linked services. Service and creative industries represent specialised fields of study.²

In the case of public policy, two dimensions are involved. At one level, it is suggested that a policy system needs the capacity to scan its environment for paradigm shifts that are potentially transformative (e.g. climate change, innovation theories). Potential developments need to be evaluated. At another level, and in response to simultaneous pressures for cost control and more customised services, leaders aim to

¹ Institutional theory also explores the long run conditions for growth e.g. Douglass North, 1990, *Institutions, Institutional Change and Economic Performance* (Cambridge University Press) or for other perspectives, Rhodes et al. 2006, *The Oxford Handbook of Political Institutions* (OUP).

² For example, *Creative Industries Cluster Study* (Australia), www.artsandrecreation.gov.au/cics/; UK: DCMS, 2008, *Creative Britain, New Talents for the New Economy*, HMSO.

build public services that are subject to continuous improvement. The innovation paradigms offer fresh perspectives on both these ambitions.

These ideas and approaches constitute a (more or less) coherent family because of their shared focus on knowledge in its various forms: problem identification and definition; knowledge development; knowledge diffusion; and learning. One core thesis in innovation literatures concerns the association between markets and knowledge regimes. In institutional perspectives, competitive markets are a necessary, but not sufficient, condition for innovation and continuous improvement. The knowledge regime in any particular organisation or sector also needs to be appropriately configured. This is a fundamental finding with wide ranging implications. However despite the volume of scholarly work, many perspectives and instruments remain on the margins of practice: perhaps a pointer to the challenge associated with gaining attention for new paradigms, as well as organisational myopia and the power of habit and familiarity?

At the level of political programs, innovation has the potential to become an encompassing agenda. As noted above, innovation as a theme crosses economic and business activity, public policy, public administration and community development. Meantime, economic globalisation continues as a primary external driver of policy change. The so-called micro-economic reform agenda, which has preoccupied Australian politics since 1983, was a first response to this imperative. This agenda, which involved economy-wide structural change, is now virtually fully implemented. But, pressures for upgrading and continuous improvement continue. The institutional approach to innovation offers a fresh policy response to these concerns. Indeed, fully elaborated, this agenda would resemble the preceding micro-economic reform program. It presents distinctive and fundamental challenges to conventional wisdom about the role of the state in the economy. Conceived as a 'knowledge society', innovation could constitute a new encompassing narrative whose implications spill over to a wide range of policy areas, including social policy, infrastructure and education. One example of an effort to come to grips with this more

comprehensive agenda is provided in a report by Ireland's National Economic and Social Council (e.g. NESC, 2005).

Finally, in Australia a practical issue concerns the implications of the present resources boom. Is Australia fated to suffer the resources curse? This seems to be the Treasury view. Yet, a number of other countries – Sweden, Denmark, Finland, Norway and Holland for example – have combined substantial resource exporting with the development of innovative and successful secondary and service sectors. Similarly, in another time and context, Deakin successfully resisted the 'resource curse'. 'New Protection' in 1908 was designed to reconcile industrial development and substantial commodity exporting (Marsh, 1995, p.26-27. In a different era, but exactly one hundred years later, Australia would seem to face an analogous challenge.

The following sections explore these varied conjectures. The first section reviews relevant literatures. This is naturally not a comprehensive survey, but it is designed to indicate the scope of the domain and some fundamental contrasts between neo-classical and institutional approaches. The second section discusses some key practical implications of these differences, particularly for public policy. A concluding section identifies some particular implications for Australia.

Institutional and Neo-classical Paradigms.

A concern for innovation has figured in four recent literatures: economic theory, applied innovation studies, organisation studies and public policy. Theory germinated in the first, informed research in the second and, mediated by practical and disciplinary interests, subsequently spread to the other domains. Where appropriate, contrasts are drawn between neo-classical and institutional paradigms.

i) Economic Theory.

Innovation was originally recognised as an activity that deserves specific attention in the discipline of economics. It figured in the work of seminal theorists such as Marshall (1890), Schumpeter (1934) and Penrose (1959). Recently discussion has crystallised in two broad paradigms. One derives from neo-classical theory and involves such concepts as public goods, spillover effects, property rights, competition and market failure. The second is institutional and focuses on innovation systems and knowledge regimes, which are proposed as an essential complement to competitive arrangements. Because they carry the greatest challenge to conventional views of public policy and the role of the state in the economy, the following discussion focuses especially on institutional developments and highlights how assumptions and orientations vary between these differing perspectives.

a) Neo-classical framing: Neoclassical theories early recognised two distinct forms of knowledge: basic research and information. The former was regarded as a public good and the latter as a tradable good. The market failure argument for public investment in basic research was developed by Arrow (1962). This contributed to an expansion in public spending, which was no doubt also fuelled by defence considerations. The 1970s and 1980s saw an upsurge of neo-classical theory (Friedman, 1980; Blyth, 2002). This was associated with a renewed interest in unfettered market exchanges as the condition for efficient resource allocation. The policy implications involved deregulation and market liberalisation. Property rights and patent regimes were also particularly emphasised as were non-discriminatory incentive frameworks. Market failure licensed government action but the scope for initiative was highly qualified. Public choice theory provided a battery of arguments against social choice.

When applied to innovation, these perspectives favoured public spending on science. This became associated with a linear conception of the innovation process - from the laboratory to commercialisation. Meantime, the role of property rights and patents as the foundation of economic choices cast market-mediated commercialisation as the key process. Tax incentives were seen as the primary instrument to encourage private sector R &D. According to *The New Palgrave Dictionary of Economics*:

Economists of all descriptions have accepted that new products and processes are the main source of dynamism in capitalist economies. But relatively few have stopped to examine in depth the origins of such innovation and the consequences of their adoption...(they prefer) to concentrate their own efforts on *ceteris paribus* models, which relegate technical and institutional change to the role of exogenous variables (1998, p. 858).

Institutional framing: The paradigm associated with innovation theories draws on different assumptions. It responds to Schumpeter's insight, since termed the paradox of competition:

A system that at every point of time fully utilises its possibilities to the best advantage may yet in the long run be inferior to a system that does so at no given point in time, because the latter's failure to do so may be a condition for the level or speed of long run performance.

National Innovation System (NIS) approaches start from this paradox. From the early 1980s, the role of technology (or more simply knowledge) as a driver of growth, came increasingly into focus. This was associated with attention to two older streams of theory. One concerned the role of institutions in the economy and the other the distinctive characteristics of technologically driven growth (e.g. Hodgson, 2002; Schumpeter, 1934, 1976). This provenance was evident in three complementary literatures. The first concerned national innovations systems (e.g. Nelson and Winter, 1982; von Hippel, 1988; David, 1991; Rosenberg, 1994; Lipsey, 1995, 1997, 1998; Lipsey et al, 2005) and adopted the idea of a system as the primary motif, exploring both its component elements and the determinants of successful linkage.

The second literature was styled endogenous growth theory (e.g. Dosi, 1987, 1997; Romer, 1986, 1994). According to Verspagen (2006, p. 503): 'Romer (1986).... proposed to make technology endogenous by modeling the R and D process....The technological spillover in the endogenous growth models lead to increasing returns to scale at the aggregate level.' At the same time, other versions employ different, but no less plausible, assumptions about the form of technology spillovers. The details are less important than

the consequence, which is that no clear guidance for policy is available from endogenous models (Verspagen, p. 502-503).

The third literature involved Porter's work on national competitiveness, which shifted the focus to sectoral and regional/local sources of innovation (1989, 1998). His work highlighted the critical role of clusters. Their combination of collaboration and competition yielded economic and innovative outcomes superior to those available from competition alone. The Australian wine industry classically exemplifies these dynamics (Marsh and Shaw, 2000; Smith and Marsh 2006; for a more comprehensive discussion of the theoretical issues see Lipsey et al, 2005).

The difference between neo-classical and institutional approaches derives from their different premises. The neo-classical model originated in a mechanical imaging of physical and social processes. This was reflected in the assumption that equilibrium is the 'normal' state of the economy. This, along with subsidiary assumptions about knowledge, risk, choice and competition, made possible a model of the economy in which an optimal result became the logical outcome of price mediated exchanges amongst independent economic actors. The driver of growth differs between the two models. In institutional perspectives, it derives from the application of knowledge (i.e. value-driven productivity growth); in neo-classical perspectives it derives from the pursuit of allocative efficiency (i.e. cost-efficiency driven productivity growth). At least four fundamental assumptions separate these two approaches. These concern knowledge, uncertainty, competition and the dynamics of co-ordination.

In neoclassical theory, knowledge is generally conceived as a homogenous stock that can be augmented incrementally and that diffuses instantaneously. Knowledge externalities arise because a firm's production depends both on its own efforts and on the general stock. In this perspective, the state can influence the pace but not the direction of technological change. This can also be associated with a view of the innovation process as one that is linear in direction – with the flow from pure to applied research and then on to development and commercialisation. By contrast, evolutionary and NIS theories treat

knowledge as lumpy and diffusion as problematic. The most useful forms of knowledge often arise from problem solving at the firm level. NIS approaches also assume that pay-offs vary between different kinds of knowledge and that feedback loops are critical. These premises license attention to the pace and the direction of technological change and to different sources of knowledge. In other words, they license a selective approach.

A second difference concerns the distinction between risk and irreducible uncertainty. Optimising behaviour under conditions of uncertainty requires agents who know all the possible outcomes of their choices and who have clear probability distributions about the likelihood of each outcome. Their decisions are thus characterised by risk, but not by genuine uncertainty. As such, the equilibrium frame produces the optimising behaviour that characterises the neo-classical model. Introducing genuine uncertainty makes the possibility of an optimal, or even a determinate, end-state problematic. Two individuals with similar preferences and faced by similar choice sets are likely to select wholly different outcomes.

A third assumption dividing evolutionary and neoclassical approaches concerns the nature of competition.

Passive price taking behaviour is not involved. Rather behaviour takes the form of active struggling firm against firm, each seeking a temporary advantage over others...Long run equilibrium analysis of the competitive process is not just irrelevant but misleading because firms that are competing will cause technology to change endogenously long before any long run tendency based on fixed technology and tastes is manifested in observed behaviour (Lipsey et al. p. 39).

Finally, they differ in assessments of the dynamics of economy-wide coordination. Whereas the 'invisible hand' of unfettered markets is held to be the source of this benign outcome in neo-classical approaches, innovation theorists judge co-ordination to be contingent. In the words of Dosi and Orsenigo (1988):

“order in change” is generated by various combinations of (a) learning (b) selection mechanisms and (c) institutions.’ (cited *ibid*). This provides a logic for paying attention to whole systems and to the effectiveness of institutions that mediate learnings of many kinds, including those associated with applied research, knowledge dissemination and feedbacks.

These abstract formulations provide a frame within which studies of innovation in particular industry sectors have been conducted. Some findings of this research are sketched in the next section.

ii) Applied Innovation Studies:

Innovation literatures in the institutional stream take the lumpiness of knowledge, the irreducibility of uncertainty and entrepreneurial activism as grounding characteristics. Within this framework, empirical investigations have explored the conditions that are associated with successful innovation. Jonathan West (*An Innovation Strategy for NSW*, 2006) has summarised the key findings in relation to innovation as an economic process as follows:

Some essential components of an effective innovation system cannot be developed by private firms alone. Research to identify characteristics of innovative firms highlights several typical features, each of which appear to relate to enabling factors in innovation:

- **Innovating firms are collaborators.** Knowledge creation takes place through interaction with other enterprises, organisations, and public institutions of the science and technology infrastructure. Indeed, empirical research has shown that innovating firms are almost *invariably* collaborating companies, that collaboration persists over sustained periods, and that universities and research institutes are important collaboration partners.³

³ Basri, E. ‘Inter-firm Technological Collaboration in Australia: Implications for Innovation and Public Policy’, in OECD *Innovation Networks: Co-operation in National Innovation Systems*, OECD Paris, 2001.

- **Innovating firms accumulate capability over time.** Past developments tend to be utilised to determine future pathways of innovation. Cumulative capability acquisition underlies patterns of specialisation in economies, and creates differentiation among regional and national economies. Effective policy builds on rather than ignores or counteracts such accumulated capability.
- **Innovating firms tend to cluster.** Multiple studies have suggested that successful firms gather together geographically, either ‘horizontally’—groups of firms in the same type of business—or ‘vertically’—firms connected in related value chains... Clustering appears to help overcome limitations of scale.
- **Innovating firms in all sectors employ knowledge not developed internally.** Many new products (and processes), while not spawned by scientific discovery, draw upon knowledge not possessed by firms’.

More generally, Crouch (2005), argues that innovation is nourished best by institutional diversity. This is in opposition to analysis such as that represented in the ‘varieties of capitalism’ literature, which emphasised the institutional complementarities that characterise particular economies. Crouch argues that a meta-‘invisible hand’ would smother, rather than nourish, innovation. He suggests the “varieties of capitalism” approach obscures its true source which is institutional heterogeneity. Within any particular polity:

Institutional heterogeneity will facilitate innovation both by presenting actors with alternative strategies when existing paths seem blocked and by making it possible for them to make new combinations amongst elements of various paths (p. 70).

This creates the free play that allows new adaptive strategies to be imagined and trialled. (for a US illustration see Whitford, 2005).

iii) Innovation in Organisational Studies

As innovation has risen in priority as a practical concern for business, it has come to figure as a topic in organisational literatures. Again relevant references are legion. The following paragraphs highlight some of the more influential studies. In the 1990s, work at an academic level involved two themes. One concerned the obstacles to innovation that organisational and systemic factors introduce. Where an apparently successful product or process exists, difficulty in gaining attention for new approaches arise from organisationally-induced myopia, lock-in, group think etc (e.g. March, 1989). The second concerned the organisational conditions that might counter these responses, for example *The Knowledge Creating Company* (Nonaka, 1995) and *The Fifth Discipline: The Art and Practice of the Learning Organisation* (Senge, 1994).

More recently, a leading management theorist, Gary Hamel, has suggested that the organisational implications are much more radical than these earlier literatures estimated. They accepted the hierarchical principle at the heart of conventional views of organisational design. Hamel suggests innovation calls for variation in this basic principle. His views were summarised by Professor Jim Hesketh in a recent on-line forum hosted by the Harvard Business School (17th March 2008). I cite this in full to illustrate the substantial implications that are also envisaged on this plane:

There appears to be a growing impatience with the lack of progress in management of innovation and change in the very roles that manager's play. Gary Hamel in his new book, *The Future of Management*, regards management innovation as "anything that substantially alters the way in

which the work of management is carried out," including organizational forms.⁴ He distinguishes it from operational, product/service, or strategic innovation. Although he maintains that only limited incremental management innovation has taken place since the early part of the twentieth century, he believes the time may be right for significant change. He's not alone. Theodore Zeldin, a British historian who has spent a great deal of time studying the world of work, stated recently in an interview with the *Financial Times* that "the world of work must be revolutionized to put people—rather than things—at the centre of all endeavors."

Hamel envisions a future in which the goal of management is to build "nimble" organizations in which innovation is everyone's job; there is slack among human and other resources that allows people to think, innovate, and take measured risk outside the core activities of the business; there is more freedom and self-management and less management as we know it; there is more community and less hierarchy; and there is more shared sense of purpose and less need for management "exhortation." He sees many of these things in each of several organizations—including Whole Foods Markets, W. L. Gore, and Google—that he examines in some depth. These organizations share some things in common. All are operated in a team mode, with power given to the teams to run mini-businesses, including hiring, training, and firing personnel. All reward teams at all levels for performance. All provide generally unmonitored time for employees to develop product and service innovations as well as either redesign their jobs or relocate themselves within the organization. All share an extraordinary amount of information at all levels and devote a great deal of resources to making sure that all employees are connected. All "herald a future in which the work of managers is performed less and less by 'managers'." All are among the most outstanding places to work. All produce unusually high profits in their respective industries, which Hamel implies is the result of management innovation. And none are led by MBAs.

⁴ Gary Hamel, *The Future of Management* (Boston: Harvard Business School Press, 2007)

Reasons why we might see an unusual amount of management innovation in the coming years would certainly include the continued development of the Internet and the transparency and communities it has spawned, new attitudes toward work and the way it is performed, and global competition and cooperation, much of it fostered by the Internet. But will these forces outweigh the natural tendency of those in control to resist change? Will management innovation largely be confined to entrepreneurs (like those above) with little exposure to traditional management concepts?

Literature has also burgeoned at the applied level. To take just one illustration, a search on the keyword 'innovation' on the *McKinsey Quarterly* web site yielded 365 references. The articles covered subjects such as: surveys asking executives about key organisational opportunities and blockages; the implications of innovation for organisational structures and processes; human resource strategies favouring creativity and innovation; the importance of 'push' (bottom up) rather than 'pull' (top down) approaches; and the role of open source software as an aid to collaboration and interaction.

In building the innovative capacities of large, integrated companies, one remedy involves a partial separation between new process research and operational activity. As Bryan and Joyce (2005, p. 3) put it: 'As one executive we know put it, you don't want people who are engaged in hand-to-hand combat to design a long-term weapons system' (Bryan and Joyce, 2005, p. 3). Nauta (2007) explores some of the organisational initiatives that particular companies have adopted in responding to the challenge of innovation. For example, *Nokia* assigns particular challenges to multiple teams, while *Shell* illustrates another approach:

Let's say that you have a radical idea at *Shell*. You can submit that to the *Gamechanger* program via a website. A small team that reports directly to the CEO assesses the potential. If they like your idea you have a meeting with them within two weeks after your submission. If they like you, they will give you budget to further develop your idea into a "proof of concept".

iv) Innovation in Public Policy.

There are at least three relevant streams in public policy literatures, drawing on neo-classical, organisational and institutional approaches.

a) Neo-classical Approaches: Two studies recently published in the UK offer perhaps the best account of the current conventional wisdom concerning approaches to innovation or continuous improvement in public services.⁵ Each surveys the theoretical models that might underpin continuous improvement in public services. One author, Julian le Grand, identifies four:

Trust, where professionals, managers and others working in public services are trusted to deliver a high quality service; targets and performance management, a version of what is often termed command and control...; voice, where the users of public services communicate their views directly to service providers; and the “invisible hand” of choice and competition, where users choose the service they want from those offered by competing providers (p.1).

His short book explores some of the strengths and weaknesses of each of these approaches. Le Grand’s own preference is for a much extended use of quasi-market solutions. Whilst there is clearly more to be said about these choices, this is an important survey of the contemporary repertoire.

The second author, Michael Barber, identifies three models of change: command and control; devolution and transparency; and quasi-markets. Like Le Grand, command and control involves centrally-led targets and performance management, which:

⁵ Michael Barber, *Instruction to Deliver: Tony Blair, Public Services and the Challenge of Achieving Targets*, Politico’s, 2007; Julian Le Grand, *The Other Invisible Hand, Delivering Public Services through Choice*, Princeton, 2007.

...well done can rapidly shift a service from “awful” to “adequate”. This is a major achievement but not enough because the public are not satisfied with “adequate” – they want good or great (p. 335).

In his estimate, adequate is mostly what the Blair Governments have accomplished. Moving beyond ‘adequate’ requires much more than ‘command and control’. It requires some combination of all three approaches. However, the other two approaches present formidable design challenges. Quasi-markets require particular care to ensure all the necessary conditions are fulfilled. But, Barber argues, where this is possible: ‘the argument for introducing market like pressures into public services is clear – people like choice; also competition drives productivity improvement in other sectors of the economy, so why not public services?’

Where quasi-markets are not feasible, Barber proposes a third paradigm, devolution and transparency. This approach, pioneered in the New York Police Department:

Unleashes front line managers to do the job and holds them to account for their performance..It (also) allows for services to be contracted out...Thus a small number of privately run prisons or privately provided local education authority services have been commissioned, resulting in a boost to the performance of the whole system (for a critique of targeting see Bevan and Hood, 2006; Hood, 2006).

Although these paradigms are different in theory, Barber argues that in practice in any particular domain a combination of the three approaches might be adopted:

Thus in the school system, failing schools are required to improve under pressure from government (command and control), parents exercise choice and funding follows their decision

(quasi markets), but also funding is devolved to the school level, head teachers have extensive operational authority and their results are published (devolution and transparency) (p.337).

This discussion usefully highlights some of the means within a broadly neo-classical repertoire by which universality, diversity and productivity might be reconciled.

b) Organisational Approaches: Perhaps the most comprehensive recent overview of studies of innovation in service organisations is available in a synoptic assessment by Greenhalg et al (2004), which focused primarily, but not exclusively, on the UK National Health Service. Their meta-analysis, which involved a survey of over 1200 individual papers, identified the complex array of background, systemic, organisational and individual factors that condition the successful dissemination of innovations. They explored the variability of these factors depending on settings. This study unpacks in great detail the ramifications of the propositions identified earlier concerning the critical roles of collaboration and knowledge systems. Their synthesis is not however as compact as West's review of applied business literatures, which was cited earlier

Another, much less systematically developed, approach was suggested by the UK think tank Demos in its assessment of challenges to the New Zealand public service, (2006; also Mulgan and Ashbury, 2003). This study emphasised the desirability of basing innovation on the experience of front line workers and providers:

Public services are human systems in which change is at least as likely to happen at the front line interface between state and individual as it is in central policy departments. This offers the opportunity to create a genuine learning system within government which can in turn drive a more evolutionary model of reform and management – trying lots of things serially, seeing which works best, doing more of them, repeating as necessary...By helping citizens become involved in the

process of change this organic and evolutionary approach should create its own legitimacy with the counties that take part in it (p. 19).

Later they contend:

Innovation in public services is little understood, but the work carried out in this area is challenging to “command and control” models of governance...such approaches to reform are built on the belief that *people* (their italics) throughout organisational hierarchies will respond predictably to pressures and incentives set from above ...Such assumptions rarely reflect the reality in which individuals and professional groups learn to “game the system”, often in response to concerns over the impact of particular rules and regulations on service users themselves... But rather than trying to neutralise this inherent human tendency, governments should be learning how to harness it to achieve the goals of policy (p. 48)

Elsewhere, Grosfeld et al (2004, p. 39-40) have identified five key problems in innovation system governance in the public sector.

- Too strong a focus on accountability at the expense of more strategic goal setting
- A missing link between strategic intelligence and policy design
- A lack of vertical coherence between government strategy, policy design and implementation
- A lack of transparency, especially in the policy design phase
- A lack of coherence over time because of a focus on single solutions rather than continuous improvement.

As such, they recommend deliberately fostering learning and knowledge exchange:

Similarly, in a study of innovation in government Borins (2006) noted the importance of gathering information across a variety of organisations and focusing efforts on frontline service providers:

Innovation crosses boundaries: Around two-thirds of the innovations in the US and advanced Commonwealth countries involved a 'whole systems' analysis of the problems and solutions that involved different organisations working together.

Innovation happens at the frontline: Frontline workers and middle managers account for half of the innovations generated in the US and developing Commonwealth countries, rising to 82 per cent in advanced Commonwealth countries. Policies that empowered communities, citizens or staff to drive change account for between 14 per cent and 30 per cent of the innovations surveyed.

c) Institutional Approaches: Recent literatures on innovation in public management all underline the desirability of basing continuous improvement on knowledge exchange, but this finding is not placed in a systematic framework. One exception is Sabel's work (2006, 2007), which attempts to reconcile central control, efficiency and continuous improvement. Sabel proposes a 'learning by doing' design for the legion of public sector settings that involve principal-agent (or purchaser-provider) relations. In past decades, approaches to such relationships have been influenced by neo-classical principal-agent theory. This alerts principals to their problematic relationship with agents. They are encouraged to take deliberate action to counter asymmetries in knowledge, moral hazard, opportunism and shirking on the part of agents. Principals are invited to invest in determining the outcomes they expect from agents and to design contracts and incentive programs to reward appropriate and punish dysfunctional performance (Miller, 2005). Sabel argues that this ignores three basic features that characterise virtually all principal-agent contexts:

- First, the knowledge guiding the decisions of both principals and agents is provisional. Both are operating with corrigible information and judgements. Unintended consequences, ambiguity and

difference abound. It is impossible to devise programs from first principles that survive the effort to realise them. In the case of the principal, this involves judgements about attainable outcomes and, in the case of agents this involves judgements about the practices most likely to enhance performance in the pursuit of these outcomes.

- Second, agents have information that is essential in adapting performance outcomes for the overall system. The principal is setting outcomes that need to reconcile efficiency and quality in a way that minimises incentives for agent gamesmanship, creates incentives for efficiency and does so in a way that also promotes quality services for clients. Any one of the outcomes is complex. Their achievement in combination is a daunting challenge. Agents have information that is essential in setting these outcomes. The principal needs access to this information in order to establish initial outcomes and to revise them in the light of best practice performance.
- Third, agents own knowledge of how to attain quality services for clients is varied and developing. The agent's own knowledge of how best to serve clients – and how best to establish organisational routines that reinforce these outcomes - is itself corrigible and experimental. Different organisations will attain different outcomes and it will not be immediately apparent which represents the best achievement of not necessarily consistent purposes. Dynamic efficiency through the whole system thus requires the routine collection, assessment and evaluation of performance information and the dissemination of learning amongst agents.

Sabel's alternative framing involves an 'experimentalist' or pragmatist approach (Dorf and Sabel, 1998; Sabel, 2006). This shifts exchanges from a punitive basis to a learning basis and builds on earlier work on continuous performance improvement and 'learning by doing' – an approach to dynamic efficiency that was developed by the Toyota Motor Company in its management of buyer-supplier relationships (Sabel, 1992)

Sabel's architecture is based on the inappropriateness of hierarchical relationships in contexts in which continuous performance improvement is the goal:

After 1980, for reasons we do not know, and may not ever fully understand, the world becomes too volatile for hierarchies.....(which fail) to capture the idea that information in an organisation flows up and down as well as sideways.....General goals or designs are set provisionally by the highest level – parliament, a regulatory authority, or the relevant corporate executives – through benchmarking.....then the provisional goals are revised in the light of proposals by lower level units responsible for executing key aspects of the overall task (p. 11).

The tools used to determine best practice have been pioneered and proven in a wide variety of commercial and public sector settings. These include:

.... routines such as benchmarking, simultaneous engineering, continuous monitoring, error detection and root cause analysis...(which) define methods for choosing provisional, initial goals and for revising them in the light of more detailed, partial proposals arising from efforts to implement them (p. 11)

Sabel's approach proposes to reverse the direction and substance of the exchange between purchasers and providers:

Compliance or accountability in the principal agent sense of rule following is impossible. There are in effect no fixed rules, or, what comes to the same thing, a key rule is to continuously evaluate possible changes in the rules. *Accountability thus requires not comparison of performance to a goal or rule, but reason giving: actors in the new institutions are called upon to explain their use of the autonomy they are accorded in pursuing the corrigible goals* (our italics). These accounts enable evaluation of their choices in the light of explanations provided by actors

in similar circumstances making different ones and vice versa. To encourage this kind of ongoing mutual reflection monitoring is continuous, or nearly so, rather than occasional or episodic: and it is less concerned with outcome measures than with diagnostic information – information that can redirect the course of "treatment". When failure to follow the rule in principal-agent systems is, in theory, immediately penalised, in pragmatist systems non-compliance in the sense of inability or unwillingness to improve or otherwise respond to change at an acceptable rate triggers...increased capacity enhancing assistance from the oversight authority. Repeated failure to respond, even with assistance, is, however, likely to bring about the dissolution of the offending unit (Sabel, 2006, p. 14)

This broad approach has been widely tested in a variety of human services and other public policy settings in the United States including teaching disadvantaged students (Liebman and Sabel, 2003), defence contracting (Dorf and Sabel, p. 332 et seq), environmental regulation (ibid. p. 373), nuclear regulatory safety (ibid. p. 370), policing in deprived neighbourhoods (ibid. p. 327), occupational health and safety (ibid. p. 358) etc.

These pragmatist, or experimental, principles define an approach to the architecture of purchaser-provider or principal-agent relations that is wholly different from present designs. Of course, the transaction costs and the organisational implications in particular settings remain to be assessed. Comparisons may be complicated by the need to assess outcomes over a period of time and to estimate the value gains of gains in quality as well as efficiency. Nevertheless, this approach has wide application in a variety of public sector settings – and represents an alternative to the neo-classical approaches described earlier by Barber and Le Grand that are now conventional wisdom.

This section has surveyed an array of literatures concerned with innovation. Basically, there are two streams of theory, one emerging from the neo-classical tradition with its assumptions concerning knowledge, risk, competition and coordination, and the other from an institutional model, which casts the

same assumptions in a different form. The substantial policy implications are discussed in the next section.

Public Policy Issues Arising from Differences between Neoclassical and Institutional Paradigms

As the previous discussion suggests, the policy implications of these differing paradigms are profound. Perhaps the most important arises from the role of knowledge in innovation. In institutional perspectives, whilst competitive markets are necessary, they are far from sufficient. For successful innovation, the knowledge system in any particular domain also needs to be appropriately configured. A knowledge system involves the institutions and processes through which problems are identified, solutions generated and information disseminated to those who need to know. Knowledge systems vary between sectors and regions. For example, the knowledge system for a global MNC or an industry characterised by oligopolistic competition will differ from one with numerous, relatively small, participants. The knowledge system for the public sector as a whole differs from that for the education or health systems, for regional health or school systems or for individual hospitals or schools. This is to say nothing of the political system, which is, in effect, a knowledge system for a whole society. Within any particular knowledge system, speed of dissemination is also a critical variable. The distinguished Swedish economist Lundvall (2004) notes that the key test of a 'learning system' is its speed in moving from a gain in knowledge to its application; indeed, because of its behavioural implications, he sees this activity as no less important than the breakthrough itself.

Knowledge systems may also vary according to the kind of innovation that is involved. One common distinction in the economics literature is between transformative (radical) and incremental innovations. Another is between high technology activities and established industries. Some see innovation as a result of the development of the former (e.g. Freeman and Louca, 2001). Other emphasise the continuing importance of low technology endeavors (e.g. furniture, shoes, fishing) and the need to ensure new

platform technologies diffuse to these activities. In this framing, innovation needs to be conceived as a multi-sectoral process (e.g. Dahmen, 1989).

A concern with knowledge systems highlights at least four basic differences between institutional and neo-classical approaches, involving the focus of government; the scope of its role; the contents of its policy assessments; and the merits of decentralisation. Of course, these do not exhaust the differences, but they do indicate some fundamental implications.

First, evolutionary and NIS perspectives require an analysis that focuses on sectoral or regional industry structures, sectoral or regional research capabilities and, in these contexts, contingent assessments of opportunities. Indeed, evolutionary theories imply that choices focusing on knowledge-driven growth necessarily involve selective or focused approaches. Countries are not competitive across the full range of industries, or the full range of activities within industries. Knowledge infrastructure (universities, research institutions etc) is expensive and needs to be allocated to those activities that promise the highest returns. In other words, where innovation is the objective, selective or focused policies are no more or less effective *a priori* than general remedies.

Second, the scope of government deepens. At a first level, its responsibilities can (as discussed above) extend to the effectiveness of regional and/or sectoral knowledge systems. At another level, a fresh narrative reframes the case for policy towards education and the development of skills. The case for intervention, and the scope of intervention, may both be extended across the life course. This also has implications for the welfare system as job and career switching becomes more frequent. This issue is explored further in the concluding section.

The content of policy assessments are a third source of difference between innovation-based and neo-classical approaches. In innovation theory, systems, linkages and systemic capabilities are a key focus of policy. Feedback loops, learning, and organisational or other capabilities all claim the attention of public

policy. But the techniques and templates for these assessments remain to be developed. Systematic approaches and evaluative metrics are under-developed (but see Lipsey et al. p. 526-539).

Finally, innovation literatures offer a fresh perspective on the challenge of central leadership and coordination. On the one hand, innovation suggests the merit of experiment and a diversity of approaches to similar challenges. Incidentally, this is an argument for federal and/or decentralised as opposed to unitary political arrangements. On the other hand, innovation theory also calls for the rapid dissemination of best-practice approaches. How are these imperatives to be reconciled? The European Union has sought to square this circle through an approach described as the 'open method of coordination' (Borras and Jacobsson, 2004; Sabel and Zeitlin, 2006; Zeitlin, 2007). By this means local diversity can be reconciled with central concerns for overall systemic performance, but without uniform central controls.

These findings about the role and scope of government are naturally hedged with appropriate cautions about the dangers of ill-conceived approaches. Innovation literatures list a variety of criteria for distinguishing effective, from ineffective, institutions, processes and instruments (e.g. Rodrik, 2004; Lipsey, Carlaw and Becker, 2005, p.526-543; Porter, 1999, pp. 197-289, 2003). The central point is this licenses a fresh approach by the state: one that involves a special kind of leadership in governance and that can involve action at the level of clusters, sectors, capabilities or activities.

These reflections on the role of the state can be contrasted with those derived from neo-classical theorems, which are now the conventional wisdom. For example, in neoclassical eyes, costs and prices are the critical variables in mediating exchanges. There is, at best, limited need to attend to the properties of institutions other than markets. Indeed, the remedy to problems in non-market areas of state activity is to replicate their benign allocative properties. For example, quasi-market approaches will improve the effectiveness of publicly-funded research and publicly-funded human services, incentive pay will improve the performance of publicly-funded teachers and other professionals etc.

In other words, the pre-eminent task of government on the supply side of the economy involves the pursuit of quasi-market structures that will foster allocative efficiency. In theory, this is the market condition in which resources are allocated in a way that maximises the net benefit attained through their use. Allocative efficiency is also defined as the production of that quantity that is most beneficial to society. For an individual firm, this is a situation in which price equals marginal costs. In practice, this has led to policies that extend market-style arrangements to new areas and that liberalise arrangements where the latter's benign effects are inhibited by regulation. Any other approach is assumed to distort prices and, thus, to induce outcomes that fall short of the optimum; *pace* Schumpeter's paradox of competition.

Hence, in neo-classical perspectives, selective policies interfere with the benign allocative properties of unfettered markets. Selective policies are always second or worst best. In other words, policies designed to correct market failures that are perceived to be associated with technological development should not be selective or focused. In practice, proponents of this approach clearly believe that the social returns from a non-discriminatory policy will be far greater than those that might be achieved through any alternative policy. General tax relief or a general subsidy is always preferable to focused or selective support.

This judgment is buttressed by another body of theory, public choice theory. Public choice theory transposes neo-classical rational actor assumptions to politics. In this perspective, market failures pose less long run risks than government failure. The 'natural' mechanisms that work to identify and eliminate error in market exchanges are absent in the case of political exchange. Indeed, political decision making processes are regarded as especially recalcitrant. Public choices are assumed to be mostly in liege to the representatives of sectional rather than general interests (Olson, 1965).

These differences in theory highlight the scale of the challenge that confronts political and public sector decision making. James Q Wilson (*Public Interest*, 64, 1981, pp. 31-47) has described the problematic nature of this choice:

[Theories] contribute the conceptual language, the ruling paradigms, the empirical examples (note I say examples, not evidence) that become the accepted assumptions of those in charge of making policy. Intellectuals frame, and to a large degree conduct, the debates about whether this language and these paradigms are correct. The most influential intellectuals are those who manage to link a concept or a theory to the practical needs and ideological predispositions of political activists and government officials. The most important source of intellectual influence on public policy arises out of the definitions of what constitutes a problem....What intellectuals mostly bring to public policy debates is not knowledge but theory.....Some theories, if adopted, will make us better off. The problem is to know which ones.

These choices will be made in the meta-knowledge system that frames public policy and political decision making. In this context, Peter Hall (1992) has distinguished three different kinds of innovation: settings (e.g. a tax rate); instrument (e.g. forms of tax); and paradigms (e.g. supply side theory). From a strategic perspective, the last is naturally the hardest to evaluate and digest; but it is also potentially the most important. It is difficult not only because of the technical difficulties in evaluating contrasting paradigms, but also because of organisational imperatives. Complex inter- and intra-organisational settings, which particularly characterise the public sector, encourage group-think and lock-in (e.g. March, 1989). Such outcomes are not inherently irrational. The preservation of discipline around centrally determined purposes (e.g. budgetary norms) may require a degree of organisational myopia. Further, in a competitive political structure, there can be substantial political risks and penalties in sponsoring originality and novelty. This is the issue to which I now turn.

Specific Issues for Australian Public Policy.

Perhaps the most important specific implication of the foregoing discussion concerns processes for strategic assessment within the public policy system. How might space be created for a conversation concerning the merits of these competing paradigms as they might apply to particular cases? This question is considered first. Subsequently, and more briefly, some specific substantive issues are identified. This is not an exhaustive list. It is simply designed to indicate the range and variety of substantive concerns to which the innovation agenda may lead. Since it is the subject of a current enquiry, the issue of a general innovation strategy is not addressed.

i) Innovation in Political and Public Policy Strategies: Perhaps the most important implication of the foregoing discussion involves the question of the capacity of the political and public policy system to recognise and assimilate new issues or new paradigms. Summits, along with enquiries (e.g. Garnaut, 2008; Cutler, 2008), have become favoured devices for achieving this outcome. However enquiries mostly address only the technical aspects of issues: important though these are, they usually contribute little to building a platform in public or interest group opinion for policy action. Summits may have a role in this latter process. But, the past record of summits is mixed. In 1983, the Hawke Government used its national economic summit to great advantage. This seeded a base in interest group and public opinion for its liberalising agenda. The subsequent tax summit failed. There has since been a succession of such events. What makes the difference between success and failure?

The dilemmas of innovation in public policy paradigms were illustrated in another enquiry. In 2000, the former Federal Government convened an innovation summit. This was a three day affair with some 500 delegates from business, the universities and the finance community. The Summit was billed as an opportunity to revisit Australia's fundamental approach to innovation.

Pre-summit activity extended over several months. Background papers were commissioned from an expert group, six summit task forces and the Department of Industry. These papers and a considerable volume of other submissions drew attention to the various paradigms through which the challenge of innovation might be interpreted. There were broadly three options. The first was a science-push view of the innovation process, which was then the conventional wisdom. In this linear perspective, ideas proceed from the laboratory to business and, hence, into new products. A second view posited a more complex innovation system with many opportunities for market failure. A third view saw innovation as a process that is mostly driven from the user and consumer end of the chain. In this perspective, well-functioning markets are a necessary, but not sufficient, condition. An appropriately configured knowledge system is equally critical. Further, opportunities lie as much with established industries as with high technology activity.

This last interpretation of the innovation challenge made no impact on the policy process. Indeed, there is no evidence that it was ever seriously assessed (Marsh and Edwards, 2008). It was certainly totally ignored in post-Summit evaluations. A case study of the process suggests that the Summit was no more than an elaborate piece of theatre. It was a public relations masque whose purpose was to project the Government's commitment to a wider public. The Summit had virtually no impact on public policy thinking.

Why was this so? As already noted, the public sector is an especially challenging context for policy innovation. One core reason has to do with the task of actually running a government. The well-documented hazard of lock-in in large complex organisations is especially salient to a governmental policy system. A governmental system is characterised by multiple interconnections and dispersed and divided authorities. Interdependence, on the one hand, between political and administrative structures and, on the other, between administrative organisations and semi-independent agencies augments the potential for conflict. This can work perversely to suppress attention to issues or to constrain the range of solutions. This is exactly what happened in the case of the Innovation Summit.

A new paradigm is particularly challenging to established ways of thinking. A new approach will likely violate some cardinal assumptions in existing ways of doing business. People who are busy with day-to-day issues are naturally reluctant seriously to entertain disruptive or heretical ideas. An experienced manager can always find a thousand reasons to reject a new approach. This is not just a problem for the public sector. In research on innovation blockages in the private sector, a recent McKinsey study commented:

The analysis revealed those employees, largely middle managers, with the most negative attitude towards innovation were also the most highly sought after for advice about it. In effect, they served as bottlenecks to the flow of ideas and the open sharing of knowledge (Barsh et al, 2008).

Further, paradigms and fresh ways of thinking do not spring into policy life ready made. They inevitably raise complex political and technical questions. Ideas will need to be researched and assessed at a technical level. Their political feasibility will also need to be evaluated. This is not an immediate given. For example, how might an issue be reframed to broaden its attractiveness to more of the public? Who are the potential winners and losers? What compensation, log rolling or other tactics might convert the position of the losers? How might supporting coalitions be mobilised? How will possibilities be tested?

In Ireland, *Forfas* and the *National Economic and Social Council* partially separate the consideration of strategic choices from day to day decision making. Their brief is to assess new and emerging issues, to scope them in general terms and to specify broad options. They also begin the task of building supporting coalitions. These are protracted processes. On big questions, this is as it should be. Policy commissions perform a similar task in Denmark, but both Ireland and Denmark are relatively small states.

The Blair Governments have followed a different approach. Tony Blair created a dedicated Strategy Unit in the Cabinet Office. This unit has made a major contribution and there is much to be said for this

supplementary capacity. But, its evidence-based analysis mainly serves the priorities that the Prime Minister has already established. It cannot venture too far beyond this frontier. Its capacity to undertake a bold discussion of new paradigms is constrained. In addition, it has only a very limited role in building coalitions and mobilising consent.

Strategy Unit papers have aired sensible policy suggestions on some big issues, including a waste tax and road pricing. Another paper called for a fresh approach to drugs. But consideration of the surrounding strategic questions, of which these specific proposals were a part, was instantly killed by sensational headlines. This underlines the need for infrastructure in which broader strategic considerations can be publicly aired, but without committing the executive.

Translating such approaches to Australia is no easy task. The fate of the old Commission on the Future is salutary. However, a space must surely be found in which options can be routinely aired and assessed without executive commitment. Otherwise the temptations of competitive politics will destroy challenging possibilities at birth. This likelihood is compounded by the media's appetite for sensation and bite-sized facts

The need to create a space for sustained strategic deliberations is one imperative. Another is to find settings where competent, but independent, technical analyses can be developed and acknowledged. A third is to assess what is politically feasible. One option might be to assign at least the technical tasks to a division in the Productivity Commission. Its mandate would need to be extended to include a forward-looking brief. Many may feel its past ideological positioning is a handicap. But, the Productivity Commission has now reinvented itself several times. New appointments might ameliorate its past reputation. The Commission has the great attraction of standing and legitimacy in the broader policy system. Another option might be to revive the Economic Planning Advisory Council (*EPAC*) in some extended version, perhaps on the model of Ireland's NESC.

Political assessment is also a must. This involves gauging interest alignments, framing issues in ways that build supporting coalitions and mobilising public opinion more broadly.⁶ This can occur more or less subtly. But, the engagement of organised interests and the development of supporting coalitions are essential. This would begin the broader development of public opinion. Governments must sometimes confront their publics, but, mostly, they need to work with the grain of opinion. However, public opinion develops like a snowball. It gathers scale and momentum as it evolves. This is a protracted process, which requires transparency. Parliamentary committees might be given a role in this task.

An ambition to make the national political conversation more responsive to new paradigms and new strategic issues requires sustained technical and political attention. This capability is now absent. For these gaps to be closed, a setting that is partially independent of the executive seems essential. In its absence, new thinking will probably be stillborn and opportunities to craft wiser public policies foregone.

ii) Innovation and Resource Windfalls: One immediate issue concerns current resource developments: Is Australia fated to suffer a resources curse? What are the implications for industry structure? How did Sweden, Finland, Denmark, Norway and Holland avoid this fate? These states approximate Australia in size and in the significance of their resource sectors. In recent years they have all adopted new strategies in response to the twin imperatives of globalisation and innovation/the 'knowledge economy'. An analysis might build on the existing extensive, but mostly country-specific, literatures. In each case, qualitative and quantitative data could be gathered following a standard framework.

Such a study might be focused at three levels: sectoral; policy frameworks; and political mobilisation. Assessments at the sectoral level could cover approaches to capability broadening, capital mobilisation and adaptation to changes in currency values. At the level of policy frames, the tax regime, export and

⁶ W J McKenzie: 'I have suggested that any explanation of the democratic process, which ignores the role of organised interests, is grossly misleading. I would add that it is hopelessly inadequate and sterile in that it leaves out of the account the principal channels through which the mass of the citizenry brings influence to bear on the decision-makers whom they have elected. In practice, in every democratic society, the voters undertake to do far more than select their elected representatives; they also insist on their right to advise, cajole and warn them regarding the policies they should adopt. This they do, for the most part, through the pressure group system.' cited Richardson, 1999.

tariff policies, the role of foreign investment and the paradigms judged relevant by policy makers could all be assessed. At the level of political mobilisation, the way narratives and the institutional structure facilitated policy development and the mobilisation of interest group and public opinion might be evaluated. Data relevant to each of these areas would also need to be gathered. Australia's historic experience with booms might also be mapped to illustrate distinctive institutional dynamics.

iii) Innovation in Education and Welfare Strategies: The conservative American columnist David Brooks has recently put the case for making education a new priority:

The central process driving change is not globalisation but....the skills revolution. We're moving into a more demanding cognitive age. In order to thrive, people are compelled to become better at absorbing, processing and combining information....The globalisation paradigm emphasises the fact that information now travels 15000 miles in an instant. But the most important part of information's journey is the last few inches – the space between a person's ears or eyes and the various regions of the brain. Does the individual have the capacity to understand the information? Does he or she have the training to exploit it? Are there cultural assumptions that distort the way it is perceived? (*New York Times*, 2 May 2008).

In a complementary assessment, the Irish National Economic and Social Council (2005) has suggested that there are similar and significant implications involved in various education policies. Lifetime learning requires access over the life course. The significance of school outcomes dictates attention to early childhood experiences and perhaps renewed opportunities for access for early or under qualified school leavers. Significant career shifts over the life course implicates welfare policy. All these linkages lead to new understandings both of the role of government and of the scope for state-led intervention. They also imply an array of new organisational and accountability challenges and new possibilities of public-private collaboration.

In relation to academic research, Mark Matthews (2006) has argued that measuring the value of innovation in terms of its potential for commercialisation obscures its other no less important role, which is to facilitate preparedness. The former focus derives from neo-classical assumptions about risk and equilibrium: the latter from acknowledgement of Knightian uncertainty. The implications of the different approaches are profound, both for government-university research funding relationships and, within universities, for the disbursement of research funds. Matthews draws on management literatures to recommend an assessment system based on peer review that is informed by an analyses based around project milestones, option valuations and a portfolio profile.

iv) Innovation in Public Services: The implications of innovation literatures do not seem to be recognised in the discussion of public sector reform, in particular the conditions under which continuous improvement might be achieved. Whilst competitive markets may be a necessary condition, they are far from sufficient. For this to occur, the knowledge system in any particular context also needs to be appropriately configured. But knowledge systems are variable. The knowledge system for a large MNC is different from that confronting a dispersed array of human service providers.

If continuous improvement is the goal, quasi-market designs need to be augmented by arrangements for identifying the knowledge needs of providers and for developing and disseminating responses. Where an organisation is too small to manage this task by itself, or where collaboration between organisations is an essential element, competitive arrangements will not by themselves deliver the desired outcome. On this point, there is abundant scholarly evidence.

In this context, Charles Sabel's 'learning by doing' approach merits attention (e.g. 1992, 2005, 2007). Sabel's design takes it to be fundamental that centrally-determined performance targets can never be more than provisional. He further takes it to be fundamental that much necessary knowledge lies with service providers, not with central planners. His architecture builds on these fundamental facts and, thus,

promises to reconcile the twin imperatives of professional knowledge and the need for overall system control.

v) *Innovation at the Firm/Cluster level*: The most important immediate substantive implication perhaps concern approaches for encouraging business and other relevant actors (e.g. universities) to identify and map the knowledge systems, which determine the innovative potential of any particular sector or region. Ideally this process would cede ownership to the affected interests and relevant processes should strengthen collaboration between them. There are also issues associated with the roles of regional universities, research organisations and research centres, more general skills development strategies, the role of public procurement, and access to global supply chains by small Australian firms.

What policy design might encourage such action? Elsewhere (Marsh and Shaw 2000), I have sketched an approach for encouraging innovation through collaboration between firms in areas of shared interest. This is based on the example of the Australian wine industry, arguably the most successful illustration of cluster development in the country. It reflects the ‘learning by doing’ model. The wine industry went from vine pulls in the 1980s to become a global pace setter in the 1990s. Collaboration was a significant contributor to industry success. How might its example be generalised? One core lesson concerns the ownership of industry development by industry leaders. In effect the industry boot-strapped its own success, albeit with considerable assistance from public sector research and educational institutions.

In generalising this experience, incentives could be offered to collaborating firms and other relevant protagonists to build an opportunity-focused vision for their future. The steps in realising this vision could be set forth as a series of distinct phases. Each phase could be associated with a measurable outcome, one of which might involve global engagement. Groups of firms, or the industry associations that represent them, could be encouraged to initiate these assessments, thus devolving ownership to those who need to undertake the designated actions. Funding could support the various phases in the collaboration, with specific sums allocated to cover specific phases. The concern that this might induce

rent-seeking could be countered by ensuring an agency like the Productivity Commission had independent rights to audit and affirm cluster performance against milestones. The above is no more than the sketch of a 'learning by doing' process. There may be other approaches. For example, Enterprise Ireland operates a suite of policies to build innovation capacities at firm level. These possibilities need much deeper analysis and transaction and other costs need to be assessed.

Conclusion

This paper has surveyed a large and varied domain. Innovation figures in a wide array of policy fields, ranging from a specialised branch of economics to business and organisational studies, public policy and politics. One common theme concerns the appropriateness of the knowledge system in each domain. Although contexts and circumstances differ, there are broad, common, criteria for assessment of knowledge systems, including speed of adoption. Such commonalities are explored in the voluminous specialised literatures which surround each activity and function.

Ideas of innovation have special relevance to public policy. Here, the narratives and conceptual frameworks that ultimately become conventional thinking are critical. They justify designating a particular situation as a problem, set forth the scope of remedial action, determine conceptions of reality, pertinent facts, relevant causalities and (often tacitly) champion particular values. They also determine which interests or identities have standing and define their role(s) in the relevant system. Choice between frameworks will be heavily influenced, if not determined, by deliberation amongst bureaucrats and between departments. This reflects the authority and standing of Departments in the policy making process and the role of knowledge or expertise (e.g. Mintrom, 2003; Schumpeter, 1976). Interests quite properly continue to wield considerable power. However, the notion of an interest is itself constructed and how particular interests perceive issues is institutionally framed.

The public policy system is arguably a particularly complex environment for identifying and evaluating new paradigms: more complex than in private sector organisations. The absence of a specific profit metric, the diversity of stakeholders and the problematic intersection between political and public policy incentives and imperatives are just some of the relevant factors.

Yet, innovation, as sketched in this paper, raises new and fundamental challenges. It does so in its own right as a critical economic process. It is also relevant to a variety of social outcomes. As the Irish have already shown (NESC, 2005; also Powell and Snellman, 2005), embracing broader knowledge economy concepts has wide-ranging implications for social, education, infrastructure and migration policies. These varied issues have only been sketched in this present paper. But, their range and comprehensive implications point to the fundamental significance of the paradigm that is now emerging. Indeed, there are parallels between present choices, which are partly associated with resource windfalls, and those that arose in the first decade after Federation, also a period of resource prosperity. Deakin seized this moment to create a distinctive national response that fused economic and social agendas and that implicated the interests of all Australians, including business, unions and a diverse array of narrower constituencies, in an effective national government (Marsh, 1995, Chp.1). This settlement shaped Australian society in distinctive ways and its fundamentals endured for seventy years. Can the present moment be turned to similar advantage?

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