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The Impact of Globalisation on the Regional Economy: measuring "knowledge intensity" and preparedness for the "knowledge-based economy"

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Introduction: globalisation and the "modern economy"

The "modern economy" is a global phenomenon characterised by:

- increasing economic integration across national boundaries;
- increasing pace of technological and social change;
- increasing pace of flow and transformation of information and knowledge;
  - productivity growth linked to the rising influence of information and communication technologies (ICT); and
- entrepreneurship in creating and growing firms.

The term "modern economy" is often used interchangeably with the term "knowledge economy" or "knowledge-based economy". A distinction should be drawn between these terms and "new economy" and "information economy". These latter "economies" are subsets of the broader knowledge-based economy.

A *knowledge-based economy* (KBE) is an economy in which the production, distribution, and use of knowledge is the main driver of growth, wealth creation and employment across all industries. In this context, being a KBE means more than simply having a thriving "new economy" or "information economy" somehow separate from a stagnant "old economy". In a truly knowledge-based economy, all sectors have become knowledge-intensive, not just those usually called "high technology". It is not just an "information technology issue".

Australia's economy has dramatically transformed itself into an information economy in recent years. Australia is recognized internationally as a leader in the development, deployment and use of ICT, particularly in government. However, Australia is far from being a "knowledge-based economy" (National Office for the Information Economy *Advancing Australia: information economy progress report* November 2002)

In a 2001 report to APEC, four key dimensions of a knowledge-based economy were identified:

- Innovation and technological change are pervasive, and supported by an effective national innovation system (i.e. a network of institutions in the public and private sector whose activities and interactions initiate, import, modify, and diffuse new technologies and practices).
- Human resource development is pervasive: education and training are of high standard, widespread and continue throughout a person's working life and beyond.
- An efficient infrastructure operates, particularly in information and communications technology (ICT) which allows citizens and businesses to readily and affordably access pertinent information from around the world.
- The business environment (i.e. the economic and legal policies of government, and the mix of enterprises operating in the economy) is supportive of enterprise and innovation.

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(Sources: Rob McKeon and Tony Weir *Preconditions for a Knowledge-based Economy* B-HERT News July 2001, pp.4–5 / Department of Industry Science and Resources *Issues for Australian Business in the Modern Economy: a report of some industry consultations* ISR New Economy Issues Paper No. 6 August 2001)

The empirical evidence in that APEC report strongly suggests that economic growth is most sustainable for those countries that are strong in all of these four dimensions. In short, it is becoming ever more the case that the most successful economies are those that are closest to being KBEs. These characteristics could be referred to as preconditions to becoming a KBE.

The Allen Consulting Group/Monash University report *Australia's information economy: the big picture* (National Office for the Information Economy April 2002) also highlighted research that showed firms in the information economy enjoyed a substantial competitive edge over those that were not.

The knowledge-based economy is a reality. Performance and prospects of firms and farms, organisations and individuals depends increasingly on what they know, how they know it, how they use it, how they access it, who they know and how they exchange it with others.

Impacts on the regional economy

In recent years, drivers of change in non-metropolitan Australia have included:

- globalisation
- technological advances, particularly transport and telecommunications
- demand for on-line services
- downward trends in commodity prices
- changes in consumer taste
- changes in lifestyle (coastal migration)
- government policy – tariffs, deregulation and competition policy

The rapid improvement in communications technology and the tendency towards more open economies has lead to the development of the globalisation concept, with the implication that the world is one big market, accessible to all regions and all communities. Globalisation has been heralded as a new age which offers world markets to rural regions and thereby new opportunities for growth at the local level. However, globalisation is a two-edged sword as it also ensures that the markets of each region will be vulnerable to exploitation by external firms.

We must successfully manage the transition to regional knowledge based economies if all Australians are to share in the benefits of globalisation and the digital revolution. A defining feature of globalisation is the re-emergence of the local and regional economy as an important unit for innovation. One of the ironies of globalisation is that regions and localities have emerged as key spatial units of economic activity, with the fortunes of key regions impacting the performance of the national economy. Regional production systems have become increasingly important in the global economy. Regional stakeholders will be central to the development and implementation of region- specific knowledge-based strategies if Australia is to successfully make the transition to the knowledge-based economy. Although knowledge intensity won't shield regions from economic downturn it can provide them with greater flexibility and adaptability in the face of uncertainty.

Individuals, organisations and nations are increasingly recognising that high levels of knowledge, skills and competence is critical to success. The *OECD Jobs Study (1994)* placed particular emphasis on investment in people, in a framework that seeks to extend lifelong learning for all. Evidence shows that in OECD countries overall:

- a substantial proportion of national income is devoted to investment in human capital - public and private spending on formal education and training are on average about 6 per cent of GDP;
- there is considerable private investment in human capital (eg enterprise based training) though it is not fully accounted for;
- there are significant social and economic returns to investment in education - at least in the case of relative earnings of employed individuals with different levels of education; and
- human capital is not equitably distributed within countries.

The growing importance of human capital to competitiveness is reflected in the changes in the occupational distribution of employment in OECD countries. During the 1980s, employment in member economies grew fastest in high-skilled jobs and slowest - or declined - in low-skilled jobs. Within the white-collar group of occupations, high-skilled jobs grew the fastest.

Industry and community expectations are increasing. The Productivity Commission report *Skill and Australia's Productivity Surge* has stated that more attention has been placed on developing skills for the workplace in recent years. The interest stems from three propositions:

- Australia needs to become a higher skill, more knowledge intensive producer in response to global pressures if it is to raise or maintain its living standards
- technological change, particularly information and communications technologies, increases the relative demand for skills
- the shift toward services in economic activity changes the demand for certain types of skills, with a focus on conceptual and interpersonal skills

The deregulation of financial markets and advances in transport and communications has resulted in factors of production becoming highly mobile. Labour is the least mobile factor, particularly at the unskilled level. Location decisions are made on the cost and availability of labour, but also on the basis of local fiscal benefits and lesser regulatory constraints. Proximity to markets is becoming less important as markets become global and production more fragmented. Opportunities, rewards and the nature of work for skilled and unskilled labour are increasingly diverging.

The question to consider is the relative competitive strength of rural regions in securing their own markets and exploiting external markets. In general rural communities lack the advantages - research, new technologies, skilled workforce and market information - desired by firms exploiting the global market. Globalisation may in fact have weakened the advantage rural areas once possessed in lifestyle terms. Rural communities need access to state-of-the-art communication and information technology. It is difficult to suggest at this stage that globalisation has worked to the advantage of rural communities.

The implications of globalisation are generally discussed at a national level. However, it is at the regional level that the effects will be registered. The adjustment pressures caused by globalisation have been felt most keenly by regional and rural Australia. Urban Australia has had the same adjustment pressures but outside the major metropolitan centres employment alternatives are generally limited and therefore the impact of structural changes is greater and the associated consequences more readily seen.

Effective competition in the knowledge economy requires enhancement of regional responsiveness, in communities, in industry and in government.

<u>A new occupational structure for analysis of skill levels</u>

This section is based on the work of Leo Maglen and Chandra Shah *Emerging occupational patterns in Australia in the era of globalisation and rapid technological change: implications for education and training* (CEET Working Paper no.21, February 1999).

Analysis of occupational structure building on the work of Robert Reich enables us to look at regional jobs in terms of knowledge content. The more highly skilled the workforce, the better it will be positioned in the global economy and the more flexible and adaptable it will be in the event of structural change. This analysis looks at the types and nature of work and shifts in the skills and personal qualities education and training should be fostering.

Based on Reich, work can be categorised as follows:

> Routine Production Workers (advanced skill level, intermediate – white collar, intermediate – blue collar, low skill level)
>
> Blue collar occupations and repetitive jobs in high technology firms such as data processing which are globalised occupations and most vulnerable to job loss through industry restructuring and automation. Standard procedures to produce goods sold world-wide. Work can be codified and automated, often in high-volume. Workers are competing against other workers and products world-wide on a price basis.
>
> Examples include cleaners, general clerks, secretaries, truck drivers, farm hands, motor mechanics, kitchen hands, carpenters, bookkeepers and storepersons.
>
> In Person Services (professional, intermediate, elementary)
>
> Services provided person to person in direct contact with the recipient of the task. Workers are competing against other workers and enterprises in the domestic market based on cost quality. There is little global competition.
>
> High skilled occupations include nurses, teachers, sales and service managing supervisors, vocational education teachers, police, welfare and community workers and general medical practitioners.
>
> Lower skilled occupations include sales assistants, check out operators, receptionists, bar attendants, waiters and sales representatives.
>
> Symbolic Analysts (conceptual, technical)
>
> Problem-identifying, problem solving, strategic broking and creating unique products traded world-wide. These services can be traded globally and compete in the world market, even for domestic services.
>
> Examples are research scientists, specialist managers, software engineers, engineering technologists, architects, lawyers and artists.

In Australia between 1986 and 1991, at the national level the employment of symbolic analysts increased by 4.6% annually and in-person service workers 1.4% annually. Routine production workers decreased 1.0% annually.

Analysis of occupational change between 1986/97 and 1995/96 at the national level shows that all the stagnation and decline in employment was in the occupational categories most vulnerable to

globalisation, technological change and restructuring (symbolic analysts - technical and routine production workers). On the other hand, only part of the growth was in the occupational category best placed to take advantage of the opportunities these forces opened up (symbolic analysts – conceptual). Much of the growth occurred in the occupational categories not directly open to global forces and which did not directly add to the competitiveness of the Australian economy (in-person services).

Indicators of "knowledge intensity"

The following indicators can be used to identify the proportion of current economic activity in an economy that is in some sense "knowledge intensive":

- The % of GDP attributable to "knowledge-intensive" industries
- The % of the labour force that are engaged in "knowledge-intensive" occupations
- "Investment in knowledge" as a proportion of GDP.

*(*Source: *Australia as a modern economy: some statistical indicators 2002* Department of Industry Tourism and Resources June 2002)

Based on McKeon and Weir (2001) economies on the way to becoming KBEs have around 50% of GDP attributable to "knowledge-based industries", a workforce of which over 30% are "knowledge workers" and around 7% of GDP as "investment in knowledge". These benchmarks have been developed from an analysis of national economies but could be applied to larger regional economies. There is a broad correlation between economic status and knowledge intensity (0.66) *(Source: McKeon R and Weir T Towards KBEs; Preconditions and Assessments APEC Symposium on KBEs Seoul June 2000)*

The most accurate indicator is the first. Disaggregation of occupational data is possible to low levels of detail that are indicative of the skill levels of the occupation. This is considered a good de facto measure for knowledge intensity. The second indicator includes industries such as health, finance and business services that may be knowledge-based, but can be at a low knowledge or skill level. "Investment in knowledge" is based on measures of R&D activity that may not include areas such as government research, in-house research and investment in other knowledge activities such as education and training.

It should be noted that the ABS is developing a national set of indicators applicable to measuring the "knowledge intensity" in Australia (refer to the discussion paper *Measuring a knowledge-based economy and society: an Australian framework* 2002 ABS 1375.0). Since 1999 the Department of Industry Tourism and Resources has also published an annual set of national indicators (see *Australia as a modern economy: some statistical indicators 2002* for the most recent set).

Analysis of the regional labour force

An efficient knowledge economy combines codified knowledge (information) and tacit knowledge (defining the regional competitive edge) to create new knowledge which leads to innovation and wealth creation.

In recent years tacit knowledge, which in the main can only be exploited at the regional level for effective wealth creation, has become by far the most important input. This is because codified knowledge is now largely available to all (provided the appropriate global knowledge workers are available in the region) thanks to the information technology revolution of recent years. Although codified knowledge is still a necessity for competitive success, it is tacit knowledge which is a necessity for a competitive edge in both innovation and commercialisation.

It has to be kept in mind that knowledge creation only leads to competitive success if the region has all the attributes required to translate knowledge into commercially successful goods and services. It is an understanding of the way tacit knowledge works that makes the regional dimension so important.

Enabling knowledge creation requires mobilising (and intensifying) tacit knowledge. It requires:

- having skilled workers who can access and use efficiently global codified knowledge
- forming relationships (that is, increasing the degree of socialisation) between persons with individual tacit knowledge

Breakthroughs in knowledge creation occur when individuals come together and share tacit knowledge and insights into interpretations of codified knowledge. By themselves, the individuals could not achieve breakthroughs. These individuals form teams or micro-communities with an optimal size of between five and seven persons.

Mobilisation of tacit knowledge is a measure of social capital within a region. That social capital transforms the raw material of codified knowledge identified with skilled workers. A measure of the "knowledge intensity" or workforce skill levels will define to foundation that this transformative process is based on. The higher the level of workforce skill the greater chance of successful transformation.

Essentially this measure of workforce skill shows the preparedness of the regional population to take up the opportunities of the knowledge-based economy. A region that does not have the appropriate level of preparedness may still remain a high-level production region but may lose the benefits of transformative processes. In basic terms the region may continue to produce raw materials but the economic benefits of transformation may be realized elsewhere, even if the transformation physically occurs in the region.

To estimate the region's level of preparedness an analysis of the regional labour force has been undertaken based on 1996 census data at SSD level. ASCO 4-digit data has been transposed into Reichian categories and skill levels using a modified version of the concordance between ASCO2 and Reich's USA-based categories, as originally proposed by Maglen and Shah.

This analysis of the regional workforce reveals that the traditional broadacre agricultural and horticultural production and processing region of Lower Murrumbidgee and the manufacturing region of Albury are the most vulnerable to the impacts of globalisation, with a lower proportion of high skilled workers and a higher proportion of low skilled workers. The Murray-Darling region also has a high proportion of low skilled workers.

Distribution of skill levels across regional planning areas (%)

	Albury	**Upper Murray**	**Central Murray**	**Murray-Darling**	**Central M'bidgee**	**Lower M'bidgee**	**Region**
High skill level	**39.03**	**44.60**	**47.73**	**45.22**	**42.01**	**41.58**	**42.36**
Symbolic Analytical (conceptual)	14.82	25.11	28.93	28.09	18.22	21.73	20.35
In-person (professional)	9.94	6.73	7.12	6.48	8.90	7.05	8.31
Routine production (advanced)	14.27	12.76	11.68	10.65	14.89	12.80	13.70
Intermediate skill level	**35.18**	**28.48**	**28.23**	**22.84**	**31.93**	**29.23**	**31.04**

Last updated14 November 2002

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Symbolic Analytical (technical)	2.30	1.26	1.56	1.06	2.13	1.77	1.93
In-person (intermediate)	13.39	10.52	11.44	8.99	12.65	9.49	11.80
Routine production (white collar)	13.28	9.21	8.90	7.08	11.17	11.13	10.99
Routine production (blue collar)	6.21	7.49	6.33	5.71	5.98	6.84	6.32
Low skill level	**25.81**	**26.92**	**24.04**	**31.94**	**26.25**	**29.19**	**26.61**
In-person (elementary)	14.91	9.83	10.36	8.96	12.76	9.91	12.03
Routine production (low skill)	10.90	17.09	13.68	22.98	13.29	19.28	14.58

Albury and Lower Murrumbidgee (major production centres) have the lowest proportions of high skilled workers.

Albury and Central Murrumbidgee have the highest levels of medium level skills as the major service centres of the region.

Low skill workers are in highest proportion in the remote Murray-Darling SSD and the Lower Murrumbidgee agricultural production area.

Skill levels compared to regional employment profile (%)

	Albury	**Upper Murray**	**Central Murray**	**Murray-Darling**	**Central M'bidgee**	**Lower M'bidgee**
High skill level	17.74	7.89	13.41	4.22	39.83	16.91
Symbolic Analytical (conceptual)	14.02	9.25	16.92	5.46	35.95	18.40
In-person (professional)	23.03	6.07	10.20	3.09	43.01	14.61
Routine production (advanced)	20.05	6.98	10.15	3.07	43.66	16.09
Intermediate skill level	21.83	6.88	10.83	2.91	41.33	16.23
Symbolic Analytical (technical)	22.96	4.90	9.65	2.18	44.48	15.83
In-person (intermediate)	21.85	6.68	11.54	3.01	43.05	13.86
Routine production (white collar)	23.28	6.28	9.64	2.55	40.82	17.44
Routine production (blue collar)	18.93	8.89	11.92	3.58	38.04	18.65
Low skill level	18.68	7.58	10.75	4.75	39.33	18.90
In-person (elementary)	23.87	6.13	10.25	2.95	42.61	14.19
Routine production (low skill)	14.40	8.79	11.17	6.24	36.63	22.79
Employment						
% regional employment	19.35	7.49	11.90	3.96	40.16	17.22

Albury has a low level of high skill workers. Central Murray has a high proportion.

Albury and Central Murrumbidgee have a high proportion of intermediate skills. Upper Murray, Murray-Darling and Lower Murrumbidgee have a low proportion.

Reichian category compared to regional employment profile (%)

	Albury	**Upper Murray**	**Central Murray**	**Murray-Darling**	**Central M'bidgee**	**Lower M'bidgee**
Symbolic Analytical Services						
Symbolic Analytical (conceptual)	14.02	9.25	16.92	5.46	35.95	18.40

Last updated14 November 2002

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Symbolic Analytical (technical)	22.96	4.90	9.65	2.18	44.48	15.83
In-person Services						
In-person (professional)	23.03	6.07	10.20	3.09	43.01	14.61
In-person (intermediate)	21.85	6.68	11.54	3.01	43.05	13.86
In-person (elementary)	23.87	6.13	10.25	2.95	42.61	14.19
Routine Production Services						
Routine production (advanced)	20.05	6.98	10.15	3.07	43.66	16.09
Routine production (white collar)	23.28	6.28	9.64	2.55	40.82	17.44
Routine production (blue collar)	18.93	8.89	11.92	3.58	38.04	18.65
Routine production (low skill)	14.40	8.79	11.17	6.24	36.63	22.79
Employment						
% regional employment	19.35	7.49	11.90	3.96	40.16	17.22

High proportion of in-person services are found in Albury and Central Murrumbidgee as the main service centres of the region.

High proportion of routine production services are found in Albury and Lower Murrumbidgee, as the main manufacturing and agricultural production areas.

The impact of e-commerce

Australia rates consistently in the top ten nations globally for its E-commerce environment – over 35% of businesses have an on-line presence and all medium sized and over 80% of small business use personal computers. Over half of Australian households have personal computers and close to 35% have internet connections. Regional Australia has experienced a 164% increase in on-line households since February 1998. Take up rates for e-commerce are high.

E-commerce will have an impact through

- reduced tyranny of distance
- access to global markets
- productivity gains
- changes to value chains
- new products and processes
- changes in prices and inflation
- changes in employment profiles

There are significant benefits of E-commerce for the Australian economy. The National Office for the Information Economy has produced reports *E-commerce beyond 2000* and a companion report *E-commerce across Australia* that outline these benefits. The more recent *Australia's information economy: the big picture* report projected that Australia's GDP would increase by an additional 2.6% by 2004-05 through the impact of e-commerce with a sustained long-term (to 2010) increase of 2.0%. Employment will be higher by 1.2% returning to current levels in the longer term and real wages increasing by 2.0$ sustainable in the long-term.

One of the key risk factors in achieving these benefits is a shortage of labour with the necessary skills. Businesses already operating in the information economy rate this factor more highly than any other as an inhibitor. The growth projected in the Allen report is based on the assumption of an increase of 30% in the employment of people in key IT occupations. If this assumption is not "realised" employment would grow by only 0.8% rather than 1.2% and GDP would increase by 1.7% rather than 2.6%. Lack of skilled labour is the greatest inhibitor on output (GDP). It should be noted that

employment in the long-term is projected to remain at current levels if the impact of e-commerce is negated by risk factors such as skilled labour, broadband access, security and privacy issues etc.

There are no significant differences expected in the impact on metropolitan and non-metropolitan regions. The impact depends on the composition of the underlying economy. Broad based economies can expect to expand, narrow based economies (such as those primarily dependent on agriculture or mining) are expected to contract. An overall net loss of jobs is expected in non-metropolitan areas, though output is expected to increase, but not to the extent of metropolitan areas.

For example, the impact of E-commerce is projected to result in a 1.5% decline in overall employment in the Riverina region. Industries most affected are projected to be retail trade, banking and government administration. Industries expected to increase employment as a result of E-Commerce are wholesale trade, communication services and education.

The extent of structural change as a result of increased use of E-commerce can be measured as an industrial dislocation index. Both the Murrumbidgee and Murray statistical divisions fall into the medium dislocation range. They are the least dislocated regions in NSW.

The dislocation involved in the greater use of E-commerce is expected to be largest in regions that have the most to gain from the change. As long as people upgrade their skills to meet changes in demand in the labour market, they should be able to find employment in their local area. This would reduce many of the normal transitional difficulties often seen with major structural change.

Greater use of E-commerce is expected to stimulate activity and employment in industries that benefit from increased awareness of their products or services, meet the growing E-commerce needs of other industries or grow through productivity enhanced expansion. Most industries are expected to benefit from E-commerce. Those that will benefit most through increased activity are expected to be tourism, wholesale trade, communication services, finance and insurance, construction, property and business services, transport, government administration, health and education, utilities and manufacturing. Industries that will not benefit are retail trade, mining and agriculture.

The Murray SD is expected to increase gross regional product (GRP) by 2.6%, peaking in 2010, 0.3% lower than the 2.9% increase nationally. Sectors to benefit most are property and business services, government administration, education and health, tourism, wholesale trade, construction, transport and finance and insurance. Industries that will not benefit are retail trade and agriculture. The impact on employment is expected to be minimal in the long term (to 2016).

The Murrumbidgee SD is expected to increase gross regional product (GRP) by 2.8%, peaking in 2010, 0.1% lower than the 2.9% increase nationally. Sectors to benefit most are property and business services, government administration, education and health, wholesale trade, construction, tourism, transport, manufacturing and finance and insurance. Industries that will not benefit are retail trade and agriculture. The impact on employment is expected to be minimal, but positive, in the long term (to 2016).

Measuring the knowledge economy at the regional level

NIEIR (in *State of the Regions 2001*) has proposed some measures that can be used to determine a region's position in relation to the developing knowledge economy. These are:

- Global workers (proportion of the workforce)
- Skill sustainability (ratio of symbolic analysts to routine workers)
- Tertiary degree attainment (1996 weighted for course difficulty and duration)
- University enrolments (1998 persons over 15 years)

- Patent applications (per 1,000 people 1990-2000 as a proxy measure for innovation and entrepreneurial dynamism)
- R&D supply (1998 weighted for regional employment levels)
- R&D demand (1998)

	M'bidgee	Rank (out of 64)	Murray	Rank (out of 64)
Global workers	46	35	56	20
Skill sustainability	38	38	47	27
Tertiary attainment	0.21	45	0.22	35
Uni enrolments	3.3	30	3.2	34
Patent applications	0.9	37	0.8	46
R&D supply ($)	$356.00	2	$82.20	44
R&D demand ($)	$186.60	28	$217.80	19

Benchmarks have yet to be developed to allow these indicators to be used to evaluate the "knowledge economy positioning" of the regional economy.

The supply of global workers and the skill sustainability level are the most useful of these indicators, as this information is readily available through the ABS both as a Census measure and as a continuous measure through the Labour Force Survey. Manipulation from ASCO2 to the proposed new categories will provide an indicator of the changes in knowledge positioning over time. The next step in the analysis commenced above will be to take census data from 1986 through 2001 and track changes in the global worker and skill sustainability indicators to determine if the global economy has had an impact at the regional skill level and to determine the level of that impact (if any) on regional skill levels. This information will then contribute to the regional planning process in determining skill priority areas and resource allocation.

Application of this model at the state level would be dependent on its applicability at the regional level.

Concluding comments

While many of the traditional policy challenges and prescriptions will continue to be critical for success in a knowledge-based economy, there are some emerging challenges that need to be addressed. These include:

- the need to address issues of 'access' to new technology, especially ICT, for all sections of the population. Income distribution and inequality issues are more than ever becoming part of the technology debate. This involves facilitating effective communication infrastructure and addressing barriers to access;
- resolving the issue of cooperation between firms versus competition law;
- a re-thinking of labour market and social policies - the growing demand for skilled workers may lead to the exclusion of certain sections of the workforce (the unskilled and older employees);
- the role of intellectual property in the knowledge-based economy
- a need to encourage firms and individuals to invest in training and to develop appropriate education and training policies given the importance of life-long learning in a KBE;
- how to help firms find, assess and make use of new knowledge; and
- a better understanding of the implications of the growing convergence between economic and social policy in most OECD countries.

Some specific priority areas for government action include:

- strengthening Australia's science and research base;
- encouraging/facilitating collaboration between firms;
    - re-orienting labour market policies, including the need to promote investment by firms and individuals in training;
    - ensuring the development of a world class infrastructure, and competitive regulatory environment;
    - facilitating the diffusion of technology, by improving the access of small and medium-sized firms to technology and to the managerial and organisational know-how for absorbing technology;
- continuing regulatory reform to improve the functioning of markets;
- strengthening education and training programs and encouraging life-long learning;
    - helping those adversely affected by the adjustment to the knowledge-based economy and addressing issues of access, income distribution, and equality; and
    - adopting policies which permit the growth of venture capital markets capable of supporting potentially successful new firms - particularly small and medium-sized enterprises.

A fundamental characteristic of a knowledge-based economy is an educated population. A key role for government is ensuring that formal education systems respond to this new environment, by providing a solid foundation in basic education supplemented with initiatives to encourage adult education. Lifelong learning is paramount in an increasingly flexible labour market.

Longer term training and development is a vital ingredient in building entrepreneurship and fostering innovation in the context of a global knowledge economy.

This conclusion is supported by the Chairs of State and Territory Training Boards. In consultations as part of the development of the National Strategy 2004-2010 they highlighted the connections between education and training and community strength, confidence and renewal. VET is seen as central to local communities and regions lifting their skills, growing their leadership and collaborative capacity and embedding their businesses, institutions and workers in the global economy. It is at the regional and local level that the Chairs believe VET is best placed to deliver on its multiple missions as a force for economic and social development (National Strategy for Vocational Education and Training 2004-2010 *Report of consultations with Chairs/Deputy Chairs of State and Territory Training Boards* October 2002).

Further references:

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