

An enterprising approach to regional growth:
Implications for policy and the role of
vocational education and training

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Foreword

The problems of uneven growth of regional areas have long been a concern in Australia for both economists and policy-makers. For many decades attempts have been made to understand the processes that shape regional economies and which perpetuate the differences between regions and major metropolitan areas, with a view to creating policies and programs to offset these differences. The recent drought and its implications for some regional areas make the issue particularly topical.

Over the last 25 years there have been major shifts in regional economic fortunes in the face of internationalisation and globalisation of the world economy. This period has witnessed a process of de-industrialisation, the demise of many traditional industries and the growth of Asian economies, especially those of China, Korea and, more recently, India. We have moved to a knowledge-based economy where business service industries are the principal economic driver. It is an era characterised by intensified competition at national and international levels.

Yet we still have only a partial understanding of how local and regional economies fit into these nationally and internationally competitive frameworks, and we still seek to more fully appreciate the processes that promote and shape regional economic performance and the fortunes of regional communities.

This research adds to what we know about the drivers of regional economic performance, and its conclusions are quite provocative. It argues strongly against development policies that are built on the belief of the importance of strong institutional involvement by business and government (as represented, for example, by the concepts of ‘social capital’ and ‘learning regions’). Rather, it argues that what counts is ‘enterprising human capital’—the ability of individuals to get things done. Moreover, vocational education and training (VET) has a key role in providing enterprising skills within its courses.

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This report will make VET policy-makers, regional VET providers and regional planning bodies think hard about the role of vocational education and training in regional development.

Tom Karmel
Managing Director

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Key messages

This report explores patterns of regional economic growth in Australia over the period 1984 to 2002 in order to identify the drivers of variation in regional growth. It attempts to identify regional opportunities and the policies and practices that assist in realising them, in particular, the potential contribution of the vocational education and training (VET) sector to regional growth.

- ✧ National growth over the last two decades has not been equally spread. Key metropolitan regions have been the main beneficiaries of national growth, while other regions generally have had declining growth.
- ✧ Traditional regional growth theories, focused on an ‘institutional’ approach, are flawed because they fail to take account of:
 - ◆ global capitalism
 - ◆ the ways in which business relationships are conducted
 - ◆ the dynamics of regional economies.
- ✧ Human capital, in particular ‘enterprising’ human capital, whereby individuals take responsibility for action, is the key driver of regional growth. Other drivers include access to high technology, greater industry specialisation and less government intervention.
- ✧ The VET sector’s size and its significant presence in the regions means that it is ideally placed to play a key role in regional growth by:
 - ◆ developing enterprising skills, knowledge and cultures
 - ◆ using its connections with business to establish regional coalitions that link regional attributes, objectives, strategies, investment and VET programs.

Executive summary

Introduction

This report explores patterns of regional economic growth in Australia over the period 1984 to 2002 in order to determine how and why these patterns evolved. From the results, we have attempted to identify regional opportunities and the policies and practices that can assist in realising them and, in particular, the potential contribution of the vocational education and training (VET) sector towards regional growth. Understanding the patterns and determinants of regional growth is an important prerequisite before any policy or practice can effectively be designed and implemented.

A multi-methods approach was used to ensure that factors determining both the breadth and depth of regional growth variation within a national framework of all regions were identified. The quantitative side of the analysis used econometric modelling across 94 regions, while in-depth, facilitated community workshops in 11 diverse regions enabled us to inform the quantitative results with specific regional circumstances, thereby gaining a closer understanding of how regional growth actually occurs.

Behind the analytical approach was a significant assessment of the current international theory and literature on regional development. The detailed literature review was undertaken for three reasons. First, we were not convinced that the last two decades of regional development policy and practice had generated much in the way of successful competitive growth outcomes for regions. This was borne out by both the quantitative and qualitative assessments carried out in this project. Second, a number of cross-checking qualitative analytical methods were used to ensure that the quantitative analysis results accorded with the reality of regional growth. Third, we believed that there was much to question about the accuracy of accepted regional development theory and its use in policy and practice implementation.

Our assessment is that regional development theories built on a strong institutional role are flawed, as they ignore the realities of global capitalism, the quest for profit, the control of price and the means of production. They also ignore the influence of interfirm power inequalities in shaping business relationships, whereby collaboration is favoured over competition. They fail to adequately incorporate issues of time, change and path dependency¹ in understanding the way regional economies actually work. Equally, they oversimplify firm-based entrepreneurial processes and the way new knowledge is converted into commercial ventures and, at the same time, they fail to appreciate the potential of existing regional attributes, particularly human capital.

Over recent decades, policy-makers and practitioners have, in our view, been too easily seduced by ‘off the shelf’, highly promoted theory that offers a quick-fix solution but is underpinned by thin evidence, poor analysis and layers of theoretical concepts. For example, concepts like ‘social capital’, ‘flexible specialisation’, ‘business agglomeration’², ‘learning regions’ and ‘institutional thickness’³ have become popular expressions for an approach to regional development that emphasises strong institutional involvement by business and government in particular in

¹ Path dependence is the dependence of economic outcomes on the path of previous outcomes, rather than simply on current conditions <<http://eh.net/encyclopedia/article/puffert.path.dependence>>.

² That is, adopting practices such as networking and clustering of similar businesses.

³ That is, the presence of relevant institutions and infrastructure.

establishing new structures, programs and partnerships amongst themselves. The growing body of evidence in the literature and our analysis in this project call into question much of this approach as explaining regional growth.

Findings

The quantitative and qualitative analysis in this project revealed the following.

- ✧ Growth rates amongst Australia's regions over the last two decades have diverged. Clusters of high- and low-growth regions are now more apparent and more entrenched. There has been no long-term trend amongst regions in approaching equality in growth. Key metropolitan regions have been the main beneficiaries of national growth, while non-metropolitan regions have fallen behind. The key metropolitan regions, particularly Sydney, have also widened the geographic spread of their growth, becoming even larger. Non-metropolitan regions, in the main, have had declining relative growth, although there may be some individual hot spots of growth among them.
- ✧ We believe that a combination of increased amounts of human capital, access to high technology, greater industry specialisation and less government intervention has the largest impact on regional growth. Other potential drivers, such as population growth, access to local markets and information, and relationships between small firms, do not have the impact on regional growth suggested by existing regional development theory.
- ✧ In relation to the importance of human capital, we have found from the analysis of theory, the econometric modelling and the qualitative analysis that 'enterprising' human capital, rather than the other form of human capital—creative human capital—holds the key to regional development. Enterprising human capital—whereby individuals take responsibility for action—goes beyond simply generating the 'good idea' or being highly skilled, and embraces the knowledge that enables on-the-ground achievements. Regional development practice in Australia has struggled to go beyond 'good ideas' and the strategic planning processes attached to them.
- ✧ At the local level there is little continuity between regional planning and regional development outcomes, with an over-reliance on solutions from government and business. There is little focus on harnessing and directing local human capital on a regional scale, with the result that it either 'leaks' out to other regions, as is particularly the case with younger people, or is left under-utilised (that is, under-employed), as is the case with older and knowledge workers employed in occupations below their skill levels. Regional leadership tends towards a narrow reliance on institutional (business and government) solutions, rather than towards engaging the enterprising attributes of the region's workers (human capital) across a broad front.

A policy and practice focus on engaging local enterprising human capital is the way forward for regions. Because of its highly regionalised presence, its established connections with local business, its size, and its core business of creating human capital through education and training, the vocational education and training sector has an important role in facilitating successful regional growth. Developing enterprising skills in addition to traditional and vocational skills fits more comfortably with a vocationally focused education program than with one based around the narrow science, technology and liberal arts programs of higher education. Nevertheless, a background in these areas is also important to the enterprising process because they encourage people to think 'outside the box'.

Consultations undertaken through the 11 regional workshops suggest that the education—as opposed to the training—component in VET is underdone and in need of more direction in the face of a number of challenges. These include increased competition from other post-secondary education providers, increasing pressure from industry for VET to be more responsive in the provision of 'just in time' training, and a perception that students and parents prefer higher education. The consultations highlighted the need for more flexibility in the way VET is delivered

and for a funding model that allows for innovative and anticipatory initiatives or for diversity in program design and delivery.

From our analysis, we feel VET can contribute in two main areas. First, the education element of VET has much to offer in fostering regional development in an environment where, in most regions, potential for growth is not being realised, the key metropolitan centres being the exception. This education role would play a part in developing enterprising skills, knowledge and cultures to ensure that regional human capital is used to its full potential rather than being lost to major metropolitan centres, left to languish unrecognised and unrewarded, or directed to areas where, in a competitive world, there is little prospect that regional development will result.

The second area where VET could contribute to regional development is through using its connections with business to establish regional coalitions that link regional attributes, objectives, strategies, investment and VET programs to promote human capital development to ensure brighter regional futures.

We believe that fostering an enterprising culture on a broad front is the way to realise regional growth and competitiveness objectives. VET courses designed to develop enterprising skills need to be linked closely to key regional attributes, strategies and investment and be comprehensive across VET programs.

Context

In examining patterns of regional economic growth in Australia over the period 1984 to 2002, this project explores the following:

- ✧ patterns and drivers of regional growth, vulnerability and opportunity across Australia
- ✧ the relationship between current theoretical analysis and current regional policy and practice
- ✧ the policy and other initiatives that can be employed by governments, institutions and local stakeholders to enhance regional growth
- ✧ the role the vocational education and training (VET) sector can play in enhancing regional growth.

Understanding the patterns and drivers of regional growth is an important prerequisite before any policy or practice can effectively be put in place.

Background

There has been long-standing concern in Australia, as in all developed countries, over the problems of regional areas and their differential growth in prosperity. For many decades there have been attempts to understand the processes that shape regional economies and which perpetuate these regional differences. The aim always has been to create policies and programs that will ameliorate these differences and allow regional areas to contribute to the national economy to the maximum of their capabilities and resources.

Over the last 25 years there have been major shifts in regional economic fortunes in the face of internationalisation and globalisation of the world economy. This period has seen the demise of 'smoke-stack' industries and de-industrialisation, and the growth of Asian economies, especially those of China, Korea and, more recently, India. It is argued (Drucker 1993) that we have moved from an era of Fordist mass production to one of flexible production where knowledge and learning are the most important factors, and business service industries are the principal economic driver. It is an era characterised by intensified competition at national and international levels.

Yet we still have only a partial understanding of how local and regional economies fit into these nationally and internationally competitive frameworks, and through theory we still seek to more fully appreciate the processes that propel, retard and shape regional economic performance and the fortunes of regional communities. Having such an understanding is important, if institutions, particularly those like the VET sector which have an influence on human capital, are to identify how they can play an effective role in regional development processes. It is also important for regional development policy-makers and practitioners who seek to ensure they have the appropriate mechanisms in place to facilitate the process of growth and competitiveness at this level.

Approach

The debate among theorists concerning the determinants of regional development has in the last few years revolved around three perspectives:

- ✧ the regionalised interaction of endogenous *structures and processes*
- ✧ the *behaviour of regionalised agencies* whose actions impinge on local outcomes
- ✧ the *enterprising capacity of endogenous human capital*.

In effect, the first two arguments are institutionally based approaches (that is, based on the behaviour and structural characteristics of entities), while the third, a non-entity based approach—the one advocated in this project—calls for stronger engagement with a region's enterprising human capital on a broad scale.

Those arguing for the simple institutional provision of enabling structures, programs and their processes to kick-start a region's development say what is required is better regional access in such areas as training and technology diffusion programs, business advice networks, infrastructure, regulation, learning programs, regional management structures, the provision of local governance arrangements, and so on. Those taking an agency-behaviour approach to regional development suggest that the rules, cultures and routines of regionalised organisations influence decision-making and determine the extent to which local resources can be mobilised.

Both these 'institutionalist' arguments have, over the last decade, been given a regional perspective, and a range of factors said to be regional growth determinants have been spawned on the back of them; for example, social capital, learning regions, flexible specialisation, business agglomeration and institutional thickness. We argue that these approaches to regional growth are out of step with the realities of competition in a capitalist world economy. They choose to promote regional collaboration, while ignoring the harsh realities of global competition. They confuse process with outcome. They inadequately deal with issues of time, change and path dependency in understanding local economic dynamics and, while they argue the importance of spatial proximity in business activity, they neglect the subtleties of those spaces and the entities that operate within them.

Most importantly, the institutional theories of regional development are predicated on thin evidence of what actually occurs in regions.

Two issues have influenced this approach to theory: method; and a view about the role of the region in driving growth and competitiveness vis-a-vis the role of business and government policy.

In relation to method, the debate has been between those who use a quantitative approach to judge a region's performance in the context of all regions in a national or international system, and those who believe there are deeper issues that need to be explored through intensive case study work at the individual region level. Consistent with principles of 'critical realism'⁴, we have included both quantitative and qualitative approaches in this project in an interactive way. We sought both to avoid the narrowness and limitations of the methodology debate and to realise the synergies that a multi-methodology approach to regional research has to offer.

This project has balanced and linked quantitative and qualitative analysis; has approached competitiveness in a way that juxtaposes the performance and determinants of a region's growth with those for other regions nationally; links theory, policy and practice; and emphasises regional dialogue, learning and knowledge transfer. The result of such a comprehensive approach is a better explanation of the circumstances of development in particular regions, enabling clearer policy articulation and more responsive practice to take place. Further detail on the methodological

⁴ Any doctrine reconciling the real, independent, objective nature of the world (realism) with a due appreciation of the mind-dependence of the sensory experiences whereby we know about it (hence, critical).

approach taken is contained in the support document which can be accessed from NCVER's website <<http://www.ncver.edu.au/publications/1801.html>>.

In relation to the role of the region in generating growth and competition, the generally held view is that only businesses and nations compete, not regions, and that regional growth and change is the product of structural and behavioural responses of institutions and organisations within these spheres. By contrast, we believe that regions do compete for skills, investment, tourism, infrastructure, and so on, and that regions, through their competitive actions, have an important impact on national growth and competitiveness, along with business actions and institutional policies.

We argue that the institutional, or entity-based approach to regional development policy and practice over the past 20 years has prevented Australian regions from achieving anywhere near their full potential. We have seen the creation of many regionally focused organisations and government programs, a lot of 'busyness' of local 'social capital', a wealth of plans and reports, but little change in the growth and competitiveness of regions and the businesses and organisations within them. In short, these two decades of so-called bottom-up regional development policy and practice have been high on process and, in terms of economic performance, low on meaningful impact.

This study shows that over this period of regionally based institutionalism, growth and competitiveness among regions have become more concentrated and divergent as overall national growth has increased. Clusters of low and declining growth are becoming more distinct and widespread, and areas of high and rising growth are increasingly confined to a few key metropolitan regions that are expanding their reach, and a few isolated non-metropolitan hot spots. This suggests that the winners and losers in the regional growth stakes have become entrenched in their respective positions as overall national growth has improved.

Through analysis, the drivers of these divergent patterns of spatial growth and competitiveness, and the *transmission and translation process* that turns them into outcomes, are becoming clearer. A different approach to theory, policy and practice—one that better embraces the enterprising capacity of each region's human capital—is called for to ensure improved growth at the regional level and also that the process of strategic planning does not represent the end game. Policy and practice need to facilitate the strong link between engaging a region's enterprising human capital and the effectiveness of the region's growth process.

In our view the institutionalist approach to regional development policy has, over time, allowed regional initiative to ossify and become increasingly institutionally dependent. The capacity for endogenous growth transmission and translation has therefore been compromised. There is now a real need to activate and/or strengthen the connection between regional attributes—particularly human capital—and the institutions that can become involved in a *mutual*, rather than subordinate, way with them. VET could be an active participant in the region, both as a partner and as a facilitator in human capital formation.

VET institutions, like higher education institutions, are highly regionalised and their core business is developing human capital, yet their engagement with the future of the communities in which they're located has been limited. In our view, because of its links to industry and its focus on job-specific education, VET is best placed to embrace an enterprising human capital approach to regional development.

Literature and concepts

Regional growth and competitiveness theory

In the past 25 years, various theoretical frameworks and empirical analyses have emerged to explain the dynamics of regional economies and their capacity to cope with change. While there is general agreement as to what makes up national competitiveness and business firm competitiveness, there are two broad arguments in the literature over what contributes to regional growth and competitiveness. Behind the debate are differences of opinion about method and about the role of the region itself. Understanding these determinants of regional growth is important before considering what role VET can play in regional development.

One group of theorists bases its statements on the notion that regional competition can only occur through business firms within the region or through national policy and programs, and not through the coordinated mobilisation of the full attributes of the region itself. The argument is that competitive regional development results from having a critical mass of 'free market' competitive business firms and institutions operating in proximity as rational actors with standard rules (Porter 1998; Krugman 1995). The best-performing regions, therefore, will be those with a concentration of high-tech firms (Saxenian 1994), knowledge-based industries (Armstrong 2001; Thrift 2001), and stock of creative human capital (Florida 1995, 2002), all facilitated by institutional intervention of one kind or another. Information communications technology (ICT) and technology-diffusion industry policies, science and technology parks, universities (Porter 1998; Patchell & Eastham 2001; Saxenian 1994), business agglomeration practices such as clustering and networking (Porter 1998, 2000; Porter & Ketels 2003; Cooke 1996; Kanter 1995), and institutional presence—so-called 'institutional thickness' (Amin 1999) through such mechanisms as advice and information centres are seen as the structural tools by which institutions and firms foster this regional competitiveness. In other words, it's the Silicon Valley solution for regions everywhere—a high-tech firm and supportive industry policy view about what makes up a regional innovations system (Braczyk, Cooke & Heidenreich 1998).

In relation to this group of theorists, there have been two arguments about the way these non-region specific approaches to regional growth and competitiveness manifest themselves. The first and the most simplistic is that structures and their processes are important for kick-starting a region's development. It argues that the solution to stimulating regional development comes from the top, with institutions putting in place such enabling mechanisms as:

- ✧ new skill development or attraction programs
- ✧ infrastructure provision
- ✧ technology- and innovation-diffusion programs
- ✧ new business firm start-up initiatives
- ✧ government-imposed regulation
- ✧ business support programs
- ✧ the facilitation of networks of enterprises and institutions

- ✧ enhanced access to learning and knowledge
- ✧ regional management structures, and so on.

Bottom-up regional processes take these program initiatives from the top as a given and try, generally with considerable difficulty, to encourage some synergy from them, despite the organisational stove-pipe and cultural constraints each structural initiative generally brings with it through its institutional delivery agency.

The second argument suggests that an ‘organisation behaviour approach’ to regional development is important (Amin & Housner 1997). It maintains that the simple availability in the region of institutionally provided structures, programs and their processes built around local business is not enough. As Amin (1999, p.367) states, it requires: ‘... an understanding of the economy as something more than a collection of atomised firms and markets driven by rational preferences and a standard set of rules’.

Another approach to explaining regional development drivers has therefore gained momentum, one based on softer, more romantic, regional milieu ‘atmospherics’ or ‘dynamics’ (Maillat 1995) such as ‘social capital’ (Bolton 1992; Putnam 1993, 2000; Etzioni 1994), ‘trust’ (Fukuyama 1999), ‘loyalty’ and ‘learning regions’ (Maskell, Eskelinen & Hannibalsson 1998; Keane & Allison 2001), and organisation culture, norms and rules (Hodgson 1998). This approach suggests that there are deeper organisational management values, cultural issues and norms in local agencies (and their external and head office affiliates) that determine the extent to which endogenous resources become mobilised locally. The discussion about this socialising behaviour and networking of agencies and agents through regional proximity and association has been labelled ‘untraded interdependencies’ (Storper 1997).

Over the past two decades the structures and behaviours approaches have been placed within the regional development discipline to create a powerful model of local economic growth (Granovetter 1985).

The model draws on a range of complementary literatures on ‘new industrial spaces’, ‘clusters’, ‘learning regions’, ‘innovative milieu’ and ‘regional innovation systems’ (Braczyk, Cooke & Heidenreich 1998; Maskell, Eskelinen & Hannibalsson 1998; Oinas 1997; Porter 1998; Simmie 1997; Storper 1997; Taylor & Conti 1997). It emphasises the social and somewhat complex construction of inter-firm relationships, collaborative supplier–buyer interaction, the creation of ‘social capital’, and the local significance of ‘institutional thickness’ to create local economic growth and forge sustainable democracies (Maskell 2000; Putnam 1993, 2000).

In the institutional approach, successful local economies are said to depend on complex local processes of integration—built on trust, reciprocity and loyalty—that create social capital. They involve the exchange of information, ideas and innovation through mechanisms of quasi-integration, creating new knowledge through processes of situated learning. In addition, there is a supposed process of collaboration that creates an overall ‘thickness’ in structural capacity, further bolstering this local economic process (Amin & Thrift 1994a, 1984b). Enmeshed in webs of global coordination and value transfer, local economies are interpreted in this model as nodes of untraded interdependence (Storper 1997) that are tapped into by internationalised and globalised corporations, with the corporations acting as global information arbitrageurs (Kanter 1995; *Economist* 2003).

An enterprising approach to regional development

The third argument on the way regions grow and compete takes the position that they are neither scaled-down versions of national economies nor simple aggregations of competitive firms; nor are they only the result of institutional decision-making. We believe regions do compete with one another on the basis of the full range and unique mix of their endogenous economic, social,

natural, historical, cultural and human attributes (Maillet 1995; Reich 1991; Kanter 1995; Plummer & Taylor 2001a, 2001b; Martin & Tyler 2003; Taylor 2003). Regions are highly diverse in terms of their attributes, particularly their human capital attributes, but few of these are being realised to anywhere near their full potential, with the result that growth in many regions, as well as nationally, falls short of its full potential.

The enterprising capacity of a region's human capital refers to its ability to turn creative ideas into results using attributes and skills in market identification, risk assessment, persistence, access to development finance, business planning, and so on. These ubiquitous but generally latent abilities can be activated at the regional scale by facilitating temporary coalitions where ideas and non-linear thinking, energy and resources come together to generate convergent regional directions. These coalitions of interest form and disband, depending on the idea and enterprise-formation processes being pursued at the time. As we have said elsewhere (Plummer & Taylor 2001a, p.12):

It is not the setting up of businesses that is the 'enterprise culture'. Rather, the 'culture' is what brings people together in the first place to create, re-create, mould and extend coalitions that seek to exploit business opportunities ... It is not picking winners and subsidising them. It is about creating forums where potential coalition members might meet and generate ideas—people from the small firms sector, the corporate sector, the public sector, and the local community.

The limitations of institutionalist theories of local economic development

In this section, and in more detail in the support document, we spend some time highlighting the inadequacies of the current institutionalist approach to regional development. We do this because there are at least seven areas where these approaches can be questioned on the basis of *omission* and *commission*.

The imperatives of capitalism

The principal limitation of the generally used institutionalist model of regional growth is its neglect of the profit-generating objectives of capitalism (Hudson 1999). Capitalist objectives contain little of the altruism necessary to link them with the cooperative communities of interest built on trust that are at the heart of the institutionalist model of regional growth. Indeed, the only communities of interest evident in the past decade of competitive capitalism have been collusive communities of self-interest that have fuelled the excesses of corporate enterprise (*Economist* 2003).

Equally central to capitalism is the control of labour. Advocates of the institutionalist model emphasise paternalism in labour markets to mobilise labour's tacit knowledge, to enhance learning and innovation and to promote local growth (Brusco 1996). In so doing, they conveniently choose to ignore the long-standing processes involved in the New International Division of Labour, the long history of corporate down-sizing and job loss, the history of union struggle, the casualisation of labour, heavy-handed workfare schemes, labour's fight for wages, and the self-exploitation of labour associated with new forms of production and working. Most regions around the world have been exposed to some if not all of these institutional practices over the last decade.

The impact of power inequalities

The institutionalist model of regional growth, especially the 'learning regions' theory, naively treat capital-capital as well as capital-labour relationships as benign (Bathelt & Taylor 2002). They argue that cooperation between firms in regions mobilises knowledge, induces learning, generates innovation and produces local growth. They downplay the significant impact that power inequalities have on the way firms do business—something that was recognised in economic geography over 20 years ago in Taylor and Thrift's (1982a, 1982b, 1983) enterprise segmentation model.

Time and the ‘institutional instantaneous’

Staber (1996) argues that studies of regional growth have tended to select case studies ‘on the dependent variable’; in other words, they have selected localities, like the Third Italy or Baden Württemberg (Cooke & Morgan 1994) or Silicon Valley (Saxenian 1994), that are considered to be ‘successful’. That success is then attributed to the nature of the current business and social environments of that place and the network relationships that link firms locally. In short, these types of study extrapolate specific cross-sectional, or point-in-time, analyses to speculate about more general temporal relationships. The key question is whether the revealed relationships between businesses in a place are: the currently prevalent relationships that can create growth; relics of past relationships that once created growth but are now being superseded; or portents of future business relationships that might bring a very different local economic outcome.

The translation of new knowledge into new firms and enterprise

A problem with all the ‘soft’ institutionalist theories of local economic growth is that they treat the creation of new firms and new enterprise as unproblematic. Management science literature would suggest that this is a naïve proposition and that the process is far more complex and far less inevitable.

Knowledge on its own is of no commercial consequence until it is incorporated into goods and services. Knowledge must be absorbed to generate innovations. Opportunities must be recognised, knowledge must be translated into commercial ideas, and the right coalition of people has to be persuaded to bring it to fruition. Knowledge and learning require significant other inputs to turn them into new businesses and, on this score, current approaches to regional development theory are again naïve.

Overemphasising the importance of proximity

The majority of cross-sectional studies stress the need for regional proximity in order to achieve growth (see Maskell, Eskelinen & Hannibalsson 1998; Braczyk, Cooke & Heidenreich 1998). However, a number of recent studies add caveats to the importance of proximity as a growth driver. Search and Taylor’s (2002) study of non-metropolitan business services in the United Kingdom shows that proximity is important but only for small firm solicitors and accountants. A study of the electronics industry (Openshaw & Taylor 2002) in the United Kingdom also supports this interpretation of selective relevance rather than broad-based significance. In this study, the strongest embedded local business relationships persisted only as long as the government continued to push large amounts of money into the defence industries of southern England, where the case study was conducted. But, proximity need not be spatial; it can also be emotional. Hardill, Raghuram and Strange (2002) have made this point forcefully in a case study of Asian businesswomen in the United Kingdom. Their study showed that the connections of these businesswomen were with an imaginary and emotional ‘home’ extending beyond the United Kingdom to the Indian subcontinent, not a ‘home’ based on juxtaposition and proximity in a narrow geographical sense.

What these studies suggest is that ‘proximity’ is in some cases necessary for the creation of embedded business ties and local growth, but it is rarely a sufficient condition in itself. Time, social relationships and institutional support are intimately intertwined with the issue of proximity and, together, they are just as likely to generate economic ossification and ‘lock-in’ as they are to generate growth.

Institutional thickness and social capital

Institutionalist theories of local economic growth have at their heart two chaotic concepts. The first of these is ‘institutional thickness’, which is plagued with ambiguity and indeterminacy.

Institutional agencies represent a large and influential group of players in the region, along with business. Their role in a region's economic development arises from the influence of their culture of decision-making on the social dynamic of the region (Hodgson 1988, 1998). The concept of 'institutional thickness' has been coined (Amin & Thrift 1994a, 1994b) to refer to the region that is able to embed the strengths of the institution in its development activities.

The essential problem with the concept is in determining how much institutional involvement is beneficial for local growth and at what point that 'tissue of institutional support' (Amin & Thrift 1994a, 1994b) becomes a smothering blanket. As well as this, the concept does not stand the test of empirical scrutiny. A growing number of studies suggest that institutional thickness may not always bring economic success to an area or make it more resilient. There are questions over whether it is the cause or the consequence of economic growth, whether it marginalises and excludes some groups from the economic development process, what types of organisations are institutions and what their prime motivations are.

The second problematic and chaotic concept is social capital, which essentially relates to networked social and business relationships based on trust, reciprocity and loyalty. It has been defined by Robert Putnam (2000, p.19) as: 'connections among individuals—social networks and the norms of reciprocity and trustworthiness that arise from them'. For Samuel Bowles and Herbert Gintis (2002, p.1), 'social capital generally refers to trust, concerns for one's associates, a willingness to live by the norms of one's community and to punish those who do not'. And Putnam earlier observed (1993, p.167):

Voluntary cooperation is easier in a community that has inherited a substantial stock of social capital, in the form of norms of reciprocity and networks of civic engagement. Social capital here refers to features of social organisation, such as trust, norms, and networks that can improve the efficiency of society by facilitating coordinated actions.

These observations, however, only serve to reinforce the contention of Durlauf (2002) that social capital is a confused concept that mixes causal and functional elements. The functional element is evident in the set of norms and values social capital is said to provide, which facilitate cooperation and efficiency. The causal element of social capital emerges because the cooperative behaviour of others makes the cooperative behaviour of individuals a rational choice. Woolcock (1998) has expressed this same concern, arguing that defining different status groups and further segmenting the region into a different suite of elite groups is a form of moral coercion. Because it is defined so broadly, it is difficult to identify whether social capital is the infrastructure or the content of social relations—it becomes impossible to separate what it is from what it does. This begs the questions what is the 'right sort' of social capital, and when might it help and when might it hinder local growth? Without doubt, social processes and social networks affect local growth potential within regions. The concept of social capital might simply be too broad to be analytically useful and might best be abandoned in favour of simpler and more tractable ideas on the role of social processes in economic growth and change.

Against this background of the shortcomings of the current approaches to regional growth and competitiveness, we suggest that what is needed is a fuller and less ideologically driven understanding of the processes of local economic growth *within the context of a competitive framework*. Not only should these institutionalist approaches be unpacked, they need to be more thoroughly tested against appropriate empirical evidence. Only through testing will these theories shed their conceptual obesity and the layers of contingency they continue to accrete. We undertook this testing, and details are contained in the support document. A summary is provided later in this report.

Local human resources

The core argument of this report is that the important determining influence on a regional community's viability in a competitive world comes from its own human resources, not from its

structures or the behaviour of external institutions that might have a local presence (Garlick 2001, 2003; Garlick et al. 2006; Plummer & Taylor 2003; Taylor 2000). Local human resources can be said to be made up of at least two capital components—social capital and human capital—neither of which is straightforward and unambiguous (Sayer 1992, 2000). Social capital was briefly discussed in the previous section and is covered in more detail in the support document.

In this project we make the distinction between human capital and human resources for explaining regional growth. We distinguish human capital from human resources by seeing the former's creation, refinement and enhancement as being about education *not* training. The latter concept of course would include training. In this project we are concerned with human capital, rather than human resources.

Education is about equipping people to work where they will have some influence in shaping the nature of economic activity (Le Heron & McDermott 2001; Cohen Wesley & Goe 1994; Patchell & Eastham 2001; Keane & Allison 2001). It is about providing individuals with an understanding of the economies and societies they live in, the processes of change that run through them (Cooke 1996; Hudson 1994; Nijkamp & Mouwen 1987; Saxenian 1994), and ways in which they might effect change. Training, on the other hand, equips people for what is known now. It is about providing people to meet the labour needs of existing local employers as a mechanism for promoting local firm growth within existing structures (Leonard 2001). It is about conforming to and supporting winners that others have picked. It is not about new directions, ideas, and opportunities.

Enterprising human capital

We argue that, in the context of achieving meaningful regional development in a competitive global environment, human capital comprises two elements:

- ✧ creative human capital
- ✧ enterprising human capital.

The term 'creative human capital' refers to the capacity within a region to generate the ideas and non-linear thinking needed to identify new ways of responding to regional needs (Florida 1995, 2002; Maskell, Eskelinen & Hannibalsson 1998; White 2002). Richard Florida (2002, p.8) wrote:

I define the Creative Class to include people in science and engineering; architecture and design, education, arts, music, and entertainment whose economic function is to create new ideas, new technology, and/or new creative content. Around the core, the Creative Class also includes a broader group of creative professionals in business and finance, law, health care and related fields. These people engage in complex problem solving ...

According to Florida (1995, 2002) and others, the region with the highest concentration of these creative people will prosper. The answer to regional development is simple: spend public money to ensure there are strong connections between the city/region and a university or similar institutional presence; to have public authorities provide trendy sidewalks and an upbeat entertainment culture; and to put in place other incentives to attract bohemians and an eclectic array of minorities so as to push a region's ranking up against the so-called 'Creativity Index' (Florida 2002, pp.283–314).

Governments, regional practitioners and others have been attracted to this 'instantaneous' solution. But we have a number of concerns with such a 'ready made' approach to regional development, which we believe, like other institutionalist approaches, misses the point in a competitive capitalist world. Prime among these is our belief that it is not the generation of the idea or the innovation that actually creates regional development outcomes, but the *transmission and translation* of the idea through a process of being 'enterprising'. We are also concerned that the Florida argument is 'elitist'. It suggests that the engines of regional growth are people in the arts, entrepreneurs, investment angels and other professionals, whereas in reality the tacit knowledge and ideas that might create growth and change at the regional level are far more pervasive across many stratum of regional society, occupations and ages. The Florida argument takes us back 20 years, when the

main approach to regional development was to provide incentives to attract skills, rather than to realise the full potential of endogenous human capital through better planning and endogenous education provision.

We define ‘enterprising human capital’ in the regional development context as those who take an idea and turn it into an outcome using the regional attributes at their disposal. They are people that some might call ‘can do’; they are not reckless with other people’s money, as they understand the way markets operate; they can access finance, can see an opportunity, can understand risk management without necessarily being risk-takers, and can mobilise resources, particularly teams, to good effect. They are outcome-oriented people, and they are an undeveloped resource that exists across demographic groups in most communities.

The concept of enterprising human capital as a key driver for regional growth comes not only from our analysis of theory, but from the modelling and qualitative analysis discussed later in the report and in more detail in the support document.

It is important at this point to draw out the significant distinction between what often is called an *enterprise culture* for business generation and what we are calling in this study an *enterprising community*. The difference between the two concepts is at the root of our main argument, which sees, on the one hand, an institution-driven, or entity-driven, approach to regional development and, on the other, a community engagement, or people-centred, approach focused on outcomes. One is about organisational structures and processes with rules, norms and behaviour; the other is about the potential of endogenous human capital, educated people, to achieve regional outcomes through various mutual partnerships. One is formal and inflexible; the other is informal and made up of groups that change depending on need.

The usual interpretation of enterprise culture is that it revolves around processes of new firm formation. Again, this is a preoccupation with structures first, not people, following the Michael Porter (1998, 2000; Porter & Ketels 2003) argument. Where this enterprise culture does not occur, nationally or regionally, it is generally concluded—erroneously—that there is an ‘enterprise deficit’ in the community: an insufficient number of risk-takers. An accusing finger is pointed at the disincentives of business taxation, business regulation, ‘red tape’, risk-averse banks, ‘welfarism’, unions, the professions, and an elitist disdain for the trades created by private and university education.

By our interpretation, high rates of new firm formation are not indicative of an ‘enterprise culture’, although they might be the *outcome* of such a culture. Rather, an enterprise culture is what brings people together in the first place to create, re-create, mould and extend the coalitions that seek to translate ideas into commercial realities. As a result, we believe that policies and programs to create an enterprise culture in a city, region or community need first to create the circumstances that will facilitate the formation of coalitions, and the exchange and implementation of ideas. When those policies are aimed only at helping to set up new firms, they are in effect subsidising coalitions *after* the enterprising event has occurred. Indeed, the policies and programs themselves might be the very opportunities that such coalitions are set up to exploit—the opportunity to leverage funds from the public purse!

The key to fostering an enterprise culture, in the regional and local context, is *facilitation*: creating the circumstances that allow coalitions to form in order to exploit the opportunities that *they* identify. It is not about picking winners and subsidising them; it is about creating forums where potential coalition members might meet and generate ideas. It is about easing the passage of new coalitions through the red tape of regulation, and standing with them as they present their business plans to commercial sources of finance and potential buyers and suppliers.

Establishing an enterprise community is not about public sector policy-makers imposing their preconceived ideas of economic success on local communities; however, it is something in which education could play a mutual role in facilitating. This is a key argument in this study.

The role of universities

Tertiary education institutions are potentially key players in building the knowledge, learning and enterprising capability of the regional community in which they are located. They have a regional presence and a prime focus on learning, together with independence, networks, and research and teaching capabilities. However; their role in contributing to regional development has only recently been recognised (Goddard 1997; Charles & Goddard 1997; Garlick 1998, 2000; Chatterton & Goddard 2000; OECD 1999; Charles 2001).

The relationship that universities have with their regional and local communities in this country is quite patchy. While there might be a number of small-scale, project-specific initiatives going on at any one time, it is rare for a university's research and teaching, infrastructure and other attributes to be strongly connected, on a whole-of-institution basis, with the objectives of the regional community in which it is located (Garlick 2000, 2002, 2003; Garlick & Pryor 2002).

There are several myths attached to the spatial provision of higher education. The first is that the location of a university campus in a regional or local community can boost the economy because knowledge-dependent businesses agglomerate around it, along the lines of the science and technology parks at Silicon Valley (connected to Stanford University) and other places (Saxenian 1994; Florida 2002). The second myth—one that has underpinned the regionalisation of university campuses over the past two decades in this country—is that historically low participation rates in higher education in non-metropolitan and peri-urban areas could be turned around by putting a campus closer to students in these areas. Stevenson, Maclachlan and Karmel (1999, 2001), James, Baldwin and McInnis (1999) and others over recent years have shown that, by itself, university campus proximity does not boost higher education participation. Without policies that prompt universities to go beyond a 'just being there' approach to their location, it is unlikely that the university will benefit from its regional location and unlikely that the university will have a positive impact on the viability of the community in which it is located.

A much stronger engaged connection, with a focus on outcomes not just process, is needed. Universities can establish this by:

- ✧ tailoring teaching and learning programs to areas of regional skill need, and building in course elements that will facilitate an enterprising culture among the students
- ✧ introducing initiatives such as business incubators, practicums, scholarships and awareness-raising programs to maximise undergraduate attendance, build enterprising skills, and retain graduates locally
- ✧ targeting local research in partnership with local community groups
- ✧ contributing through leadership and strategic focus, marketing and promotion, and the provision of infrastructure.

In a few cases, contributing means going beyond simple civic capital and into *enterprising action* and *involvement* to get things done locally.

Entrepreneurship and enterprising education

Entrepreneurialism has been defined as 'the ability to perceive opportunities and to tap the resources necessary for exploiting them' (Volkman 2004). Universities argue this 'ability' is something that can be learned and taught and involves two skills:

- ✧ the ability to detect or perceive an opportunity
- ✧ the ability to work out what resources are needed, and how they can be obtained, to realise the opportunity.

It is argued that the ability to recognise and operationalise opportunities does not occur equally in all people, and that learning can enhance both the depth and spread of this ability. Hence, many

universities now have such entrepreneurship programs in place. Invariably they are business-firm oriented programs with little in the way of broad-based regional connectivity.

'Focused' entrepreneurship programs in universities are generally attached to business and engineering schools, incubators and science and technology parks (Streeter, Jaquette & Hovis 2002). However, university-wide entrepreneurship programs target students outside the fields of business and engineering. They encourage the spread of entrepreneurial teaching to non-business students in non-business disciplines of the university. As Streeter, Jaquette and Hovis (2002) explain, 'The aim is to produce graduates who are capable of being innovative and who can recognise and create opportunities, take risks, make decisions, analyse and solve problems, and communicate clearly and effectively'; in other words, a generalised teaching and learning approach to encourage students to think and behave in an enterprising way. Course content can include dialogue, arbitrage, problem-solving, team work, finance, legal issues, management, networking, business planning, and market research—importantly within a hands-on 'learning by doing' environment.

When there is engagement between university teaching and learning and the regional development objectives of the community, this approach to entrepreneurialism, we believe, can add value to a region's human capital and regional outcomes generally. This is where there is an opportunity for VET to become involved in providing education in enterprising competencies tied to practical situations in the region in which they are located.

The role of VET

With the exception of local authorities, technical and further education (TAFE) courses and other VET programs have a greater regionalised presence than any other institution, with a critical mass to make a difference in the regional development process. With its education and training core business and links into the compulsory education system as well as higher education, the VET sector should be more engaged in regional futures in a purposeful and meaningful way.

Extensive consultation and research went into the former Australian National Training Authority's⁵ 2003 strategy document *Shaping our future: Australia's national strategy for VET 2004–2010* (ANTA 2003). As part of the strategy's formulation, a large number of focus group workshops were held in regional communities to explore the ways in which VET could enhance the communities' resilience and minimise the loss of young people to larger centres. A key goal of *Shaping our future*, therefore, was that: 'Communities and regions will be strengthened economically and socially through learning and employment'.

Over the last few years, considerable research has been undertaken on the back of this identified potential role of VET in the development of the regional community. However, in our view, most of this research can be distinguished by two criteria. The first is that the few case localities studied in this research are generally selected according to the dependent variable; in other words, selected on the basis that they will demonstrate the outcome sought. The second is that these studies generally take an aspect of received regional development theory (such as social capital, learning communities, regional innovation systems, industry clustering etc.) and apply its principles without questioning its empirical basis. Examples of these studies can be found in Kearns (1999, 2004), Falk (2001), Bawden (2001), Courvisanos (2001) and others.

Our other concern with much of this research is that theory is being expounded in the form of policy and practice, yet from evaluative case studies there is little evidence that such approaches have generated regional growth and reduced competitiveness vulnerability.

We disagree with the statement: 'Overall there is sufficient evidence on the impact of social capital on economic outcomes in a range of contexts for VET policy and practice to take account of the

⁵ The Australian National Training Authority was abolished in 2005 and its functions taken over by the Department of Education, Science and Training.

role of VET in building social capital in communities ...' (Kearns 2004, p.10). Regional development in a competitive capitalist global world is a far more complex and ruthless landscape than that seen through the conceptual glasses of the romantic concepts of social capital, learning regions and business clustering. The position regional economies find themselves in today is largely because these forces of global competition and its associated institutional decision-making have been allowed to hold sway locally. This is also the reason why we have spent some time reviewing the literature in this area (support document).

We also do not agree, as our review of the literature indicates, with the statements from Falk (2001, pp.239, 240) that: 'In regional economics, establishment of an institutional environment conducive to innovative business and social investment is probably the most important factor influencing growth' and 'presence of a good stock of social capital in the community is essential to achieving growth'.

We cannot agree with isolated case study research that does not spell out the regional growth outcomes from such strategies, does not rate endogenous human capital as a key regional driver, and argues that more institutional intervention is important for regional growth in a competitive world.

The research that comes closest to what we have undertaken in the present project is that by Stimson et al. (2003). In this extensive multi-regional approach, a large range of data variables were spatially mapped over the period 1991–2001 to identify cluster groupings of similar statistical local areas in terms of vulnerability and opportunity. Stimson et al. concluded—and we concur—that there was considerable spatial variability in regional vulnerability and opportunity, and that human capital was the key driver for determining this. While this study is the closest so far to our own, we have developed a methodology that differs from it in many ways, as the following sections of the report identify. Key among these is the adoption of a multi-methods approach that links quantitative and qualitative method, tests available regional development theory, tests the significance of a range of regional growth and competitiveness drivers, and identifies their spatial presence.

Empirical validation and analysis

The 'new regionalism' debate

The debate about method comes down to whether the approach should be an in-depth, qualitative analysis of individual case studies that attempts to get to the heart of regional behaviour and contingency (Clarke 1998; Martin 1999), or the quantitative approach that seeks to determine *relative* performance and return on investment outlay across space in a world of diversity using 'stylized facts' (Krugman 1995). The essence of this debate parallels that around so-called 'new regionalism'. One of the arguments is that theorising economic geographers have been too quick to jump from superficial analysis to a description of results with broad applicability and then to normative conclusions of what ought to frame theory. Lovering has stated, for example (1999, p.384):

We are not dealing here with the normal science applications of rigorously developed fundamental theoretical insight but rather with a loose bundle of ideas, an accretion of notions, gathered together because they seem to resonate and point to broadly similar policy implications somewhere on the horizon. The New Regionalism is a set of stories about how parts of a regional economy might work, placed next to a set of policy ideas which might just be useful in some cases.

In this project, following Downward and Mearman (2002) and Downward, Finch and Ramsey (2002), we have sought to break the distinction between quantitative and qualitative research design and bring some balance to method. 'Extensive' and 'intensive' research strategies are in the same methodological boat in achieving closure of intrinsically open social systems, and the challenges that are involved in constructing empirical knowledge of the social world from non-experimental data and methods of analysis (Downward 2003; Lawson 1997; Plummer & Sheppard 2001; Plummer 2003).

‘Critical realism’

How is it possible to explain the circumstances of development in particular regions so that clearer policy articulation and more responsive practice can take place? The concept of ‘critical realism’ (Bhaskar 1998; Sayer 1984, 1992, 2000) has become a useful tool in determining the extent to which theory—in this case, regional development theory—explains actual regional events in a social world.

Yeung (1997) discusses three methodological principles for a critical realist approach, and we have adopted them in this project. The first is iterative abstraction, which enables a move from the description of a circumstance to a description of what generates or causes the circumstance (Bhaskar 1998). The second is that the research should be grounded by theory rather than simply built around empiricism. Third, realist research should ensure a link between theory and context through triangulation.

Typically, debates in both economics and economic geography adopt a critical realism perspective grounded in qualitative methodologies and ask the question: what is the role of quantitative methodologies? In this project we look at the issue of constructing empirical knowledge of the social world from the other side of the coin by assuming an economic modelling perspective and asking the question: how do ‘intensive’ case studies better inform an empirical modelling methodology? (cf Martin 2004).

Regionalisation

There is no one best way for subdividing up a country for regional analysis; different configurations depend on the purpose for which they will be used. There are, however, a number of considerations that need to be taken into account when designing such a system of regions, particularly in a country where there are no ‘designated’ regions that are embraced by all stakeholder interests. These considerations include the place of regions from a governance perspective in our federalist system of government, the purpose to which the regionalisation is being used, and, importantly, the type of region chosen for delineation. In this regard, regions may be either uniform or nodal. Uniform, or functional, regions will enable comparisons to be made according to a particular administrative function, socioeconomic or demographic characteristic, health characteristic, types of agriculture, income disparity, house prices, social characteristics and so on.

It may be argued that uniformity in regional definition may simply be created by using a small spatial unit, such as the statistical local area (SLA). However, key points of connectivity and flows can be lost when the spatial definition is too small. Also, errors inherent in small values are enhanced. A large number of regions in a regionalisation model with smaller values can lead to patterns of extreme regional variability which may overstate the true situation. The reverse of this, of course, is that having too few regions in a defined regionalisation model can cause too much averaging and too many generalised results within each regional definition.

Nodal regions, which have been used in this project, on the other hand, refer to the functional hierarchy within each region. They might, for example, connote urban centres, rural hinterlands or catchments. They therefore emphasise the diversity, rather than the uniformity, within a regional boundary, and the flows of labour, capital, knowledge, information etc. that occur within it.

Method

The objective of this project was to identify the patterns and drivers of growth among Australian regions, to identify the issues that arose from this, and to explore opportunities for policy and practice that would enhance the role of VET in achieving better regional development. In this section we outline the multi-method approach to identifying regional growth patterns, determinants, and the growth transmission process, and examine the results of the analysis. The support document provides considerably more information both on the method and its rationale, and on the results of the analysis, including mapped patterns. Serious readers are urged to consult this.

Creating a tension between qualitative and quantitative method is both unnecessary and unfortunate, being derived from the untenable supposition that mathematical and statistical modelling must be grounded in ‘foundationalist’ knowledge rather than being part of a ‘pluralist’ methodological perspective (Plummer 2003). As a result, in this project we have put ‘extensive’ and ‘intensive’ research strategies in the same methodological boat. This enables ‘realist’ limits to be put on intrinsically open social systems by closing the model so that it includes only the significant influencing variables, and assists with the challenge involved in constructing empirical knowledge of the social world based upon non-experimental data (Downward 2003; Lawson 1997; Plummer & Sheppard 2001).

In this project, the quantitative analysis was undertaken first, using a closed modelling approach to isolate the factors with a significant impact on regional growth. The quantitative approach enabled the *breadth* of regional growth and its determinants to be assessed across 94 Australian regions. This meant that the growth potential in each region could be seen in the context of its competitive relationship with all other regions, and not in isolation, as is the usual practice among regional analysts. Analysis, however, needs to be *deep* as well as broad and to be able to capture underlying, unrealised, regional capacity that may not be apparent from the quantitative work. This was explored through 11 detailed and diverse regional case studies chosen to represent different spatial circumstances.

Quantitative analysis

Regionalisation

The original regional model of Australia for comparative economic analysis based on nodal regions was compiled by Taylor and Garlick (1989). This notionally comprised contiguous polygons with an urban centre of between 5000 and 10 000 people and a hinterland, and used the Australian Bureau of Statistics (ABS) statistical local area as the base building block. We updated this approach for the present project and defined 94 nodal regions covering the whole of the country for our analysis. Appendix A shows the regions.

Regional growth measures

Relative regional growth over the period 1984–2002 has been ascertained using changes in unemployment rate relativities (Plummer & Taylor 2001a, 2001b) as a universal proxy. Despite the limited availability of regional data, this measure, as an outcome of regional demand and supply, enables a comparative perspective across all regions, both at a point in time and through time.

Regional unemployment relativity is defined here as the region's unemployment rate relative to the weighted average unemployment rate across all 94 regional labour markets. Labour force size in each region has been used as a weight. Change in unemployment relativity, or regional growth (or lack of), between 1984 and 2002 is measured as the degree of change between the relative unemployment rates of each year, $R_{it} = U_{it}/U_t$, where U_{it} is unemployment in region i and time t , U_t the average unemployment at time t , and T is time at the point of equilibrium. The regional growth equation (equation 1) we have used for the analysis is as follows:

$$\ln(R_{it}) = \beta_0 + \beta_1 \ln(R_{it-T}) + \sum_j \beta_j X_{ij,t-T} + \varepsilon_{i,t,T}$$

Where $\beta_j, j=1, \dots, K$ are unknown parameters, $X_{ij,t-T}$ is the j th covariate associated with region i at time $t-T$, and $\varepsilon_{i,t,T}$ defines a set of random and serially uncorrelated shocks to a region's unemployment relativity. In the context of this model, β_1 defines the speed of convergence in regional unemployment relativities. In the absence of regionally specific steady state disparities between regions ($\beta_2, \dots, \beta_K=0$), if $0 < \beta_1 < 1$ then regional unemployment relativities will converge to a common mean, whereas $|\beta_1| > 1$ implies divergence of regional unemployment rates, and $\beta_1=1$ implies stable unemployment relativities.

Accordingly, $\sum_j \beta_j X_{ij,t-T}$ represents the set of regionally specific effects, reflecting the set of local capacities in each region. By construction, ε_{it} is interpreted as a 'white noise' process containing all of the non-systematic determinants of local unemployment relativities. That is, ε is assumed to be a normally distributed process with an expected value of zero, errors independent of the set of explanatory variables, uniform variance, uncorrelated, and with fixed regressors in repeated samples.

Using a conventional gap convergence (Barro regression) econometric model (Plummer & Taylor 2001b), regional growth is broken down into three components:

- ✧ *transition dynamics*: the speed at which a region's growth rate returns to a long-run equilibrium after a shock; that is, mean reversion
- ✧ *'structural' characteristics*: the extent to which there are growth differences between neighbouring regions
- ✧ *random shocks*: the unanticipated and unpredictable factors that can impact on the regional growth rate (Martin & Sunley 1998).

It is hypothesised that, in a competitive labour market, unemployment rates in all regions will converge towards a general common rate over time. If this does not occur and each labour market converges to its own long-term unemployment rate, then there are particular 'structural' factors, or drivers, at work, giving rise to region-specific outcomes. These reflect the local capacities of each region rather than simply being a product of national competitive trends. The nature of the long-term growth in each region is determined by the relative impact of each of the structural factors or drivers (Baddeley, Martin & Tyler 1998).

The type of ordinary least squares (OLS) regression equation we have used enables the use of a range of testing procedures to evaluate the explanatory value of the model.

To explore the patterns of regional growth in Australia over the period 1984–2002, three different approaches to explaining spatiality have been used:

- ✧ the significance of the spatial association among all regions, using Moran's I (Anselin 1996) and Moran's I scatterplots
- ✧ the identification of particular spatial clusters of growth among regions (spatial accumulation), using a Getis-Ord (or G) statistic (Getis & Ord 1996)

- ✧ the significance of specific spatial clusters that have been identified, to the extent that they may be classed as ‘hot spots’ of difference from neighbouring regions, using local indicators of spatial association (LISA) (Anselin 1996).

Growth drivers

From six ‘institutionalist’ regional development theories, eight hypothesised drivers of regional growth have been extracted and tested in the Australian situation (Plummer & Taylor 2001a, 2001b). The institutionalist theories and the variables they connote are detailed in appendix B. The data used to test the variables are summarised in appendix C. Table 1 shows the variables and their theoretical connection. They can be nested within the following over-parameterised model (equation 2):

$$\ln(R_{it}) = \beta_0 + \beta_1 \ln(R_{it-T}) + \beta_2 HITECH + \beta_3 INFOACC + \beta_4 MOLCN + \beta_5 PROT + \beta_6 NODEG + \beta_7 TOTPOP + \beta_8 MKTACC + \beta_9 SPEC + \varepsilon_{i,t,t-T}$$

Table 1 Growth drivers

Theoretical dimension	Variable name	Description of variable*
Technological leadership at the enterprise level	HITECH	An index of the presence of high-technology industries
Knowledge creation and access to information	INFOACC	An index of access to information
Locational integration of small firms	MLOCN	Percentage of establishments in multi-locational enterprises
Infrastructure and institutional support	PROT	Industry assistance
Human resources	NODEG	Percentage of working population <i>without</i> a degree
Power of large corporations	TOTPOP	Index of corporate control
Local demand and interregional trade	MKTACC	Index of intermediate goods market access
Local sectoral specialisation	SPEC	Index of specialisation

Note: *Refer to appendix B for details on growth driver variables.

Our objective has been to subject the variables to a series of ‘shocks’ in the model and eliminate those that do not provide, at each iteration, a significant explanation for growth across the 94 regions, until we have a parsimonious empirical model congruent with the available Australian regional data. This analysis is described in the support document.

Final model specification

Employing a general-to-specific model reduction strategy on the gap-convergence model specified in equation 2, INFOACC, MLOCN, TOTPOP and MKTACC were eliminated as explanatory variables. They are not significant determinants. Thus, the final model is a theory-inspired, congruent, parsimonious empirical model that encompasses all rival model specifications that are consistent with equation 1.

A number of other mis-specification and other statistical tests (for example, Chow tests for parameter instability and Lagrangian multiplier tests for omitted variables) suggested that there was no evidence in the sample of 94 regions to suggest that INFOACC, MLOCN, TOTPOP or MKTACC should be included, either individually or jointly, in the final model specification as explainers of regional growth.

Based on this final model specification and the lack of mis-specification errors for exploring regional growth in Australia between 1984 and 2002, the statistically significant conditioning variables of regional growth are HITECH, PROT, NODEG and SPEC. Specifically, increasing

HITECH and SPEC enhances local economic performance, while PROT and NODEG retard local economic performance. In the final model specification, these four key drivers account for 63% of the variability in unemployment relativities in 2002 and so are regarded here as the key growth drivers used in the analysis. While the eight variables tested are taken from the six main referenced regional development theories of the last few decades, we acknowledge there could be other variables that could be tested. However, the testing procedure we have employed relates to the ability of each variable to satisfy tests of significance over the entire study period, as is explained in the support document.

Qualitative analysis

The mere presence of a positive growth driver, such as human capital (or 1-NODEG), access to high technology or industry specialisation, is no automatic guarantee of growth, as there are impediments to the growth transmission process in regions. Therefore, the 11 case study regions needed also to be explored through qualitative processes.

Four-hour facilitated workshops were held in each case study region, the purpose being:

- ✧ to gain on-the-ground feedback on the quantitative modelling results
- ✧ to gain an appreciation of what the regional development process in each region had been, including its drivers and impediments over the past two decades
- ✧ to identify some of the emerging opportunities in each region and the role for VET—in particular technical and further education (TAFE)—in realising these as outcomes in the regional development process generally
- ✧ to make conclusions about policy to enhance VET's contribution to the regional development process.

Written reports from each workshop were sent to participants for confirmation and further contribution. Other stakeholders, not present at the workshops, were also sent copies of the results and asked for feedback.

Each workshop was attended by between 12 and 30 participants from a broad spectrum of interests, including TAFE, other VET providers, local government, state government, business, schools, universities, regional development organisations and social development bodies. Participants included both small and large business managers, institutional managers, students, teachers, social entrepreneurs and others. Workshops were chosen as the medium because they promoted dialogue and enabled a learned response, a consensus view (Bohm 1996; Isaacs 1999; Yankelovich 2001) and understanding (Mumford 1991; Checkland & Holwell 1998; Cherry 1999). The regions selected portrayed a mix of growth rates and growth driver impacts, were spread across states and territories, and had a mix of urban and rural regions (see table 2).

Table 2 Case study regions

Region (state)	Growth characteristics
Orange (NSW)	Rural city, high growth, high-tech access, relatively low human capital, relatively low sector specialisation, relatively low institutional support
Western Sydney/Penrith (NSW)	Peri-urban metropolitan, high growth, high-tech, high market access, high human capital, high sector specialisation, medium-level institutional intervention
Wollongong (NSW)	Provincial, stationary growth, low- to medium-level human capital and access to high technology, medium-to-high levels of institutional intervention and sector specialisation, high market access
Mt Isa (Qld)	Remote mining, low growth, relatively high human capital, high sector specialisation, low institutional intervention, low access to high technology
Wide Bay Burnett (Qld)	Rural cities, low and declining growth, low human capital, low-technology access, sector specialisation varies considerably between centres, institutional intervention low
Shepparton (Vic.)	Rural city, close to zero growth, low access to high technology, medium-to-low human capital, low sector specialisation, relatively high institutional intervention
Horsham (Vic.)	Rural city, stationary but relatively high level of growth, relatively low human capital, low specialisation, relatively low technology access, medium level of institutional intervention.
Burnie (Tas.)	Rural city, declining growth, low-technology access, relatively low human capital, low technology access, middle-level institutional intervention and sector specialisation
North-East Adelaide (SA)	Peri-urban metropolitan, low growth, high access to high technology, high institutionalism, low human capital, high sector specialisation
Pilbara/Port Hedland (WA)	Remote mining, rapidly declining growth, low access to high technology, relatively high human capital, high sector specialisation, low institutional intervention
Alice Springs (NT)	Remote city, recent relatively high growth, very high human capital, high sector specialisation, low institutional intervention, relatively high access to high technology

Patterns of regional growth

This section summarises the patterns of regional growth and its drivers using the method outlined in the previous section. Further details about these are provided in the support document.

Growth analysis

Moran's I

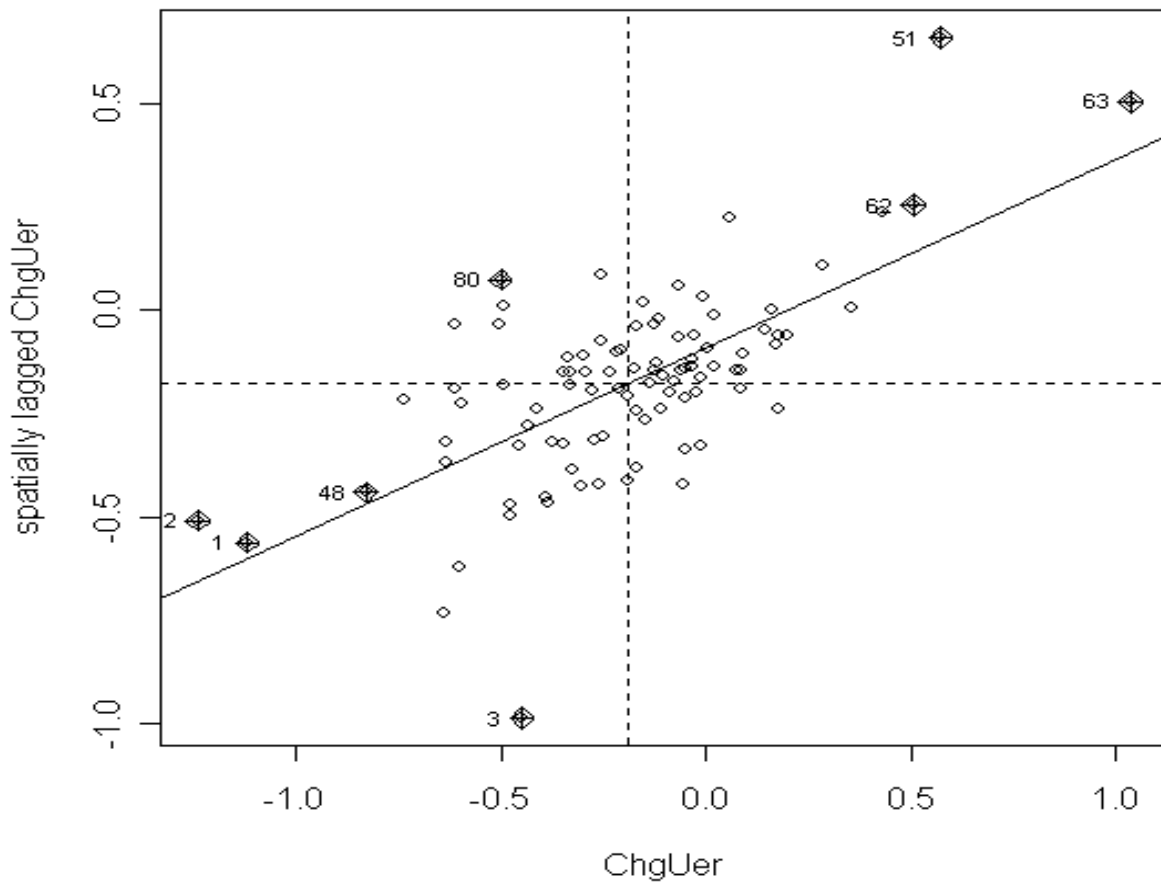
Our analysis shows that growth and competitiveness across the 94 regions became increasingly divergent and entrenched over the period 1984–2002. The computed Moran's I statistic for regional unemployment rose from 0.213 to 0.416 between the two decades, with the pattern of growth over the 18-year period having a Moran's I at 0.455, all significant at the 1.0% level, suggesting a degree of spatial growth association or clustering. As aggregate national growth has risen over the period, spatial divergence has increased and become more concentrated, with fewer regions becoming larger high-growth centres and more regions becoming low-growth areas.

Moran scatterplots give some idea about the nature of this growth clustering. Figure 1 and figures 1 to 3 in the support document show the relativity and degree of change (that is, growth) for each region (horizontal axis) compared with that of its contiguous neighbours (vertical axis). The figures and the data given in table 2 in the support document suggest that spatial patterns of high growth are occurring around central Sydney (1), Gosford (2), North Sydney (3) and Wollongong (48) (to name a few). Patterns of poor growth are occurring around Morwell (63), Moe (62), Sale (57) and Traralgon (51) in the Gippsland in Victoria, and Maryborough (43), Bundaberg (79), Hervey Bay (88), Gympie (81), Maroochydore (71) and Caloundra (69) in the Wide Bay Burnett and Sunshine Coast areas of Queensland. Cairns (80) is interesting in that it exhibits, along with several other hot spot locations, relatively high growth (negative values) in a segment of the scatter diagram that comprises zero growth regions. No-growth regions are centred around the axis intersection.

Scatterplot diagrams of relative unemployment for 1984 and 2002 are shown in figures 1–3 in the support document. The diagram for 1984 suggests Maryborough, Bundaberg, Gympie and Hervey Bay are local labour markets with relatively high unemployment rates and have neighbours in a similar situation. This includes, for example, regions like Maroochydore and Caloundra. Similarly, Gosford and Wollongong are high unemployment regions surrounded by other regions with relatively high unemployment. Conversely, in 1984, northern Sydney was a local labour market with a relatively low unemployment but with neighbouring labour markets that had relatively high unemployment (for example, south-western Sydney, central and inner western Sydney).

Figure 1 in the support document shows the presence of low-growth spatial clusters in 2002 around Maryborough, Gympie, Hervey Bay and Bundaberg in the Wide Bay Burnett area of Queensland, as well as around Morwell and Traralgon in the central Gippsland area of Victoria; Maroochydore and Caloundra on the Queensland Sunshine Coast; and Whyalla, Port Pirie and Port Augusta in the Upper Spencer Gulf area of South Australia. Conversely, northern Sydney and Narrogin had low relative unemployment rates and were surrounded by regions that also had low unemployment rates.

Figure 1 Moran scatter plots



Getis-Ord

A computed value of $G=3.3$ (when $n=94$) suggests the presence of a significant spatial cluster at the 1.0% level. Positive values indicate declining relative growth and negative values indicate positive relative growth over the 18-year period. The results indicate the presence of distinct 'local' clusters of positive growth around northern Sydney ($G=-4.24$), southern Sydney ($G=-3.413$), western Sydney ($G=-3.655$), and, to a lesser extent, south-western Sydney ($G=-2.136$), Newcastle ($G=-2.176$), and central and inner Sydney ($G=-2.123$). At the other end of the spectrum, there are clusters of negative growth in Traralgon ($G=4.66$), Sale ($G=3.627$), Moe ($G=3.511$) and Morwell ($G=4.047$) in Victoria.

In 1984, the main cluster of negative relative unemployment was Maryborough ($G=3.265$)—only just significant—while in 2002, Maryborough (Queensland) was again a significant negative cluster of relative unemployment ($G=3.31$), suggesting a very long-run growth problem for this area of the country.

Local indicators of spatial association (LISA)

Examples of regions where significant hot spots of positive growth were surrounded by other regions of quite different growth (at 1%) were: central, inner western, southern, northern and western Sydney; Gosford; and, to a lesser extent, Wollongong and Newcastle. Regions in the same situation for negative growth included Traralgon, Sale, Moe, Morwell and, to a lesser extent, Port Augusta and Port Lincoln.

In 1984 the most significant hot spot region of relative positive growth was northern Sydney, while on the negative side, the hot spots were: Traralgon, Moe, Morwell, Sale, Maroochydore, Caloundra,

Maryborough and, to a lesser extent, outer eastern Melbourne, Wangaratta and Taree. In 2002 the most significant hot spot regions for positive growth were central and inner western Sydney, northern Sydney and, to a lesser extent, western Sydney. On the negative side they were Maryborough, Morwell and, to a lesser extent, Maroochydore and Narrogin.

The results of this analysis show that there were three key regional areas for negative growth over the period 1984–2002. These were Wide Bay Burnett in Queensland (comprising the Maryborough, Hervey Bay, Bundaberg and Gympie regions) with some spillover to the Sunshine Coast to the south (Caloundra and Maroochydore in particular); Gippsland in Victoria (comprising Morwell, Moe, Traralgon and Sale); and the Upper Spencer Gulf area of South Australia (comprising Whyalla, Port Pirie and Port Augusta). Of these, the Wide Bay regions have had continuing poor growth over the entire period, whereas the situation in Gippsland and the Upper Spencer Gulf had become markedly worse over the period. On the positive-growth side, the stand-out area was Sydney metropolitan (in particular, the regions of northern Sydney, central and inner western Sydney, Gosford, southern Sydney and western Sydney). Over the period, the cluster of high growth around metropolitan Sydney widened to include peripheral areas (for example, western Sydney, Wollongong and Gosford), producing a larger growth conurbation.

Driver impact

Aggregate driver impact

To compare the relative importance of the significant drivers of regional growth, their values are converted to Z scores as shown in table 3. It can be seen immediately that the human capital driver NODEG is considerably more important in determining regional growth than SPEC, followed by HITECH and then by PROT. Table 3 in the support document gives the data for all 94 regions for the four significant regional growth drivers.

Taking the coefficient for each of the four significant variables, we can ascertain the change in regional growth that occurs with a change in each driver to a specified level (and holding the other three constant). In table 3, the impact on regional growth is shown under four scenarios:

- ✧ a 1.0% change
- ✧ a change to the median across all 94 regions
- ✧ a change to the minimum value among the 94 regions
- ✧ a change to the maximum value among the 94 regions.

Table 3 The importance of determinants of economic performance

Variable	Z score	Coefficient	Impact on relative unemployment and regional growth			
			1% increase	Median value	Min. value	Max. value
HITECH	-0.307	-0.15	-1.16	-0.0435	0.0423	-0.366
PROT	0.164	0.013	1.013	0.0338	-0.05252	0.20566
NODEG	0.640	0.025	1.026	1.15375	-0.52625	0.49875
SPEC	-0.406	-1.14	-3.16	-0.1824	0.1596	-0.2736

In other words, a 1.0% increase in the HITECH coefficient will increase average regional growth (reduce relative unemployment) by 1.16%. A 1.0% increase in NODEG will lead to reduced regional growth (increase relative unemployment) by 1.026%. This analysis can be carried out for each region, with growth outcomes varying according to relative driver presence.

The conclusion that can be drawn from the modelling of drivers is that, when positive human capital growth (or 1-NODEG) and sector specialisation (SPEC) are linked with some degree of access to high technology (HITECH), the result is an ‘enterprising’ culture at the regional scale

(Plummer & Taylor 2001a). Alice Springs, Wollongong and western Sydney are examples of where this might already be occurring. On the other hand, in Hervey Bay, Bundaberg, Mt Isa, Maryborough, Burnie, Shepparton and north-eastern Adelaide, there is a need for significant initiatives to boost regional growth competitiveness, and these need to be examined closely.

Table 4 highlights those regions, from the total 94, with the highest and lowest presence of significant regional growth drivers.

Table 4 Regional growth driver presence

Variable	Highest 10 ranking	Lowest 10 ranking
HITECH	Northern Sydney, southern Sydney, south-west Sydney, Orange, outer east Melbourne, southern Melbourne, western Melbourne, north Adelaide, inner east Melbourne, inner Melbourne	Lithgow, Renmark, Port Augusta, Port Pirie, Mandurah, Port Lincoln, Taree, Whyalla, Goulburn, Traralgon
NODEG	Hervey Bay, Gympie, Port Macquarie, Coffs Harbour, Maroochydore, Caloundra, Taree, Port Pirie, Moree, Mandurah	Northern Sydney, inner east Melbourne, Canberra, Darwin, outer east Melbourne, east Adelaide, Traralgon, north Perth
SPEC	Renmark, Murray Bridge, Narrogin, Colac, Goulburn, Hamilton, Horsham, Albany, Armidale, Bathurst	South-west Sydney, Canberra, Hobart, Geelong, Broken Hill, Kalgoorlie, southern Adelaide, north Adelaide, Port Augusta, east Perth
PROT	Geelong, north-east Melbourne, southern Melbourne, Mornington Peninsula, western Melbourne, inner Melbourne, Wangaratta, western Sydney, Bendigo, southern Sydney	Mandurah, Port Hedland, Kalgoorlie, Broken Hill, Gladstone, Northern Territory, Moree, Armidale, Port Augusta, Rockhampton

The conclusion we are making about ‘enterprising’ human capital is based on triangulating existing theory, the empirical evidence available from our modelling and our case study research, enabling us to arrive at a plausible interpretation of the data. This analysis of the Australian data has also been tested in the international academic arena, with the authors undertaking similar analysis in a number of other European and North American countries through an international network of scholars. Our future modelling research will narrow down the interpretation of ‘enterprising’ human capital to better distinguish it from other forms of human capital. This might entail incorporating into the model more specific data sources that better conceptualise human capital and ‘enterprising’ activity.

Regional variability in driver impact on growth

Different regions will have a different mix of drivers determining their respective growth paths. Table 5 shows what it takes for each driver to change in order to give a parity relative growth outcome in each of the case study regions. For example, northern Adelaide needs to considerably reduce its NODEG from 42.9 to 28.62 to reach parity, and Hervey Bay needs to reduce its NODEG from 66.1 to 39.05. Nonsensical values may be discounted.

We have concluded from this modelling process, therefore, that regional growth theories that embody greater openness to interregional trade (MKTACC), encourage connections between enterprise-based firms (MLOCN), emphasise the power of large corporations influencing firm structure and strategy (TOTPOP) and the processes of learning (INFOACC)—as well as the policies and practices that rely on them—do not have as large a regional impact on growth as might be expected.

A combination of low NODEG, high HITECH, low SPEC and low PROT appears to have the potential to generate better growth, if these drivers can be effectively harnessed. The human capital element (NODEG) has the largest relative impact. We conclude from this work, and from theory and the qualitative analysis, that an enterprising approach to human capital will have the greatest impact on regional growth. Importantly, the results also suggest there is a case for region-specific attention to correct particular imbalances because of the different mix of drivers present. For this reason, each region needs to be explored in more detail to see what measures could be put in place

to enhance growth through human capital, and what other non-drivers have an impact on the growth transmission and translation process. The qualitative work was undertaken for this reason.

Table 5 Required change in driver to achieve parity regional growth outcome

Region	Relative unemp. 2002	HITECH		PROT		NODEG		SPEC	
		Actual	Parity	Actual	Parity	Actual	Parity	Actual	Parity
Western Sydney	-0.17	1.35	0.25	8.99	21.8	36.2	42.82	0.07	-0.08
Northern Adelaide	0.37	1.95	4.32	12.57	-15.05	42.9	28.62	0.05	-0.37
Orange	-0.21	2.40	1.05	3.04	18.74	51.6	59.72	0.28	0.10
Shepparton	0.16	0.23	1.26	4.64	-7.42	49.30	43.07	0.29	0.43
Maryborough*	0.42	0.39	3.11	2.39	-29.45	53.30	36.83	0.20	0.57
Burnie	0.49	0.04	3.19	4.79	-31.98	46.60	27.59	0.19	0.62
Wollongong	-0.05	0.28	-0.02	6.70	10.25	41.30	43.13	0.10	0.06
Alice Springs	-0.32	0.74	-1.34	0.32	24.50	31.40	43.94	0.08	-0.22
Mount Isa	0.07	0.12	0.58	0.66	-4.71	40.80	38.02	0.06	0.12
Horsham	-0.48	0.30	-2.79	3.76	39.93	52.90	71.60	0.35	-0.07
Bundaberg*	0.50	0.30	3.53	1.75	-36.06	56.10	36.54	0.23	0.67
Hervey Bay*	0.69	0.13	4.60	0.86	-51.45	66.10	39.05	0.07	0.67

Note: *All part of the Wide Bay Burnett region (Qld).

Confirming quantitative analysis

One of the objectives of the 11 regional workshops was to get feedback on the quantitative results in relation to regional growth and its drivers. In each region, presentations of the modelling results on a region-specific basis were given and discussion was encouraged. The workshops generally confirmed the quantitative analysis, with real stories adding insights into: labour flows; key industry sectors and their restructuring; changes in demographics, housing and migration; innovation diffusion; markets; skills supply; infrastructure; telecommunications; and the provision of education.

Growth drivers

In relation to the regional presence of growth drivers, we sought comment on the four key areas that the quantitative analysis identified as significant. In relation to high-technology access, regions either said they did not have the industry base to generate high-technology business access, or that the high-technology industries they did have in their region did not enable a wider diffusion to other enterprises locally. The motor vehicle industry in northern Adelaide was an example of this. Also, many existing companies in non-metropolitan regions do not upgrade their technology quickly and the required knowledge workers in regions with pockets of specific-purpose high technology tend to either commute to the region daily from adjacent metropolitan regions (for example, northern Adelaide), work on a fixed-term contract and leave when it is finished (for example, Wide Bay), or fly-in and fly-out (for example, Mt Isa and Pilbara/Port Hedland). As a result, it appears that high-technology access as a regional growth driver is only being realised in key metropolitan regions, such as the western Sydney case study region.

In relation to human capital, there is a general outflow of tertiary-educated people from non-metropolitan regions to larger centres. As a result, the capacity for generating new enterprising outcomes from within the regional labour market has been reduced. This has occurred in nearly all of the non-metropolitan case study regions, the only exceptions being remote mining regions where there are special fly-in, fly-out mining labour forces; there was also a concern among regional representatives about the ability of the education system to address the problem.

Government agencies generally play a large role in providing services and support to the regions. The nature of the intervention depends on the particular mix of the industry base, the degree of structural change that has occurred over time, and the extent of structural issues remaining unresolved at any one time. Of the case study regions examined, the remote mining and farming centres appear to have had the least institutional support, while the older industrial regions (for example, northern Adelaide, Burnie and Wollongong) have had the greatest.

Regional growth has not followed sector specialisation in the remote mining regions of Pilbara/Port Hedland and Mt Isa, or the industrial regions of northern Adelaide, Wollongong and Shepparton. This suggests a problem in the transmission process, or that other driver variables have had a more significant local impact.

Opportunities and impediments to regional growth transmission

Participants in the 11 case study workshops identified the opportunities and impediments to realising those opportunities, and these have been listed for each region in table 1 in the support document. The following discussion presents general observations across all the workshops relating to opportunities and impediments. The transcript discussion from each workshop has not been included as part of this report.

Opportunities

In our view the feedback from the regional workshops highlighted a general inability at the community level to fully appreciate the underlying globally competitive dynamic influencing business development. This included an inability to identify opportunities consistent with this global perspective, to see how opportunities are realised in other competitive regions, and to have a staged approach to realising opportunities.

There appears to be an apparent naivety about the way companies utilise their capital and labour, and the way networks are used for corporate rather than community gain. With some exceptions, we found there was little concerted effort to harness endogenous attributes within a strategic framework, and no region had undertaken an audit of its knowledge resources, even though knowledge was viewed as important for regional growth and competitiveness. Generally, there was a penchant for the off-the-shelf, 'quick-fix' external solution, without questioning whether it would fit within the particular local circumstance, how sustainable it might be, and whether it was founded on firm evidence. Examples included attracting established businesses with established workforces from other regions, relying on a fly-in, fly-out workforce in remote mining centres rather than building a local skill capability, and relying on knowledge workers commuting daily from metropolitan areas to enhance local research and development outcomes.

There are some exceptions, where local knowledge and expertise are being used creatively to spawn new activity and where the appropriate analysis has been undertaken. The Desert Knowledge Precinct in Alice Springs is one good example. There have been attempts in Shepparton to build on the cultural diversity of the growing population, which has led to better planning around skill and development needs. And in Burnie, Mentor Resources Tasmania, together with the Chamber of Commerce, is undertaking a skills-matching service for local industry.

From our workshop analysis, we found a lack of formality in formulating regional opportunities. The process tends more towards the 'good idea' than the fully articulated approach. Instead, there needs to be a definitive process, with pathways based on market assessment, finance options, risk assessment, partnering etc. and formal arrangements between stakeholder interests. Where a regional strategic plan existed, there appeared to be an inability to move beyond the planning document, with a consequent dependence on government to turn opportunity into meaningful outcomes with local growth impacts.

After more than 20 years of bottom-up regional development policy and practice, the state of regional development at a local level is disturbing. It is questionable whether grass-roots initiatives in facilitating regional development will be effective without a major rethink. Our research, as well as our experience, suggests that the current model of regional leadership and governance is not

especially effective, and that a new agenda for building communities' enterprising capacity is needed—one based on knowledge exchange, dialogue and learning and involving many local stakeholders and networks over some length of time.

Our analysis suggests that this sort of enterprising culture in regional communities will not automatically occur in a sustained manner through a small group with a government-auspiced mandate for regional leadership. Rather, it calls for an environment of free-flowing ideas and enthusiasm across the whole of a region, with the aim of generating wide local participation.

Impediments to growth transmission

In the workshops, participants discussed impediments to regional growth in their areas, with findings as follows.

- ✧ There is a general complacency and lack of dynamism in some regions, with little impetus for change.
- ✧ Key local driver attributes, specifically, human capital, are being exported to larger metropolitan regions. This has been the case in northern Adelaide, Orange, Wide Bay, and Burnie, in particular. There is general acceptance of such a human capital exodus as 'normal'.
- ✧ There appears to be little innovation diffusion from key industries to encourage R&D spin-outs throughout the region. This was particularly noticeable in industrial case study regions such as northern Adelaide and Wollongong.
- ✧ The process of facilitating regional planning and realising opportunity appears disorganised. Communities are unclear about whose task it is to develop the region's human capital (that is, whether it's the domain of educational institutions) and tend to depend on external solutions from government and big business.
- ✧ The inability of the education system to inspire the region's human capital to be enterprising ensures that there is poor connectivity between the drivers for change and the human capital needs that have to be developed locally to underpin its growth.
- ✧ There is an over-emphasis on specific sectoral winners who are determined by institutions and consultants from outside the region, rather than on creating something unique from the range of attributes within the region.

Engaging regional enterprising human capital

Two concepts of how regional development is transmitted stand out from the quantitative and qualitative analysis. These are *enterprising human capital* and *regional engagement*.

Enterprising human capital

In the regional development context, we define 'enterprising' people as those who take an idea and turn it into an outcome using the attributes at their disposal. This includes people who understand the way markets operate; can access finance; see an opportunity; understand risk management without necessarily being risk-takers; and can mobilise resources, particularly teams, to good effect. They are regarded as outcome-oriented people, and they are, generally, an unidentified and undeveloped resource that exists across demographic groups in most communities. The *process* of enterprising is one of working together in groups with complementary and reinforcing skills and knowledge with the objective of achieving a better result with the attributes at hand. It does not refer only to processes of business entrepreneurship. Enterprising outcomes in a region may manifest as social, cultural or environmental outcomes as much as they might be business outcomes.

Developing an enterprising culture in the regional context is something that needs to be taken on by the education system, not the training system, as it is about behavioural processes of thinking and acting that have long-run implications. It is about human capital rather than human resources. It enables a flexibility to pursue emerging opportunities rather than be stuck within existing imposed structures.

All the regions participating in the case studies saw the lack of an enterprising culture among their human capital and a lack of connectivity between regional attributes as serious limitations to growth. Not one had any mechanisms in place to facilitate, on a broad front, an enterprising capacity within their communities, and none had attempted to assess and develop skills in this area. We see these as initial tasks in assessing the capability for regional growth, and as a prelude for action by the education system to foster these skills on a wide and deep front.

Regional engagement

In this project, regional engagement refers to the mutual and creative connections that can be formed by a region's human capital in order to achieve outcomes that may not have been possible with an isolated approach or one constrained by business or institutional structures. It is, in a sense, a framework of mutual cooperation and dialogue that surrounds the enterprising human capital within the region. It is a concept of regional involvement, where participants are accepted on equal terms to exchange knowledge as learners. Importantly, it is about getting results, not just about establishing a process.

The role of VET

Earlier sections highlighted the importance of education in building human capital, particularly ‘enterprising’ human capital, as the key driver for building regional growth. Because of its regionalisation, strong links to industry, and role in education and training, the VET sector should be developing the skills to translate ideas into meaningful outcomes (that is, being ‘enterprising’) in the regional community. The 11 case study workshops were an important source in understanding this role.

Current role of VET in the regional community

The workshops revealed that many communities do not recognise the potential role of education in long-run competitive growth in their regions, and that education institutions have been reluctant to get involved. Training tends to dominate VET’s role in most regions, because it shows immediate results in the form of jobs. The ‘E’ in VET is undervalued and constrained to education in the general life skills area and in student pathways from school, whereas it should have a fundamental role in community-building tied to strategic directions that are well beyond the immediate need for training in response to skill shortages.

The workshops highlighted the following challenges for VET in facilitating regional growth.

- ✧ Among young people at school, there is a poor image of trade occupations compared with white collar and professional occupations, which means students favour university over VET.
- ✧ VET is always in catch-up mode when it comes to providing the required skills. The VET sector lags behind industry demand rather than leading it, and can therefore miss out on being involved in cutting-edge developments.
- ✧ There is no flexibility in funding arrangements, which would enable VET to be responsive to local initiatives.

Potential future directions

VET should take a proactive role in education by ensuring that communities learn how to maximise their inherent regional resources. This new role could take shape in a number of ways by building on local knowledge and skills.

- ✧ VET should aim to develop competencies for building enterprising skills in the regional community. This will include two aspects of learning. First, there is a need for skills that enable people to turn opportunities into on-the-ground regional growth outcomes. This requires expertise in: identifying opportunities, business planning, marketing, accessing venture and development finance, entrepreneurialism, networking, risk management, and communication. Second, there is a need, through a broader liberal arts education, for knowledge of how the global economy operates and the mechanisms available to facilitate change. These two areas could be core courses across all disciplines.
- ✧ There is a need for regional capacity-building, where the VET sector takes a leading role developing temporary coalitions of enterprising human capital, built around areas of common

interest of competitive value, together with connections into business and other institutions and their long-term strategic plans.

- ✧ An expanding market for people over 40 years of age should be acknowledged and provided for.
- ✧ Information about a region's knowledge resources should be gathered and used to help the regional community identify and realise opportunities.

To achieve these ends, VET needs to:

- ✧ take a long-term view
- ✧ have a strategic plan at a regional level, to which other regional bodies may have input
- ✧ undertake detailed and ongoing analysis of existing and emerging employment opportunities and associated 'skills base' needs
- ✧ increase partnerships, including those with regional bodies and private companies, and identify the needs for industry experience and training in order to respond appropriately
- ✧ satisfy immediate training and education requirements without compromising what may be required in the future.

Business role

Business currently tends to view VET in a purchaser/provider relationship and to see education as a cost rather than an investment in future competitiveness. It has a preference, therefore, for 'just in time' training. However, VET has the potential to be much more than this for business and the community in its regional location. In partnership with business it could monitor global trends and be on the lookout for niche markets. It could be driving industry development in its region in a strategic way rather than following it. To bring this to fruition, VET needs to be proactive, creative, and strategic in developing a business contribution.

Pathways

An emphasis on meeting the training needs of industry at the expense of providing an enterprising education has, in our view, made VET less competitive in attracting high-quality students from the school system. The availability of education and career pathways is important in influencing students' course choices and the views of parents and teachers. There is a perception that training-based occupations are short term and carry little glamour compared with the professions available through higher education, which are viewed as having a long-term future.

It is important for VET to attract more students through clearer education-based pathways with schools and business. As well, the opportunity exists to develop courses about how to shape and be a creative part of a different future. These might or might not be industry-based, but the focus would be on offering skills in innovation and entrepreneurialism to tackle opportunities within the region. This would counter the current default option for students, which is to leave regional communities for larger centres because these are viewed as the only places where innovation and entrepreneurialism takes place.

Rural needs

In a number of the rural workshops, 'thin' markets for VET and the current limited labour market in rural areas were issues thought to limit VET's capacity to provide enterprising education. Nevertheless, through the case study regional visits, we saw small examples of innovative and enterprising initiatives being undertaken within VET. Some of these struggled for full institutional acceptance and support, but nevertheless were popular with students and generated exciting, opportunity-based outcomes. The race car building course in Horsham was one example of such an initiative, where links were being made with the race car industry on a national scale.

Funding issues

Currently there is no funding for innovative or anticipatory programs, nor are current funding allocations in tune with regional requirements. There is a need for more discretionary funding to allow for some creativeness. The sector tends to follow the sources of funding rather than leading or directing the funding bodies to those areas where money should be committed to meet future labour-force needs. The catch cry is, 'It is too expensive to be innovative'.

Approaches to funding need to be reviewed. There may be 'thin' markets in some regional communities where businesses are mostly small, but the VET sector has a corporate responsibility to provide locally relevant options and to develop partnerships with business and institutions that have a local interest and where they can be a key partner in developing a creative future within the regional community's competitive development agenda.

Facilitating regional human capital

Policy directions

As we have previously discussed, an important determinant of a region's growth prospects is the creative and enterprising behaviour of its local human capital, not merely its structures or the behaviour of its institutions. This includes experience, skills, knowledge and innovativeness, a preparedness to work with others for shared objectives, and an ability to get things done in a way that generates sustainable returns. Enterprising regions are those that work together to build connectivity, to unleash local knowledge, to be strategic and to translate new ideas into meaningful outcomes.

Government can help to build an enterprising culture at the regional level by facilitation, and by education and learning.

Government policy must support the *process* of being enterprising, rather than trying to pick winners or restrict regions to particular areas of work through policy or the provision of sector-specific programs. Initiatives with an enterprising human capital approach do not need extensive program funding. They are about letting go and giving 'permission' for local action to address impediments and obstacles that are within a region's own policy and administrative remit. In particular, the public sector can act as a facilitator by:

- ✧ setting up *local community forums* to give individuals, and the institutions they belong to, a voice to identify local strengths, weaknesses, opportunities and threats
- ✧ putting *facilitators* into local communities to help identify and promote locally generated commercial ideas
- ✧ offering *local services* to help people prepare business plans and to commercialise their ideas
- ✧ encouraging all local public sector services, especially planners and producer services (like banks, accountants etc.) to establish *fast-track review structures* that will expedite business development and expansion
- ✧ fostering the provision of *local venture capital*
- ✧ establishing *business forums* and/or regular seminars to foster links and social ties in the business community; that is, to facilitate knowledge transfers
- ✧ enhancing links between universities and the business community to build knowledge transfers and innovation (Garlick 2000; Patchell & Eastham 2001).

In our federalist system of government there is some hesitancy, particularly at state and local levels, in providing this enabling capacity for regions.

Education and learning programs should aim to assist people to identify and pursue opportunities relevant to their local region. A number of tertiary education institutions design and deliver programs to assist people involved in regional development practice, but most programs targeted at local learners do not seek to build an *enterprising capability* in those who undertake them. Enterprising capability includes skills and knowledge in strategic, financial, human resource and business planning; marketing; raising capital; negotiation; event planning and operation; problem-solving; risk assessment; and so on. The relevance of these skills is not restricted to the world of business;

they are important for all facets of society. Developing them should be core business for tertiary education institutions.

In our view, a culture that supports human capital and that values and rewards creativity and entrepreneurship will stem the current flow of human capital from our regions.

The entrepreneurship education component would need to:

- ✧ allow people to identify all forms of opportunity across the business and non-business spectrum in the region, and to help them float their own business ideas
- ✧ facilitate the conversion of technologies and knowledge into commercial ventures
- ✧ equip entrepreneurs with the skills to run a business
- ✧ link education more strongly to the community to help people realise their ventures
- ✧ raise awareness of the processes of 'globalisation', the 'knowledge economy' and 'enterprise culture', and their impact business performance.

These elements of entrepreneurship education should be in addition to the broadly based scientific, technological, and liberal arts education of higher education institutions, which encourages people to think beyond what is already known. This broad, 'outside the box' thinking is vital for meeting the changing needs of society.

Regional development practice

We are not convinced that the conventional approach to regional development will build the sort of enterprising community capacity we advocate in this report. Knowledge exchange, dialogue, learning and enterprising outcomes need to be fostered at the local level on a wide front and over quite some length of time. This will not occur via a small group chosen by government for regional leadership. Guided bottom-up approaches to regional development in Australia over the last two decades have failed to move from the 'good idea' and strategic plan to real outcomes, with an impact on the lives of the region's residents, without ongoing government funding commitment. The 11 case study workshops were surprising in that they revealed the apparent lack of achievement.

We therefore advocate developing, at the regional community level, an environment of free-flowing ideas and enterprising enthusiasm, with the aim of generating wide local participation. This calls for leaders who will adopt facilitator/supporter roles, enabling regional effort to be guided through coordination and resource support, rather than through a small group of elites, or through institutionally imposed leadership. Effective regional leadership requires the ability to balance the interests of a diverse range of stakeholders and to enable them to work together to achieve a sustainable community vision and strategic direction.

Conclusions

Conclusions

Regional growth in Australia over the last two decades has become spatially divergent, with concentrations of high and low growth. National growth has not been reflected equally across different regions, and there has been no trend towards long-run equilibrium growth for all regions. Key metropolitan regions have been the main beneficiaries, while other regions have had declining relative growth, although there appear to be some individual hot spots of growth among them. The growth performance of key metropolitan centres like Sydney has extended throughout its greater metropolitan conurbation, while the growth performance in most non-metropolitan regions continues to languish.

An examination of regional growth drivers suggests that received institutionalist regional growth theories and the policies and practices that rely on them—embodying proximity to demand, business firm links, the power of the large corporation, and access to information—do not have as large an impact on regional growth as might be expected and may need to be re-thought.

In combination, positive human capital, high technology access and greater industry specialisation appear to have the potential to generate better growth outcomes if they can be effectively harnessed. Of these, we assessed human capital as having the largest impact. Government funding support was assessed as not having a significant positive impact on regional growth outcomes; indeed, the assessed impact of this on regional growth was negative. Because of regional differences in the impact of each driver, there is a case for region-specific attention to correct particular imbalances. Different regions will have a different mix of drivers determining their respective growth paths.

We tentatively concluded from the modelling of drivers and from the analysis of theory and the 11 case study workshops that, when human capital and sector specialisation are linked with high-technology access, an ‘enterprising’ culture at the regional scale results. Enterprising human capital is described as those skills and abilities that enable an opportunity or idea to be put into practice in order to achieve a real on-the-ground benefit to the regional community. This needn’t only be a business benefit, but could also include social, environmental and cultural outcomes.

Two interrelated concepts of regional growth transmission have emerged from the analysis: *enterprising human capital* and *regional engagement*. To develop an enterprising culture in the regional context, these two concepts must form the basis of regional policy and practice. It is also something that needs to be taken on by the education system—not the training system. VET has an important role to play in facilitating an enterprising approach because of its core business of building human capital, its regional community presence and its strong connections with business.

The bottom-up approach to regional development policy over the past two decades has not been particularly effective as it has been too heavily institutionalised and has not engaged enterprising human capacity within the regions on a broad front.

Suggestions for further action

- ✧ Policy-makers and practitioners should be more circumspect about current institutionalist regional development theory and should seek empirical evidence of its success in generating growth before promoting its use.
- ✧ Multi-method approaches within a temporal framework should be the favoured mode of regional analysis. This will ensure that both the breadth and depth of regional growth determinants are identified within a framework of competitiveness and societal 'realism'.
- ✧ Greater policy attention needs to be given to the growing uneven distribution of growth in Australia's regions, as its impacts are divisive and have a negative effect on national growth outcomes.
- ✧ Policy and practice in regional development should be focused on fostering enterprising human capital and regional engagement. The VET system is in a good position to facilitate its uptake at the regional level by providing programs that build enterprising skills and by facilitating knowledge-based engagement locally on a broad scale.

References

- Amin, A 1999, 'An institutional perspective on regional economic development', *International Journal of Urban and Regional Research*, vol.23, no.2, pp.365–78.
- Amin, A & Housner, J (eds) 1997, *Beyond market and hierarchy: Interactive governance and social complexity*, Edward Elgar, Aldershot.
- Amin, A & Thrift, NJ 1994a, 'Living in the global', in *Globalization, institutions and regional development in Europe*, eds A Amin & N Thrift, Oxford University Press, London, pp.1–22.
- 1994b, 'Holding down the global', in *Globalization, institutions and regional development in Europe*, eds A Amin & N Thrift, Oxford University Press, London, pp.257–60.
- Anselin, L 1996, 'The Moran scatterplot as an exploratory spatial data analysis tool to assess local instability in spatial association', in *Spatial analytical perspectives on GIS*, eds MM Fischer, HJ Scholten & D Unwin, Taylor & Francis, London, pp.111–25.
- Archer, M, Lawson, T & Collier, A (eds) 1998, *Critical realism: Essential readings*, Routledge, London.
- Armstrong, P 2001, 'Science, enterprise and profit: Ideology in the knowledge-driven economy', *Economy and Society*, vol.30, no.4, pp.524–52.
- Asheim, B 1997, '“Learning regions” in a globalised world economy: Towards a new competitive advantage of industrial districts', in *Independent and uneven development: Global–local perspectives*, eds M Taylor & S Conti, Ashgate, Aldershot, pp.143–76.
- ANTA (Australian National Training Authority) 2003, *Shaping our future: Australia's national strategy for vocational education and training 2004–2010*, ANTA, Brisbane.
- Baddeley, M, Martin, R & Tyler, P 1998, 'European unemployment disparities: Convergence or persistence?', *European Urban and Regional Studies*, vol.5, pp.195–215.
- Bathelt, H & Taylor, M 2002, 'Clusters, power and place: Inequality and local growth in time-space', *Geografiska Annaler*, vol.84, no.2, pp.93–109.
- Bawden, R 2001, 'Life beyond economics: Learning systems and social capital', in *Learning to manage change: Developing regional communities for a local–global millennium*, ed. I Falk, NCVER, Adelaide.
- Bhaskar, R 1975, *A realist theory of science*, Leeds Books, Leeds, Eng.
- 1998, General introduction, in *Critical realism: Essential readings*, eds M Archer, T Lawson and A Collier, Routledge, London.
- Bohm, D 1996, *On dialogue*, Routledge, London.
- Bolton, R 1992, 'Place prosperity vs people prosperity revisited: An old issue with a new angle', *Urban Studies*, vol.29, no.2, pp.185–203.
- Bowles, S & Gintis, H 2002, 'Social capital and community governance', *The Economic Journal*, vol.112, pp.419–36.
- Braczyk, HJ, Cooke, P & Heidenreich, M (eds) 1998, *Regional innovation systems: The role of governance in a globalized world*, UCL Press, London.
- Brusco, S 1996, 'Trust, social capital and local development: Some lessons from the experience of the Italian districts', *Networks of enterprises and local development: Competing and co-operating in local productive systems*, OECD, Paris, pp.115–19.
- Charles, D 2001, *Universities and regional development*, project funded by the European Community under the Targeted Socio-Economic Research (TSER), Brussels.
- Charles, D & Goddard, J 1997, 'Higher education and employment: Linking universities with their regional industrial base', paper delivered at *Territorial Employment Pacts*, Ostersund, Sweden.
- Chatterton, P & Goddard, J 2000, 'The response of higher education institutions to regional needs', *European Journal of Education*, vol.35, no.4, pp.475–96.
- Checkland, P & Holwell, S 1998, *Information, systems and information systems: Making sense of the field*, Wiley, New York.
- Cherry, N 1999, *Action research: A pathway to action, knowledge and learning*, RMIT University Press, Melbourne.
- Clarke, G 1998, 'Stylised facts and close dialogue: Methodology in economic geography', *Annals of the Association of American Geographers*, vol.88, no.1, pp.73–87.
- Cohen Wesley, R & Goe, W 1994, *University–industry research centers in the United States*, Carnegie Mellon University, Pittsburgh, PA.

- Cooke, P 1996, 'Reinventing the region: Firms, clusters, and networks in economic development', in *The global economy in transition*, eds P Daniels & W Lever, Longman, Harlow.
- Cooke, P & Morgan, K 1994, 'Growth regions under duress: Renewal strategies in Baden-Württemberg and Emilia Romagna', in *Beyond market and hierarchy: Interactive governance and social complexity*, eds A Amin & N Thrift, Edward Elgar, Aldershot, pp.91–117.
- Courvisanos, J 2001, 'Regional economic decay and regeneration under structural change', in *Learning to manage change: Developing regional communities for a local–global millennium*, ed. I Falk, NCVER, Adelaide.
- Curran, J & Blackburn, R 1994, *Small firms and local economic networks*, Paul Curran Publishing, London.
- Dicken, P & Thrift, N 1992, 'The organization of production and the production of organization: Why business enterprises matter in the study of geographical industrialization', *Transactions of the Institute of British Geographers, New Series*, vol.17, pp.279–91.
- Department of Immigration, Local Government and Ethnic Affairs 1992a, *Regional economic strength, resilience and vulnerability*, working paper, DILGEA, Canberra.
- 1992b, *Accessibility and remoteness*, working paper, DILGEA, Canberra.
- 1992c, *The regional impact of changing levels of protection in Australian industries*, working paper, DILGEA, Canberra.
- Downard, P (ed.) 2003, *Applied economics and the critical realist critique*, Routledge, London.
- Downard, P, Finch, J & Ramsey, J 2002, 'Critical realism, empirical methods and inference: A critical discussion', *Cambridge Journal of Economics*, vol.24, pp.211–24.
- Downard, P & Mearman, A 2002, 'Critical realism and econometrics: Constructive dialogue with post-Keynesian economics', *Metroeconomica*, vol.53, pp.391–415.
- Drucker, P 1993, *Post-capitalist society*, Butterworth, Oxford.
- Durlauf, S 2002, 'On the empirics of social capital', *The Economic Journal*, vol.112, pp.459–79.
- Economist* 2003, 'The new geography of the IT industry', 17 July, pp.53–5.
- Etzioni, A 1994, *The spirit of community: Rights, responsibilities, and the communitarian agenda*, Crown Publishers Inc., New York.
- Falk, I (ed.) 2001, *Learning to manage change: Developing regional communities for a local–global millennium*, NCVER, Adelaide.
- Florida, R 1995, 'Towards the learning region', *Futures*, vol.27, pp.527–36.
- 2002, *The rise of the creative class: And how it's transforming work, leisure, community and everyday life*, Basic Books, New York.
- Fukuyama, F 1999, *Trust: The social values and the creation of prosperity*, Penguin Books, London.
- Garlick, S 1998, 'Creative associations in special places': *Enhancing the partnership role of universities in building competitive regional economies*, EIP report no.98/4, Department of Employment, Education, Training and Youth Affairs, Canberra.
- 2000, *Engaging universities and regions: Knowledge contributions to regional development through knowledge-based engagement*, Evaluations and Investigations Program report no.15, Department of Education, Training and Youth Affairs, Canberra.
- 2001, 'The enterprising region: Policy and practice', paper presented to the Australian and New Zealand Regional Science Association Conference, Bendigo.
- 2002, 'Creative regional development: Knowledge-based associations between universities and their places', paper presented to the Universities and Community Engagement Forum, University of Western Sydney, September.
- 2003, 'Universities and their regional communities: Is the connection myth or reality?', *Australian University Alumni Council Conference: A Bridge to the Community*, Launceston.
- Garlick, S & Pryor, G 2002, *Universities and their communities: Creative regional development through knowledge-based engagement*, report for the Department of Transport and Regional Services, Canberra.
- Garlick, S, Bennenworth, P, Vaessen, P 2006, *Twente in the Netherlands: A peer review evaluation*, OECD, Paris.
- Getis, A & Ord, JK 1996, 'Local spatial statistics: An overview', in *Spatial analysis: Modeling in a GIS environment*, eds P Longley & M Batty, Geoinformation International, Cambridge, pp.261–77.
- Goddard, J 1997, 'Managing the university/region interface', *Higher Education Management*, vol.9, no.3, pp.7–27.
- Granovetter, M 1985, 'Economic action and social structure: The problem of embeddedness', *American Journal of Sociology*, vol.91, no.3, pp.481–510.
- Hardill, I, Raghuram, P & Strange, A 2002, 'Diasporic embeddedness and Asian women entrepreneurs in the UK', *Embedded enterprise and social capital: International perspectives*, eds M Taylor & S Leonard, Ashgate, Aldershot, pp.207–24.
- Hodgson, G 1988, *Economic institutions: A manifesto for a modern institutional economics*, Polity Press, Cambridge.
- Hodgson, G 1998, 'The approach of institutional economics', *Journal of Economic Literature*, vol.36, no.1, pp.166–92.

- Hudson, R 1994, 'Institutional change, cultural transformation, and economic regeneration: Myths and realities from Europe's old industrial areas', in *Globalization, institutions and regional development in Europe*, eds A Amin & N Thrift, Oxford University Press, London, pp.196–216.
- 1999, 'The learning economy, the learning firm and the learning region: A sympathetic critique of the limits of learning', *European Urban and Regional Studies*, vol.6, no.1, pp.59–72.
- Issacs, W 1999, *Dialogue and the art of thinking together*, Currency, New York.
- James, R, Baldwin, G & McInnis, C 1999, *Which university? The factors influencing the choices of prospective undergraduates*, Evaluations and Investigations Program report 99/3, Department of Education, Training and Youth Affairs, Canberra.
- Kanter, R 1995, *World class: Thriving locally in the global economy*, Simon & Schuster, New York.
- Keane, J & Allison, J 2001, 'The intersection of the learning region and local and regional economic development: Analysing the role of higher education', *Regional Studies*, vol.33, pp.896–902.
- Kearns, P 1999, *VET in the learning age*, NCVER, Adelaide.
- 2004, *VET and social capital: A paper on the contribution of the VET sector to social capital in communities*, NCVER, Adelaide.
- Krugman, P 1995, *Development, geography and economic theory*, MIT Press, London.
- Lawson, T 1997, *Economics and reality*, Routledge, London.
- Le Heron, R & McDermott, P 2001, 'Rethinking Auckland: Issues and risks relating to new industries, policies and governance', in *Promoting local growth: Process, practice and policy*, eds D Felsenstein and M Taylor, Ashgate, Aldershot.
- Leonard, S 2001, 'Regulating labour, transforming human capital and promoting local industrial growth', in *Promoting local growth: Process, practice and policy*, eds D Felsenstein and M Taylor, Ashgate, Aldershot.
- Lovering, J 1999, 'Theory led by policy: The inadequacies of the new regionalism', *International Journal of Urban and Regional Research*, vol.23, no.2, pp.379–95.
- Lundvall, B-Å. (ed.) 1992, *National systems of innovation: Towards a theory of innovation and interactive learning*, Pinter, London.
- Maillat, D 1995, 'Territorial dynamic, innovative milieu and regional policy', *Entrepreneurship and Regional Development*, vol.7, pp.157–65.
- Martin, R 1999, 'The new "geographical turn" in economics: Some critical reflections', *Cambridge Journal of Economics*, vol.23, pp.65–91.
- 2004, 'A plea for a multi-method research strategy in economic geography', panel notes presented to Economic Geography Research Group Annual Symposium on Debating Methodology in Economic Geography, School of Geography, University of Nottingham, April 2004.
- Martin, R & Sunley, P 1998, 'Slow convergence? New endogenous growth theory and regional development', *Economic Geography*, vol.74, pp.201–27.
- Martin, R & Tyler, P 2003, 'Regional productivity evolutions and competitiveness', paper presented to the Conference on Rethinking Regions and Regional Competitiveness, University of Cambridge.
- Maskell, P 2000, 'Social capital innovation and competitiveness', in *Social capital*, eds S Baron, J Field & T Schuller, Oxford University Press, London.
- Maskell, P, Eskelinen, H & Hannibalsson, I 1998, *Competitiveness, localized learning and regional development: Specialization and prosperity in small open economies*, Routledge, London.
- Mumford, A 1991, 'Learning in action', *Personnel Management*, vol.23, p.7.
- Nijkamp, P & Mouwen, A 1987, 'Knowledge centres, information diffusion and regional development', in *The spatial impact of technological change*, eds J Brothie, P Hall & P Newton, Croom Helm, London, pp.254–70.
- OECD (Organisation for Economic Co-operation and Development) 1999, *The response of higher education institutions to regional needs*, Programme on Institutional Management in Higher Education, OECD, Paris.
- Oinas, P 1997, 'On the socio-spatial embeddedness of business firms', *Erdkunde*, vol.51, pp.23–32.
- Openshaw, S & Taylor, M 2002, 'Weakening ties: The embeddedness of small UK electronics firms', in *Embedded enterprise and social capital: International perspectives*, eds M Taylor & S Leonard, Ashgate, Aldershot, pp.95–111.
- Patchell, J & Eastham, A 2001, 'Creating university–industry collaboration in Hong Kong', in *Promoting local growth: Process, practice and policy*, eds D Felsenstein & M Taylor, Ashgate, Aldershot.
- Perroux, F 1955, 'A note on the notion of growth poles', *Economie Appliquée*, vol.8, pp.308–20.
- Plummer, P 2003, 'Modelling economic landscapes: A geographical perspective', *Regional Studies*, vol.37, pp.687–95.
- Plummer, P & Sheppard, E 2001, 'Must emancipatory economic geography be qualitative? A response to Amin and Thrift', *Antipode*, vol.33, pp.194–99.
- Plummer P & Taylor, M 2001a, 'Theories of local economic growth: Concepts, models and measurement', *Environment and Planning A*, vol.33, pp.385–99.
- 2001b, 'Theories of local economic growth: Model specification and empirical validation', *Environment and Planning A*, vol.33, pp.219–36.

- Plummer P & Taylor, M 2003, 'Theory and praxis in economic geography: "Enterprising" and local growth in the global economy', *Environment and Planning C: Government and Policy*, vol.21, pp.633–49.
- Porter, M 1998, *On competition*, Harvard Business School Press, Boston.
- 2000, 'Locations, clusters, and company strategy', in *The Oxford Handbook of Economic Geography*, eds G Clark, M Feldman & M Gertler, Oxford University Press, London, pp.253–74.
- Porter, M & Ketels, C 2003, *UK competitiveness: Moving to the next stage*, DTI economics paper no.3, Department of Trade and Industry, London.
- Putnam, R 1993, *Making democracy work: Civic traditions in modern Italy*, Princeton University Press, Princeton, New Jersey.
- Putnam, R 2000, *Bowling alone*, Simon & Schuster, New York.
- Rees, J & Stafford, H 1986, 'Theories of regional growth and industrial location: Their relevance for understanding high technology complexes', in *Technology, regions and policy*, ed. J Rees, Allen & Unwin, Boston, pp.24–50.
- Reich, R 1991, *The work of nations: Preparing ourselves for 21st-century capitalism*, Vintage Books, New York.
- Saxenian, A 1994, *Regional advantage: Culture and competition in Silicon Valley and Route 128*, Harvard University Press, Cambridge, MA.
- Sayer, A 1984, *Method in social science: A realist approach*, Routledge, New York.
- 1992, *Method in social science: A realist approach*, 2nd edn, Routledge, New York.
- 2000, *Realism and social science*, Sage Publications, London.
- Scott, A & Storper, M 1992, 'Industrialization and regional development', in *Pathways to industrialization and regional development*, eds M Storper & A Scott, Routledge, London, pp.3–17.
- Search, P & Taylor, M 2002, 'Local embeddedness and service firms: Evidence from southern England', in *Embedded enterprise and social capital: International perspectives*, eds M Taylor & S Leonard, Ashgate, Aldershot, pp.151–67.
- Simmie, J (ed.) 1998, *Innovation, networks and learning regions*, Regional Policy and Development Series, no.18, Regional Studies Association, Jessica Kingsley Publishers, London.
- Staber, U 1996, 'Accounting for differences in the performance of industrial districts', *International Journal of Urban and Regional Research*, vol.20, no.2, pp.299–316.
- Stevenson, S, Maclachlan, M & Karmel, T 1999, *Regional participation in higher education and the distribution of higher education resources across regions*, occasional paper no.99-B, Department of Education, Science and Training, Canberra.
- 2001, *Access: Effects of campus proximity and socio-economic status on university participation rates in regions*, occasional paper no.00-D, Department of Education, Science and Training, Canberra.
- Stimson, R, Banns, S, Mangan, J, Gellecum, Y, Shyy, T-K & Yigitcanlar, T 2003, *Analysing spatial patterns in the characteristics of work, employment and skills in Australia's capital cities and across its regional cities and towns: Modelling community opportunity and vulnerability*, ANTA, Brisbane.
- Storper, M 1997, *The regional world: Territorial development in a global economy*, Guilford Press, New York.
- Streeter, DH, Jaquette, JP & Hovis, K 2002, *University-wide entrepreneurship education: Alternative models and current trends*, working paper, Cornell University Press.
- Taylor, M 2000, 'The firm as a temporary coalition', paper presented to the Workshop on Conceptualising the Firm in Economic Geography, University of Portsmouth, March.
- Taylor, M 2003, 'Drivers of local growth: Ideologies, ambiguities and policies', paper presented to the Australian and New Zealand Regional Science Association Conference, Perth.
- Taylor, M & Conti, S (eds) 1997, *Independent and uneven development: Global–local perspectives*, Ashgate, Aldershot.
- Taylor, M & Garlick, S 1989, *A regionalisation of Australia for comparative economic analysis*, Australian Regional Developments, no.4.6, Department of Immigration, Local Government and Ethnic Affairs, Canberra.
- Taylor, M & Thrift, N 1982a, 'Industrial linkage and the segmented economy: 1. Some theoretical proposals', *Environment and Planning A*, vol.14, pp.1601–13.
- 1982b, 'Industrial linkage and the segmented economy: 2 An empirical reinterpretation', *Environment and Planning A*, vol.14, pp.1615–32.
- 1983, 'Business organisation, segmentation and location', *Regional Studies*, vol.17, pp.445–65.
- Thrift, N 2001, "'It's the romance, not the finance, that makes the business worth pursuing": Disclosing a new market culture', *Economy and Society*, vol.30, no.4, pp.412–32.
- Volkman, C 2004, 'Entrepreneurship studies: An ascending academic discipline in the twenty-first century', *Higher Education in Europe*, vol.29, p.2.
- White, S 2002, *New ideas about new ideas*, Basic Books, New York.
- Woolcock, M 1998, 'Social capital and economic development: Towards a theoretical synthesis and policy framework', *Theory and Society*, vol.27, pp.151–58.
- Yankelovich, D 2001, *The magic of dialogue: Transforming conflict into cooperation*, Simon & Schuster, London.
- Yeung, H 1997, 'Critical realism and realist research in human geography: A method or a philosophy in search of a method?', *Progress in Human Geography*, vol.21, pp.51–74.

Support document details

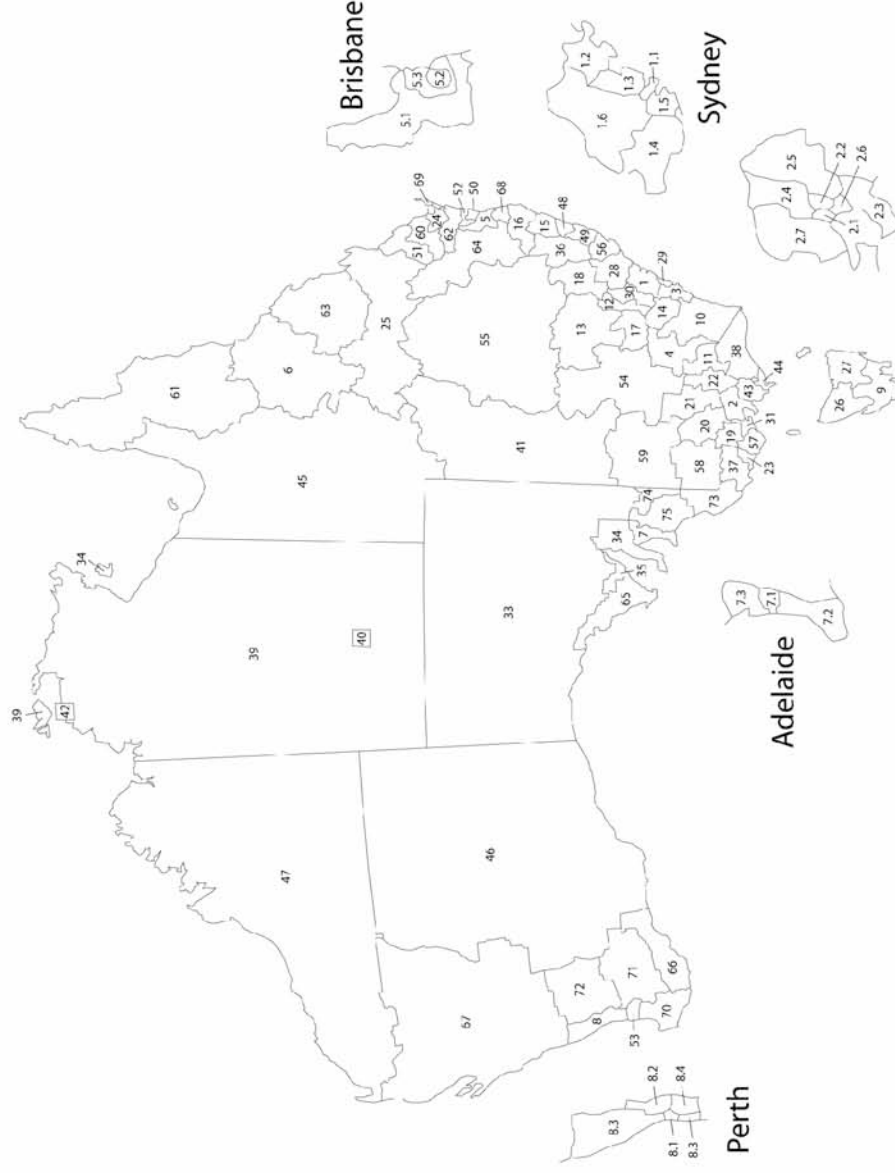
Additional information relating to this research is available in *An enterprising approach to regional growth: Implications for policy and the role of vocational education and training—Support document*. It can be accessed from NCVER's website <<http://www.ncver.edu.au/publications/1801.html>> and contains:

- ✧ Regional opportunities and impediments
- ✧ Regional growth values for all regions
- ✧ Regional growth driver values for all regions
- ✧ Theories and concepts
- ✧ Method
- ✧ Patterns of regional growth.

Regional codes for Australia with Metropolitan Areas

CODE	REGION	CODE	REGION
1.1	Central and Inner Western Sydney	29	Wollongong
1.2	Gosford	30	Lithgow
1.3	Northern Sydney	31	Geelong
1.4	South Western Sydney	32	Traralgon
1.5	Southern Sydney	33	Port Augusta
2.1	Western Sydney	34	Port Pine
2.2	Inner Melbourne	35	Whyalla
2.3	Inner-east Melbourne	36	Armidale
2.4	Mornington Peninsula	37	Hamilton
2.5	North East Melbourne	38	Sale
2.6	Outer-east Melbourne	39	Northern Territory
2.7	Southern Melbourne	40	Alice Springs
3	Western Melbourne	41	Broken Hill
4	Nowra	42	Darwin
5.1	Wagga Wagga	43	Moe
5.2	Balance Brisbane	44	Morwell
5.3	Inner Brisbane	45	Mount Isa
6	Outer Brisbane	46	Kalgoorlie
7.1	Townsville	47	Port Hedland
7.2	Eastern Adelaide	48	Coffs Harbour
7.3	Southern Adelaide	49	Port Macquarie
8.1	Western Para & N.E. Adelaide	50	Caloundra
8.2	Central Perth	51	Gladstone
8.3	East Perth	52	Maroochydore
8.4	North Perth	53	Mandurah
8.5	South East Perth	54	Griffith
9	South West Perth	55	Moree
10	Hobart	56	Taree
11	Canberra	57	Colac
12	Albury - Wodonga	58	Horsham
13	Bathurst	59	Mildura
14	Dubbo	60	Bundaberg
15	Goulburn	61	Cairns
16	Grafton	62	Gympie
17	Lismore	63	Mackay
18	Orange	64	Toowoomba
19	Tamworth	65	Port Lincoln
20	Ballarat	66	Albany
21	Bendigo	67	Geraldton
22	Shepparton	68	Gold Coast
23	Warrnambool	69	Hervey Bay
24	Maryborough	70	Bunbury
25	Rockhampton	71	Narragin
26	Burnie	72	Northam
27	Launceston	73	Mount Gambier
28	Newcastle	74	Renmark
		75	Murray Bridge

Regional codes for Australia with Metropolitan Areas



CODE	REGION	CODE	REGION
1.1	Central and Inner Western Sydney	29	Wollongong
1.2	Gosford	30	Lithgow
1.3	Northern Sydney	31	Geelong
1.4	South Western Sydney	32	Traralgon
1.5	Southern Sydney	33	Port Augusta
1.6	Western Sydney	34	Port Pirie
2.1	Inner Melbourne	35	Whyalla
2.2	Inner-east Melbourne	36	Armidale
2.3	Mornington Peninsula	37	Hamilton
2.4	North East Melbourne	38	Sale
2.5	Outer-eastern Melbourne	39	Northern Territory
2.6	Western Melbourne	40	Alice Springs
2.7	Southern Melbourne	41	Broken Hill
3	Nowra	42	Darwin
4	Wagga Wagga	43	Moe
5.1	Balance Brisbane	44	Morwell
5.2	Inner Brisbane	45	Mount Isa
5.3	Outer Brisbane	46	Kalgoorlie
6	Townsville	47	Port Hedland
7.1	Eastern Adelaide	48	Coffs Harbour
7.2	Southern Adelaide	49	Port Macquarie
7.3	Western, Para & N.E Adelaide	50	Caloundra
8.1	Central Perth	51	Gladstone
8.2	East Perth	52	Maroochydore
8.3	North Perth	53	Mandurah
8.4	South East Perth	54	Griffith
8.5	South West Perth	55	Moree
9	Hobart	56	Taree
10	Canberra	57	Colac
11	Albury - Wodonga	58	Horsham
12	Bathurst	59	Mildura
13	Dubbo	60	Bundaberg
14	Goulburn	61	Cairns
15	Grafton	62	Gympie
16	Lismore	63	Mackay
17	Orange	64	Toowoomba
18	Tamworth	65	Port Lincoln
19	Ballarat	66	Albany
20	Bendigo	67	Geradon
21	Shepparton	68	Gold Coast
22	Warragatta	69	Hervey Bay
23	Warrambool	70	Bunbury
24	Maryborough	71	Narragin
25	Rockhampton	72	Norham
26	Burnie	73	Mount Gambier
27	Launceston	74	Renmark
28	Newcastle	75	Murray Bridge

Appendix B:

Theories of regional development

Table 6 shows the linkage between the eight potential regional growth drivers and the six existing theories of regional development they are based on. They have all, in one way or another, found their way into the policies and programs of government and the strategies and actions of regional practitioners over the past two decades (Plummer & Taylor 2001a, 2001b).

The competitive advantage model, following Porter (1998), suggests regional competitiveness results from the concentration of local demand and the availability of competitive firms which agglomerate to generate productivity improvement through external economies, such as greater access to information, skills, learning, R&D, and other institutional support.

The learning region model (Lundvall 1992; Maillat 1995; Kanter 1995; Asheim 1997; Maskell, Eskelinen & Hannibalsson 1998) emphasises the role of local ‘tacit’ knowledge and learning and its exchange, linked to regional economic activity. The learning region is manifested through the local stickiness of knowledge (that is, information or knowledge remaining in the region), networks between regional agencies, and the common norms and other backgrounds of the region’s participants.

Table 6 Variables used to measure regional variations within Australia of the ‘drivers’ of local economic growth

Regional growth dimension	Variable name	Description of variable*
Technological leadership at the enterprise level	HITECH	Index of high-technology industries
Knowledge creation and access to information	INFOACC	Index of access to information
Locational integration of small firms (including trust, reciprocity and non-price relations)	MLOCN	Percentage of establishments in multi-location enterprises
Infrastructure support and institutional thickness	PROT	Effective rate of protection
Human resource base (including education, skills, experience) (D)	NODEG	Percentage of working population without a degree
Power of large corporations affecting structure and strategy (C)	TOTPOP	Index of corporate control
Inter-regional trade and the extent and nature of local demand	MKTACC	Index of intermediate market accessibility
Local sectoral specialisation (S)	SPEC	Index of specialisation

Note: *Data sources used for these variables are listed at appendix C.

The flexible specialisation model (Scott & Storper 1992) suggests that transaction cost savings can occur through firm proximity and firms’ integration in industrial districts of like focus; for example, the high-technology centres of Silicon Valley, Boston’s Route 128, the craft districts of northern Italy, the movie-producing backblocks of Hollywood etc.

The product cycle model (Rees & Stafford 1986) is a model based around the role of technological change and its relevance to the different stages of product development, from design through to production and distribution. It is concerned with the regional implications these stages have for labour skills, local intermediate demand, and so on. This sees, for example, R&D take place in key high-wage major metropolitan centres, warehousing and distribution in other centres, and low-skilled factory-based processing occurring in low-wage peripheral regions.

Table 7 Growth determinants and theories of regional development

Growth determinant	Theoretical model					
	Com	Lrn	Flx	Pro	Grw	Seg
HITECH	X	X	X	X	X	X
INFOACC	X	X		X	X	
MLOCN	X	X	X			X
PROT	X	X	X			
NODEG	X	X	X	X		
TOTPOP				X	X	X
MKTACC	X			X		
SPEC	X	X				

Key: Com = Competitive advantage model; Lrn = Learning region model; Flx = Flexible specialisation model;
Pro = Product cycle model; Grw = Growth pole model; Seg = Segmentation model.

Source: Plummer and Taylor (2001)

The growth pole model follows Perroux's (1955) original theory, where innovative firms act as magnets to attract other upstream and downstream activity. A concentration of activity occurs through this, generally in an urban area.

The enterprise segmentation model (Taylor & Thrift 1983) suggests that relative power and control endows enterprises with distinctive operational characteristics and growth possibilities. Therefore, for example, the head office locations of enterprises will have different regional impacts from those of branch plants because of where the power and control are vested within the corporation or institution.

Appendix C: Variables used to measure regional variations in local economic growth drivers

The measures described in this appendix were taken originally from a large number of monographs and working papers. The publications were part of a large database describing the economic, social and accessibility vulnerability and resilience of 94 Australian regions (Department of Immigration, Local Government and Ethnic Affairs 1992a).

Technological leadership at the enterprise level (HITECH)

The data surrogate for this measure is the regional significance of R&D-intensive industries. The Department of Industry, Technology and Commerce identified the following Australian Standard Industry Classifications (ASIC) industry groups and classes as measures of science and innovation containing high-technology components:

- ✧ pharmaceutical and veterinary produce
- ✧ aircraft manufacturing
- ✧ photographic, professional and scientific equipment
- ✧ data processing services
- ✧ research and scientific institutions.

The HITECH measure is calculated as the proportion of employment in each region in these four-digit industries using the Australian Bureau of Statistics (ABS) IRIS (Integrated Register of Industrial Statistics) database.

Knowledge creation and access to information (INFOACC)

This measure is based on a simple interaction model in which the size of information activity at a place is measured as employment in professional and managerial jobs in each region and the distance between pairs of regions measured as time distance by the quickest means available. The measure is more fully described in the publication *Accessibility and remoteness* (Department of Immigration, Local Government and Ethnic Affairs 1992b), which describes six elements of regional accessibility (access to goods and services, access to intermediate goods markets, the cost of access to intermediate goods markets, access to export ports, access to information, and the cost of access to information).

The local integration of small firms (MLOCN)

This measure is the inverse of the proportion of establishments in a region that belong to multi-location enterprises, taken from the ABS integrated register (IRIS). Data on the local incidence of establishments belonging to multi-location enterprises are used to isolate the importance of single-plant firms in each region. This enables the removal of establishments with the weakest local affiliations from the region.

Infrastructure support and institutional thickness (PROT)

The surrogate for this measure is the regional effective rate of industry protection as spelled out in the publication, *The regional impact of changing levels of protection in Australian industries* (Department of Immigration, Local Government and Ethnic Affairs 1992c). A weighted averaging method has been used to allocate industry-effective rates of protection to regions using sectoral employment levels from the IRIS database. The rate of change in estimated levels since 1986 is then mapped. The data for all 94 regions are provided in appendix 2 of the 1992 report.

Through this approach it is possible to identify those regions that have undergone radical restructuring of their industry to meet the challenge of increased competition brought on by reductions in Australian protection levels under policy arrangements at the time.

Local human resource base (NODEG)

The measure used here is the proportion of the population in each region without university degrees. This is a surrogate, not only for local skill levels, but also for issues of income and, indirectly, for the local availability of capital.

The power of large corporations (TOTPOP)

An index of corporate control in the region was constructed using the head office regional address for companies listed in the top 1000 in *Business Review Weekly* magazine. Employment for each business was expressed as a quotient of the total employment of the particular region in which it was located using IRIS data.

Inter-regional trade (MKTACC)

The measure for this driver of regional growth is taken as a region's accessibility to intermediate goods markets within Australia. It has been taken from the working paper *Accessibility and remoteness* (Department of Immigration, Local Government and Ethnic Affairs 1992b, p.16). It is expressed as a function of the employment level in each pair of regions in intermediate goods industries, such as manufacturing and construction, and the direct road distance between the pairs of regions.

Local sectoral specialisation (SPEC)

This is a simple measure of the numbers of business establishments taken from the IRIS database for each industry category in each region.



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