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EXECUTIVE SUMMARY

This final report of the convergence review outlines a framework for the Commonwealth Government to address the impacts of structural convergence on policy formulation. This is the final of a series of policy reviews arising from the digital television legislation.

The convergence review issues paper was released in November 1999 and 14 submissions were received from interested organisations. The issues paper identified convergence-related issues in a systematic and comprehensive way based on a coherent model of structural change. The role of this final report, in contrast, is to use the insights provided in the issues paper to develop a preliminary decision-making framework for dealing with convergence policy issues.

The framework identifies the implications of the principal convergence trends, sets out the working assumptions and policy approaches for both traditional and convergence industry environments, identifies convergence policy priority areas and possible intervention points, and combines these to identify options to achieve desired national outcomes in plausible scenarios of particular interest. The result is not a comprehensive checklist of actions, but an insight into the way that convergence could affect government, and how it should be addressed.

Convergence is only one of a number of factors that will determine industry outcomes, and will need to be considered where setting policy. The structural approach of the convergence perspective does not capture all of the issues that are important, and other factors may in fact be more important when determining policy responses to changing industry conditions. The convergence perspective cannot determine policy responses, but it can inform them in important ways.

Convergence trends and structural scenarios

Convergence is defined as services sector restructuring enabled by digitalisation. It is the transition between two structural models for service delivery. The traditional model is dominated by analog or physical technologies favouring mass production, domestic market focus, and vertically and horizontally integrated corporate structures. Conversely, the new service delivery model uses digital programmable networks that favour mass customisation, an international market focus, and vertical separation between the services the users see and the underlying delivery platform. The process of convergence results in a services sector that is more fragmented, competitive, and international in its outlook.

The primary focus of this report is on the telecommunications and media industries, but the observations contained in this report also have a wider significance. Structural convergence affects all of the knowledge and transaction-intensive services industries, including telecommunications, finance, broadcasting, education, health, and retail. Convergence began decades ago in some industries, but has barely begun in others. It is eroding traditional economies of scale and scope, leading to a corresponding shift in industry structure and business strategy.

The inflexibility of analog technology and physical infrastructure makes it difficult to supply customised services. Traditional service industries are dominated by the supply side with standardised services aimed at mass markets. Regulation in traditional industries is industry specific, closely matching this model. In contrast, digital technology permits

multiple service offerings to be provided over the same network. This allows third party service providers and customers greater control over service delivery, shifting control of the services market away from traditional infrastructure owners.

A different structural model for service provision on digital networks is emerging with business activity at three main levels: applications, connectivity and infrastructure. The applications industry is about providing the functionality and services. The connectivity industry is about providing the links which applications need to connect users in different locations. The infrastructure industry is about providing the hardware and basic operating functions that underpin the provision of connectivity and applications. Interconnection and access markets emerge in each industry as the capabilities and substitutability of different digital networks increase.

Three major convergence trends were identified in the issues paper. These are the emergence of new intermediate markets and industry structures, the growing role of user communities through mass customisation, and a growing internationalisation of service markets. An analysis of reports on convergence from other governments and international organisations reveals similar trends. These reports also agree that it is too early to determine what industry structure and business strategies will prevail. The final outcome will depend on the relative strengths of convergence trends and countervailing forces.

Countervailing forces that could constrain these major convergence trends include the abuse of economic power, the collapse of technical standards processes, variation in patterns of demand in different geographical markets, whether complementary physical infrastructures are required for electronic service delivery, and user preferences about access devices. The interplay of convergence trends and countervailing forces will reveal future industry structure.

At this stage, industry structure cannot be predicted. Since policy needs to match the prevailing industry structure, a scenario planning approach has been adopted for this review to explore the convergence policy challenge. Mapping the two critical uncertainties of vertical integration/disintegration and domestic/international market scope against each other yields four plausible scenarios of future industry structure. These four scenarios are:

- Déjà Vu: . Service firms vertically integrated to infrastructure businesses with service markets generally domestic in scope.
- Virtual Countries: . Global-scale vertically integrated service firms with service markets crossing international boundaries.
- Home Alone: . Domestically-focussed service firms only loosely integrated to underlying infrastructure business.
- Cut and Thrust: . A fully converged environment of global-scale service firms not integrated to the underlying global infrastructure business in international services markets.

Different service industries may take different structural trajectories. Likewise, the same service industries in different countries may take on different structures. The actual future will certainly be more complex than any of the described scenarios and will most likely combine features from each of the scenarios.

The nominal date for these scenarios is around the year 2010, far enough into the future for significant structural change to have occurred. There is no single timetable for convergence since different industries will restructure at different rates. A necessary condition for structural convergence in a service industry is the emergence of a digital alternative to traditional service delivery. However, this “convergence test” is not sufficient. Even if a digital alternative is available, market adoption could be delayed or prevented by a range of obstacles such as lack of consumer confidence or restrictive technical standards.

Desired outcomes and strategic intent

Traditional policy, regulations and regulatory structure have focussed on specific industries because of their traditionally vertically integrated silo structure. The digital economy is cutting across these previously stable industry boundaries which have traditionally acted as the basis of policy formulation.

Structural convergence requires a renewed emphasis on desired national outcomes so that alternative non-traditional policy options can be identified. An amalgam of desired national outcomes from a survey of the policies of national governments and international organisations has been adopted for the purposes of this review. These desired outcomes are relevant in all structural scenarios. The outcomes are subdivided into economic and employment outcomes, social and cultural outcomes, and industry and regional development outcomes.

Traditional and convergence policy approaches

The working assumptions identified in various traditional industry environments and convergence scenarios are the products of idealised industry structures. Real industry structures are bound to be more complex and ambiguous than the idealised ones set up for the purposes of this review.

Similarly, the policy approaches identified in this chapter are a guide, not a substitute, for judgement. They are based on working assumptions, and will not be relevant unless those assumptions are valid.

This means that policy approaches cannot be applied without regard for an industry’s structural features and level of convergence. Real policy judgements will require detailed knowledge of the structural features of industries, along with a wider knowledge of the host of other factors that affect industry development. This is particularly true of industries experiencing a structural transition.

There are few verities in these situations, and a mixture of traditional and convergence policy approaches will be appropriate in many industries. The closer that an industry comes to an idealised environment, the more relevant the corresponding set of policy approaches will be. Conversely, as long as real industries do not conform to idealised environments, a mixture of policy approaches will be a permanent state of affairs.

In conclusion, predetermined policy approaches are only as good as the working assumptions that underpin them. They are not a substitute for a careful examination of the structural context of policy decision-making.

Convergence scenarios, policy priorities and policy options

Policy priorities emerge when markets fail to deliver desired national outcomes. The potential for market failure will vary between different convergence structural scenarios. Greater vertical integration causes higher priorities for economic outcomes due to the emergence of bottleneck power in infrastructure and connectivity industries. Greater internationalisation of service markets cause higher priorities for social/cultural and industry/regional outcomes due to the risk of domestic economic activity shifting to international locations. Scenarios that combine vertical integration and market internationalisation are highly problematic and exhibit high policy priorities in all outcome categories.

The available points of intervention determine the options for government policy, which are in turn determined by the prevailing industry structure. Government has an important part to play in entrenching beneficial structural changes but unlike traditional policies, it cannot control convergence industry structure. Structural change will be determined primarily by technological and commercial factors, with intervention playing a secondary facilitative role. There are three types of intervention strategies: interventions in market and industry structure such as controls on market entry, interventions in market conduct such as competition rules and interventions in market activities like direct participation through public broadcasting. These intervention strategies can occur in input and output markets and also in intermediate markets where service industries are vertically disintegrated.

When vertical disintegration is combined with market internationalisation, many output market interventions are eliminated. Government participation is mostly unaffected by structural change, so these interventions are available in all scenarios. Since vertical disintegration makes market internationalisation more likely by facilitating service market entry, earlier convergence policy will tend to focus on entrenching intermediate markets. This focus will change to the consequences of market internationalisation as this trend picks up pace. Common approaches across service industries to achieve economic, social and industry development outcomes will become more feasible as the growing capabilities of different digital networks make them more substitutable.

Policy options for desired national outcomes

Practical policy implementation will require judgements about a wide range of economic, social and cultural issues. Many of these judgements will have a significant subjective dimension. It is not the intention of this report to canvass these issues to the degree of complexity that arises in practice. This report will focus on the structural factors, primarily in order to demonstrate how these factors may be integrated into policies in a convergence environment.

Economic and employment outcomes

The impact of convergence on economic and employment policy options in domestic scenarios is primarily to increase the complexity of implementation of established intervention strategies. As the capital structure of the services sector becomes more inter-related, assessments about the competitive impact of conduct, mergers and acquisitions will become harder to make. This suggests that a light-handed approach to economic regulation is justified. In scenarios where efficient access and interconnection

markets are established, competition provides considerable assistance in curtailing the abuse of economic power.

The economic power associated with intangible assets such as copyrights, technical standards and information databases is expected to grow in all scenarios, creating new challenges for economic regulators. It is not clear that traditional economic interventions are relevant in all of these cases. Intellectual property law, technical regulation and privacy law can potentially offer other solutions.

The benefits of technology take-up and innovation in domestic scenarios are important because these flow through into the whole economy, ultimately affecting international competitiveness. While large countries have an inherent advantage through their stronger economies of scale, smaller countries can keep up by promoting technology development and investment through awareness-raising and targeted funding programs designed to demonstrate the benefits of digital technologies and spread information about successful implementation.

The mobility of service activity in vertically disintegrated scenarios creates a tendency for service activities to centralise, shifting the distribution of service employment. These measures which retain activity in regional areas include skills formation policies which are linked to regional economies, designed to capture local service activity.

In international scenarios, these issues are exacerbated. Regulatory power shifts to "global regulators" who have global impact (if not necessarily global reach). These regulators increasingly dominate the economic regulation of international service markets over time, but even they have difficulty if service provision is structurally separated from infrastructure provision (and hence is highly mobile). International cooperation between economic regulators then becomes important, and is beneficial to smaller countries like Australia which are better able to influence the agenda of multilateral organisations than foreign regulators.

The effect of economies of scale and scope become more pronounced in the internationalised scenarios. This means that efforts to attract service activities (e.g. global financial services) may need to be stepped up in order to entrench Australia's strengths as a service centre. This will also ensure that the benefits of technology take-up and innovation both here and internationally are captured, and that investment in skills development and high-value employment are maintained.

Social and cultural outcomes

The electronic provision of services subject to State-based regulation and accreditation raises significant jurisdictional problems for consumer protection. The most promising solution is State harmonisation of these standards, with the Commonwealth playing a coordinating role. Where electronic services are substitutes for traditional services, this will increase pressure for harmonisation of consumer protection and service regulation across the board.

Access issues are not substantially different in international scenarios. In contrast, consumer confidence issues are exacerbated in those scenarios. International harmonisation will present significant challenges, especially to federations like Australia where responsibility for consumer protection is dispersed. Multilateral efforts to establish basic consumer protection are at an early stage. Failure to achieve international

harmonisation may result in commercial solutions such as a consumer flight to quality global brands or a return to domestic service providers.

The media and cultural environment will become more complex in all plausible scenarios. This will make the implementation of traditional media and cultural interventions more difficult, but this process is expected to happen gradually.

Scenarios where broadcast and content-based service provision is structurally separate from infrastructure provision are problematic for the imposition of content requirements such as Australian content and community standards. If service markets are domestic then it is still possible to impose these requirements on domestic service providers.

In international scenarios these issues become acute, and direct support for content production in input markets becomes a primary intervention. These interventions need to integrate cultural and industry development perspectives in order to ensure sustainable cultural outcomes.

Industry and regional development outcomes

Industry and regional outcomes are becoming more dependent on successful formation of human, intellectual and social capital, as well as digital infrastructures designed to support electronic services. Integrated development of both tangible and intangible capital is essential to avoid national and global centralisation of service activity that can result in the export of economic activity from the regions and the nation.

The range of interventions in support of industry and regional outcomes does not vary a great deal between scenarios because most industry and regional development interventions involve direct or indirect government participation in market activities, and are relatively unaffected by structural change. The primary difference between scenarios is that the scale of intervention required to ensure the capture of service activity nationally and regionally is greater in scenarios where service markets are international in scope.

Legislative and regulatory responses to convergence

Broadly, the structure of the telecommunications legislation reflects the current realities of the industry, both in terms of the key activity definitions and the level of competition. Telecommunications is still in a transitional phase, and some industry-specific and asymmetric elements are still present and appropriate. These arrangements will be the subject of a review in 2000, and the need for industry-specific and asymmetric regulation will be examined. However, the analysis of this review suggests that the telecommunications legislation is generally congruent with the structural trends in the telecommunications industry, and will not require fundamental change in the next few years.

Like the telecommunications legislation, broadcasting legislation largely reflects the current structure of the broadcasting industry, and these structures are likely to persist until digital technology substantially penetrates the broadcasting industries. Based on reasonable assessments of the likely take-up of digital television and radio, this is several years off. As a result, it is likely that the corresponding structure of the broadcasting legislation will remain sound for some time.

Shifts in market boundaries suggest that a whole-of-economy approach to economic regulation remains the best approach to economic regulation, and that competition responsibilities should remain with the Australian Competition and Consumer Commission (ACCC). Both the Australian Communication Authority (ACA) and the Australian Broadcasting Authority (ABA) retain specialised roles, and it is difficult to identify any significant synergies that would be generated by merging them. The cultural and social focus of the ABA has little in common with the economic and technical focus of the ACA. This is also reflected in management skills and the membership of the boards of these organisations. This suggests that continued separate operation of these regulators would be the best approach for the foreseeable future.

1.0 INTRODUCTION

"Nobody can predict the future, but you can understand the forces that will shape the future - and it is always better to play with the forces than against them."

Lester Thurow

This report sets out the results of the review's analysis of structural convergence in the service sector generally and the communications industries in particular.

There is a consensus that major industry changes are under way, but this consensus does not extend to agreement on its likely outcomes or to the government responses that should be made. The discussion in Australia about the long-term impact of convergence on Australia's economic, social and industry performance, and how this should be reflected in government policy, is only beginning.

In these circumstances, definitive industry predictions and comprehensive policy recommendations are impossible. This is the view of most other national governments and international organisations, which have generally adopted an evolutionary approach to convergence issues. The detailed objectives and action plans needed to address convergence issues comprehensively will need to be developed over the next two to five years. The review provides a preliminary framework for that effort, rather than trying to pre-empt it.

The convergence issues paper released in 1999 identified convergence related issues in a systematic way, based on a model of convergence structural change. The paper's primary aim was not simply to identify an *ad hoc* list of issues. Its primary aim was to develop a coherent analysis of structural change in the service sector, and to identify the issues arising from it.

The role of this final report, in contrast, is to use the insights provided in the issues paper to develop a preliminary decision-making framework for dealing with convergence policy issues. It does not provide complete solutions for all of the policy issues raised in the issues paper. The purpose of the report is to identify the implications of the principal convergence trends, set out appropriate policy approaches, and apply those approaches in plausible scenarios of particular interest. The report is not a comprehensive checklist of actions, but an insight into the way that convergence will affect government policy, how it should be addressed, and the implications for legislation.

1.1 Genesis of the Convergence Review

The convergence review arose from clause 59 of Schedule 4 of *the Television Broadcasting Services (Digital Conversion) Act 1998* that amended *the Broadcasting Services Act 1992*. The convergence review is one of a number of reviews on whether legislative amendments need to be made relating to the introduction of digital television broadcasting. The specific clause for the convergence review asks whether any amendments of laws of the Commonwealth should be made in order to deal with convergence between broadcasting services and other services.

This review has also been conducted to address the government's 1998 election commitment to "undertake a review of convergence between telecommunications, information technology, broadcasting and other forms of media".

The subject matter of this convergence review is quite different to the other reviews required under clause 59. The convergence review takes a strategic perspective whereas the other reviews take a more operational view. This review is not restricted to the broadcasting sector but specifically makes reference to other services that could be impacted by convergence.

The Terms of Reference are attached to this report.

1.2 Convergence, industry structure and the service sector

The absence of a universally agreed definition of convergence has made it difficult to conduct a coherent discussion of convergence. "Convergence" has been taken at different times to mean new technology, new service types, or corporate restructuring. All of these are related to convergence, but none fully captures the nature and extent of convergence restructuring.

The issues paper offered a definition of convergence in the following terms:

"Convergence is service sector restructuring enabled by digitalisation".

This definition was designed to capture three main characteristics of convergence:

- convergence affects not just telecommunications and broadcasting. The scope of convergence is the entire knowledge- and transaction-intensive service sector;
- convergence is structural in nature, and changes to industry structure are the most profound changes associated with it; and
- convergence is enabled by technological change, but is not driven by it. The drivers of convergence are commercial.

Seen from this perspective, convergence is the transition between two structural models for service delivery. As spelt out in the issues paper, the traditional services delivery model revolves around:

- analog and physical technologies capable of delivering only one service;
- vertically integrated industry structures;
- business models based on mass production, with little or no service flexibility; and
- domestic market scope.

In contrast, the new services delivery model is based on:

- digital, programmable networks which support many services;
- vertical structural separation between the services which users see and the underlying means of delivery, and new competition in industries which were previously monopolies or oligopolies;
- business models based on mass customisation, with user involvement in service definition, and significant service flexibility and service innovation; and
- international market scope.

The result is a service sector that is more fragmented, competitive, and international in its outlook. There is no consensus about where this transition will ultimately lead. What is clear is that convergence will be a complex process, because different industries and countries are travelling down this road at different speeds (and possibly to different destinations). This will create significant issues in domestic and international markets and will require changes to current strategies for business, regulatory authorities, and the wider community to successfully manage the transition.

1.3 Convergence and the digital economy

In recent years a number of reports have identified the digital economy as a key area of future economic growth and social development. Subsequently, the government has launched a range of initiatives designed to address the issues raised in these reports, and the "information economy" has become a high priority.

The government's basic objective for the digital economy is to stake out Australia's claim to a disproportionate share of the benefits of the emerging international political economy that will dominate the twenty-first century. That objective is realistic, but its achievement is not certain. Australia's success in capturing the benefits of convergence restructuring will depend on industry's capacity to mobilise the required resources and investment, and the government's ability to identify and facilitate the removal of roadblocks that threaten that mobilisation.

Many of the policy challenges raised by the digital economy have been addressed from the perspective of the information economy. This perspective has highlighted the legal and regulatory infrastructure for electronic services. Key issues include privacy protection, online authentication, copyright and trademark protection, tax treatment of transactions, community access and participation, and support for innovation and commercialisation. This agenda reflects the importance of a robust, accessible and innovative transaction environment for electronic services as a basis for consumer and supplier confidence.

In contrast, convergence is about the physical infrastructure and commercial systems for electronic services. The convergence agenda is primarily about establishing robust and competitive digital networks, industry structures and business models as a basis for Australia's international competitiveness and socio-cultural development. This agenda reflects the importance of both generating and capturing the economic, social and industry benefits of the information economy by securing a strong national position in global service markets.

Both of these overlapping perspectives are necessary to grasp the national challenge presented by the digital economy. The common fundamental challenge is to shift the policy focus away from traditional industry-specific interventions. Instead, policy needs to be flexible enough to ensure the achievement of desired national outcomes in the wide range of plausible scenarios that could emerge from global industry change.

1.4 The approach and structure of the report

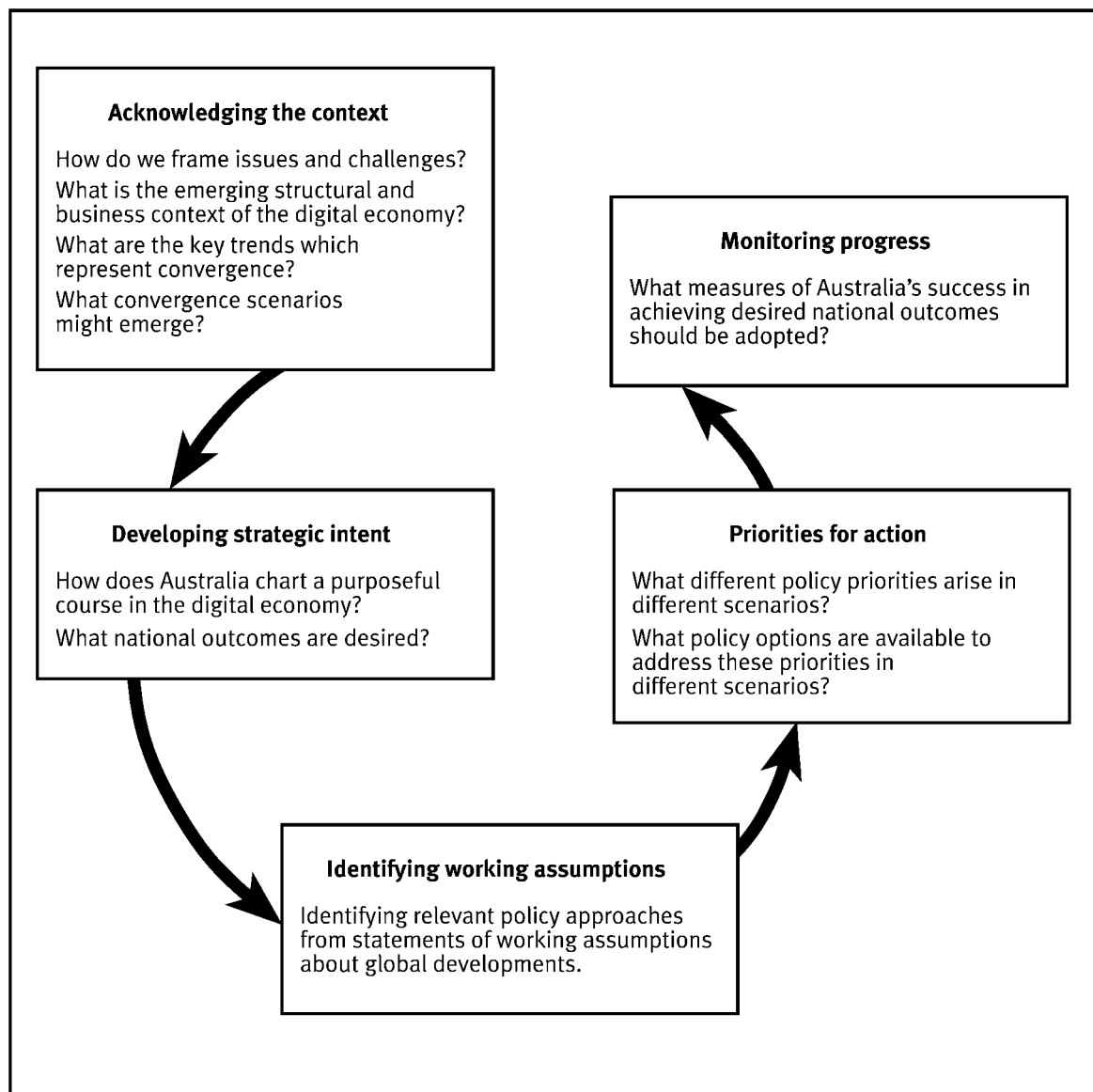
As stated earlier, the approach of the review has been to analyse the enablers and drivers of convergence, and use those insights to develop a preliminary decision-making framework for dealing with convergence policy issues. The methodology is loosely

based on the 1997 report "The Commonwealth of Information",¹, with the addition of a some new elements:

- an explicit structural analysis designed to establish the links between digital technology, industry structure and key convergence trends;
- a "plausible scenario" analysis designed to explore possible global industry environments and options for policy responses in those scenarios.

This line of argument is reflected in the diagram below.

Exhibit 1.1 Structure of the report



SOURCE: Adapted from *The Commonwealth of Information*, Information Policy Advisory Council, 1997.

¹ Information Policy Advisory Council, *A National Policy Framework for Structural Adjustment within the New Commonwealth of Information*, Commonwealth of Australia, August 1997. This report remains a useful introduction to the policy priorities of the information economy.

Chapter 2 examines the impact that convergence could have on the structure of service industries. It includes a recap of the analysis of convergence from the issues paper, with the benefit of some comments from submitters and similar analyses from other governments and international organisations, to determine the key convergence trends and countervailing forces. The interplay between these trends and forces is then used to develop a set of four plausible scenarios for long term service sector development in Australia. These scenarios are fairly generic, in order to make them as widely applicable as possible. Timeframes for convergence in different industries are also examined.

Chapter 3 describes the outcomes-based approach that is required for policy towards convergence service industries. The structural changes underway in service industries can undermine traditional industry-specific policies, requiring a re-examination of the desired outcomes of policy intervention. A set of desired national outcomes is described, based on a reading of international policy settings. This set of outcomes is adopted for the purposes of this review. .

Chapter 4 returns to the key convergence trends and global industry conditions identified in chapter 2, and uses them to determine working assumptions about the global industry developments. These working assumptions are used to develop a number of generic policy approaches for policy intervention in traditional and convergence industry structures. The relevance of different approaches in different structural scenarios is discussed.

Chapter 5 begins with a reminder of the desired national outcomes adopted in chapter 3. Market failure is the principal threat to the achievement of desired national outcomes. The likely sources of market failure in each scenario are used to determine an indicative checklist of policy priorities specific to that scenario. These checklists differ between scenarios because different types of market failure will prevail in different industry and market structures.

Chapter 6 identifies the points of intervention that can be used to address the policy priorities. Policy options are determined by the available points of intervention, and these points of intervention are dependent on industry structure. Indicative checklists of available points of intervention are produced for each structural scenario to use as a template for policy development.

Chapter 7 takes the output of chapters 5 and 6 to identify points of intervention for each scenario. The points of intervention and corresponding policy options differ in different scenarios because a different mix of interventions will be available in different industry and market structures.

Finally, chapter 8 sets out the implications of these findings for the communications legislation and the structure of the communications regulators.

2.0 CONVERGENCE TRENDS AND STRUCTURAL SCENARIOS

The focus of this report is on the telecommunications, broadcasting and Internet industries, but the observations made about the relationships between technology, industry structure and policy have a wider significance for all convergence industries.

In the issues paper, convergence was defined as a process of structural change which is affecting all of the knowledge and transaction-intensive service industries, including telecommunications, broadcasting, education, health, and retail. These are referred to in this report as the “convergence” industries.

This chapter examines the impact that convergence could have on the structure of those industries. It combines the discussion of convergence outlined in the issues paper with feedback from submissions and an analysis of international policies and developments to identify key structural trends and plausible scenarios for service industries restructuring. The analysis has three main steps:

- identify the technological enablers which are eroding traditional economies of scale and scope in the convergence industries;
- determine how changes to the underlying economies of scale and scope are affecting industry structure, having regard to other countervailing forces which may emerge; and
- map out the structural scenarios that could emerge from the interplay between convergence trends and countervailing forces.

2.1 The political economy of convergence

The issues paper pointed out that the impact of new technology on business and policy strategies cannot be understood unless the relationship between technology, industry structure and the policy framework is also understood.

Industry structure and business strategies are designed to exploit the economies of scale and scope which the prevailing technology provides. The shift from analog to digital technologies in the service sector has eroded traditional economies of scale and scope, leading to a corresponding shift in structure and strategy as innovative developments using digital technologies unearth new sources of economic value.

New corporate integration strategies will be pursued as industry participants experiment with combinations which yield the economies of scale and scope they need to generate and capture economic value and (hopefully) profits. This means that significant merger, acquisition and divestiture activity should be expected over the next few years as industry participants position themselves in new service markets.

The political economy of the convergence industries will depend on how these new economies of scale and scope are converted into economic value and economic power. Industry structure is the agent which performs that conversion, because industry structure determines who internalises sources of economic value, and who will occupy the centres of economic power. This in turn determines whom, domestically and internationally, will capture the commercial opportunities the new technology brings.

2.2 The analog legacy and the digital future

Any discussion of convergence must begin with a discussion about technology. This is because technology is the primary supply-side constraint on commercial action and policy intervention. Business and policy strategies are always designed to exploit a technology's underlying capabilities.

Industries in the traditional service sector rely on analog or physical networks to deliver their outputs. Prior to the introduction of digital technology, all communications networks were comprised exclusively of "analog" electronics which represented the content of the transmission as a direct electronic copy of the original content. For example, in telephony, the sound waves from a human voice are converted into electrical waves by a microphone, transmitted through wires, and converted back to sound waves again at the other end of the line.

The inflexibility of analog technology makes it difficult and costly to provide intelligent and configurable services, so the traditional service sector was limited in the way it could address individual needs. This results in the wide deployment of standardised services aimed at mass markets. The high cost of analog communication infrastructure also prevented the emergence of infrastructures spanning national markets.

Services based on physical infrastructure such as education, health and retail exhibited similar characteristics. In all of these industries, the customer relationship was dominated by the supply side, which exercised bottleneck power through its control of key infrastructure and skills.

Digital technology poses a significant challenge to traditional structural arrangements in the service sector. Digital technology differs from analog technology in the way it treats the data and signals that travel on networks. Instead of representing a signal as a true electrical copy, it represents signals as numbers. All forms of content and transaction can be encoded as digital numbers: video, audio, text, and financial data. Once these different types of content are digitally encoded they all have the same form, and can be carried on the same digital network. The network doesn't know or care about the substance of the data, only its form.

Digital technology permits multiple service offerings to be provided over the same network. This allows third party service providers and customers greater control over service delivery, shifting control of the services market away from traditional infrastructure owners.

At the same time, standardised interfaces for digital network interconnection are making alternative networks substitutable, and opening up infrastructure and connectivity industries to greater competition. Cheaper international communications has allowed international markets to develop for services over digital networks. These two factors are having a profound impact on industry structure in the service sector.

2.3 Structural trends in the service industries

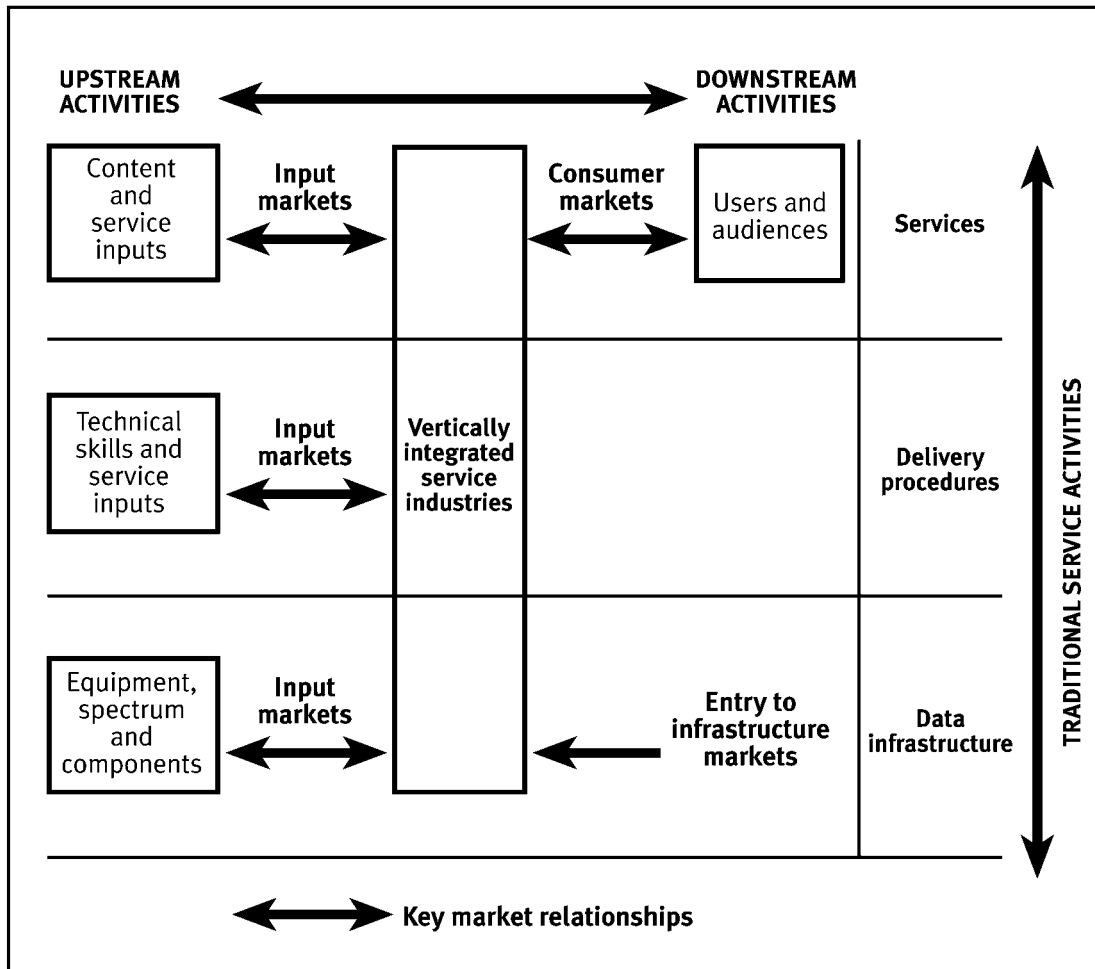
The spread of digital technology throughout the service sector is the key enabler of convergence. Digital technology is undermining the industry structures, and challenging the regulatory frameworks inherited from the analog era.

Prior to digital networking, the service industries exhibited three major structural features that characterised the traditional services delivery environment:

- Strong economies of scope promoted vertical integration of infrastructure and services. This placed control of service definition and development firmly in the hands of infrastructure owners;
- Strong economies of scale promoted horizontal integration of infrastructure. This placed the economic power in most input and consumer markets into the hands of infrastructure owners. The result was the emergence of monopolies or oligopolies in many service markets;.
- Technological limits to the creation of international infrastructures, combined with the vertical integration of service and infrastructure, confined consumer service markets within national boundaries and provided protection from international competition.

In this environment, national and State regulators were able to control domestic service providers on an industry-sector basis. In Australia, this control extended to government ownership of much of the country's services infrastructure. Exhibit 2.1 illustrates the generic relationships between the principal businesses in traditional service industry as a two-dimensional value chain, with separate input markets for service, procedural and infrastructure activities.

Exhibit 2.1 Traditional services industry structure

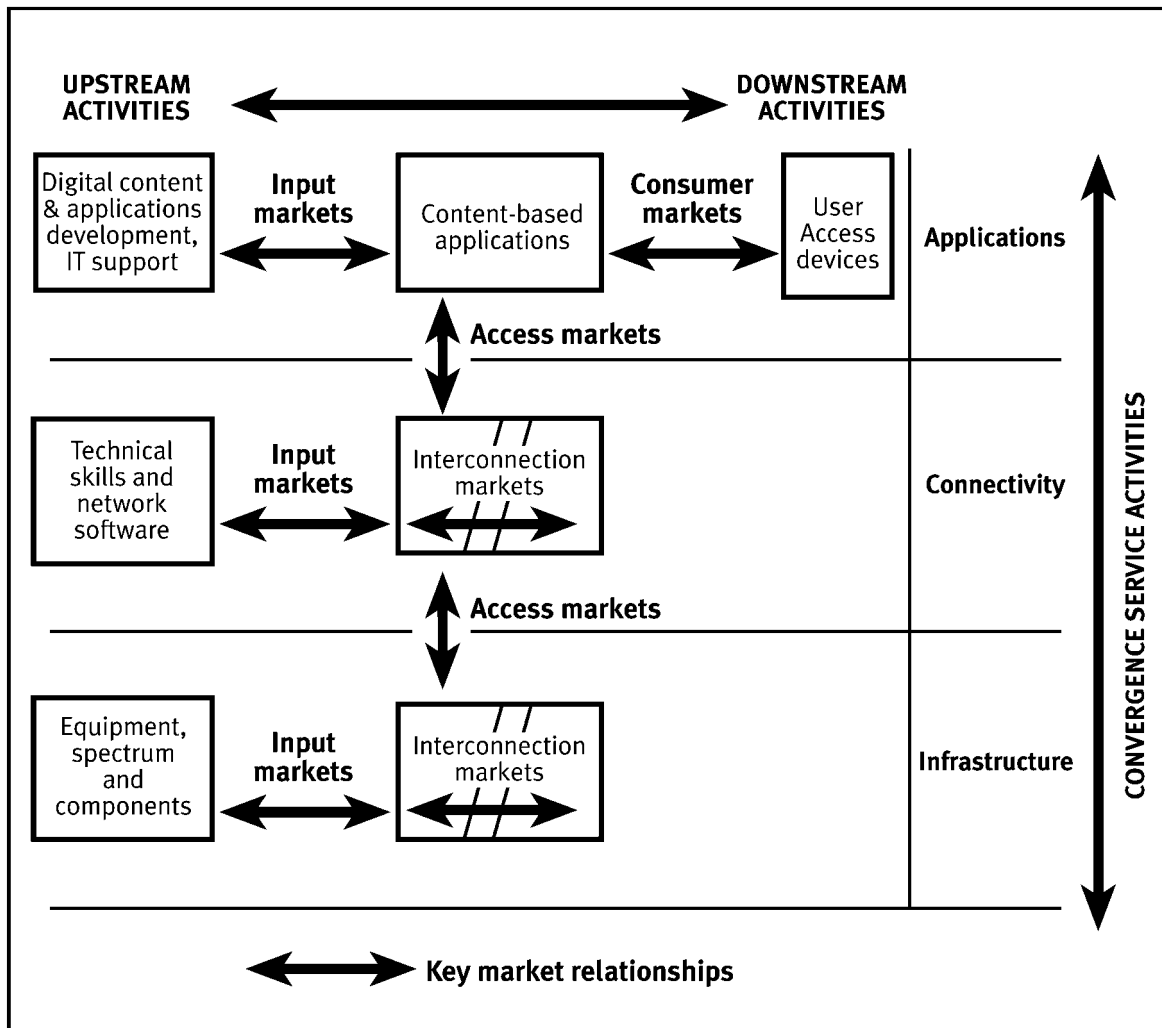


Each regulatory regime was purpose-built to address the requirements of each vertically-integrated industry. Telecommunications and broadcasting are the oft-quoted examples of industry specific regulation—but industries dominated by physical networks such as postal services, financial services and education services could also be effectively controlled.

The spread of digital technology has the potential to affect the traditional industry and regulatory structures. Eroding economies of scale and scope are leading to increased competition and the vertical disintegration of incumbent service providers. A different structural model for service provision on digital networks is emerging with business activity at three main levels, —applications, connectivity and infrastructure.

Exhibit 2.2 illustrates the generic relationships between the principal businesses in a convergence services industry.

Exhibit 2.2 Convergence services industry structure



The **applications** industry is about providing the functionality and services. Applications may deliver content such as voice telephony services, television broadcasting services, audio and video streaming services, and web browsing. Non-content based applications include electronic commerce services, search engines, and networked data processing services. High levels of innovation in the applications industry are leading to interactive entertainment services that are both content-based and transactional.

The **connectivity** industry is about providing the links which applications need to connect users in different locations. Connectivity is simply managed digital bandwidth. Many connectivity providers are not infrastructure providers, or provide only limited infrastructure. Telecommunications resellers and many Internet Service Providers (ISPs) operate in this way.

The **infrastructure** industry is about providing the hardware and basic operating functions that underpin the provision of connectivity and applications. Infrastructure providers are generally also connectivity providers, although some utility companies are installing infrastructure such as "dark fibre" (i.e. unused optical fibre) for use by other infrastructure and connectivity providers.

As the capabilities and bandwidth of digital networks increase over time, the level of competition and substitution between digital services and traditional services will increase. Traditional financial, educational, health and retail services can all be potentially delivered over digital networks. Recent examples of substitution include Internet banking and the development of online distance education courses.

Another major consequence of digitalisation is the falling cost of infrastructure and user access devices, leading to much cheaper international communications. Combined with the vertical separation of applications from infrastructure, this has allowed the emergence of international markets for digital content and other services.

2.4 Convergence "givens", convergence trends and countervailing forces

In the issues paper, three key convergence trends were identified. With the benefit of submissions and analysing international reports, certain elements can be expected to definitely occur. These are the convergence "givens". Other elements can be considered to be convergence trends that may or may not occur depending on the strength of any countervailing forces.

Convergence "givens"

The convergence "given" elements are:

- Growing penetration of digital technology into service delivery

Digital technology is entering many service industries. It is not only associated with the telecommunications and broadcasting industries but also the retail, education and finance service industries. Digital technology permits the same service to be delivered over different networks. With increasing network bandwidth, customers could obtain the same service over broadcasting spectrum, mobile phone, cable, telephone line, microwave or satellite networks.

- The growing role of user communities

Digital technology allow services to be re-programmed by users to better meet their own needs, weakening the service providers' hold on service definition. Users are opting to select the services that they wish to receive rather than receive standardised services aimed at mass markets. This "mass customisation" of services by users is a powerful source of economic value in convergence service markets. Growing user control is fuelling the emergence of niche service providers that can support particular communities of interest.

- The growing importance of intangibles

Intangibles are growing in commercial importance as sources of economic value and centres of economic power. Customer relationships and customer databases are primary assets for marketing by digital service providers. Other intangibles such as recognised brands, technical standards, and scarce management and technical skills are equally important.

- The growing consolidation of service providers

The economic value of effective mass customisation strategies and strong customer relationships is multiplied when information about users' preferences is exploited across a range of services, not just one. There is a strong incentive towards horizontal integration in service markets through cross-holdings and strategic alliances between a range of service providers.

Industry consolidation is also a natural consequence once disruptive structural change subsides. The shake-out of many industry players coincides with the reduced margins on commoditised services. Residual players who fail to consolidate move to value added services with higher margins or to markets where specialised services can be offered to niche markets.

These convergence "givens" have important implications for privacy. The global trend is currently towards some regulatory safeguards for personal privacy. Although some firms have commercial incentives to defend their significant investments in corporate image, there is also a strong incentive for firms without those investments to abuse the climate of trust created by responsible information holders. Privacy legislation will not only protect the social good of personal privacy, it will also protect the investment of firms which have developed and implemented responsible information handling systems.

The relatively lighter regulation of information transfers between associated companies creates incentives for allied firms to become associated through capital cross-holdings, mergers or acquisitions in order to consolidate and use customer databases. It is hard to argue that this will be a decisive factor in industry consolidation because there are so many other factors pushing in the same direction. However, it may accelerate those developments.

Convergence trends

Two further convergence trends were identified in the issues paper. The outcome of these trends is uncertain. Strong countervailing forces in some service industries could overpower these trends, resulting in a traditional or partially converged industry structure.

- The emergence of new intermediate markets and industry structures

The most important trend in this category is the structural separation between services (which users see) and the underlying delivery mechanisms. This distinction is reflected in the difference between applications (which represent services on a digital network) and the underlying connectivity and infrastructure (which are the delivery mechanism).

At the same time, weakening economies of scale are eroding bottleneck power in connectivity and infrastructure markets. The emergence of interconnection markets is gradually linking different digital platforms into a single platform spanning the service sector, and competing with traditional physical means of service delivery.

The vertical disintegration of an industry does not preclude the pursuit of vertically integrated business models. There is nothing to prevent an industry participant from participating in more than one industry or market. It only means that no-one can prevent someone from pursuing a vertically disintegrated model and focussing on infrastructure activities, service activities, or some other subset of convergence industry activity.

- The growing internationalisation of consumer service markets

Digital service markets are (at least potentially) international because service provision can occur through international networks, and is not longer tied to domestic infrastructures. International or even global markets for content, transactional and information services are emerging as applications service providers exploit cheap international connectivity to reach customers outside their national boundaries.

Some other national governments and administrations of international organisations, most notably the EC, OECD, ITU, UK and the US, have also conducted reviews of convergence or convergence related subjects. Direct comparisons with this review are difficult as other reviews have tended to focus on the telecommunications and broadcasting sectors rather than the broader service industries and different definitions of convergence were used. However, generally similar convergence trends of structural change brought about by digital networking disrupting existing business processes were identified.

Two UK reports proffered opposing industry strategies to adapt their structure in a convergence environment. One report noted that convergence will further drive industry structures away from conventional vertical integration to more complex structures incorporating contracting out whereas the other stated that the convergence trend will be towards integration and concentration through leveraging market power vertically and horizontally. An EU report also noted a market trend of companies moving up the value chain to higher margin activities such as content production and service delivery through vertical concentration. Opening access to network infrastructure for unaffiliated service providers or vertically integrating service delivery with infrastructure provision in a competitive marketplace are key business strategies that will influence industry structure. Other reported trends include: the greatly enhanced value of brands; a polarisation of the retail industry (between physical shopping for those with free time and electronic shopping for those whose time is at a premium) and a significant impact for existing intermediaries from direct delivery channels; and the creation of many new alternative intermediaries.

An analysis of these reviews leads to the conclusion that it is impossible to definitively predict structural outcomes. Common convergence trends are apparent but it is too early to determine what industry structure and business strategies will prevail, and in which areas. The final outcome will depend on the relative strengths of convergence trends and countervailing forces in different industries.

Countervailing forces

Convergence trends should not be considered in a deterministic way. While they are powerful trends, there are also countervailing forces which could limit them. Several of these forces were noted in the issues paper:

- The abuse of economic power or the collapse of technical standards processes in access markets could promote the re-integration of services and delivery infrastructures, reversing the trend to vertical disintegration;
- Patterns of demand in different geographical markets will vary, which could restrict international service delivery. A service that is accepted in one locality, country, or region may not necessarily be successful in another. Demand patterns depend on tastes, cultures, and income and education levels. Each of these factors depends in

turn on geography. Also, a lack of international agreement on consumer protection or similar issues could lead consumers to fall back on domestic regulatory schemes. Although services may be available internationally, the scope of demand could be global, regional, national, or even local in scope.;

- Electronic service delivery often requires complementary physical infrastructures, which are generally domestic. Obvious examples are online retailing (which requires sophisticated logistics systems), and health and education (which often require specialised physical facilities). To the extent that this ties service delivery to domestic physical infrastructures, the scope for internationalisation may be limited;.
- Consumer preferences about access devices will also constrain the way that services are deployed, and will have implications for industry structure. It is possible that certain applications will continue to cluster around certain access devices and the associated infrastructure. For example, entertainment services may primarily gravitate to the digital TV infrastructure, while business and personal applications may cluster around the PC and personal wireless access devices. It is uncertain whether users will wish to receive interactive services through previously passive devices or passive services through previously interactive devices. If they do not, there may be persistent segmentation between different digital networks that would limit direct competition between them. Different industries might then move towards different structural and business models.

The interplay between convergence trends and countervailing forces is unpredictable. In order to understand the relationship between structural convergence and the government's policy priorities and policy options, it is necessary to identify the principal structural scenarios which could arise from this interplay. The policy implications of convergence in each scenario can then be investigated.

2.5 Structural scenarios for convergence futures

Convergence will have a profound impact on traditional service industries. Existing industry structures are changing, and future industry structures are unknown. Business, community and government stakeholders need to adapt to an environment where traditional industry structures, previously entrenched, are shaken by the driving forces enabled by digital networking. Structural scenarios are a useful means of investigating the relationship between structural change, policy priorities and policy options.

The nature of scenario planning

Scenario planning differs from strategic planning. In strategic planning, the future is predicted in a linear fashion and strategies are developed accordingly. In scenario planning, alternative futures are envisaged that are both plausible and challenging. These scenarios are used to identify the implications of these alternatives - —to develop "memories of the future"— - and to enable the formation of plans to address alternative futures.

The number of scenarios is usually limited to three or four to focus attention on the critical issues. These scenarios are plausible outcomes, not predictions. The reason that more than one structural scenario is considered is in order to analyse the impact of structural factors on policy priorities and options.

The best scenarios are simple ones that don't have too many variables. These variables should represent the critical uncertainties that will determine ultimate outcomes. It is just

as important to identify the factors which are treated as constant across all scenarios (i.e. the “given” elements that are predetermined).

Scenario planning is useful, despite the simplification it entails, because it allows complicated change to be broken down into manageable pieces. Different issues arise in different scenarios, and the insights gained from the consideration of a few simple scenarios can be assembled to help develop strategies and options for the more complicated scenarios that will inevitably emerge.

Convergence scenarios for year 2010

The two critical uncertainties considered in the scenario planning exercise of this review are:

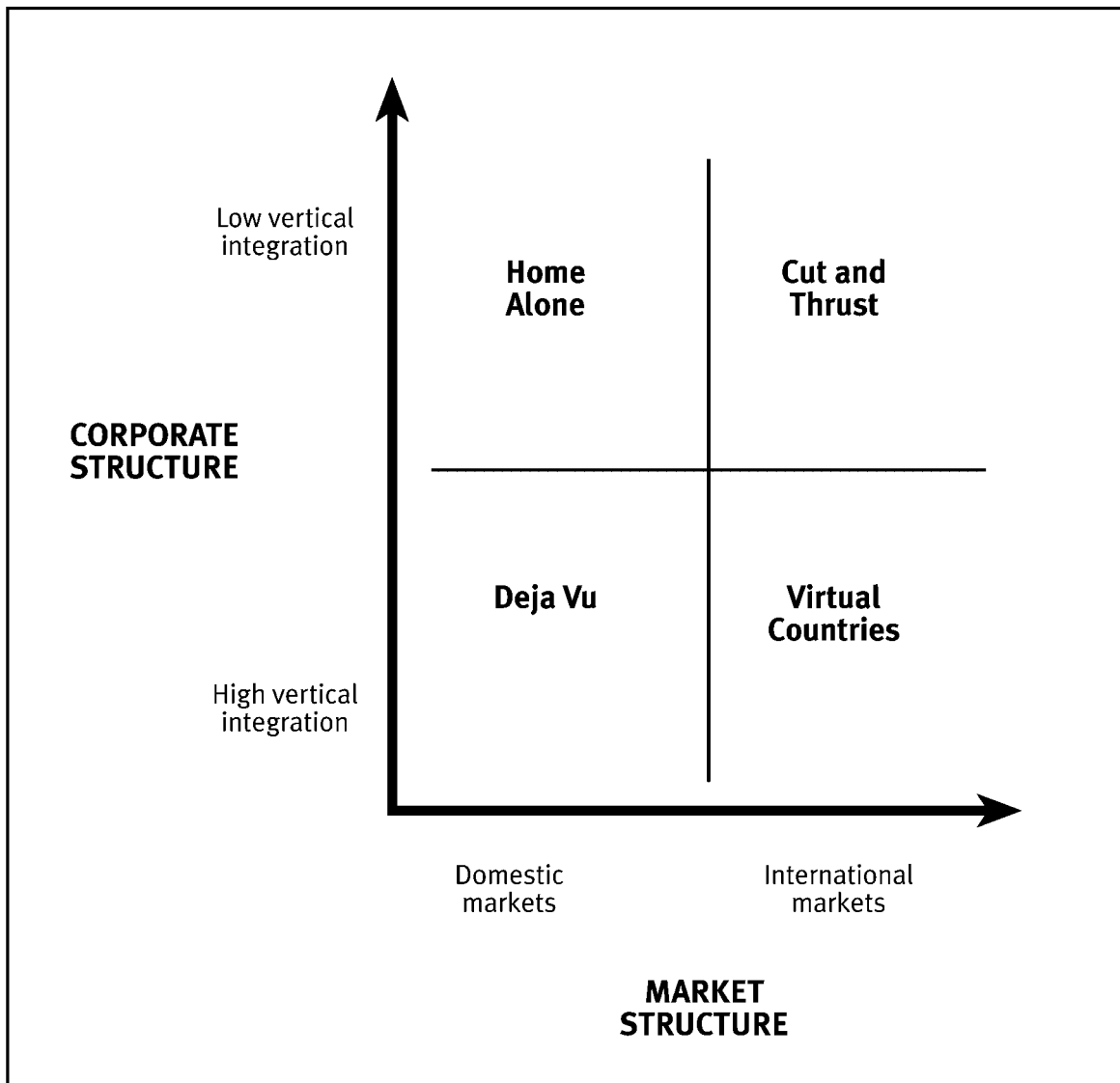
- the level of vertical integration between service and delivery activities; and
- the level of internationalisation of consumer markets.

These two variables have been chosen because they capture the most important features of supply side organisation and the structure of demand. The kinds of industry structures that emerge and the extent of internationalisation will have a profound impact on both policy priorities for government and the policy options available to address those priorities. In contrast, the convergence “givens” have been treated as a constant. This is because these trends are a feature of any scenario where digital technology is widely deployed and available to service providers: .

Mapping the two critical uncertainties against each other yields four principal scenarios, nominally around the year 2010. Industry developments may prove faster or slower than this, but these scenarios are placed far enough into the future for significant structural change to have occurred.

Each of these four scenarios offers a plausible picture of the future. The actual future will certainly be more complex and combine features from each of the scenarios. The levels of vertical integration and service market internationalisation in an industry are matters of degree. The four structural scenarios developed in this report can be represented by the four corners of a two-dimensional continuum of scenarios. Each point on that continuum represents a possible outcome of structural convergence in the service sector.

Exhibit 2.3 Convergence structural scenarios



A fuller description of each scenario is attached to the end of this chapter, but they may be summarised as follows:

- "Déjà Vu": Domestic service firms are horizontally integrated into service suites and vertically integrated to infrastructure businesses, but service markets have generally remained domestic in scope. This structure is similar to the traditional services industry structure, differing only in the wider range of services offered by industry participants.
- "Virtual Countries": Global-scale service firms offer comprehensive service suites, and service markets cross international boundaries. These powerful service companies are all closely associated with global mega-carriers, either by cross-ownership or strategic alliance. These companies rival many governments in the strength of their relationships with customers and their revenues.

- "Home Alone": . Domestically-focussed horizontally-integrated service firms are only loosely integrated to the underlying infrastructure business. Domestic service oligopolies and niche providers meet a wide range of consumer requirements.
- "Cut and Thrust": . Global-scale horizontally-integrated service firms dominate many international services markets, with an additional array of firms competing in a diversity of niche markets. These firms are not integrated to the underlying global infrastructure business, which operates largely independently.

Of course, the real world is more complex. It is possible that differing technology, marketing or demand factors will segment the service sector, and result in different service industries taking different structural trajectories. For example, the broadcasting and entertainment industry might retain strong elements of vertical integration on a digital TV platform in order to retain the benefits of end-to-end service. Other services might adopt a more vertically disintegrated industry model built around multi-purpose access devices in order to provide a better environment for service innovation. Each approach has its strengths and weaknesses.

Nor can it be assumed that the same structural trajectories will be observed in different countries, because national factors will have some effect on industry development. For example, telecommunications carriers have developed a significant upward presence in the Australian Internet service provision market. In contrast, the AOL America Online (AOL) model of downward vertical integration from content and applications into Internet access and infrastructure seems to be the trend in the US (for now at least). Neither is necessarily the "correct" approach. Structural trajectories depend on a range of factors: the relative scarcity of different assets, the history of industries and companies, what consumers want, and technological developments in the domestic marketplace.

2.6 Timeframes for change: the convergence test

A major complicating factor is that there is no single timetable for convergence. Different industries are experiencing structural change at different times and rates. Convergence began decades ago in some industries, but has barely begun in others.

The primary enabler of structural convergence has been identified in this Chapter chapter as the emergence of a viable digital alternative to traditional service delivery mechanisms. This has direct implications for the timetable of convergence, which can be encapsulated in the convergence test:

A necessary condition for structural convergence in a service industry is the emergence of an affordable, reliable digital alternative to traditional service delivery.

The convergence test provides a necessary condition for convergence to affect an industry, but not a sufficient one. This is because convergence is a two-stage process. The first stage involves the development of technology that enables digital service delivery. The convergence test applies to this first stage. The second stage is when structural convergence actually occurs with the emergence of new business models which exploit the new technology.

Structural convergence caused by the market adoption of digital service delivery may be delayed or prevented by a number of obstacles. Examples of these obstacles include lack of consumer confidence, restrictive technical standards, scarcity of key assets and

resources, and the absence of suitable access devices. Government has an important role in removing some of these obstacles, but this must be accomplished by attacking the obstacles directly, not by imposing convergence policy approaches in advance of industry development.

This means that the timetable for convergence policy development cannot be solely driven by technological developments. The timetable must be driven by industry and market developments, and this will differ from industry to industry due to the different take-up rates of digital networking technologies and different industry responses.

The telecommunications industry is an example of relatively advanced convergence. Digital technology has already displaced analog technology on all national and international telecommunications trunk networks, but the analog local customer access network prevents the full exploitation of the network's digital capabilities.² As a result, interconnection and access markets already are structured much as convergence analysis would predict, but this has not yet extended to consumer markets. Consumer markets will not begin to restructure in a major way until digital access technologies are more widely deployed.

An even more advanced example of convergence is the Internet content industry. Vertical disintegration is present with infrastructure provided by the telecommunications industry, connectivity by separate ISPs in many cases, and applications by content and electronic commerce developers. This industry is increasingly internationalised with few barriers to international trade and publication, and has parallels with the *Cut and Thrust* scenario.

There is relatively little penetration of digital technology in the traditional television transmission to households, so the current industry is still traditionally structured.³ The bandwidth limitations of wired infrastructures in Australia mean that television broadcasting has been isolated from convergence, and will continue to be isolated until a digital alternative capable of carrying real-time video of sufficient quality is available. In practice this means the wide deployment of ADSL technology, cable broadband services, or digital television, none of which are likely to be widely distributed for some time.

The radio industry is an intermediate case. The narrowband Internet already offers sufficient bandwidth to be used as an audio delivery channel, but a number of factors prevent this being a complete substitute for traditional broadcast radio e.g. the lack of portability and the inconvenience of using a PC as the access device. In addition, there are significant commercial difficulties associated with establishing a new online audio service. These difficulties include copyright management (a difficult issue to manage online), the marketing costs required to establish market share, and ongoing uncertainty about audience and hence advertising revenues. One result is that much Internet radio is provided by the existing radio broadcasters.

In physical service industries such as transport and tourism, digital networks do not offer substitutable delivery channels and hence structural convergence is unlikely to have much impact. This does not mean that digital technology will have no impact in these

² The ACCC's recent decision to 'declare' the local loop under the access regime may result in the significant acceleration of end-to-end digitalisation.

³ In contrast, the penetration of digital technology into production, post production and the national networking of television and radio is high.

industries, only that the impact will not manifest itself in the convergence trends. Other changes may result instead.

DÉJÀ VU SCENARIO

"Déjà Vu": domestic service firms are horizontally integrated into service suites and vertically integrated to infrastructure businesses, but service markets have generally remained domestic in scope. This structure is similar to the traditional services industry structure, differing only in the wider range of electronic services offered by industry participants.

In this scenario, service industry structures are still dominated by major domestic infrastructure owners. The principal structural difference is that the advantages of cross-marketing and exploitation of consolidated marketing databases has led the services industries to develop complex arrays of interrelationships. It is possible to obtain communications, entertainment, financial, education, retail and health-related services through a single service provider contract, with single billing and end-to-end service management.

Infrastructure ownership remains the key to economic power. Independent innovation is suppressed, and established industry participants acquire most new ideas and technologies. The domestic scope of consumer markets entrenches the economic power of infrastructure owners.

VIRTUAL COUNTRIES SCENARIO

"Virtual Countries": global-scale service firms offer comprehensive service suites, and service markets cross international boundaries. These powerful service companies are all closely associated with global mega-carriers, either by cross-ownership or strategic alliance. These companies rival many governments in the strength of their relationships with customers and their revenues.

In this scenario, large service companies control the whole value chain from service production or content creation through to its delivery to the consumer, wherever they were located. This control enables profits to be internalised, reducing competition by denying network access to competitors, while offering consumers a safe and secure transaction environment.

Organisations from the banking, health and education service industries merged with those from telecommunications and media service industries. Bundling of infrastructure, connectivity and service provision became the norm as global "general services providers", offering a wide range of financial, information, and communications services, were constructed through cross-ownership and strategic alliances. These competing service providers cluster around competing infrastructure platforms.

The global dominance of markets by big service companies has lowered the overall variety for consumers. The pace of innovation is low due to the bottleneck power of infrastructure. New industry participants with innovative technologies or processes tend to be acquired by one or more of the mega-companies. Industry sets the technical and governance standards in nearly all international forums with government playing little role.

A strong use of loyalty programs inhibits the churn of customers from one mega-company to another with most consumers and businesses using the services of one, or at most two, different mega-companies. Many companies now even offer their own private insurance coverage and retirement pension schemes, and provide direct medical services.

HOME ALONE SCENARIO

"Home Alone": domestically-focussed service firms are only loosely integrated to the underlying infrastructure business. Domestic service oligopolies and niche providers meet a wide range of consumer requirements.

The domestic focus of service firms combined with increased demand for local services combine to further weaken demand for overseas services. Overseas qualifications and standards are increasingly not recognised within Australia, a barrier to trade and skills mobility. The infrastructure/connectivity and content/service industries have taken different paths.

The markets for telecommunications and broadcasting infrastructure have merged. Higher levels of competition have placed downward pressure on profits, but the combination of rising traffic levels (and hence rising revenues) and falling technology costs have offset this. Urban and rural markets are increasingly characterised by different technologies, marketing approaches, and business models.

Service providers offer a diverse range of bundled entertainment, financial, education and other services to consumers, and are interlinked through a web of alliances, cross-holdings and acquisitions. Large oligopoly companies exploit the advantages of cross-marketing and common resources to protect their position where branding, customer recognition and the advantages of service bundling are the key to success. A range of niche service providers thrive in some areas by exploiting unique skills and privileged access to consumers and communities.

CUT AND THRUST SCENARIO

"Cut and Thrust": global-scale service firms dominate many international services markets. These firms are not integrated to the underlying global infrastructure business, which operates largely independently.

A two-tier service sector has emerged, with one dominated by a few horizontally-integrated global players and the other tier comprising a large number of diverse niche service providers. The combination of robust competition between competing different infrastructure providers and advanced digital compression techniques drives down communications prices.

Telecommunications and broadcasting infrastructure markets merged and consolidated. The result is the emergence of a two-tier carrier market with a handful of mega-carriers using economies of scale to dominate global traffic and urban communications infrastructure, while a range of specialist and niche carriers address rural, remote and developing country markets with wireless and satellite technology.

Innovation and unique skills are a key source of economic power. The emergence of global markets has made it easier to attain critical mass for networked products and services. The global marketplace is highly varied with an amazing array of products and services on offer.

Trusted brands are another key source of economic power. They enable firms to further develop economies of scope by exploiting these economies in global markets. Branding is especially important for horizontally integrated firms to elicit consumer trust.

3.0 DESIRED OUTCOMES AND STRATEGIC INTENT

The preceding chapter determined that service industries have entered a period of significant structural change. Traditional service industry structures have been dominated by vertically integrated and domestic firms due to the underlying nature of analog and physical delivery technologies. The traditional policy approach has been based on the assumption that these industry silos will continue to exist indefinitely.

This traditional policy approach is a natural outcome of a long period of relative structural stability. Rigid industry boundaries have made it possible to develop and implement separate and independent policies for those industries. The digital economy is dissolving those boundaries, sometimes in spectacular and disruptive fashion as new technologies and business models erode traditional industry structures.

Some national policy positions already take account of different structural models for service delivery. The most notable example is the telecommunications industry, where convergence is relatively advanced. In other industries such as broadcasting convergence has barely begun to have impact, so traditional policy positions retain their relevance.

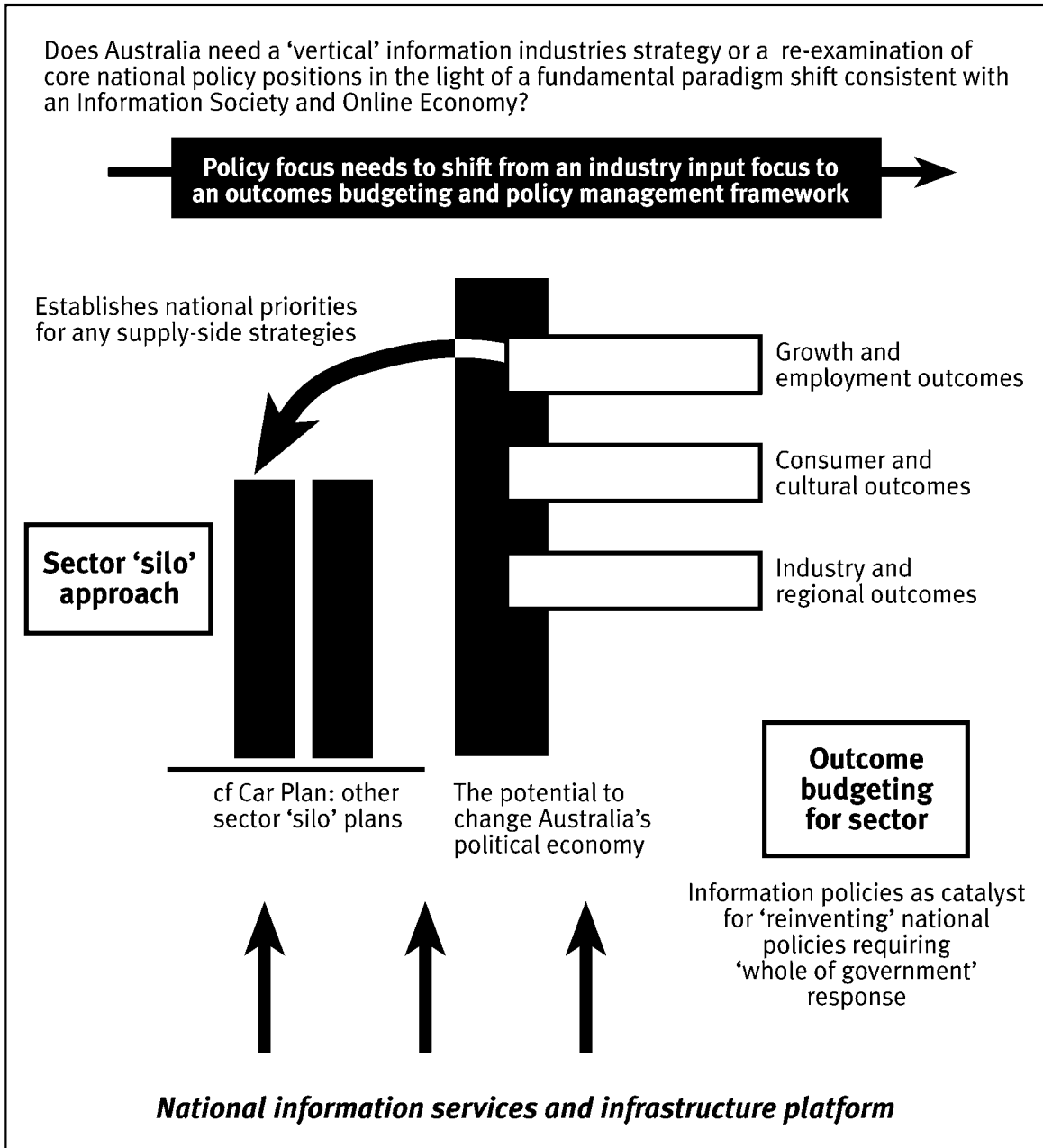
3.1 A renewed focus on outcomes

Policy needs to be directed towards the achievement of desired national outcomes. It is essential to re-assess those outcomes in an environment where structural change is accelerating because the effectiveness of traditional interventions can no longer be taken for granted. The desired outcomes do not change, but the means of achieving them do.

The achievement of desired national outcomes will require an ongoing evaluation of Australia's national policy positions in the light of global industry developments and of Australia's strategic intent for the digital economy. Policy strategies designed to address industry-level issues must be constructed within a common policy framework for the entire convergence sector.

Only this "outcomes" focus can provide the benchmarks needed to assess whether proposed policies are necessary or sufficient to address the gaps between actual national performance and desired national outcomes.

Exhibit 3.1 Outcomes-focused policy development



SOURCE: Adapted from *The Commonwealth of Information*, Information Policy Advisory Council, 1997.

In outlining an outcomes-based approach, it is critically important to be clear in the use of terminology and the sequence of the methodology. *Outcomes* are the result or consequence of activity. The identification of desired outcomes requires considerable strategic thought on the desired consequences from the mix of policies, rather than the activities of the policies themselves. Focussing on outcomes frees policy formulators to consider alternative non-traditional policy options.

An emphasis on desired national outcomes requires industry and supply-side interventions to be prioritised according to their relevance to the outcomes. Focussing

on outcomes requires a methodical approach. Once the outcomes and priorities have been determined, policy options can be identified. Specific policy strategies can then be developed and implemented to address the policy priorities.

Objectives differ from outcomes because they are more closely related to the interventions undertaken to achieve the outcomes. Objectives are designed to address the failure of markets to achieve desired national outcomes. In contrast to outcomes, objectives change whenever new challenges to desired national outcomes appear, or old ones are resolved. For example, an objective may be the promotion of competition in intermediate markets in digital networking or the promotion of Australian content on free-to-air television. The corresponding desired outcomes are efficient markets and the representation of Australian culture.

No policy approach can guarantee the achievement of desired national outcomes because governments do not control everything. Convergence erodes the power of government to impose some traditional interventions. An outcomes-based approach recognises that policy plays a facilitative role in convergence environments, not a deterministic role.

3.2 Desired national outcomes for convergence policy

A survey of national policies for the digital economy around the world reveals a wide range of desired outcomes and objectives for different service industries. The adoption of a set of definitive desired outcomes for the Australian digital economy would require a considerable period of consultation and debate.

Since this is not possible in the timeframe of this review, an amalgam of desired outcomes that captures the strategic intent of many national policies is proposed. This amalgam of desired national outcomes set out below is not intended to be definitive, but captures at a high level the strategic intent of many national governments' policies for the digital economy. Not all governments pursue all of these outcomes, because different desired outcomes have different relevance in different countries. This amalgam is adopted for the purposes of this review purely as a working assumption, although much of the intent will be familiar.

In summary, the “working” desired national outcomes adopted in this review are:

Exhibit 3.2 Desired national outcomes for the digital economy

Economic and employment outcomes

- Efficient markets along the entire digital economy value chain
- Increasing productivity through uptake of digital technologies
- Innovative, diverse service markets
- Broad, deep markets for high-skill and high-value employment

Social and cultural outcomes

- Widespread, affordable, reliable access to digital services
- Consumer confidence in service markets
- Local participation and representation in the domestic and global culture

Industry and regional development outcomes

- International attractiveness as investment site for digital infrastructure and services
- Global recognition as reliable, affordable service provider
- Strong capabilities in innovative applications and content development
- Broad geographic spread of domestic economic activity

These desired national outcomes can generally be divided into three separate areas. Growth and employment outcomes are those that focus on the development of an efficient domestic economy that uses digital technology effectively in order to drive innovation and high value employment. Policies to achieve social and cultural outcomes are those that aim to protect consumers, promote local identity and ensure access to services. Industry and regional development outcomes are those that promote international investment, spread economic activity widely and develop key inputs such as a skilled workforce. The kinds of objectives and issues commonly encapsulated in these desired outcomes are set out below.

Economic and employment outcomes

- Efficient markets along the entire digital economy value chain

This outcome is concerned with the allocative, productive and dynamic efficiency of markets to maximise the national benefits of economic activity. High levels of competition are required to ensure the efficiency of markets throughout the value chain from applications, through to connectivity and infrastructure markets by limiting cross-subsidisation between these value chain segments. The result of this efficiency is better allocation of capital and other resources, and ultimately lower costs to consumers. Lower costs enhance international competitiveness and allow services to be effectively marketed on a global scale.

Market efficiency also refers to the ability of service providers to obtain an adequate return on their investments. If costs of access to infrastructure are set too low, core investment could be reduced. In convergence industries, this is most likely to occur with infrastructure investments. To gain optimum market efficiency, a balance needs to be reached between exercising bottleneck power and gaining monopoly rents on the one hand and enabling adequate returns on investment and reduced consumer prices on the other.

- Increasing productivity through uptake of digital technologies

An increased uptake of digital technologies within the larger community lowers input costs to businesses as technology suppliers can provide services at lower cost through the generation of economies of scale. Productivity will be highest where the economies of scale are greatest and where intellectual capital is centralised. This suggests that major service centre hubs and countries with larger markets will be in the best position to generate these productivity benefits.

A low uptake of digital technology will reduce the international competitiveness of smaller markets. Input costs will be higher, reducing the ability of domestic service providers (and other industries which use services as inputs) to compete in international markets.

- Innovative, diverse service markets

Innovation is an increasingly important source of economic power. Knowledge-based economies are emerging where the primary assets are intellectual and human capital and management acumen. The exploitation of these assets is best exemplified in the diverse range of Internet businesses, each with an innovative business strategy that if successful will provide significant returns to investors.

One of the major drivers of the current boom in innovation is the emergence of the Internet. The key enabler for innovation is the lack of any restriction on distribution. Global market reach is possible which permits niche market opportunities to be exploited, encouraging a diversity of service offerings. Diversity enables services to be more closely customised to the consumer.

Innovation and diversity in service markets can be stifled when access to delivery channels is unavailable or when potential customers are effectively locked-in to existing service providers. New ideas and technologies can also be purchased outright by larger incumbents to include in their own service offerings and remove potential competitors.

- Broad, deep markets for high-skill and high-value employment

This outcome reflects the alignment of desired employment outcomes with desired economic outcomes. Efficiency, productivity, innovation and diversity all require a strong and highly skilled labour force as a key input. Employment markets of this nature are important to ensure that Australia captures a significant share of the benefits of the digital economy.

Social and cultural outcomes

Social outcomes deal with the way that industry activities impact on the community. They address both cultural and consumer-related issues such as national identity, a diverse media, consumer protection, and universal access to basic services.

- Widespread, affordable, reliable access to digital services

This outcome is based on the premise that all members of the community, regardless of their location or other potential disadvantage, are able to access digital services at reasonable cost and quality. Access to digital services is not restricted to a standard telephone connection but also higher bandwidth digital connections and reception of broadcasting services.

Access in regional and rural areas has traditionally been obtained by cross-subsidising the services to rural and remote users from premiums on services in more densely populated areas. The increasing number of digital delivery mechanisms and the growing diversity of demand for services increases the complexity of access policies. Developments in satellite and wireless technology have the potential to be profitable in currently loss-making rural areas.

- Consumer confidence in service markets

Achieving this outcome involves clearing blockages that prevent the take-up of digital services. Effective consumer protection mechanisms including privacy protection are important. When consumers are confident, they are more inclined to engage in transactions with a variety of service providers, encouraging innovation and diversity through maximising consumer choice.

In the absence of generic consumer protection mechanisms, consumers may either refuse to engage in digital service markets or they will transact with companies with trusted brands. To obtain the trust of consumers, firms will have provided their own internal protection mechanisms through self-regulation.

- Local participation and representation in the domestic and global culture

Influential content-based services have the potential to powerfully affect the Australian national identity and reflect its diversity. Sufficient domestic investment in local content production is required to ensure that broadcasts and other content-based services contain a significant proportion of locally produced content. Media diversity is also important as it encourages diverse views and ensures that a balance of views is represented.

The increasing globalisation of input markets causes local production industries to be vulnerable to competition from the economic power of larger global competitors. In addition, the emergence of niche service offerings can significantly fragment domestic mass audiences, weakening local cultural identity. These factors may increase the importance of public broadcasters both as representative cultural institutions and as participators in global culture.

Industry and regional development outcomes

Industry and regional development outcomes deal with the internal and external structural competitiveness of domestic industry. A domestic industry with strong internal capabilities is required to be able to attract international capital and be globally recognised. Decentralisation of service provision is required to ensure that the benefits of digital technology are spread throughout the community.

- International attractiveness as investment site for digital infrastructure and services

This outcome is based on attracting international investment capital to boost domestic industry. Investment capital is highest where the opportunities for returns on the investment are maximised. This tends to be countries with skilled workforces, political and social stability and sophisticated consumer markets.

Economies of scale are also important for investment attraction. Larger service centres—where communication costs are lower and intellectual capital reserves higher—tend to capture a relatively greater proportion of the pool of investment funds, posing a significant threat of trade imbalances. Smaller markets have the potential to attract investments towards the development of niche market offerings and using global reach to generate returns.

- Global recognition as reliable, affordable service provider

This outcome is closely aligned with international investment attractiveness, and is the supply-side counterpart to consumer confidence. The objective is to develop a cycle where services are globally recognised which leads to greater service activity and investment. The ability to create and manage trusted brands in international markets is an important factor in gaining global recognition.

- Strong capabilities in innovative applications and content development

The digital economy is characterised by a strong demand for intangible capital resources. Human and intellectual capital is required to develop innovative applications and content. This capital tends to be centralised where the returns are higher in the major service centres. If these service centres are hosted elsewhere, a "brain drain" can result with the most talented people emigrating to centres of service activity.

- Broad geographic spread of domestic economic activity

This outcome is concerned with ensuring that regional and rural areas are able to participate in economic activity in the digital economy. The development of efficient access markets is important to promote the development of regional content and applications. Niche specialist services could then be developed and these services marketed both nationally and internationally.

4.0 WORKING ASSUMPTIONS AND POLICY APPROACHES

A fundamental step in the development of effective policy responses is to identify the basic working assumptions that should inform policy intervention in traditional industry environments and convergence scenarios. These working assumptions are the foundation of the decision-making framework for convergence policy development, and are essential to the development of robust policy strategies for the service sector.

In order to determine these working assumptions, this chapter sets out preliminary statements and observations about traditional industry environments and the convergence trends and conditions identified in the issues paper. These forms the basis for the policy "working assumptions" which are implicit in these environments, trends and conditions.

These working assumptions are used to develop a number of policy approaches for both traditional industry environments and convergence scenarios, intended as a preliminary guide to policy and regulation.

It is important to remember that convergence policy approaches are relevant to the trends and conditions of a convergence scenario, not a traditional environment. Nor are traditional approaches relevant in convergence scenarios. Whether an approach is relevant in any particular case depends on whether a particular industry has undergone convergence, and this cannot happen before it satisfies the *convergence test*: the actual presence of an affordable, reliable digital alternative to the traditional service delivery mechanism. Only when the consequent structural changes have occurred will convergence policy approaches be relevant.

4.1 Traditional industry conditions and working assumptions

The issues paper identified a number of characteristic features of the traditional service industry environment. This section elaborates the features that have had major policy significance and traditionally influenced the development of service industry policies.

It is important to understand traditional working assumptions because these assumptions are still valid in many cases. Convergence is a process, not an instant in time, and the relevance of traditional working assumptions in many areas is still strong and will probably remain so for some time. These traditional working assumptions can be summarised under six headings.

Domestic service markets

The domestic scope of most service delivery infrastructures has confined consumer service markets within national boundaries. The traditional service industries are essentially national industries, and enjoy natural protection from international competition.

This has had a naturally stabilising effect on the distribution of service investment and employment. Capital has tended to be allocated on a domestic basis, often by governments in Australia. These capital expenditures have principally been to construct the physical and analog infrastructures that are the primary assets in a traditional service business.

Vertical integration

In traditional industry structures, delivery infrastructures are specialised for the delivery of particular services. Medical, educational and communications infrastructures are generally separate and not substitutable. This is the basis for the separate vertical industry silos that dominate the traditional services sector landscape.

These industry silos have been fairly stable over the last few decades because digital technologies capable of delivering multiple applications and services did not exist. In some industries, notably broadcasting, this is currently still the case. None of the digital networks currently available have the capacity to deliver television services (as opposed to low-quality video), and it will probably be some years before there is substantial penetration of digital broadcasting technologies into average households. Similar comments can be made of other electronically delivered services in the education and health-related industries.

Low levels of uncertainty

The absence of major structural changes or disruptive technologies have given traditional services industries relatively low levels of technological and commercial uncertainty. This has also lowered the risks of regulatory failure and allowed governments to be fairly prescriptive in setting requirements for industry performance in consumer service markets.

Stable market boundaries

The mass standardisation of services and the vertical silo structure of the traditional service industries have meant that the boundaries between different service markets and different delivery markets have been relatively stable for a considerable time. This has also limited cross-industry investments that would have otherwise complicated judgements about the impact of mergers, acquisitions and forms of predatory behaviour.

Limited competition

The difficulty and cost of building competing service infrastructures has traditionally limited the scope of competition in many service industries. These barriers to entry resulted in natural monopolies in some industries. Some of these natural monopolies were government-owned (e.g. telecommunications), while other industries were dominated by government participation (e.g. education and, to an extent, broadcasting).

Dominance of physical assets

In traditional industry structures, the sources of economic value and centres of economic power are mainly physical infrastructures. The skill sets required to operate both infrastructure and services are also standardised, and their wide distribution tends to lower their economic importance relative to physical capital.

4.2 Convergence industry conditions and working assumptions

In contrast, the convergence trends and industry conditions identified in the issues paper imply a different set of working assumptions. These assumptions can be summarised under six headings.

Internationalisation of service markets

Convergence is about the structural context of the information economy, and the information economy is a global economy. The trend to internationalisation of service markets means that the convergence industries are global industries, characterised by international capital movements and the increasing mobility of skilled individuals across national borders.

In principle, all convergence industries are exposed to international competition. In practice, this is a matter of degree. Countervailing forces such as the localisation of demand for services, regulatory barriers, and lack of consumer confidence in international transactions will affect the extent of internationalisation. The trend, however, is for levels of international competition to rise as convergence progresses over the coming years.

This will have significant long term trade implications. International networks make it possible to "import" customers, but it also allows customers to be "exported" to overseas service providers as well. Australia's success in capturing a disproportionate share of the global information economy will depend on its capacity to attract overseas customers to Australian service hubs.

The most important technical and legal standards for the convergence industries (e.g. software standards and online copyright) are international in origin, formed in multilateral forums where governments and global industry participants negotiate agreed positions, or entrenched through the market dominance of key industry participants. The internationalisation of service markets means that these standards will dominate domestic transactions as well.

No national industry development policy can ignore the fact of current US dominance. US capital markets finance much of the technological and business innovation that is driving the growth of the information industries and undermining traditional business models. The consumer penetration of online services is higher in the US than in any other country in both relative and absolute terms. Most of the recognised online brands are American.

Vertical disintegration

The emergence of alternative digital delivery platforms means that service provision is no longer linked to a single technology. This encourages the vertical separation of service and delivery activities. This vertical disintegration is a matter of degree because there are many graduations between complete integration and complete separation, but the current trend is towards more, not less, structural separation between services and infrastructure/connectivity.

A related development is the growing horizontal integration of the markets for different delivery platforms (particularly electronic platforms) and different services, driven by the pursuit of economies of scale and scope at the infrastructure, connectivity and

applications levels. This is manifested in the growing substitutability of different electronic infrastructures and the emergence of integrated service companies with a presence in multiple service industries.

These electronic services and platforms also substitute for traditional services and delivery infrastructures. This horizontal integration of markets will increase as the capabilities of different electronic networks are expanded and the differences in technical capability are reduced.

High levels of uncertainty

The convergence industries are experiencing high and increasing levels of commercial uncertainty, because the pace and complexity of technological change means that convergence restructuring is also disruptive and unpredictable.

Regulatory risks are high in this environment, particularly where regulation constrains the structural options available to industry. Inappropriate regulation is costly, because it prevents the kinds of structural and business innovations that are necessary to generate and capture the benefits of new technology.

Fluid market boundaries

Digital technology creates new opportunities to extend service, connectivity and infrastructure-related activities, and to leverage both physical and intangible assets into wider markets. These convergence business activities cut across traditional industry boundaries. Content provision is no longer confined to broadcasting, and digital infrastructure provision is no longer the prerogative of the telecommunications industry.

Growing competition

As the capabilities of different electronic technologies converge and expand, the substitutability between traditional and digital delivery platforms is increasing. The result is growing levels of competition between delivery channels. Online retail financial services are in competition with traditional branch banking, and Internet telephony is a substitute for traditional analog telephony.

Competition is also being stimulated as traditional industry participants extend their activities into related service markets and move into upstream and downstream markets. This places new market participants in direct rivalry for assets and customers with traditional incumbents.

Importance of intangibles

One of the most important features of the global information economy is the significant increase in the value margin generated by intangible assets relative to physical assets. These assets include content, skills and other human capital, technical standards, software, recognised brands and trademarks, and customer databases and relationships. National balance sheets are increasingly dominated by these kinds of assets, and a balanced portfolio of physical, human and intellectual capital is emerging as one of the keys to national competitiveness.

A related development is the growing importance of intangible assets as centres of market power. In the online environment, recognised brands, unique content and customer databases, and proprietary technical standards can confer bottleneck power. Just as physical, human and intellectual capital must all be regarded with equal emphasis as sources of economic value, they must also be viewed as equally important centres of economic power.

4.3 Working assumptions and policy approaches

The simple traditional industry environments and convergence scenarios presented in this report are idealisations. Their simplicity can be deceptive because economic and social forces complicate real industry environments. Generic conclusions drawn about idealised environments provide a guide, but cannot be applied in real situations without taking into account the industry context.

The working assumptions adopted in a traditional industry environment imply that certain approaches will be more effective than others. Conversely, the working assumptions adopted in a convergence scenario may imply that different approaches are more effective. In either case, the policy approaches implied by the working assumptions are only as good as the assumptions that underpin them.

This is particularly true during a period of structural transition. It is impossible to apply fixed policy approaches uncritically during the intermediate stages of structural change.

This has important implications for the management of the transition from traditional policies to convergence policies. National outcomes may not be achieved by carrying traditional policy approaches into a fully converged environment. Equally, it is important to avoid wholesale and rapid regulatory change. A too-rapid shift to convergence policy approaches in advance of industry developments will be just as damaging as a tardy response.

Scope of service markets, domestic regulation and international conformance

The domestic scope of consumer service markets in traditional industry environments has allowed national and State Governments to impose a domestic policy agenda on the service sector. International issues are typically confined to input markets where international trade in equipment and content is common.

The relevant policy approach in traditional industry environments is **domestic regulation**:

'Domestic policies reflect domestic priorities and conditions'.

This approach reflects the primacy of domestic policy agenda when international competition is limited.

In contrast, the internationalisation of service markets is a feature of two of the convergence scenarios considered in this report. In these scenarios, the key regulatory, legal, governance and technical standards are settled either in multilateral forums or by industry consensus in key country markets of Europe and the US.

Australia's position as a medium-sized services economy makes it impractical to move outside an established international consensus on either technical or regulatory matters.

Attempts to do so will simply reduce our international competitiveness because this will raise domestic costs and increase policy uncertainty relative to our international service competitors. This would be fatal to our ambitions to establish a strong position in the global digital economy.

The relevant approach in this case is ***international conformance***:

'Domestic policies reflect relevant international regulatory positions based on clear multilateral leadership or international industry consensus'.

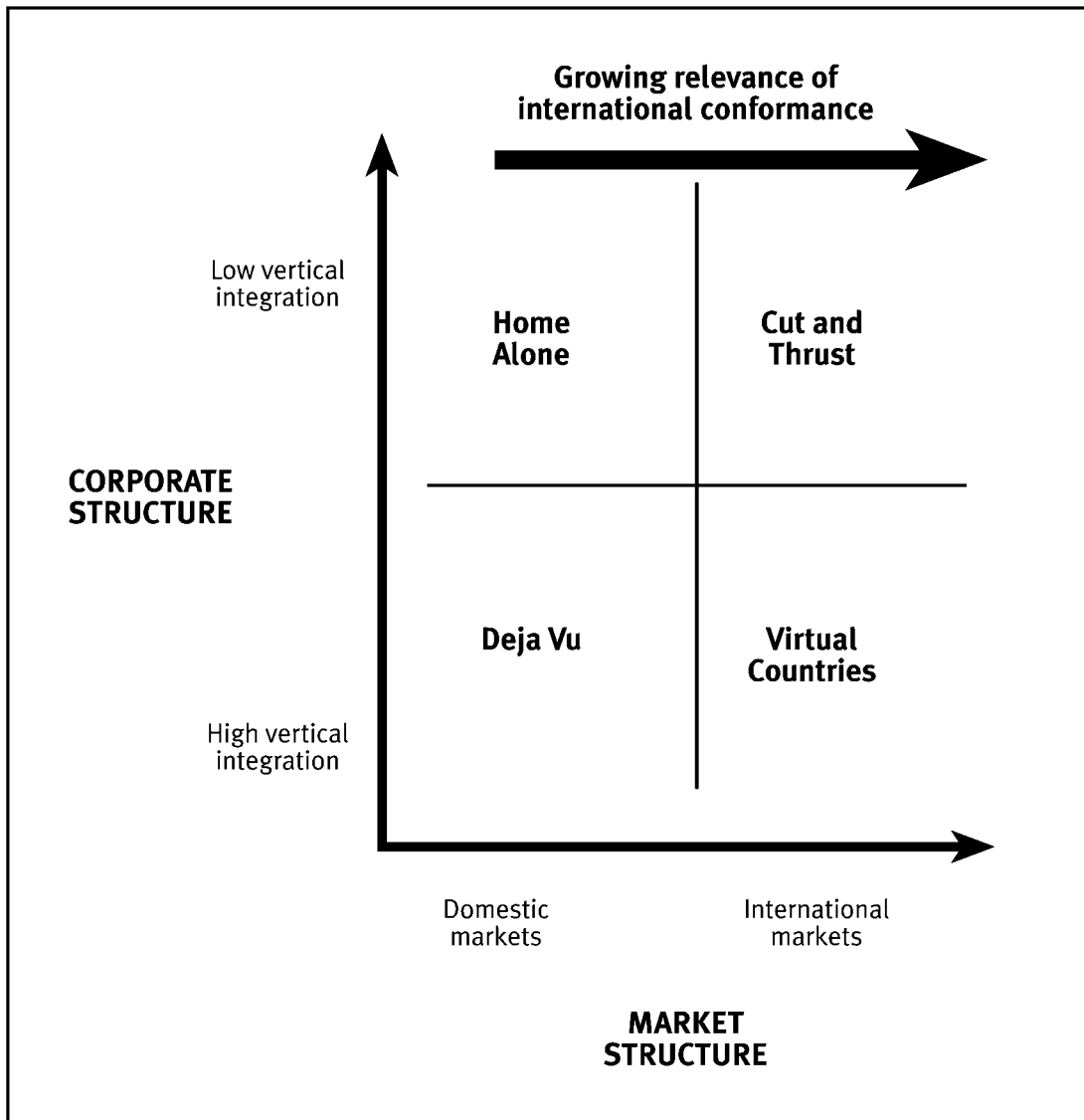
This statement is carefully qualified. It refers to global consensus, not national or regional consensus. In cases where rival national or regional approaches are in contention, Australia should not support the entrenchment of national regulatory, commercial or technical standards if this entrenchment pre-empts the emergence of a constructive global consensus.

This highlights the importance of Australian participation in multilateral and international industry forums that form consensus on key regulatory, commercial and technical issues. Australia has a strong interest in the establishment of global standards because it is not a standards-setter, and these forums are our primary means of influence.

The OECD, the WTO, WIPO, and the ITU are obviously relevant forums, but other multilateral and private sector forums are also important influences on global standardisation of business practices and technologies. Since Australia must submit to a consensus, its interests will be best served by playing a role in the determination of that consensus.

The relevance of the *international conformance* approach depends on the assumptions of international consumer markets, and will therefore depend on the structural scenario being considered. This working assumption is not valid in a traditional environment, and is not valid in some convergence scenarios either. The relevance of *international conformance* in convergence scenarios can be mapped as follows:

Exhibit 4.1 Relevance of *international conformance* approach



This means that *international conformance* will not be relevant in some of the convergence scenarios considered in this review, and that *domestic regulation* will be more appropriate in these cases.

Vertical industry structure, technology-specific regulation and technology neutrality

Traditional structural industry environments are characterised by the vertical integration of service, connectivity and infrastructure activities. This integration has allowed governments to control services indirectly by controlling domestic infrastructures. Each type of service has its own distinctive delivery technology; different from the technologies used in other service industries.

The relevant approach in this case is ***technology-specific regulation***:

'Policy intervention respects the technological characteristics of each industry.'

This approach reflects the realities of a traditional industry environment where services and their respective infrastructures are inseparable.

In contrast, a key supply-side convergence trend identified in Chapter 2 was the vertical separation of services and delivery. The ultimate result of this trend is that content, services and applications can be delivered over a range of digital technologies, and it is difficult to make assumptions about the nature of this technology.

The relevant approach in this case is ***technology neutrality***:

'Policy intervention in content, service and applications markets is independent of the nature of the underlying delivery technology.'

The idea behind this statement is that the regulation of a particular service should address all instances of that service, irrespective of the delivery technology. There is only one delivery technology in the traditional industry structure, but there may be many technologies when service and infrastructure activities are separated.

This situation generally requires intervention in services activities to be conducted at arms' length from intervention in infrastructure and connectivity activities. In particular, content or service regulation should be imposed on content or service providers rather than onto underlying connectivity or infrastructure providers.

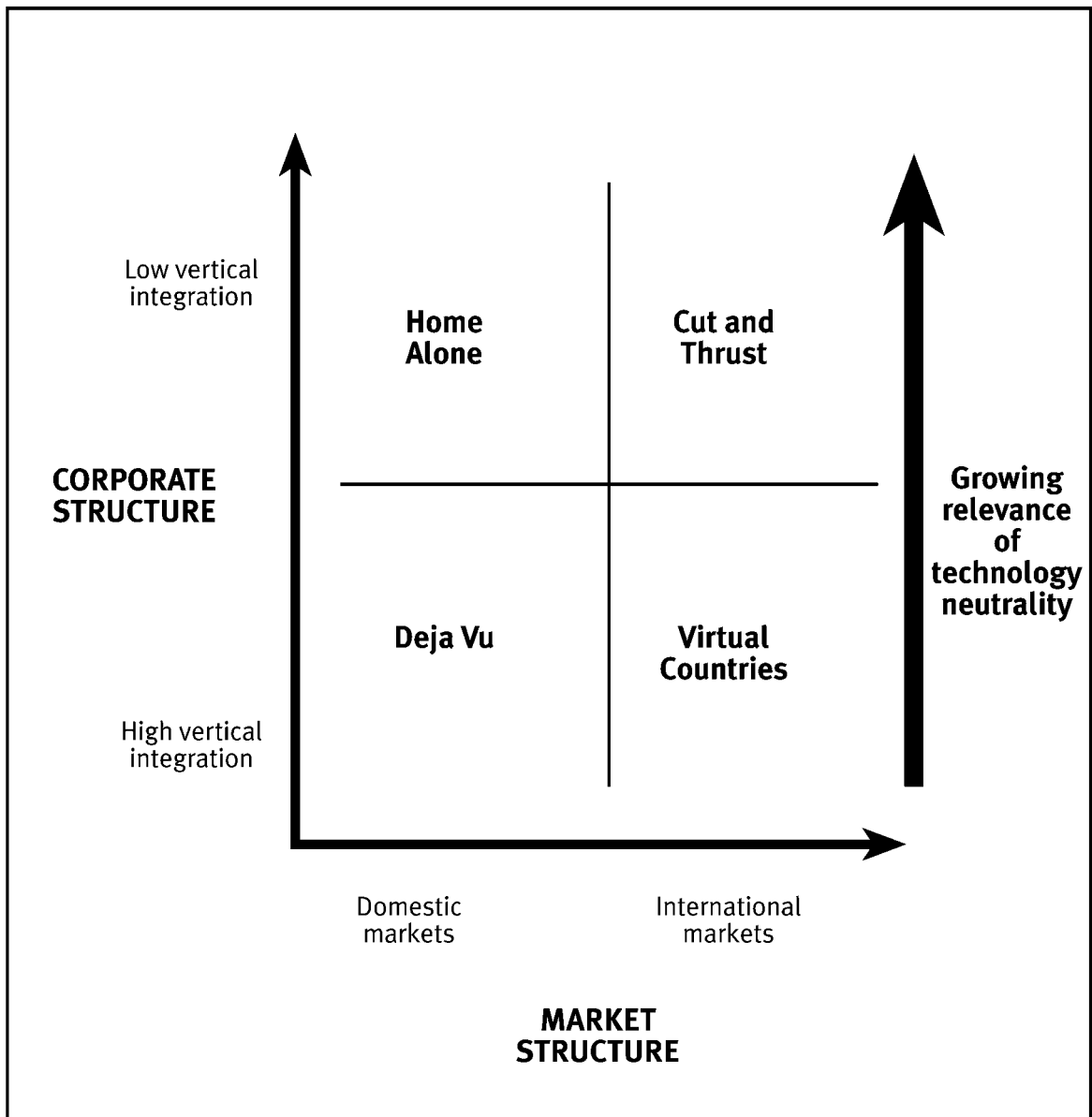
This does not exclude the possibility that infrastructure or connectivity providers should bear secondary responsibilities to assist in the imposition of service provider requirements. However, it does require that infrastructure or connectivity providers should only be responsible for their own actions in that regard, not for the action of third-party service providers.

It is important to understand that technology neutrality does not mean the absence of technical regulation. Technical regulation should be judged on its merits. In particular it does not mean there should be no spectrum management or technical standards, but it does suggest that these interventions should be conducted independently of interventions in service output markets in vertically disintegrated scenarios.

It is also important to re-emphasise that technology neutrality and the other convergence policy approaches are applicable in fully converged environments. In traditional and transitional environments, asymmetric arrangements and technology-specific regulation can often be appropriate, depending on the specific industry conditions which prevail.....

Like *international conformance*, the relevance of *technology neutrality* depends on the validity of the working assumption that underpins it. In general terms, *technology neutrality* will be more relevant as the technical capabilities of different networks converge, and more services are made available over an integrated delivery network. In contrast, *technology-specific regulation* will be the most effective approach if different applications are vertically integrated to different delivery technologies, or the technical capabilities of different networks are different.

Exhibit 4.2 Relevance of *technology neutrality* approach



This means that *technology neutrality* will not be relevant in traditional industry environments, or in *Déjà Vu* and *Virtual Countries* scenarios, and *technology-specific regulation* will be more appropriate. In contrast, *technology neutrality* will be more relevant in *Home Alone* and *Cut and Thrust* scenarios.

Levels of uncertainty, prescriptive regulation and regulatory forbearance

Traditional industry environments are characterised by relatively low levels of structural uncertainty. The strength of the economies of scale and scope generated by traditional service industry structures protects the basic business model, and have led to long term structural stability in many service industries.

This stability minimises concerns about regulation being overtaken by industry restructuring, and makes practical a range of detailed, prescriptive regulatory requirements. Many service industries such as education, health and telecommunications have evolved highly prescriptive regulatory systems along these lines.

The relevant policy approach in this environment is **prescriptive regulation**:

'Policy intervention extends to the detailed prescription of outcomes in consumer service markets'

In contrast, one of the working assumptions identified for all convergence scenarios was a high level of structural uncertainty. The structural nature of convergence, and the unpredictable effects of countervailing trends, means that the progress and outcomes of convergence cannot be determined in advance. No-one knows how convergence will unfold, and navigating the structural transition is the major commercial and regulatory challenge.

The relevant approach in this case is **regulatory forbearance**:

'Policy intervention is confined to identifiable, significant and persistent market failure to achieve desired national outcomes.'

This statement encapsulates a number of points:

- policy intervention is a last resort, and that markets should generally be left to form and operate without undue interference;
- policy intervention must be a response to identifiable issues, not imaginary or speculative ones;
- policy intervention should only occur where there is a significant threat to the achievement of desired national outcomes, and the benefits of intervention outweigh its costs; and
- policy intervention should address persistent issues, not transitory issues that will fade as convergence progresses. Specific interventions should be withdrawn after a designated time period or when certain milestones for market structure or activity are achieved.

Market structure, industry-specific intervention and activity-based intervention

One of the consequences of vertical integration in the traditional industry environment is that the service sector is structured into separate vertical silos with little competitive interaction. Each of these industries operate in distinct service markets. This is the basis for the traditional working assumption that market boundaries are relatively stable.

The lack of interaction between different service industries has made **industry-specific intervention** the appropriate policy approach:

'Intervention is conducted in industry-specific terms, and is backed by specialised requirements for each industry'

This approach is related to the *prescriptive regulation* approach.

In contrast, changes to market boundaries undermine the traditional congruence between market and industry boundaries in all convergence scenarios. Generic activities such as content, applications, connectivity and infrastructure provision increasingly cut across traditional industry boundaries, while many service activities are conducted in common rather than separately.

The relevant approach in this case is **activity-based intervention**:

‘To the extent possible, intervention is conducted in industry-neutral terms, and is backed by generic regulatory requirements’

This approach addresses both the objectives and the implementation of policy intervention. Policy objectives for content, applications, connectivity or infrastructure provision should not be specified in terms of traditional industry definitions because these key convergence activities transcend those definitions. Similarly, generic regulatory requirements are needed to ensure that both traditional and new providers participate in these activities on a level regulatory playing field without the burden of legacy constraints or advantages.

Industry-specific requirements should be addressed through co-regulatory or administrative mechanisms. This is preferable to legislation, because contingencies will generally be unpredictable and may arise rapidly. This suggests that the administrative role of independent regulators will remain important. Membership of co-regulatory “industry” forums will need to reflect changing activity boundaries rather than traditional industry membership so that these forums remain representative.

Levels of competition, asymmetric regulation and competitive neutrality

The barriers to entry in traditional service industries are considerable. The traditional working assumption is that competition is limited by the bottleneck power wielded by major infrastructure providers. As a result, the regulation of dominant infrastructure providers is the regulatory focus in many service industries.

A number of industry-specific approaches have been adopted to address the competition issues arising in different industries. The asymmetric telecommunications regime is only the most notable example. Other industries have had different approaches imposed, for example, industry-specific and prescriptive regulation of bottleneck service providers to prevent exploitation of consumers.

The appropriate policy approach in this situation is **asymmetric regulation**:

‘The establishment of competition in infrastructure markets is accomplished through asymmetric requirements on dominant industry incumbents’.

In convergence scenarios, wider markets for content, applications, connectivity and infrastructure emerge, and the incumbent market participants face growing competition from well-resourced new entrants. Some of these new entrants will arise in related industries as markets merge, while others will appear from up and down the value chain.

Where this results in a genuinely competitive market, the contradictory legacies of different regulatory regimes will need to be addressed by shifting to an activity-based

policy. This is particularly so where these legacies tip the level playing field in a newly competitive market.

This can be expressed in the approach of **competitive neutrality**:

‘Both new and incumbent players in competitive markets are relieved of traditional regulatory constraints or advantages which tilt the competitive playing field.’

The words “in competitive markets” are an important qualification. Where competition is not fully established, asymmetric elements are clearly justifiable within an activity-based policy framework that encompasses both incumbent and new market participants. The Australian telecommunications regime is an example of such a framework.

Intangible assets, infrastructure focus and comprehensive treatment

In traditional industry environments, physical infrastructure is the most important source of economic value and centre of economic power. The working assumption is that physical capital is the focus of commercial and regulatory interest.

The relevant policy approach in the traditional industry environment is **infrastructure focus**:

‘The most important commercial and policy issues arise in association with physical infrastructure’.

In convergence scenarios, intangible assets such as copyrights, other intellectual property, and scarce human capital are as important as physical capital as a source of economic value and centre of economic power. The relevant policy approach in these scenarios is **comprehensive treatment**:

‘Policy interventions address issues related to physical, human and intellectual capital with equal emphasis.’

This does not mean that these different types of capital should necessarily be treated in the same way. Different approaches are appropriate to different circumstances. The point is that all forms of capital must be considered when addressing policy issues.

Taking the perspective of economic value, this means that industry development policies must address the formation of physical, human and intellectual capital with equal emphasis. Encouraging investments in infrastructure, skills, and innovation are all essential to the formation of the national balance sheet.

Taking the perspective of economic power, economic regulation must address bottleneck power arising from these different forms of capital. The telecommunications access regime is the appropriate response for “essential” digital infrastructure. Similarly, limited decompilation rights make “essential” software platforms accessible, and investment in skills development minimises the impact of skills shortages and associated bottlenecks in labour markets by making “essential” resources available.

4.4 The relevance of policy approaches in different industry structures

The working assumptions identified in various traditional industry environments and convergence scenarios are the products of idealised industry structures. Real industry structures are bound to be more complex and ambiguous than the idealised ones set up for the purposes of this review.

Consequently, the policy approaches identified in this Chapter chapter are a guide for judgement, not a substitute for it. They are based on working assumptions, and will not be relevant unless those assumptions are valid.

This means that policy approaches cannot be applied without regard for an industry's structural features and level of convergence. Real policy judgements will require detailed knowledge of the structural features of industries, along with a wider knowledge of the host of other factors which affect industry developments. This is particularly true of industries experiencing a structural transition.

There are few verities in these situations, and a mixture of traditional and convergence policy approaches will be appropriate in many industries. The closer that an industry comes to an idealised environment, the more relevant the corresponding set of policy approaches will be. Conversely, as long as real industries do not conform to idealised environments, a mixture of policy approaches will be a permanent state of affairs.

In conclusion, predetermined policy approaches are only as good as the working assumptions that underpin them. They are not a substitute for a careful examination of the structural context of policy decision-making.

5.0 CONVERGENCE SCENARIOS AND POLICY PRIORITIES

The last chapter identified a number of policy approaches for convergence and traditional industry environments that generally address *how* intervention should be undertaken. It did not address *where* intervention should be undertaken.

The determination of policy approaches for convergence environments is closely linked to the instances of market failure. Efficient convergence markets, if left to operate freely, will usually produce better economic outcomes than government intervention. The convergence policy approach of regulatory forbearance made this explicit: “*policy intervention should be confined to identifiable, significant and persistent market failure to achieve desired national outcomes, and where the benefits of intervention outweigh the costs*”.

In this chapter, the most important instances of market failure in the four structural scenarios are identified. By identifying the risks of market failure which can prevent the achievement of desired national outcomes, it is then possible to determine the policy priorities of each scenario.

All four structural scenarios are examined in this chapter for likely instances of market failure. The result in each case is an analysis of the risks from the likely failure of markets to achieve the desired national outcomes listed earlier in the report. The chapter concludes with a discussion of the links between structural factors and the corresponding policy priorities, and the determination of policy priorities in more complex structural scenarios.

The conclusions of this chapter are presented with an important qualification. They are based on an assessment of the *likely* instances of market failure, so the results are the *likely* policy priorities in different scenarios. In the spirit of regulatory forbearance, this analysis should not be used as the basis for pre-emptive intervention. Intervention should be directed towards real problems, not imagined ones. The modest purpose of this chapter is to chart the sources of risk, on the basis that “fore-warned is fore-armed”.

5.1 Desired outcomes, market failure and policy priorities

Government resources are limited, so policy interventions must be prioritised. The government's policy priorities are determined by two considerations:

- whether proposed policy priorities serve the national outcomes adopted by the government. Otherwise, interventions in support of those priorities would be pointless; and
- whether markets unaided will fail to achieve those outcomes. Otherwise, freely operating markets would deliver those outcomes anyway, and intervention would again be pointless.

The basic approach adopted in this report for the identification of policy priorities is:

Policy priorities emerge when markets fail to deliver desired national outcomes.

Desired national outcomes for the digital economy were outlined earlier in this report. Markets should be efficient, diverse and innovative, and offer high value employment

opportunities. Consumers should be informed, demanding and have ready access to digital services that present their domestic culture. Local industry should be innovative, widespread, internationally attractive, and globally recognised. These outcomes remain desirable regardless of the structural scenario.

In contrast to the desired national outcomes, the instances of market failure vary between scenarios. This means that policy priorities will also vary between scenarios. The identification of policy priorities in any given scenario must be linked to instances of market failure prevalent in that scenario.⁴

In particular, many market failures are due to centres of economic power, and are linked closely to variables like the level of vertical integration and the extent of market internationalisation. The structural scenarios make it possible to investigate how these factors will affect policy priorities.

5.2 Policy priorities in structural scenarios

Policy priorities depend on industry and market structure because these factors have a significant impact on the effectiveness of markets in delivering desired national outcomes. As convergence affects industry and market structure, new policy priorities will emerge.

Market internationalisation and vertical integration will have a powerful impact on the achievement of national outcomes. In scenarios where these are both significant factors, significant issues arise for all economic, consumer, cultural and industry development outcomes.

In other (less challenging) scenarios, the issues are still significant but different priorities arise for government. The forces of market internationalisation and vertical integration are at their weakest in the 'Home Alone' scenario. In this scenario, domestically focussed firms are only loosely integrated to underlying infrastructure businesses. Policy priorities in this scenario are lower overall because market efficiency is generally higher, and there is a lower likelihood of market failure to achieve desired national outcomes.

Priorities are ranked on a three-point scale: high, medium and low. "Medium" represents a similar level of priority to today's priority. "High" means that the priority is significantly higher than today, while "Low" means significantly lower than today.

Déjà Vu

The main feature of this scenario is its structural similarity to the traditional services industry (hence its name). The major difference is that there has been significant consolidation of the sector. The traditional industry oligopolies have been replaced by multi-industry oligopolies as integrated service providers take advantage of the cross-marketing opportunities inherent in computerised customer management, and as recognised service providers leverage their brand across multiple service markets.

⁴ This approach is based on a different definition of market failure to the definition normally used. Market failure usually means failure to achieve optimal market efficiency. The problem with this definition is that this optimum does not exist except in restricted circumstances. The approach adopted here does not rely on the identification of any theoretical optimum. Market failure is nothing more than the failure of markets to achieve desired national outcomes.

Vertical integration is closely associated with the failure of intermediate access and interconnection markets. The leverage of market power from infrastructure into service markets is the basic business strategy in this scenario, although established brands confer an additional advantage. As a result, it is difficult to reach the customer or audience without controlling significant digital infrastructure. Ownership of infrastructure becomes highly consolidated because infrastructure reach is the key to market power. Innovation is suppressed because infrastructure owners are the gatekeepers of new services. Local input industries are either squeezed by the economic power of the service providers, or go global to generate the scale and scope needed to survive.

The productivity benefits of digital technology are apparent in all countries, but a disproportionate share of the benefits go to the larger country markets like the US where internal economies of scale and scope can be realised. This advantage is increasingly reflected in their higher national competitiveness in international markets. Medium-sized countries respond by accelerating internal technology take-up, while small and developing countries fall behind.

Service providers maintain an infrastructure presence in isolated markets in order to preclude new entrants, and subsidise infrastructure tariffs from service revenues. Niche demands for service are neglected as innovation and new entry is suppressed.

The domestic scope of service markets reduces the level of competition. The result for consumers is a restriction of choice and a strong reliance on domestic regulation to secure consumer protection outcomes in the face of service providers' bottleneck power. Service providers' control of marketing and technology entrenches information asymmetries in consumer markets, discouraging the search for alternatives.

The domestic nature of service provision means that local content production is sustainable, but only with government support. Although consumer markets are still domestic, the content input market is more globalised than ever. Content service providers place use their bottleneck power to squeeze margins in the local production industry. Barriers to entry in content service markets prevent an increase in media diversity.

Investment attractiveness is largely determined by local market conditions such as the sophistication of consumers, social stability and availability of skills. The economic power associated with infrastructure raises returns to investment in digital networks relative to content and services.

The domestic scope of service markets keeps high-value activities and employment within the country, but national service centres emerge in the cities creating imbalances in urban/rural investment and job creation patterns.

The following table summarises the issues arising from market failure in this scenario, by mapping each issue to the desired national outcomes.

Table 5.1 Policy priorities for ‘Déjà Vu’ scenario

Desired outcomes	Priorities and issues
<i>Economic and employment</i>	
<i>Efficient markets along entire value chain</i>	<p>Priority: HIGH Vertical and horizontal bundling confers significant economic power, allowing service providers to capture the bulk of the economic value generated by new technology. Inefficient access markets for infrastructure and connectivity are the primary barrier to entry in service markets, but the power of established brands and customer relationships are also important. The bottleneck power associated with infrastructure raises the attractiveness of investment in digital networks.</p> <p>Consumer choice is constrained by the bottleneck power of service providers, and transfer costs are high. Significant information asymmetries constrain consumer choice, lowering competition in output markets. Input industries are under pressure to globalise and rationalise in response to the economic power of service providers.</p>
<i>Increasing productivity with uptake of digital technology</i>	<p>Priority: MEDIUM A higher share of productivity benefits is captured by technological leaders and by large country markets with significant internal economies of scale and scope. Technology take-up is slowed by barriers to entry which block innovative new entrants.</p>
<i>Innovative diverse markets</i>	<p>Priority: HIGH Customer lock-in and service provider control of delivery networks reduces the incentives for service innovation. Incumbents control service development, and hoard intellectual capital to prevent competitors or new entrants from developing new service offerings. Scope for development of niche markets by new entrants is limited by lack of access to underlying infrastructure and connectivity.</p>
<i>Broad deep markets for high skill and high value employment</i>	<p>Priority: HIGH Significant disparities between cities that host major service centres and rural areas that specialise in low-value or ancillary services and employment.</p>
<i>Social & cultural</i>	
<i>Widespread, affordable, reliable access to digital services</i>	<p>Priority: MEDIUM Infrastructure costs of rural and remote users are internally subsidised from premiums on value added services to capture market share. The Universal Service Obligation (USO) remains a safety net for basic services, but barriers to entry reduce the diversity of available services, and niche requirements are neglected.</p>
<i>Consumer confidence in service markets</i>	<p>Priority: MEDIUM The vertical and horizontal bundling of global service providers promotes economic bottlenecks and limits consumer choice. Strong information asymmetries in consumer markets discourage the search for alternatives.</p>
<i>Local participation and representation in the domestic and global culture</i>	<p>Priority: MEDIUM The economic power of domestic service providers squeezes returns to investment in local content production. Small national production industries are vulnerable to competition from global production houses which can match the economic power of service providers. Alternative outlets become proportionately more important.</p> <p>Barriers to entry in domestic content service markets prevent growth of media diversity.</p>

Industry and regional	
<i>International attractiveness as investment site for digital infrastructure and services</i>	Priority: MEDIUM Global capital markets for investment in digital infrastructure and services are attracted to relatively sophisticated consumer markets, social and political stability, and skilled workforces. Domestic market boundaries mean that the benefits are mostly internalised, but the largest domestic markets in North America and Europe benefit more because of their economies of scale. This is increasingly reflected in their overall international competitiveness.
<i>Global recognition as reliable, affordable service provider</i>	Priority: MEDIUM Domestic market boundaries limit the significance of this outcome in service markets, but global recognition is still important for input industries such as content production, applications development and IT equipment as a counter to the economies of scale and scope of global competitors.
<i>Strong capabilities in innovative applications and content development</i>	Priority: MEDIUM The domestic nature of most activity raises the demand for skills within all countries. Skilled staff are valued everywhere, but tend to be attracted to larger country markets where returns to skills (and other forms of capital) are higher.
<i>Broad geographic spread of domestic economic activity</i>	Priority: HIGH Highest economic activity is clustered near the major service centres, attracting skilled labour, training investment, and service delivery activity.

Virtual Countries

In *Virtual Countries*, the geographical scope of service markets is international, in contrast to the *Déjà Vu* scenario where these markets are domestic. The *Vertical Countries* scenario combines the economic issues related to vertical integration with the cultural and industry issues associated with globalisation. As a result, a range of policy priorities arise which are significantly higher than traditional priorities.

This scenario bears many similarities with the previous *Déjà Vu* scenario. Both scenarios share the basic business strategy of leveraging market power vertically from infrastructure into service markets and vice versa. Ownership of infrastructure becomes highly consolidated as infrastructure owners exercise bottleneck power by suppressing innovation and squeezing input industries.

Through cross-ownership and strategic alliances, the few major global players with vertically and horizontally integrated corporate structures create an oligopoly market. Competition between major players centres on the bundling of service packages with different infrastructure platforms. Cross-subsidising internal costs allows an infrastructure presence to be maintained in marginal countries and rural communities as a means of discouraging the entry of new competitors. Consumer transfer costs are high and service development and choice are controlled, lowering competition and preventing new entrants from developing niche markets.

Major industry players overtake the role of government in setting international standards. Consumers are strongly attracted as concerns about privacy and consumer protection trigger a "flight to quality". Consumer transfer costs are high due to mass customisation, and limited competition leads to a suppression of innovation.

Broadcasting and media are integrated with global distribution channels leading to a dominance of mass marketing and reduced media diversity.

Revenues from integrated service provision are funnelled back to the major players' global service centres. Nations and rural and regional centres that fail to host these service centres lose economic activity and suffer deteriorating balances of trade in services.

Investment in digital services and infrastructure are attracted to major global service centres. Mid-range and smaller countries that lack these major centres suffer significant trade imbalances as a result. Intellectual talent is also lost to countries which host these major service centres.

Table 5.2 Policy priorities for 'Virtual Countries' scenario

Desired outcomes	Priorities and issues
<i>Economic and employment</i>	
<i>Efficient markets along entire value chain</i>	<p>Priority: HIGH Vertical and horizontal bundling confers significant economic power, allowing service providers to capture the bulk of the economic value generated by new technology. Inefficient access markets for infrastructure and connectivity are the primary barrier to entry in service markets, but the power of established brands and customer relationships are also important. The bottleneck power associated with infrastructure raises the attractiveness of investment in digital networks.</p> <p>Consumer choice is constrained by the bottleneck power of service providers, and transfer costs are high, lowering competition in output markets. Input industries are under pressure to globalise in response to the economic power of service providers.</p>
<i>Increasing productivity with uptake of digital technology</i>	<p>Priority: HIGH Productivity gains are generated across the global economy, but the bulk of these gains are captured by global service centres which can exploit their economic efficiency and power, and where intellectual and human capital is centralised.</p>
<i>Innovative diverse markets</i>	<p>Priority: HIGH Customer lock-in and service provider control of delivery networks reduces the incentives for service innovation. Incumbents control service development, and hoard intellectual capital to prevent competitors or new entrants from developing new service offerings. Scope for the development of local or global niche markets by new entrants is limited by lack of access to underlying infrastructure and connectivity.</p>
<i>Broad deep markets for high skill and high value employment</i>	<p>Priority: HIGH There are significant labour market disparities between countries which host major service centres and "customer" countries which specialise in low-value or ancillary services and employment.</p>
<i>Social and cultural</i>	
<i>Widespread, affordable, reliable access to digital services</i>	<p>Priority: HIGH Infrastructure costs of rural and remote users are internally subsidised from premiums on value added services to capture market share. The USO remains a safety net for basic services, but barriers to entry reduce the diversity of available services, and niche requirements are neglected.</p>
<i>Consumer</i>	Priority: HIGH

<i>confidence in service markets</i>	The vertical and horizontal bundling of global service providers promotes economic bottlenecks and limits competitive pressure and consumer choice.. Strong information asymmetries in consumer markets discourage the search for alternatives. In the absence of international consumer protection mechanisms, consumer take-up of global electronic services is limited.
<i>Local participation and representation in the domestic and global culture</i>	Priority: HIGH The economic power of global service providers squeezes returns to investment in content production. Small national production industries are vulnerable to competition from global production houses that can match the economic power of service providers.
Industry and regional	
<i>International attractiveness as investment site for digital infrastructure & services</i>	Priority: HIGH Global capital markets for investment in digital infrastructure and services are attracted to global service centres where intellectual and human capital in centralised and traffic hubbing is high (so per-unit communications costs are lower). International market boundaries mean that international digital traffic volumes are high, but the benefits are largely captured major global service centres where traffic is hubbed and service development and deployment is centralised. Significant trade imbalances emerge as a result.
<i>Global recognition as reliable, affordable service provider</i>	Priority: HIGH Global brands are significant competitive factors, but are secondary compared to control of global infrastructure.
<i>Strong capabilities in innovative applications and content development</i>	Priority: HIGH Global service centres are powerful magnets for skilled individuals, who are attracted to the very high returns to their talents. Countries without a presence in the global services markets suffer a "brain drain" of their best talent to countries which host these centres, entrenching the global division of labour.
<i>Broad geographic spread of domestic economic activity</i>	Priority: HIGH The centralising tendencies of digital service provision are visible everywhere. Countries that host global service centres have the most uneven distribution of services activity. "Customer" nations lose economic activity across the board.

Home Alone

In this scenario, access to infrastructure is no longer the key to service markets. Efficient, competitive access markets have removed this centre of economic power. As a result, the sources of economic power are increasingly intangible. Branding and leverage of customer relationships are the basis of the business strategy in mass service markets. In contrast, the infrastructure and connectivity industries are increasingly commoditised. Structurally separated, the content/applications service and infrastructure/connectivity network industries are free to develop independently.

The establishment of intermediate access and interconnection markets drives the development of niche services and promotes competition in services provision. Infrastructure markets also experience high levels of competition. Lower returns to infrastructure, coupled with the inability to cross-subsidise from integrated service provision, places pressure on downward infrastructure investment which is offset by cost improvements through the deployment of new digital technologies.

The domestic scope of service markets reduces the impact of digital technology on international trade patterns and balances of payments, but some countries still emerge as

"winners" either by exploiting internal economies of scale and scope or by adopting technology leadership strategies, staying ahead of the pack on productivity improvements. Major global service centres fail to develop, allowing domestic service providers the ability to exploit both mass and niche markets in a local setting.

Consumer protection outcomes are enforced through domestic regulatory regimes, eroding the importance of trusted brands as a source of consumer confidence. Mass customisation strategies raise consumers' transfer costs, reducing competitive flexibility and raising some barriers to entry in the larger service markets.

Easy access to delivery infrastructure promotes media diversity and niche communities of interest. Mass markets remain important domestically. However, the globalisation of input markets continues to place pressure on the viability of high quality local-content industries.

Domestic market boundaries limit international investment. Larger domestic markets are favoured with their higher economies of scale as foci for investment and skills attraction. Regional service delivery activity fails to attract sufficient investment with activity clustering in major domestic service centres.

This scenario raises relatively lower priorities for government intervention than other scenarios. The combination of competitive intermediate access and interconnection markets and domestic market eliminates some of the priorities linked to vertical integration and market internationalisation.

Table 5.3 Policy priorities for 'Home Alone' scenario

Desired outcomes	Priorities and issues
<i>Economic and employment</i>	
<i>Efficient markets along entire value chain</i>	<p>Priority: LOW</p> <p>Domestic service providers seek economies of scale and scope through cross-ownership and strategic alliances, offering a diverse range of services. Branding and customer relationships are key advantages, but access markets encourage the proliferation of niche services. In contrast, infrastructure and connectivity markets are more commoditised, with high levels of competition amongst standardised network platforms. Lower returns to infrastructure place some downward pressure on network investment.</p> <p>Consumer capture through loyalty programs and service customisation using personal data means that oligopoly competition prevails in output markets. Content and applications development industries are under pressure to globalise in response to the economic power of service providers, or to adopt niche market approaches.</p>
<i>Increasing productivity with uptake of digital technology</i>	<p>Priority: MEDIUM</p> <p>A higher share of productivity benefits is captured by technological leaders and by large country markets with significant internal economies of scale and scope. Take-up is accelerated as new entrants use their access to networks to deploy innovative services.</p>
<i>Innovative diverse markets</i>	<p>Priority: MEDIUM</p> <p>Innovation and service customisation become as important as price in competitive offerings. Cost of innovation cannot be recovered through global reach, so innovation in small country markets tends to lag major country markets.</p>
<i>Broad deep markets for high skill and high</i>	<p>Priority: MEDIUM</p> <p>Growth of high skill/value employment held back in small markets because of lagging incentives for innovation, but "brain drains" are less</p>

<i>value employment</i>	prevalent because global distribution of service activity is more balanced.
Social and cultural	
<i>Widespread, affordable, reliable access to digital services</i>	<p>Priority: LOW</p> <p>Well-developed access markets provide opportunities for new entrants and specialists to address niche markets. A two-tier services sector emerges, with a few horizontally integrated national players and a diverse range of niche service providers.</p> <p>Infrastructure investment strategies in urban service centres and in rural areas diverge, with different technologies and commercial strategies becoming more apparent. A handful of carriers dominate urban and trunk digital infrastructure, while a range of specialist and niche carriers address rural and remote markets with wireless and satellite technology.</p> <p>The role of USO-style generic requirements is reduced as diversity of demand and niche marketing increases, and new opportunities emerge to facilitate commercial and market-based solutions for isolated groups.</p>
<i>Consumer confidence in service markets</i>	<p>Priority: MEDIUM</p> <p>National and State consumer protection regimes generate consumer confidence, promoting take-up and eroding the importance of national brands. Access to networks provides opportunities for new service entrants, but mass customisation of services raises transfer costs for consumers and raises new barriers to entry in mass markets.</p>
<i>Local participation and representation in the domestic and global culture</i>	<p>Priority: MEDIUM</p> <p>Strong access markets limit the economic power of domestic service providers, but content markets have continued to globalise, and small national production industries are still vulnerable to competition from global production houses with low-cost global content. Sources of media diversity proliferate as new service entrants target niche audiences as part of broader marketing strategies.</p>
Industry and regional	
<i>International attractiveness as investment site for digital infrastructure & services</i>	<p>Priority: MEDIUM</p> <p>Global capital markets for investment in digital infrastructure and services are attracted to relatively sophisticated consumer markets, social and political stability, and skilled workforces. Domestic market boundaries mean that the benefits are mostly internalised, but the largest domestic markets in North America and Europe benefit more because of their economies of scale. This is increasingly reflected in their overall international competitiveness.</p>
<i>Global recognition as reliable, affordable service provider</i>	<p>Priority: LOW</p> <p>Domestic market boundaries limit the significance of this outcome in service markets, but global recognition is still important for input industries such as content production, applications development and IT equipment as a counter to the economies of scale and scope of global competitors.</p>
<i>Strong capabilities in innovative applications and content development</i>	<p>Priority: MEDIUM</p> <p>The domestic nature of most activity raises the demand for skills within all countries. Skilled staff are valued everywhere, but tend to be attracted to larger country markets where returns to skills (and other forms of capital) are higher.</p>
<i>Broad geographic spread of domestic economic activity</i>	<p>Priority: HIGH</p> <p>Access markets promote the development of local and regional markets for content and applications which offset some of the dominance of the urban service centres, but the highest economic activity is still clustered near these centres, attracting skilled labour, training investment, and service delivery activity.</p>

Cut and Thrust

This scenario combines the impact of vertical disintegration with market internationalisation, and presents the most dramatically changed view of the future.

The establishment of efficient, competitive markets for access to infrastructure has shifted the centres of economic power from physical infrastructure to intangible assets such as global brands, specialised intellectual and human capital, and management of customer relationships.

The structural separation of the content/applications and infrastructure/connectivity industries has allowed these industries to develop separately. An oligopoly of globalised service providers dominates the service sector, with a large range of new entrants serving diverse needs and targeting local and global niches. Audiences and user groups have become more fragmented as a result, but mass marketed services are still a significant force. The globalisation of service and infrastructure provision have placed strong pressure on all input industries to either globalise, specialise, or both.

The economic activity associated with high-value services is concentrated in a number of global service centres where sophisticated intellectual capital and skilled workers are centralised. This has a destabilising impact on balances of services trade, reflected in large and unpredictable currency movements. The fast pace of innovation is driven by new entrants and niche providers, emboldened by the opportunity to leverage their global reach to recover their investment in new services.

A commoditised infrastructure/connectivity industry has restructured to address different geographical markets. A handful of mega-carriers now dominate urban corporate and international markets. Specialised carriers have turned rural, remote and developing country markets into a commercial opportunity by using wireless and satellite technologies to aggregate traffic nationally and regionally, reducing per unit costs.

Consumer protection in global marketplace is problematic because governments are still national. In the absence of agreed international consumer protection mechanisms, consumer engage in a "flight to quality" by sticking to globally recognised service brands, or rely on an established relationship with niche service providers. Sources of media diversity proliferate in the global marketplace.

The centralising tendencies of global service provision have a powerful impact on industry and regional development. Countries with an initial lead in specialised technical, marketing, customer management and service development skills become entrenched as major service centres because a virtuous circle of infrastructure investment and service activity draws in financial, intellectual and human capital from other countries. Countries that "miss the wave" find that high value-added activity is increasingly exported to these major service centres, along with the bulk of the economic and industry benefits. The strong centripetal force of these centres also draws skills and investment away from rural and remote areas, undermining services industry development.

The priorities that emerge from these issues are summarised in the following table.

Table 5.4 Policy priorities for ‘Cut and Thrust’ scenario

Desired outcomes	Priorities and issues
<i>Economic and employment</i>	
<i>Efficient markets along entire value chain</i>	<p>Priority: MEDIUM</p> <p>Global branding of “service suites” facilitates the emergence of globalised “general service providers” in oligopoly competition, offering a wide range of financial, information, and communications services and held together by cross-ownership and strategic alliances. In contrast, infrastructure and connectivity markets are more commoditised, with high levels of competition amongst standardised network platforms. Lower returns to infrastructure place some downward pressure on network investment. Barriers to entry in service markets are largely due to intangible factors such as global branding and possession of customer databases. Robust access markets provide opportunities for new entrants to establish a foothold in niche markets where these factors are less significant. Consumer capture through loyalty programs and service customisation using personal data means that oligopoly competition prevails in global consumer markets. Input industries are under pressure to globalise in response to the economic power of service providers.</p>
<i>Increasing productivity with uptake of digital technology</i>	<p>Priority: HIGH</p> <p>Productivity gains are generated across the global economy, but the bulk of these gains are captured by global service centres which can exploit their economic efficiency and power, and where intellectual and human capital is centralised.</p>
<i>Innovative diverse markets</i>	<p>Priority: MEDIUM</p> <p>Customer lock-in is not as strong, and innovation and service customisation are as important as price in competitive offerings. Cost of innovation is recovered by exploiting global reach, raising the pace of innovation. There is significant scope for exploitation of transitory and international niche markets through superior management of specialised intellectual and human capital.</p>
<i>Broad deep markets for high skill and high value employment</i>	<p>Priority: HIGH</p> <p>There are significant disparities between countries which host major service centres and “customer” countries that specialise in low-value or ancillary services and employment.</p>
<i>Social and cultural</i>	
<i>Widespread, affordable, reliable access to digital services</i>	<p>Priority: MEDIUM</p> <p>Well-developed access markets provide opportunities for new entrants and specialists to address niche markets. A two-tier services sector emerges, with a few horizontally integrated global players and a diverse range of niche service providers. Infrastructure investment strategies in urban service centres and in rural areas diverge, with different technologies and commercial strategies becoming more apparent. National carriers disintegrate and a two-tier carrier market emerges. A handful of mega-carriers dominate global traffic and urban infrastructure, while a range of specialist and niche carriers address rural, remote and developing country markets with wireless and satellite technology. The role of USO-style generic requirements is reduced as diversity of demand increases, and new opportunities emerge to facilitate commercial and market-based solutions for isolated groups.</p>

<i>Consumer confidence in service markets</i>	Priority: HIGH Global brands dominate the market, and are a key determinant of consumer choice, and protection of the brand generates strong incentives for industry self-regulation on consumer matters. Mass customisation of services raises transfer costs for consumers, limiting consumer choice. Niche demand is met by a range of specialist providers, but incentives for self-regulation are weaker in this sector. In the absence of international consumer protection mechanisms, consumer enthusiasm for electronic services is reduced, but global brands serve as a commercial substitute in many cases.
<i>Local participation and representation in the domestic and global culture</i>	Priority: HIGH The two-tier service market is reflected in growing fragmentation of domestic mass audiences and the emergence of global niche markets. Access markets to connectivity remove one barrier to entry, but small national production industries are still vulnerable the economic power of global service providers, and to competition from global production houses. Sources of media diversity proliferate as new local and international service entrants target niche audiences as part of broader marketing strategies
Industry and regional	
<i>International attractiveness as investment site for digital infrastructure & services</i>	Priority: HIGH Global capital markets for investment in digital infrastructure and services are attracted to global service centres where intellectual and human capital in centralised and traffic hubbing is high (so per-unit communications costs are lower). International market boundaries mean that international digital traffic volumes are high, but the benefits are largely captured major global service centres where traffic is hubbed and service development and deployment is centralised. Significant trade imbalances emerge as a result, but these are offset in some small markets by niche market strategies which exploit access to networks to develop specialised global services.
<i>Global recognition as reliable, affordable service provider</i>	Priority: HIGH Global brands are the primary competitive factor in mass markets, but niche strategies where generalised branding is less important are also viable.
<i>Strong capabilities in innovative applications and content development</i>	Priority: HIGH Global service centres are powerful magnets for skilled individuals, who are attracted to the very high returns to their talents. Countries without a presence in the global services markets suffer a "brain drain" of their best talent to countries which host these centres, entrenching the global division of labour.
<i>Broad geographic spread of domestic economic activity</i>	Priority: HIGH The centralising tendencies of digital service provision are visible everywhere. Countries that host global service centres have the most uneven distribution of services activity. "Customer" nations lose economic activity across the board. Regions and customer nations can offset this tendency by developing specialised services for international and global markets.

5.3 Industry structure, market boundaries and policy priorities

The policy priorities identified in the last section are mapped against the four scenarios in the following table. This summary allows some general observations to be drawn about the correlation between structural changes and the policy priorities which emerge.

Table 5.5 Policy priorities in the major structural scenarios

<i>Desired outcomes</i>	Déjà Vu	Virtual Countries	Home Alone	Cut and Thrust
<i>Economic and employment</i>				
<i>Efficient markets along entire value chain</i>	HIGH	HIGH	LOW	LOW
<i>Increasing productivity with uptake of digital technology</i>	MEDIUM	HIGH	MEDIUM	HIGH
<i>Innovative diverse markets</i>	HIGH	HIGH	MEDIUM	MEDIUM
<i>Broad deep markets for high skill and high value employment</i>	MEDIUM	HIGH	MEDIUM	HIGH
<i>Social and cultural</i>				
<i>Widespread, affordable, reliable access to digital services</i>	MEDIUM	HIGH	LOW	MEDIUM
<i>Consumer confidence in service markets</i>	MEDIUM	HIGH	MEDIUM	HIGH
<i>Local participation and representation in the domestic and global culture</i>	MEDIUM	HIGH	MEDIUM	HIGH
<i>Industry and regional</i>				
<i>International attractiveness as investment site for digital infrastructure & services</i>	MEDIUM	HIGH	MEDIUM	HIGH
<i>Global recognition as reliable, affordable service provider</i>	LOW	HIGH	LOW	HIGH
<i>Strong capabilities in innovative applications and content development</i>	MEDIUM	HIGH	MEDIUM	HIGH
<i>Broad geographic spread of domestic economic activity</i>	HIGH	HIGH	HIGH	HIGH

The following general observations can be made about the pattern of policy priorities:

- There are more high priorities than low ones, suggesting that the policy challenge will tend to increase as structural change advances;
- All scenarios exhibit some high priorities, but the scale of the policy challenge varies significantly in different scenarios. Scenarios which combine vertical integration with market internationalisation are highly problematic, and exhibit high policy priorities in all outcome categories. Other scenarios exhibit problems only in certain areas; .
- Vertical disintegration generally reduces the prevalence of market failure, due to the strong link between disintegration and the emergence of efficient access markets.
- Market internationalisation has a generally destabilising effect which is reflected in a large number of high policy priorities in the globalised scenarios; .
- Priorities for economic outcomes are most sensitive to the level of vertical integration, due to the strong linkage between the failure of access markets and the emergence of bottleneck power in infrastructure and connectivity industries. Higher levels of market internationalisation tend to reduce these priorities due to the benefits of international competition; .
- Priorities for social/cultural and industry/regional outcomes are strongly correlated with market internationalisation, due to the significant risk of a transfer of domestic economic activity to globalised service providers and globalised input industries. Consumer protection issues are more difficult to manage in a globalised marketplace, while Australian cultural, applications development, and equipment industries are vulnerable to international competition in these scenarios. Higher levels of vertical integration are also correlated with higher priorities in these outcome areas, largely due to the negative impact of the bottleneck power of intermediaries; .
- Digital service delivery tends to be a centralised activity. This is reflected in the generally high policy priorities for the "broad distribution of domestic economic activity" in most scenarios, and has significant implications for economic assistance policies in regional Australia.

5.4 Achieving desired national outcomes: a risk analysis

Identifying the scope for market failure does not cover the full risks from convergence on policy. True risk analyses must not only consider the impact of an event but also the likelihood of that event occurring. It requires an assessment of the relative probabilities that various scenarios will actually occur. Rather than attempt to linearly predict future industry structure, this risk analysis will simply assess whether certain scenarios are more likely relative to other scenarios.

For government, the highest risk would be present in a scenario that has both high policy priorities and a high likelihood of occurrence. Conversely, the lowest risk would be present in a scenario that has lower policy priorities and a low likelihood of occurrence.

The issues paper identified significant trends towards the vertical disintegration of industry structures and internationalisation of consumer service markets. Countervailing forces exist, but the strength of the underlying trends suggests that the convergence trends are more likely than not to be manifested in industry and market structures.

This preliminary assignment of probabilities allows likelihoods to be assigned to different structural scenarios. The most likely scenario, given convergence trends, is *Cut and Thrust*. In contrast, *Déjà Vu* is the least likely, while *Virtual Countries* and *Home Alone*

are in between. This allows a preliminary risk assessment to be made of each scenario by combining the assessments of policy priorities with the assessments of scenario likelihood.

Table 5.6 Risk analysis of convergence scenarios

	Policy priorities	Likelihood	Risk
<i>Déjà Vu</i>	Medium	Least likely	LOW
<i>Virtual Countries</i>	High	Likely	HIGH
<i>Home Alone</i>	Low-medium	Likely	LOW
<i>Cut and Thrust</i>	Medium-high	Most likely	HIGH

The internationalised scenarios tend to exhibit the highest policy risks, namely *Virtual Countries* and *Cut and Thrust*.

Although vertical disintegration and market internationalisation have been treated as mutually independent elements, there is some association between the two. Industries that have vertical structural separation will make it easier for markets to be international in scope because barriers to foreign entry are lower. The relative likelihood of scenarios may therefore vary over time. This takes us into the issue of transition management which will be discussed in the next chapter.

6.0 CONVERGENCE SCENARIOS AND POLICY OPTIONS

Policy priorities vary in different structural scenarios because the desired national outcomes are harder to achieve in some scenarios than in others. The last chapter examined which scenarios were associated with market failure to achieve certain national outcomes. This made it possible to identify the national policy priorities in each scenario.

Similarly, the appropriate intervention strategies vary in different structural scenarios because an intervention is generally more effective in some scenarios than in others. The same objectives may require different mechanisms because different “points of intervention” are available in different industry structures. This can be summed up in the following statement:

The government’s policy options are determined by the available points of intervention.

To a significant extent, these points of intervention are determined by the prevailing industry structure and business model. As that structure changes, so do the government’s policy options. What works for a vertically integrated industry or domestic service market may not work for a disintegrated industry or international service market.

This chapter identifies options for convergence intervention strategies in stages:

- the scope for structural policies to favour certain structural scenarios is determined;
- the major points of intervention in each of the four structural scenarios are identified, along with generic intervention strategies which exploit those points of intervention; and
- these generic intervention strategies are applied, in the light of convergence policy approaches, to the national policy priorities in order to identify the government’s policy options.

Policy intervention cannot always make up for market failure, and there is no guarantee that the policy options available in any given scenario will be sufficient to address the policy priorities in that scenario. Some desired outcomes will always be difficult to achieve.

As stated in the previous chapter, structural scenarios are not predictions. Similarly, these policy options are not recommendations. The purpose of this approach is to illuminate the relationship between industry structure, government policy priorities, and options for intervention. The insights gained from the analysis of these simple scenarios will equip the government to address the more complex scenarios that will ultimately arise.

6.1 Structural intervention and industry outcomes

The issues paper identified different types of intervention strategies, which can be classified into three main groups:

- Interventions in market and industry structure. Examples include access requirements on digital networks and controls on market entry, because these interventions both affect directly affect market and industry structure respectively; and

- Interventions in market conduct. Local content rules, consumer redress requirements, anti-competitive conduct rules, and licence conditions of various other kinds are all examples of conduct regulation. They are designed to influence market conduct within a given industry and market structure;
- Intervention in market activities. These interventions include direct participation (e.g. public broadcasting and government service provision) or indirectly support (e.g. subsidisation of certain activities).

Structural intervention obviously affects structural outcomes, so does this mean that government can control which structural scenarios ultimately emerge? If so, this would considerably simplify the policy challenge because the most favourable structural scenarios (favourable from the government's perspective, of course) could be selected.

There are good reasons to believe that this level of government control will not be possible. Structural intervention allows government to influence the detail of the structural scenarios that will ultimately emerge, but this influence is strictly limited by underlying technological and commercial developments. For example, the establishment of interconnection and access regulation was possible only because the technical capacity appeared, and commercial interests emerged who wanted that access. Had one or both of these factors been absent, interconnection and access regulation would never have been attempted, let alone have succeeded. Similarly, control of market entry has traditionally been common in service markets, but could not have succeeded had services not been integrated with domestic infrastructures.

Access to digital connectivity and infrastructure is a topical example. There are several examples of commercial developments which can be interpreted as the re-emergence of vertical integration strategies in overseas markets, notable the recent AOL Time-Warner merger and the AT&T acquisition of major cable networks. In these cases, the commercial resistance to these strategies has been stronger than the regulators' resistance. Content and service providers realise that their interests are best served when they can reach the widest possible consumer market, which requires access to a range of digital networks. Attempts to re-establish infrastructure bottlenecks are resisted, and even infrastructure owners seem to grudgingly recognise that they need to provide a diversity of content and services to satisfy their own customers.

The role of government in these cases will be to facilitate commercial access to digital networks. The market for this access already exists, because the commercial incentives for access negotiations already exist. The objective of intervention will be to ensure that this market is competitive and efficient.

In summary, government has an important part to play in entrenching beneficial structural changes, but it cannot control global industry change. This means that it cannot choose between structural scenarios. Technological and commercial forces will primarily determine structural developments, with intervention playing a secondary, facilitative role. "Structural" interventions are not interventions that determine industry structure; they are interventions that facilitate change to industry structure.

6.2 Points of intervention and industry structure

Points of intervention are the points where the policy levers which affect economic, social/cultural and industry development outcomes can be applied. In most cases, these points are the relationships between different industry participants, and those

relationships are generally market relationships. Policy intervention is largely about setting the terms of participation in key market relationships.

Points of intervention are dependent on industry structure, because industry structure determines which relationships are internalised within firms and which relationships externalised in markets. It is impracticable to intervene in internal relationships because they are usually invisible and unique to individual industry participants. Only market relationships are accessible to intervention.

In the traditional services industry structure, points of intervention are limited because intermediate markets for networked services do not exist. This is because of the vertical integration of industries, and of the absence of interconnection markets between different industries' analog and physical networks. The main available points of intervention are:

- entry to the domestic infrastructure markets which underpin service delivery;
- input markets such as telecommunications equipment and content production; and
- consumer markets for services such as telephony, advertising and entertainment.

All of these points of intervention are exploited in traditional services sector regulation:

- industry structure has been controlled through licensing of domestic infrastructures, which has been used to impose conduct requirements on service providers in both input and output markets. Government itself was an important or even dominant participant in many service markets such as telecommunications, broadcasting, education and health;
- participation in input markets has been extensive, principally through indirect means such as R&D grants and tax concessions, and funding for cultural content production; and
- directly-imposed requirements in consumer markets have been important in enforcing consumer rights.

Policy frameworks for traditional industries were structured independently, and were tailored to the technologies and special requirements of those industries. A strictly domestic policy agenda could be pursued because services were tied to domestic infrastructures.

In contrast, a convergence industry structure has a range of intermediate markets in addition to the traditional points of intervention:

- access regimes influence commercial outcomes in intermediate markets for infrastructure and connectivity; and
- interconnection regimes enhance competition between competing service delivery platforms.

Government control of service market entry is being eroded as service, connectivity and infrastructure activities are increasingly disintegrated, and control of domestic infrastructures no longer implies control of service market entry.

In addition, service markets are potentially international because services can be delivered through international infrastructures. This makes choices about intervention

strategies much more complex because a domestic policy agenda cannot be pursued without regard for international legal, governance and technical norms unless countervailing trends confine the service market within national borders. Even then, international input and intermediate markets will have indirect effects on domestic service market outcomes.

Until recently these norms have been determined in the US, which has dominant market share in most areas of the digital economy. Recently, multilateral efforts to set these norms (e.g. domain name allocation) have begun to have impact. The forums where these norms are determined are emerging as important points of intervention for setting commercial conditions in the global services sector.

Decisions about the appropriate intervention strategies to adopt will depend on how convergence and countervailing trends work out in practice. The review has already identified different ways that these trends could be manifested, reflected in the four structural scenarios developed in the preceding chapters. Different elements of the traditional and convergence structures are present in each scenario. In addition, different structural outcomes are possible in different industries if countervailing technological or demand factors are different in those industries. The most likely outcome is that a mixture of traditional and new interventions will be required.

6.3 Points of intervention in structural scenarios

The issues paper discussed the broad categories of intervention available to governments. The types of intervention identified in that discussion can be summed up as:

- Interventions in market *structure*. Interconnection and access requirements on networks are an example of structural intervention because they directly affect market and industry structure;
- Interventions in market *conduct*. Local content rules, consumer redress requirements, anti-competitive conduct rules, and licence conditions of various other kinds are all examples of conduct regulation. They are designed to influence market conduct within a certain industry and market structure;
- Interventions through government *participation* in markets through measures such as direct or indirect subsidisation of industry and community activities (e.g. the Australian Film Commission), participation in business activities (e.g. national broadcasting), or moral suasion designed to encourage or discourage certain activities (e.g. telecommunications industry development planning).

These three types of intervention can be mapped against the major markets along the convergence value chain. The boundaries between these three types of intervention are sometimes blurred, especially when vertical integration of services and infrastructure allows service output requirements to be enforced through controls on infrastructure entry, but the distinction is still useful because there is still a difference between structure and conduct.

Once this mapping has been completed, the points of intervention in those markets can then be classified. An indicative checklist of interventions possible in input, intermediate and output markets is presented in the following table:

Table 6.1 Indicative checklist of points of intervention

Types of intervention	Input markets	Intermediate markets	Consumer markets
Structural interventions	<ul style="list-style-type: none"> • Control of input market entry • Creation of property rights <ul style="list-style-type: none"> - copyright - patents • Technical regulation • International trading rules 	<ul style="list-style-type: none"> • Control of infrastructure and connectivity entry <ul style="list-style-type: none"> - licensing - ownership rules • Creation of access rights <ul style="list-style-type: none"> - access guidelines and arbitration • Technical regulation • International trading rules 	<ul style="list-style-type: none"> • Control of service market entry • Creation of property rights <ul style="list-style-type: none"> - copyright - trademarks and brand protection • Aggregation of government and consumer demand • Technical regulation • International trading rules • Consumer awareness and information
Conduct interventions	<ul style="list-style-type: none"> • Competition rules • Local content purchasing requirements 	<ul style="list-style-type: none"> • Competition rules • Universal service requirements for provision of infrastructure or connectivity 	<ul style="list-style-type: none"> • Competition rules • Consumer regulation <ul style="list-style-type: none"> - service standards and provider accreditation - consumer redress - privacy • Local content output rules • Community standards rules
Government participation	<ul style="list-style-type: none"> • Subsidisation or supply of inputs <ul style="list-style-type: none"> - skills - content - R&D • Allocation of spectrum and electronic addressing • Tax concessions for domestic supply or purchase of content, equipment or other inputs 	<ul style="list-style-type: none"> • Government provision or supply of infrastructure and connectivity • Tax concessions for investment in domestic infrastructure or connectivity 	<ul style="list-style-type: none"> • Government purchase of services • Government provision of services • Consumer subsidies • Tax concessions for domestic supply or purchase of services

Different subsets of these interventions are available in different structural scenarios. These subsets define the government's policy options in those scenarios.

Deja Vu scenario

In the *Deja Vu* scenario, the absence of intermediate markets removes all potential for intervention in those markets. International trading rules also lose relevance, as services markets are domestic and do not cross international boundaries (although they may retain relevance in input markets that can be international).

Table 6.2 Points of intervention in the *Deja Vu* scenario
 (blocked areas denote reduced effectiveness of these points of intervention)

Types of intervention	Input markets	Intermediate markets	Consumer markets
Structural interventions	<ul style="list-style-type: none"> Control of input market entry Creation of property rights - copyright - patents Technical regulation International trading rules 	<ul style="list-style-type: none"> Control of infrastructure and connectivity entry - licensing - ownership rules Creation of access rights - access guidelines and arbitration Technical regulation International trading rules 	<ul style="list-style-type: none"> Control of service market entry Creation of property rights - copyright - trademarks and brand protection Aggregation of government and consumer demand Technical regulation International trading rules Consumer awareness and information
Conduct interventions	<ul style="list-style-type: none"> Competition rules Local content purchasing requirements 	<ul style="list-style-type: none"> Competition rules Universal service requirements for provision of infrastructure or connectivity 	<ul style="list-style-type: none"> Competition rules Consumer regulation - service standards and provider accreditation - consumer redress - privacy Local content output rules Community standards rules
Government participation	<ul style="list-style-type: none"> Subsidisation or supply of inputs - skills - content - R&D Allocation of spectrum and electronic addressing Tax concessions for domestic supply or purchase of content, equipment or other inputs 	<ul style="list-style-type: none"> Government provision or supply of infrastructure and connectivity Tax concessions for investment in domestic infrastructure or connectivity 	<ul style="list-style-type: none"> Government purchase of services Government provision of services Consumer subsidies Tax concessions for domestic supply or purchase of services

All references to service standards and government provision of services in output markets now also imply intervention in infrastructure and connectivity because of the integration of service and infrastructure activities. This is why the infrastructure-related interventions no longer appear in the intermediate market column.

Home Alone scenario

The *Home Alone* scenario presents a vertically disintegrated industry where control of service market entry is no longer linked to control of infrastructure. While the relevance of international trading rules in consumer markets is still low, intermediate markets are present and provide a wide range of points of intervention:.

Table 6.3 Points of intervention in *Home Alone* scenario
 (blocked areas denote reduced effectiveness of these points of intervention)

Types of intervention	Input markets	Intermediate markets	Consumer markets
Structural interventions	<ul style="list-style-type: none"> Control of input market entry Creation of property rights <ul style="list-style-type: none"> - copyright - patents Technical regulation International trading rules 	<ul style="list-style-type: none"> Control of infrastructure and connectivity entry <ul style="list-style-type: none"> - licensing - ownership rules Creation of access rights <ul style="list-style-type: none"> - access guidelines and arbitration Technical regulation International trading rules 	<ul style="list-style-type: none"> Control of service market entry Creation of property rights <ul style="list-style-type: none"> - copyright - trademarks and brand protection Aggregation of government and consumer demand Technical regulation International trading rules Consumer awareness and information
Conduct interventions	<ul style="list-style-type: none"> Competition rules Local content purchasing requirements 	<ul style="list-style-type: none"> Competition rules Universal service requirements for provision of infrastructure or connectivity 	<ul style="list-style-type: none"> Competition rules Consumer regulation <ul style="list-style-type: none"> - service standards and provider accreditation - consumer redress - privacy Local content output rules Community standards rules
Government participation	<ul style="list-style-type: none"> Subsidisation or supply of inputs <ul style="list-style-type: none"> - skills - content - R&D Allocation of spectrum and electronic addressing Tax concessions for domestic supply or purchase of content, equipment or other inputs 	<ul style="list-style-type: none"> Government provision or supply of infrastructure and connectivity Tax concessions for investment in domestic infrastructure or connectivity 	<ul style="list-style-type: none"> Government purchase of services Government provision of services Consumer subsidies Tax concessions for domestic supply or purchase of services

Separate licensing of infrastructure, connectivity and services is possible in this scenario because all of these activities are confined to domestic markets and are subject to domestic control. This scenario presents the least problematic subset of points of intervention, and also happens to have the least challenging set of policy priorities as well.

Virtual Countries scenario

Like the *Deja Vu* scenario, the *Virtual Countries* scenario does not have intermediate markets and lacks all intervention points in those markets. In contrast to *Deja Vu*, international trading rules are a key point of intervention in international service markets.

The inescapably domestic nature of infrastructure licensing, in conjunction with the integration of service and infrastructure activities, means that concerted efforts by national governments can achieve effective control of international service market entry and the imposition of a range of requirements in those markets. Domestic technical regulation is displaced by reliance on international technical fora and industry consensus.

Table 6.4 Points of intervention in *Virtual Countries* scenario
(blocked areas denote reduced effectiveness of these points of intervention)

<i>Types of intervention</i>	Input markets	Intermediate markets	Consumer markets
Structural interventions	<ul style="list-style-type: none"> Control of input market entry Creation of property rights <ul style="list-style-type: none"> - copyright - patents Technical regulation International trading rules 	<ul style="list-style-type: none"> Control of infrastructure and connectivity entry <ul style="list-style-type: none"> - licensing - ownership rules Creation of access rights <ul style="list-style-type: none"> - access guidelines and arbitration Technical regulation International trading rules 	<ul style="list-style-type: none"> Control of service market entry Creation of property rights <ul style="list-style-type: none"> - copyright - trademarks and brand protection Aggregation of government and consumer demand Technical regulation International trading rules Consumer awareness and information
Conduct interventions	<ul style="list-style-type: none"> Competition rules Local content purchasing requirements 	<ul style="list-style-type: none"> Competition rules Universal service requirements for provision of infrastructure or connectivity 	<ul style="list-style-type: none"> Competition rules Consumer regulation <ul style="list-style-type: none"> - service standards and provider accreditation - consumer redress - privacy Local content output rules Community standards rules
Government participation	<ul style="list-style-type: none"> Subsidisation or supply of inputs <ul style="list-style-type: none"> - skills - content - R&D Allocation of spectrum and electronic addressing Tax concessions for domestic supply or purchase of content, equipment or other inputs 	<ul style="list-style-type: none"> Government provision or supply of infrastructure and connectivity Tax concessions for investment in domestic infrastructure or connectivity 	<ul style="list-style-type: none"> Government purchase of services Government provision of services Consumer subsidies Tax concessions for domestic supply or purchase of services

Cut and Thrust scenario

The *Cut and Thrust* scenario is the most challenging scenario from the perspective of intervention because the general lack of intervention points makes it difficult to address the significant policy priorities which also arise.

The simultaneous internationalisation of service markets and vertical disintegration of service and infrastructure activities prevents the control of service market entry. This eliminates the traditional mechanism for the enforcement of conduct interventions in service output markets, including local content requirements, community standards regulation, consumer requirements, and competition regulation.

The only alternative is the development of a range of international fora that can be used as the basis for the international regulatory cooperation needed to address the policy priorities in this scenario. On the positive side, the emergence of efficient intermediate markets can be facilitated through regulation. This offsets the loss of direct control over anti-competitive behaviour.

Table 6.5 Points of intervention in *Cut and Thrust* scenario
(blocked areas denote an inability to use these points of intervention)

<i>Types of intervention</i>	Input markets	Intermediate markets	Consumer markets
Structural interventions	<ul style="list-style-type: none"> Control of input market entry Creation of property rights <ul style="list-style-type: none"> - copyright - patents Technical regulation International trading rules 	<ul style="list-style-type: none"> Control of infrastructure and connectivity entry <ul style="list-style-type: none"> - licensing - ownership rules Creation of access rights <ul style="list-style-type: none"> - access guidelines and arbitration Technical regulation International trading rules 	<ul style="list-style-type: none"> Control of service market entry Creation of property rights <ul style="list-style-type: none"> - copyright - trademarks and brand protection Aggregation of government and consumer demand Technical regulation International trading rules Consumer awareness and information
Conduct interventions	<ul style="list-style-type: none"> Competition rules Local content purchasing requirements 	<ul style="list-style-type: none"> Competition rules Universal service requirements for provision of infrastructure or connectivity 	<ul style="list-style-type: none"> Competition rules Consumer regulation <ul style="list-style-type: none"> - service standards and provider qualifications - consumer redress - privacy Local content output rules Community standards rules

<p>Government participation</p>	<ul style="list-style-type: none"> • Subsidisation or supply of inputs <ul style="list-style-type: none"> - skills - content - R&D • Allocation of spectrum and electronic addressing • Tax concessions for domestic supply or purchase of content, equipment or other inputs 	<ul style="list-style-type: none"> • Government provision or supply of infrastructure and connectivity • Tax concessions for investment in domestic infrastructure or connectivity 	<ul style="list-style-type: none"> • Government purchase of services • Government provision of services • Consumer subsidies • Tax concessions for domestic supply or purchase of services
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General observations

A range of general observations flow from the patterns of intervention in the tables in the last section.

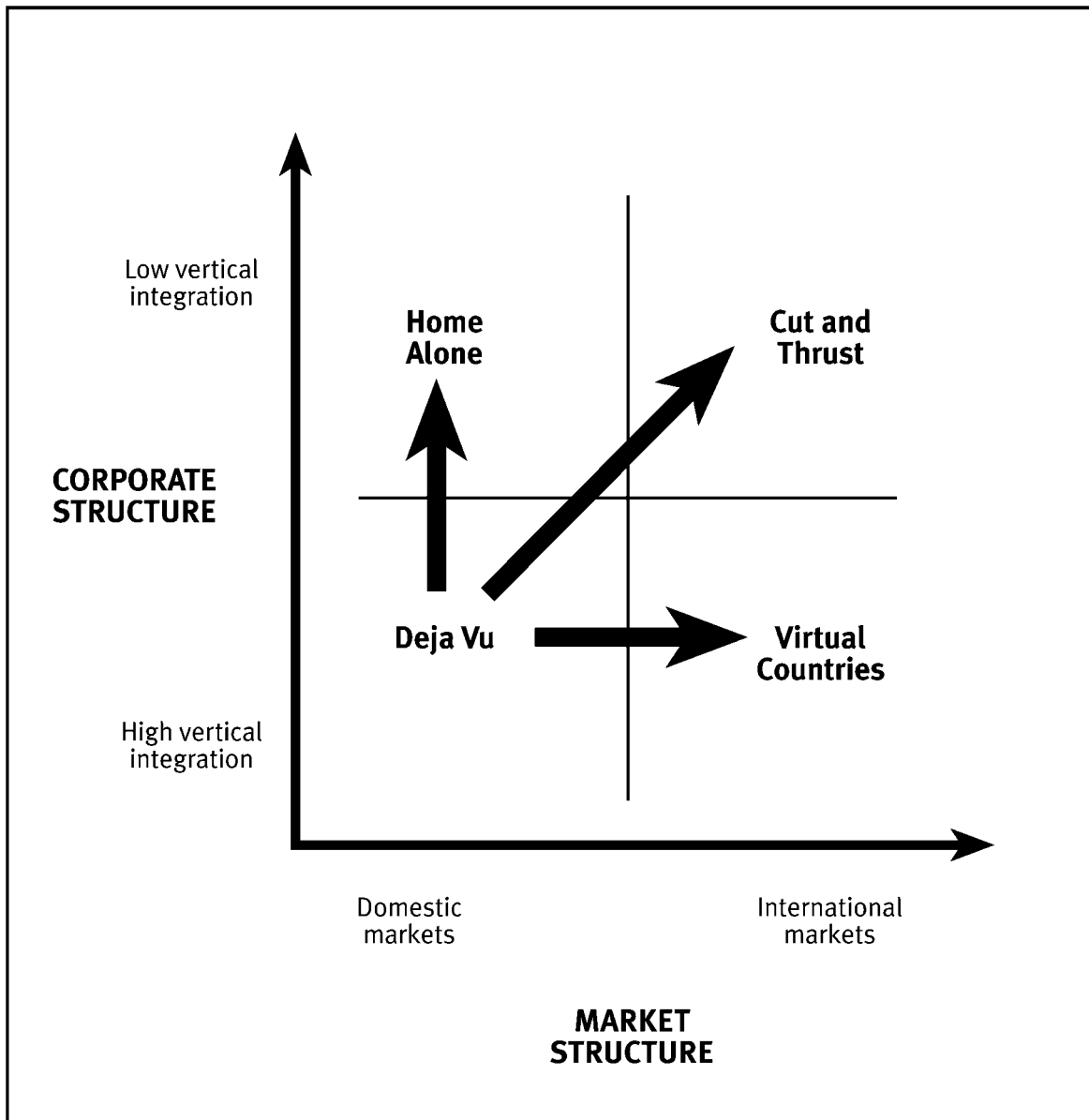
- Vertical integration eliminates intermediate markets as points of intervention, reducing the palette of intervention options. Conversely, vertical disintegration makes intervention in intermediate markets feasible, and makes the palette of intervention options much more complex;.
- The vertical disintegration of services and infrastructure, coupled with market internationalisation, eliminates many consumer market interventions that would otherwise be enforced through control of domestic service or infrastructure entry;.
- Government participation is mostly unaffected by structural change, so those types of interventions are available in all scenarios.

6.4 Transition management and structural change

The management of the transition from traditional to convergence industry structures is challenging because of the scale of convergence structural change and the uncertainty about structural outcomes. It is still possible to make some preliminary statements about the nature of transition management in the convergence industries.

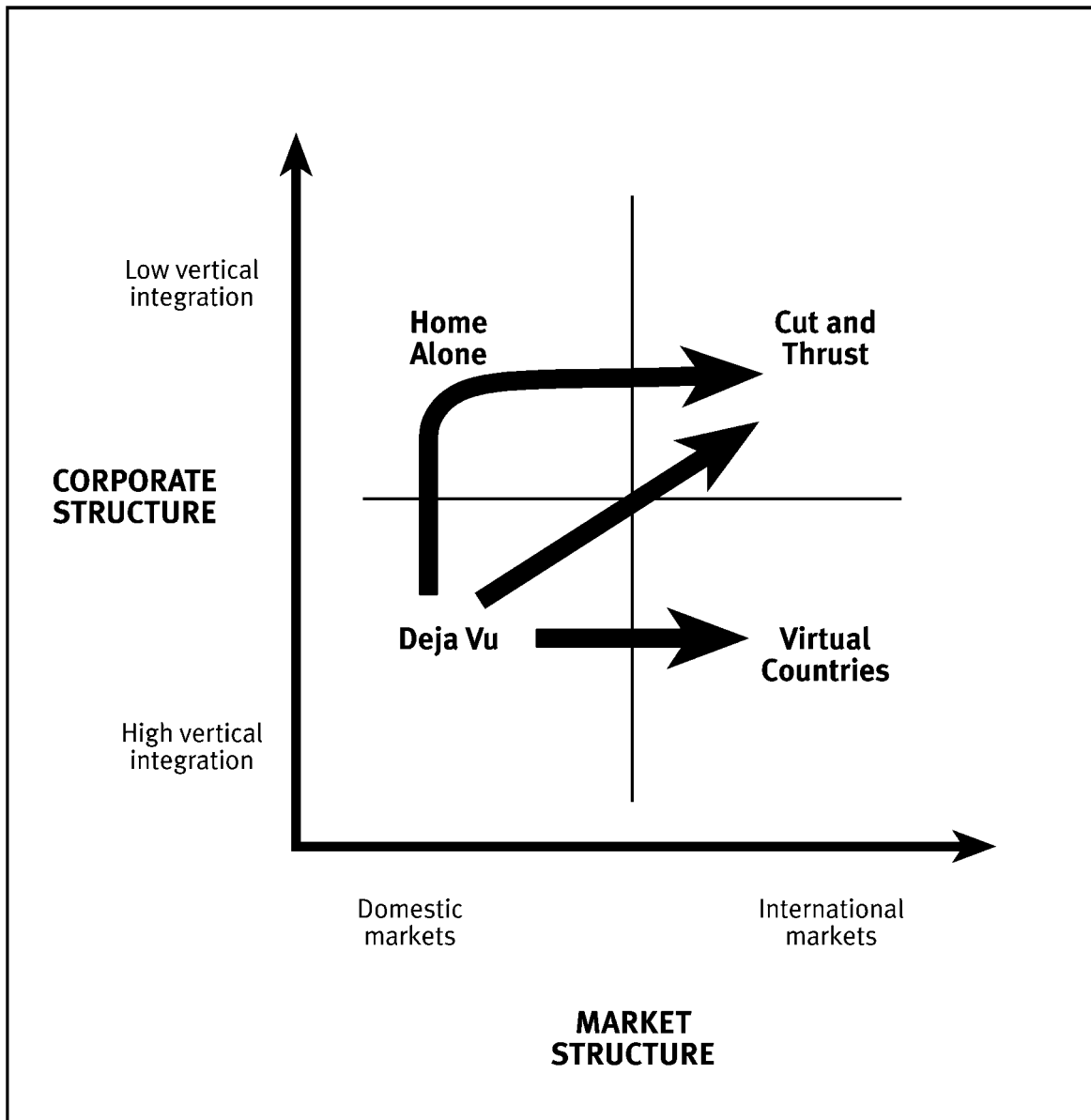
The transition between different industry and market structures can be thought of as a trajectory which crosses a two-dimensional map of structural scenarios. These trajectories begin at the *Déjà Vu* scenario because that scenario is the digital counterpart of the traditional industry and market structure. There is also a possible "zero trajectory" which stays in the *Déjà Vu* quadrant.

Exhibit 6.1 Indicative structural transitions



The linkage between these two convergence trends means that some scenarios are less sustainable than others. This reduces the likelihood of the *Home Alone* scenario, and increases the likelihood of *Cut and Thrust*.

Exhibit 6.2 Structural transition with dependent trends



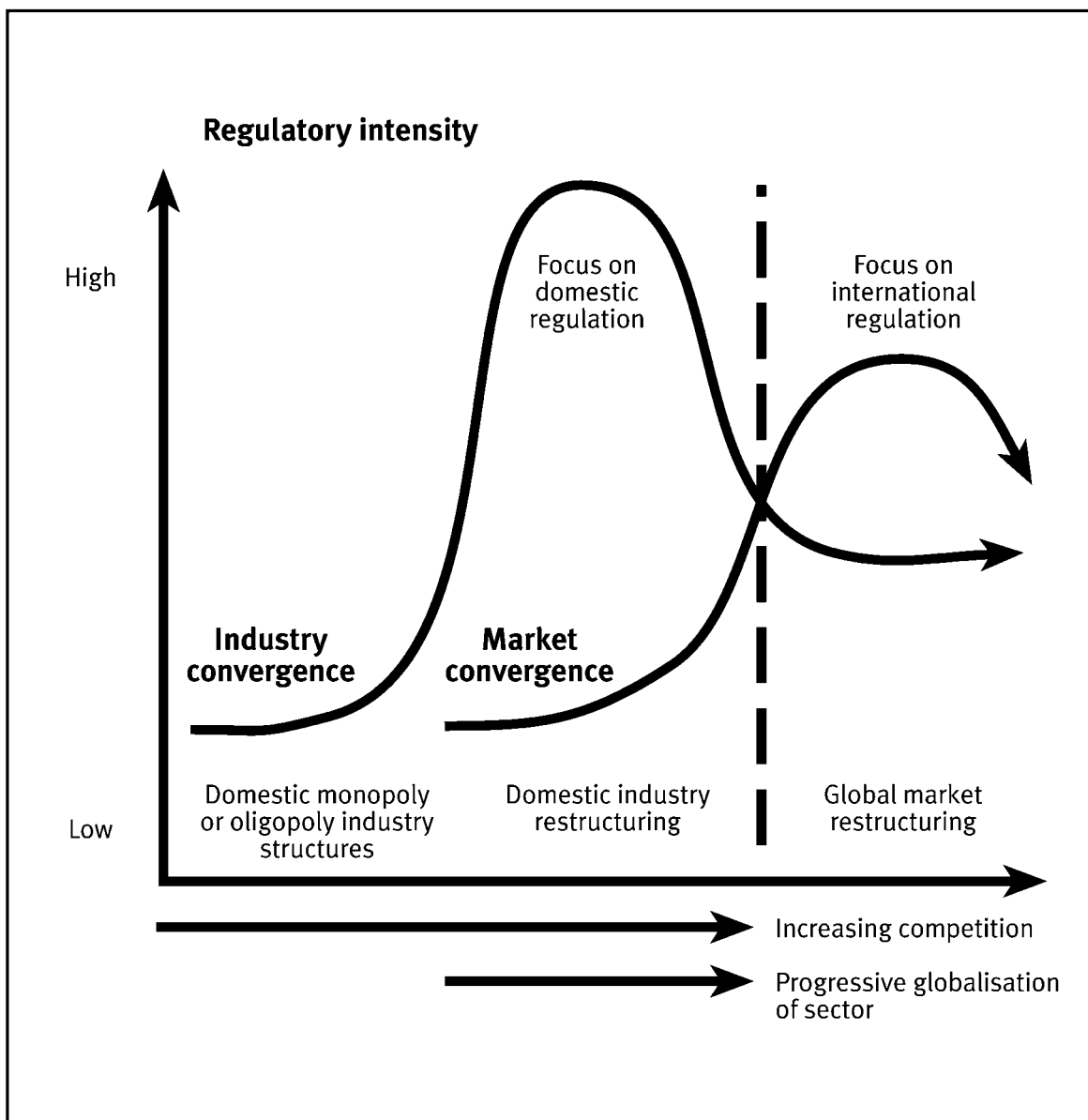
This has direct implications for the focus of convergence policy development over time. Earlier convergence policy will focus on the consequences of domestic industry restructuring as service, connectivity and infrastructure activities are vertically disintegrated, and intermediate markets become entrenched in the domestic economy. As these issues are resolved, market internationalisation will pick up pace, and the convergence policy will focus on the consequences of the globalisation of consumer, intermediate and input markets.

The timetables for this transition will vary from industry to industry because different industries will meet the convergence test at different times. This is because different industries have different requirements for bandwidth, reliability and interactivity, and consequently will tend to rely on different digital infrastructures (e.g.g. broadcasting will need to rely on digital broadcasting rather than the Internet for some time to come due to

bandwidth and reliability issues). As a result, an industry focus to policy development will be appropriate in the initial stages of convergence.

As convergence progresses, and the growing capabilities of different digital networks make them more substitutable, timetables in different industries will converge and common approaches to economic, social and industry development issues will become more feasible and appropriate. As the focus of policy development then shifts to market internationalisation, a "whole-of-economy" approach to the management of globalisation will be needed.

Exhibit 6.3 Convergence regulatory intensity



SOURCE: Adapted from *The Commonwealth of Information*, Information Policy Advisory Council, 1997.

7.0 POLICY OPTIONS FOR DESIRED NATIONAL OUTCOMES

The preceding chapters have developed the elements of a policy framework for convergence. The final step is to use these elements to identify the policy options available to achieve the desired national outcomes.

The desired outcomes will require different policy interventions in different structural scenarios, so the conclusions of this chapter are not recommendations. They are options, which *may* be employed if the structural scenario under consideration eventuates. In all probability, the scenario that ultimately emerges will be a mixture of the scenarios considered in the report. This means that the options developed here are highly simplified, but they are still useful because real policy options can be assembled from these simplified options.

In most cases, the options identified are not complete policy strategies. This is because convergence is only one factor in the determination of these strategies. What is offered here are observations and options which will need to be integrated into wider policies for economic, social and development strategies.

Practical policy implementation will require judgements about a wide range of economic, social and cultural issues. Many of these judgements will have a significant subjective dimension. It is not the intention of this report to canvass these issues to the degree of complexity that arises in practice. Here we focus on the structural factors, primarily in order to demonstrate how these factors may be integrated into policies in a convergence environment.

The broad policy options available in each scenario depend on the impact of the convergence “givens” and convergence trends. The approach taken in this Chapter is to separately identify the impact of the convergence “givens” and the impact of the convergence trends on the achievement of desired national outcomes.

These analyses are then assembled into some broad comments on policy options in particular structural scenarios. This approach is worked through separately for the economic/employment, social/cultural and industry/regional areas of policy—allowing different policy issues to be addressed in a comprehensive and relatively clear manner.

7.1 Achieving economic and employment outcomes

Structural profile of the service sector

The infrastructure-based knowledge-intensive service industries are the “convergence industries” which this report addresses. Large service providers that can capture economies of scale and scope through their control of key infrastructures for service delivery have held economic power in traditional service industries. Most of the major convergence industries are still structured along these lines. In contrast, industries without the same dependence on infrastructure tend to be dominated by small independent service providers (e.g. general practitioners and newsagents) or larger firms designed to leverage unique skills or intellectual property (e.g. global professional firms).

The current structure of Australian convergence industries is varied. Certain industries such as broadcasting remain vertically integrated and domestically oriented. At the opposite extreme, emerging electronic commerce industries are vertically disintegrated

and internationally oriented. It is no coincidence that the traditionally structured industries are based on analog and physical infrastructures, and the opposite extreme is based on digital infrastructure. This is consistent with the definition of convergence adopted in this report. Other service industries such as telecommunications, retail and education are between these two extremes, and require correspondingly different policy responses.

The physical and analog infrastructures used in traditional service delivery are not substitutable, and this is reflected in the traditional “silo” industry structure of the service sector. These infrastructures still dominate much of the service sector in Australia. The domestic nature of these infrastructures has confined the associated consumer markets within national boundaries.

The control of infrastructure and the associated power to define services are the key sources of economic value and centres of economic power in this industry structure. The high cost of these infrastructures is a significant barrier to entry. This results in oligopoly or even monopoly industry structures in many service industries, which suppress incentives for innovation and efficiency. The basic business strategy for traditional service industries is to mass-market standardised services, maximising returns to the fixed investment in service development.

These structural features are reflected in the licensing and regulatory structures for services. Most licensing and regulation implicitly or explicitly relies on the fact that service provision is tied to infrastructure or is confined within geographical boundaries, and is therefore subject to national or State government intervention.

Convergence does not mean that education services become financial services, or broadcasting services become health services. There will continue to be distinct service industries, so policy and regulation of these industries will still need to be tailored to meet the requirements of those industries. Service licensing and regulation will probably be organised on industry lines for some time to come.

Policy profile of the service sector

Policies that aim to achieve economic and employment outcomes are those related to notions of efficiency and economic performance and the development of high-value employment. Achieving these outcomes requires different approaches in different structural scenarios. The desired national economic and employment outcomes are:

- efficient markets along the entire digital economy value chain;
- increasing productivity through uptake of digital technologies;
- innovative, diverse service markets; and
- broad, deep markets for high-skill and high-value employment.

These outcomes capture the issues related to allocative, productive, and dynamic efficiency, and the character of labour markets in the service sector.

Current interventions targeted at different parts of the service sector value chain include:

- structural interventions such as:
 - creation of property rights;
 - creation of access rights;
 - technical regulation;
 - consumer awareness and information;
 - aggregation of demand;

- conduct interventions such as:
 - competition rules;
 - international trading rules;

- Government participation such as:
 - Government electronic service delivery initiatives;
 - Government support for skills formation, R&D activities, and investment in new technology; and
 - allocation of spectrum and electronic addresses.

These interventions are implemented by a variety of instrumentalities. The Australian Competition and Consumer Commission (ACCC) and the Australian Communication Authority (ACA) are the primary government bodies responsible for economic and technical regulation of digital activities. In addition, a number of interventions which impact on competitive and technical conditions in the market are conducted by government departments and the courts, either through regulation or through direct and indirect market participation.

In industries based on digital infrastructure, particularly telecommunications, structural separation of services and infrastructure is increasingly the norm. The traditional emphasis on the bottleneck power of service providers in service and input markets has been complemented by new responsibilities for the facilitation of market competition in the intermediate access and interconnection markets for digital networks. Connectivity markets for telecommunications resale and value-added services have emerged in a more vertically disintegrated industry structure. Asymmetric regulation to dismantle the dominance of Telstra in telecommunications markets is designed in part to encourage the development of access and interconnection markets, promoting efficiency and service innovation.

Technical regulation of spectrum and electronic addressing is used to ensure that limited resources are allocated efficiently. Technical regulation (increasingly industry self-regulation) is also important to entrench market-making technical standards for access, interconnection and interoperability.

The take-up of new technology and related productivity increases are largely a matter of commercial and consumer choice, although this is facilitated through awareness raising efforts and government service delivery initiatives. Innovation is facilitated by promoting access to digital infrastructure which allows third-party service developers to distribute new services.

The development of employment and skills markets is addressed primarily through traditional means of government participation and investment in education, training and R&D. This has recently included initiatives to promote skills in the IT&T industries.

Implications of convergence “givens” and convergence trends for economic and employment outcomes

The scenarios for convergence developed in the preceding chapters contained some common “given” elements, including:

- increasing user control over service definition and the emergence of niche services and mass-customisation strategies;
- a growing commercial importance of intangibles as sources of economic value and centres of economic power, such as branding, customer relationships and customer databases, and scarce management and technical skills; and
- a trend towards consolidation of services into diverse “service suites”, underpinned by cross-holdings and strategic alliances between a range of service providers.

As noted earlier, these convergence “givens” are closely related to a broader tendency to centralisation and consolidation in all structural scenarios. These tendencies have important implications for economic regulation.

The convergence trends and countervailing forces identified in the issues paper and Chapter 2 of this report outlined the uncertainties about the impact of digitalisation on industry and market structure. In contrast to the convergence “givens”, the impact of the two major convergence trends is not the same in all of the structural scenarios considered. The economic impact of convergence is therefore different in different scenarios.

The convergence “givens” challenge traditional assumptions of economic regulation and labour market management in a number of ways. The contrast between these traditional assumptions and the impact of the convergence “givens” is set out in the following table:

Traditional assumptions	Impact of convergence “givens”
Services are mainly commodities, provided over standardised infrastructures to mass markets.	Services are customised to meet the needs of individual consumers.
Control of infrastructure is the key to market power. Economies of scale in the use of infrastructure are the key to the business case.	Control of customer relationships and databases, unique skills, and other types of intangible property are the key to market power. Economies of scope in the use of information and intellectual property are the key to the business case.
Different services are marketed separately.	Different services are cross-marketed.
Capital markets for the service industries reflect the silo structure of the consumer market.	Capital structures of the service sector are characterised by a web of cross-holdings, vertical holdings and strategic alliances.

These "false dichotomies" present a contrast between extremes, but they convey the nature of the shift that the convergence "givens" will trigger. The power of digital technology to collect, organise, and act on information is great enough to generate innovative business cases based on new economies of scope.

These changes will have some significant impacts on economic and employment interventions:

- The cross-marketing and consolidation of a range of services will create significant new opportunities for service bundling, internal cross-subsidisation, and potentially for predatory pricing against other service providers who do not enjoy the benefits of consolidation. Detecting anti-competitive behaviour will become more difficult as these markets become more complex and interrelated;
- The emergence of common assets like integrated databases and branding will also make it much easier for economic power in one service market to be transferred to another service market. Economic regulators will increasingly need to make difficult assessments about the second-order effects of mergers and acquisitions in related markets. This difficulty will be compounded as the capital structure of the service sector becomes more interrelated over time;
- The access regulation available for physical and digital infrastructures cannot generally be applied to the economic power of intangibles, which can only be addressed in the context of mergers and acquisitions and in market conduct. Other interventions such as intellectual property law, support for open standards, and fair-dealing provisions may be more effective.
- Skills and employment policies will need to address a much more complex and fast-moving environment where short-term skills shortages are the norm. In-house and commercial investment in training will probably become more important as the premium on flexibility increases.

In addition to these issues, the two major convergence trends will have some other impacts of similar significance.

The broad implications of vertical disintegration for economic and employment outcomes are set out in the following table:

Traditional assumptions	Vertical disintegration assumptions
Entry to service markets is tied to control of infrastructure.	Entry to service markets is not tied to control of infrastructure, and a range of intermediate markets for access and interconnection emerge in infrastructure and connectivity industries.
Different physical and analog service infrastructures are not substitutable and are not in competition.	Different digital infrastructures are substitutable to greater or lesser extents, and different digital networks are in competition.

Vertical disintegration has the following general consequences for economic regulation and the development of employment markets:

- The emergence of intermediate markets creates a range of new markets that require regulatory oversight, along with new points of intervention in those markets. This is already true in telecommunications, but will spread into all service industries which use digital technology for service delivery, widening the scope for economic regulation of the service sector;.
- Growing competition between different digital infrastructures will erode bottleneck power in infrastructure and connectivity markets, reducing the need for industry-specific or asymmetric regulation and licensing of infrastructure and connectivity;.
- The emergence of intermediate markets erodes the bottleneck power of infrastructure, raising the relative importance of intangible assets as centres of economic power. This suggests that competition issues associated with intangible assets such as databases, customer bases, technical standards, trademarks and brands will become higher priorities for economic regulators;.
- The emergence of intermediate markets will raise the importance of technical standards. The international nature of equipment input markets means that domestic standards initiatives are unlikely to be successful even if consumer markets are domestic. Technical regulation will therefore be primarily about the implementation of agreed global standards, rather than the determination of new standards.
- The structural separation of service and infrastructure activities means that some service activities will be much more mobile in a convergence environment. Service activity will centre on key assets such as unique skills and advanced demand markets. This will have significant implications for the geographical distribution of service sector employment. In the absence of skills investment and demand stimulation in hinterland markets, there may be increased centralisation of economic activity and employment. Skills and employment policies in regional areas will be one of the ways to offset this tendency.

The implications of market internationalisation can be summarised as:

Traditional assumptions	International market assumptions
Service markets are domestic, so domestic enforcement is comprehensive.	Service markets are international, so domestic enforcement alone cannot be comprehensive.
All service market competition is domestic competition.	International service competition becomes an important aspect of overall market competition.

- Lower barriers to entry for international entrants will potentially raise the level of contestability in service markets. Where this occurs, the need for regulatory intervention to protect competition will be correspondingly reduced;.
- The enforcement of competition rules and technical standards in international markets will fall primarily to regulators in major global markets in North America, Europe and possibly the larger Asian markets. This will result in a centralisation of regulatory power in these key markets;.
- The mobility of service activity will be enhanced as international service markets emerge. High-skill employment will be able to migrate internationally, suggesting that the importance of national education and training systems for the formation of

technical, creative and management skills will increase in order to capture the employment benefits of digital service provision.

Economic & employment policy options in different structural scenarios

The implications of the convergence “givens” are relevant in all of the scenarios considered in this report, but the implications of the major convergence trends differ in different scenarios.

The policy options that arise in the *Déjà Vu* scenario are similar to traditional service industry interventions because that scenario is the closest to the traditional industry structure. Domestic, not international, regulation is the norm.

The principal difference between the traditional and *Déjà Vu* scenarios is that the implementation of the traditional interventions is more difficult in a much more complex industry. It is more difficult to identify the economic consequences of ownership changes, and it is more difficult to identify anti-competitive behaviour in markets where service bundling is the norm. These difficulties will be exacerbated by the centralisation of economic activity around key assets such as large databases, national and global brands, unique skills sets, and other unique intellectual property.

These issues will be important in all structural scenarios. In other scenarios, they will be compounded by the implications of vertical disintegration, or market internationalisation, or both. The points of intervention available in this scenario are much the same as the traditional ones. The policy options which can be deployed in support of economic and employment outcomes in the *Déjà Vu* scenario can be summarised as:

- structural interventions such as:
 - creation of property rights such as copyrights, patents and trademarks;
 - technical regulation of input and consumer markets;
 - international trading rules;
 - control and licensing of service market entry through licensing of infrastructure;
 - aggregation of demand to match economic power of suppliers;
- conduct interventions such as:
 - competition rules;
- government participation such as:
 - government support and tax concessions for skills formation and R&D activities;
 - and
 - allocation of spectrum and electronic addresses to remove resource bottlenecks.

In the ***Home Alone*** scenario, the vertical disintegration of services, connectivity and infrastructure creates a range of additional markets for regulation, but significantly erodes the traditional bottleneck power of infrastructure. This promotes economic efficiency, and facilitates new entry and service innovation, reducing the priority of economic efficiency issues in this scenario. This is the major difference between this scenario and *Déjà Vu*.

The growing importance of intangibles as centres of economic power raises some issues that are not easily resolved by traditional economic interventions. Other interventions such as balanced copyright laws, facilitation of standardisation processes, and policies to

prevent scarcity of resources such as skills are more likely to be effective in removing economic bottlenecks associated with intangibles.

Of all four scenarios, the *Home Alone* scenario has the widest range of points of intervention with only international trading rules being of little relevance in a domestic scenario. The combination of competitive intermediate access and interconnection markets and domestic markets poses the least risk that markets will fail to achieve desired national outcomes so that the requirement for policy intervention is reduced.

The policy options that can be deployed in support of economic and employment outcomes in *Home Alone* can be summarised as:

- structural interventions such as:
 - creation of property rights such as copyrights, patents and trademarks;
 - technical regulation of input, intermediate and consumer markets;
 - international trading rules in input markets for content and IT equipment;
 - direct control and licensing of service market entry;
 - aggregation of demand to match economic power of suppliers;
- conduct interventions such as:
 - competition rules;
- government participation such as:
 - government support and tax concessions for skills formation and R&D activities;
and
 - allocation of spectrum and electronic addresses to remove bottlenecks.

Virtual Countries is the most problematic scenario from an economic and employment perspective. The difficulties in implementation of economic regulation associated with the convergence “givens” are complemented by the entrenchment of economic power associated with infrastructure, and service markets which extend beyond the reach of domestic competition regulators.

The effectiveness of competition regulation in this scenario is compromised by the absence of intermediate markets, and the barriers to entry in service markets which are raised in consequence. The traditional interventions in service and input markets are still available, but the entrenchment of market power cannot be addressed directly.

The global nature of service provision has the effect of shifting regulatory power to regulators in major service markets. These regulators do not have global reach, but they can have a global impact if these major markets are ones where international technical, legal and governance norms are set. The only markets currently with this status are the United States and the European Union.

International infrastructures allow for international centres to serve many countries simultaneously, which is desirable for countries that host these centres. It is less desirable for countries that do not, because these centres largely capture the benefits of productivity gains and job creation.

The policy options that can be deployed in support of economic and employment outcomes in *Virtual Countries* can be summarised as:

- structural interventions such as:
 - creation of property rights such as copyrights, patents and trademarks;
 - international trading rules in input and consumer markets;
 - control of service market entry;
 - aggregation of demand to match economic power of suppliers;
- conduct interventions such as:
 - competition rules;
- government participation such as:
 - government support and tax concessions for skills formation and R&D activities;
and
 - allocation of spectrum and electronic addresses to remove bottlenecks.

Like the *Déjà Vu* scenario, the *Virtual Countries* scenario lacks intermediate markets, reducing available intervention points. However, markets are internationalised in their scope which increases the risk that market forces alone will fail to achieve economic and employment outcomes. Policy priorities are high and the number of intervention points low.

Domestic technical regulation is not available due to the international market scope. International trading rules are a key point of intervention. Concerted efforts by national governments can be used to establish control over entry to international markets and impose requirements on conduct. These efforts need to be balanced with the ability of companies to mutually agree on the development of open standards. The use of domestic infrastructure licensing remains a crucial point of intervention.

Limited competition and the inability to use access markets for cheap market entry leads to a suppression of innovation. Similar options as the *Déjà Vu* scenario are available for encouraging innovation including providing tax concessions and grants to companies and using technical regulation.

In the ***Cut and Thrust*** scenario the emergence of intermediate markets provides a check on the bottleneck power of infrastructure holders, but the issues associated with global centralisation are exacerbated. Regulatory power still migrates to major markets, and there is considerable centralisation of service provision and development.

The distribution of service activity is highly skewed as global service centres emerge in certain countries, capturing the benefits of the productivity increases due to digital technology. The pace of innovation is high as access markets promote new entry and new services.

Employment is highly mobile, and markets for skilled employment are global in scale. Again, this is beneficial for countries which host centres for service activity, because they attract both skilled employment and skilled individuals. First mover advantage entrenches competitive advantage in global service provision, and the competitiveness of national skills formation policies are a key determinant of that first- mover advantage.

Traditional mechanisms for the enforcement of conduct such as competition regulation, consumer requirements and technical regulation are unavailable in this scenario. Control of service market entry is also unavailable due to the market's international scope. Policy in this scenario needs to be cleverly crafted using the few points of intervention available.

One major intervention point that can be used is international regulatory cooperation. The standards that international forums and global regulators adopt can be used to regulate markets and facilitate the achievement of desired national outcomes.

The development of strong intermediate markets in this scenario facilitates economic efficiency along the entire value chain. Some downward pressure on network investment may occur because of the heavily commoditised infrastructure market. Taxation concessions and resource regulation could be used to promote investment in domestic infrastructure and connectivity.

The *Cut and Thrust* scenario comprises high levels of innovation with services heavily customised and a large range of niche service providers present exploiting global reach. Policy intervention should be directed towards the agreement of international consumer protection mechanisms that will reduce the domination from the oligopoly of horizontally integrated global service providers leveraging their intangible assets.

Although these high levels of productivity gains and innovation are present throughout the global economy, there is a concentration of economic activity and high-value employment opportunities in major service centres. Policy should be directed towards hosting and retaining control of these major service centres by subsidising start-up and R&D activity, stimulating local demand, and developing relevant skills in the workforce.

The policy options that can be deployed in support of economic and employment outcomes in *Cut and Thrust* can be summarised as:

- structural interventions such as:
 - creation of property rights such as copyrights, patents and trademarks;
 - international trading rules in input, intermediate and consumer markets;
 - aggregation of demand to match economic power of suppliers;
- conduct interventions (in cooperation with leading global regulators) such as:
 - competition rules;
- government participation such as:
 - government support and tax concessions for skills formation and R&D activities; and
 - allocation of spectrum and electronic addresses to remove bottlenecks.

In summary, the primary impact of convergence on economic and employment policy options in domestic scenarios is to increase the complexity of implementing established intervention strategies. As the capital structure of the services sector becomes more interrelated, assessments about the competitive impact of conduct, mergers and acquisitions will become harder to make. This suggests that a light-handed approach to economic regulation is justified. In scenarios where efficient access and interconnection markets are established, competition provides considerable assistance in curtailing the abuse of economic power.

The economic power associated with intangible assets such as copyrights, technical standards and information databases is expected to grow in all scenarios, creating new challenges for economic regulators. It is not clear that traditional economic interventions are relevant in all of these cases. Intellectual property law, technical regulation and privacy law can potentially offer other solutions.

The benefits of technology take-up and innovation in domestic scenarios is important because these flow through into the whole economy, ultimately affecting international competitiveness. While large countries have an inherent advantage through their stronger economies of scale, smaller countries can keep up by promoting technology development and investment through awareness-raising and targeted funding programs designed to demonstrate the benefits of digital technologies and spread information about successful implementation.

The mobility of service activity in vertically disintegrated scenarios creates a tendency for service activities to centralise, shifting the distribution of service employment. These measures which retain activity in regional areas include skills formation policies which are linked to regional economies, designed to capture local service activity.

In international scenarios, these issues are exacerbated. Regulatory power shifts to "global regulators" who have global impact (if not necessarily global reach). The economic regulation of international service markets is increasingly dominated by these regulators over time, but even they have difficulty if service provision is structurally separated from infrastructure provision (and hence is highly mobile). International cooperation between economic regulators then becomes important, and is beneficial to smaller countries like Australia which are better able to influence the agenda of multilateral organisations than foreign regulators.

The effects of economies of scale and scope become more pronounced in the internationalised scenarios. This means that efforts to attract service activities (e.g. global financial services) may need to be stepped up in order to entrench Australia's strengths as a service centre. This will also ensure that the benefits of technology take-up and innovation both here and internationally are captured, and that investment in skills development and high-value employment are maintained.

7.2 Achieving social outcomes

The structural context of the service sector is complex, and a range of interventions has been developed to ensure adequate provision of services in a range of service industries. Telecommunications, education, and health are prominent examples.

The desired national outcomes in this area are summarised in this report as:

- Widespread, affordable, reliable access to digital services
- Consumer confidence in service markets.

Traditional interventions in support of these outcomes include:

- structural interventions such as:
 - consumer awareness-raising and information;
 - aggregation of demand to leverage investment;

- conduct interventions such as:
 - universal service obligations;
 - service guarantees;
 - consumer redress mechanisms;
- government participation through:
 - investment in (or subsidisation of) infrastructure;
 - government service provision.;
 - tax concessions for infrastructure investment or service provision; and
 - consumer subsidies for equipment or services.

These interventions are commonly associated with the communications industry, but they appear in one form or another in many service industries.

The most prominent mechanism is a universal service obligation. The usual funding mechanism is internal cross-subsidisation, but the emergence of competition has made these cross-subsidies non-viable in some service industries. In the telecommunications industry for example, an independent regulator is charged with the management of the universal service obligation for telecommunications, which is funded through a levy on telecommunications carriers. In the television industry, satellite transmissions and ground equipment are subsidised in remote areas.

It is important to remember that lack of infrastructure is not the only obstacle to service access. A lack of awareness or skills can also prevent access, and this needs to be incorporated into any digital access strategy.

Implications of convergence “givens” and convergence trends for social outcomes

Traditional policies for the achievement of social outcomes, like those for economic outcomes, are based on a set of implicit assumptions. These assumptions must be made explicit in order to test their relevance to a convergence environment.

The “given” features of a convergence environment, identified in chapter 2 and summarised in the preceding section, have some significant implications for the assumptions underpinning traditional approaches to access and consumer issues:

Traditional assumptions	Impact of convergence “givens”
The same technology is used to deliver equal services to all users.	Different technologies are used to deliver equivalent services to all users.
All users want the same standardised service.	Users generally want both different services and different levels of service.
Provision of service is all about the provision of separate, specialised infrastructures.	Provision of service can be effected over common digital infrastructures
Service providers control service definition and development, and define what constitutes “good service”.	Consumer demand sets the pace of innovation, and they define what constitutes “good service”.
Consumers need little information because service offerings are highly commoditised and predictable.	Consumers need considerable information because service offerings are complex and innovative.

The policy implications of these changes include:

- The diversity of digital technology means that technology-specific universal service requirements can constrain technology choices. Infrastructure and connectivity requirements should, where practicable be specified in functional rather than technological terms;.
- “One size fits all” interventions (particularly universal service obligations) will not fully meet the growing diversity of consumer demand. Where one user may be satisfied with a basic voice service, another may demand high-speed data transfer. In this environment, care must be taken to ensure that the benefits of access initiatives are widely distributed; .
- Consumer expectations can grow faster than existing service providers’ capacity to deliver. The result is a commercial opportunity for new entrants that are unencumbered by legacy systems and technologies. As technology costs fall and revenues from electronic services rise, commercial solutions in previously unprofitable markets may emerge and should be encouraged;.
- All countries will continue to operate universal service regimes in various industries, and this will not distort international investment as long as Australia does not step radically out of line with comparable overseas markets. Excessive intervention would have the perverse effect of starving the local industry of capital, entrenching social disadvantage;.
- The growing complexity of the service and infrastructure industries will result in a potentially confusing marketplace. There is an important role for government to ensure that sufficient information is available to aid consumer choice, and that consumer redress is available.

Traditional assumptions	Vertical disintegration assumptions
Provision of specialised infrastructure is the key to provision of the associated service.	Provision of digital infrastructure allows for the provision of a range of services.
Consumer choice of services is constrained by the availability of appropriate infrastructure.	Consumer choice of services is potentially unlimited with the availability of digital infrastructure.

- The advent of digital infrastructures capable of carrying multiple applications (e.g. voice, video, text and audio) means that minimum standards for infrastructure/connectivity and content/applications must be specified separately. Minimum standards for infrastructure and connectivity are most important, but need to be determined by reference to the need for digital services which utilise the infrastructure;.
- Provision of digital infrastructure is potentially much more beneficial than traditional infrastructure because digital infrastructures can support a much wider range of services than analog or physical infrastructures.
- Consumer choice is much greater on accessible digital infrastructures because of lower barriers to entry. This means that the service industries are potentially more complex and innovative in scenarios that are vertically disintegrated.

Traditional assumptions	International market assumptions
The costs of cross-subsidisation are absorbed by the infrastructure industry because government ownership of infrastructure prevents transfer of capital.	The costs of cross-subsidisation reduce incentives for investment in national infrastructures, and promote a shift of capital to less-regulated areas.
Consumers operate in domestic markets subject to domestic regulation.	Consumers operate in international markets subject to limited regulation.

- The absence of international consumer protection and redress mechanisms may discourage the formation of international service markets unless coordinating mechanisms can be developed by national consumer authorities.

Social policy options in different structural scenarios

The policy options that arise in the Déjà Vu scenario are determined by the implications of the convergence "givens". These implications all flow from the growing diversity in both supply-side provision and demand-side expectations. A range of new infrastructure, connectivity and applications technologies are now available, and these technologies allow for a much wider variety and capability in communications services. At the same time, a wide range of new demands have emerged as communications become more integrated with service provision and consumer expectations are raised.

Traditionally, the USO is an instrument designed to ensure the universal deployment of basic services, not a diversity of enhanced ones. Recent incremental increases in the USO to include a connectivity-level requirement for a 64 kbit/s connection are justified by a forward-looking assessment about the importance of digital connectivity for electronic service delivery.

There is also growing demand for a large range of enhanced services, but many of these are not of universal appeal. It seems unlikely that USO style requirements will be a fully effective way of meeting this kind of demand. As levels of competition rise in communications markets, promoting commercial solutions for this kind of demand are more likely to achieve results. In essence, this requires the promotion of specialised infrastructure and service providers, which is the role of the pro-competitive telecommunications regime.

Turning to the other desired social outcome, the development of a consumer confidence in electronic service markets is becoming much more complex as the diversity and sophistication of electronic service markets increases. The "information economy" strategies adopted by the government in recent years address many of these issues, covering issues such as online consumer protection, privacy and data protection, authentication of transactions, and protection of copyright. This review is focussed on the structural dimension of digitalisation, so the information economy issues will not be strongly emphasised in this report. Nevertheless, the information economy agenda is a key component of an integrated strategy to address the impact of digitalisation on social outcomes.

The interventions available in the *Déjà Vu* scenario are similar to those available in the traditional industry environment because the structural differences between the two are minimal:

- structural interventions such as:
 - consumer awareness-raising and information;
 - aggregation of demand to leverage investment;

- conduct interventions such as:
 - universal service obligations for services;
 - service guarantees;
 - consumer redress mechanisms;
 - cooperative service provider accreditation;

- government participation through:
 - investment in (or subsidisation of) infrastructure;
 - government service provision;
 - tax concessions for infrastructure investment or service provision;
 - consumer subsidies for equipment or services.

Home Alone exhibits vertical separation of digital services from infrastructure and connectivity activities. The implications of this trend for social policies revolve around the split between infrastructure/connectivity and service/applications activities.

The first observation is that ensuring digital infrastructure provision will become more important as a means of promoting general service delivery because digital infrastructures can support a wider variety of services than traditional analog or physical infrastructures. Education, health information and diagnostic, electronic commerce, voice and entertainment services are all potentially available over common digital infrastructures once sufficient bandwidth is available.

This suggests that the USO may ultimately be directed towards the provision of infrastructure and connectivity, rather than certain applications like voice services. The current STS reflects this transition, containing both an applications-level specification of voice services and a connectivity-level requirement for 64 kbit/s links.

One aspect of consumer protection that will grow in importance over time is service provider accreditation. Many service industries (e.g. health, education and legal services) have developed complex State-based regulatory structures designed to ensure compliance with basic standards of service. The reduction of barriers to entry will make it harder to prevent the entry of service providers without these accreditations. This suggests that inter-State cooperation in accreditation, and possibly standards harmonisation, will be needed to prevent the exploitation of weaker standards in certain States.

The most promising solution is State harmonisation of these standards, with the Commonwealth playing a coordinating role. Where electronic services are substitutes for traditional services, this will force harmonisation of consumer protection and service regulation across the board.

The interventions available in the *Home Alone* scenario are similar to those in *Déjà Vu*:

- structural interventions such as:
 - consumer awareness-raising and information;
 - aggregation of demand to leverage investment;
- conduct interventions such as:
 - universal service obligations for connectivity and/or infrastructure provision;
 - service guarantees;
 - consumer redress mechanisms;
 - harmonised service provider accreditation;
- government participation through:
 - investment in (or subsidisation of) infrastructure;
 - government service provision.;
 - tax concessions for infrastructure investment or service provision;
 - consumer subsidies for equipment or services.

The **Virtual Countries** scenario presents few new issues for access to services, provided that access policies are not radically out of line with international norms. Access issues are not substantially different in internationalised scenarios, since most infrastructure is domestic (apart from satellite, which is important in remote area markets). However, these scenarios are problematic from the perspective of consumer confidence because the advent of international service markets undermines domestic consumer protection regimes.

The economic power of international infrastructure owners is considerable in this scenario. The international nature of service provision and the global centralisation of service activities means that many transactions will take place outside the jurisdiction of domestic consumer regulation. There will be commercial responses from major service companies designed to address consumer concerns, but these will probably require support from global regulators if they are to have credibility. This support may come in the form of international accords on consumer protection. In many ways this is a larger version of the service provider accreditation issue noted in the *Déjà Vu* scenario.

Apart from the differences already noted, the intervention options in this scenario are similar to the previous scenarios:

- structural interventions such as:
 - consumer awareness-raising and information;
 - aggregation of demand to leverage investment;
- conduct interventions such as:
 - universal service obligations for services provision;
 - service guarantees;
 - consumer redress mechanisms (in cooperation with global regulators);
 - cooperative service provider accreditation (in cooperation with global regulators);
- government participation through:
 - investment in (or subsidisation of) infrastructure;
 - government service provision.;
 - tax concessions for infrastructure investment or service provision; and
 - consumer subsidies for equipment or services.

The ***Cut and Thrust*** scenario combines the access issues of the domestic scenarios with the consumer confidence issues associated with internationalisation of service markets. The main difference between this scenario and *Virtual Countries* is that consumer protection issues are exacerbated by the mobility of service providers and the consequent difficulties in global enforcement.

- structural interventions such as:
 - consumer awareness-raising and information;
 - aggregation of demand to leverage investment;
- conduct interventions such as:
 - universal service obligations for connectivity and/or infrastructure provision;
 - service guarantees;
 - consumer redress mechanisms;
 - cooperative service provider accreditation;
- government participation through:
 - investment in (or subsidisation of) infrastructure;
 - government service provision.;
 - tax concessions for infrastructure investment or service provision; and
 - consumer subsidies for equipment or services.

In summary, the growing complexity of both supply-side technology and demand-side expectations is overtaking traditional approaches to ensuring communications access, but the USO remains an important safety net.

The electronic provision of services subject to State-based regulation and accreditation raises significant jurisdictional problems for consumer protection. The most promising solution is State harmonisation of these standards, with the Commonwealth playing a coordinating role. Where electronic services are substitutes for traditional services, this will increase pressure for harmonisation of consumer protection and service regulation across the board.

Access issues are not substantially different in international scenarios. In contrast, consumer confidence issues are exacerbated in those scenarios. International harmonisation will present significant challenges, especially to federations like Australia where responsibility for consumer protection is dispersed. Multilateral efforts to establish basic consumer protection are at an early stage. Failure to achieve international harmonisation may result in commercial solutions such as a consumer flight to quality global brands or a return to domestic service providers.

7.3 Achieving cultural outcomes

The media and cultural industries have some specialised features which are highly relevant to the policy priorities and options in different scenarios. The discussion below supplements the original discussion of service industry structure and policy which was set out in the first section.

Structural profile of the cultural industries

The media industry in Australia has a typical traditional industry structure, with major service providers in control of much of the broadcasting delivery infrastructure. This

structure reflects the minimal penetration of digital infrastructure into the delivery of broadcasting services. Terrestrial technologies dominate television and radio broadcasting, suppressing international broadcasting. The relatively late introduction of pay television has entrenched this structure by slowing the development of alternative networks and international infrastructures, particularly cable and satellite. The government is an important participant in media markets through the national broadcasters, and also supports a small community-based broadcasting industry.

The traditional industry structure is reflected in the regulatory structure. The licensing of infrastructure (i.e. spectrum) and broadcasting services are linked. Restrictions on market entry are used as an indirect means of financing Australian content requirements. Limits on the number of licences and audience reach rules are used to promote diversity of content and plurality of control.

Regulation also ensures that the capital structure of the media industry reflects the traditional industry structure. Cross-media ownership restrictions ensure that capital markets in the media industry reflect the traditional vertical industry silos of print, radio and television. Similarly, foreign ownership restrictions ensure that the capital markets reflect the domestic nature of the consumer market for broadcasting services.

In contrast, input markets for content and programming have become increasingly digital and global. The economies of scale and scope enjoyed by the film and television production industries in other countries, especially in the United States, have placed local production under increasing competitive pressure. A related trend towards large-scale and long-term programming deals between local television broadcasters and global programming suppliers has reinforced this pressure on the relatively small and fragmented local production industry. Global production scale and marketing reach, coupled with sophisticated intellectual property management skills, are becoming the key elements of competitiveness.

The severity of these pressures varies considerably between different cultural industries. Film and television content are the most vulnerable, while music is less so due to lower capital requirements. Print and the performing arts are least affected due to the physical, localised nature of activity, but even they are experiencing considerable competitive pressure from globalised electronic media which can amortise costs over huge audiences. All media and cultural forms are experiencing broadly the same impacts. This is one area where the globalisation trend cuts across desired national outcomes, not just in Australia but in most of the world.

These developments raise a number of issues for national identity, cultural diversity, media plurality and community standards objectives, as well as raising new issues about Australia's capacity to participate in global culture. The precise nature of these challenges depends on the way that structural change progresses.

The close relationship between cultural policy and structural change means that policy responses to cultural issues cannot be separated from industry competitiveness issues. The industry development agenda and the cultural policy agenda are inseparable as cultural outcomes are supported through sustainable industry development. Cultural policy and cultural industry development must be mutually reinforcing.

Similarly, a desire to develop local culture is not inconsistent with global participation. In the right circumstances, they may also be mutually reinforcing. Globalisation presents

opportunities as well as challenges, but those opportunities will only be available to production industries that are able to sustain competition in the global markets where both commercial revenues and creative reputations are earned.

Policy profile of the cultural industries

The desired national outcome in this area has been summarised in this report as:

- Local participation and representation in the domestic and global culture.

This desired outcome captures the policy objectives of national identity, cultural diversity, media plurality, and community standards. These objectives are the basis of much of the current policy framework. This outcome also leaves enough flexibility for new objectives to be adopted if new policy challenges and new opportunities arise from structural convergence.

Current cultural strategies consist of a mix of elements, targeted at different parts of the cultural industries value chain:

- structural interventions such as:
 - copyright and intellectual property laws which underpin both input and consumer markets for content;
 - foreign and cross-media ownership restrictions on capital markets;
- conduct interventions such as:
 - local content rules in consumer markets;
 - community standards for broadcasting services in consumer markets;
- government participation in output markets, such as:
 - national broadcasting;
 - government support for community broadcasting;
 - tax concessions for content production activity;
 - direct subsidisation of input production activity (i.e. film, multimedia and music funding); and
 - government support for production skills formation and industry infrastructure.

The traditional separation of the media industries from the rest of the service sector is also reflected in the structure of regulatory arrangements. The Australian Broadcasting Authority (ABA) has responsibility for the maintenance of ownership restrictions, the allocation of service/infrastructure licences, and the maintenance of community standards and required levels of Australian content on television and radio.

These traditional responsibilities are complemented by new responsibilities for subscription broadcasting and Internet content. In these cases, vertical integration of services and infrastructure is the exception not the rule, so the points of intervention and the corresponding intervention strategies are different. The focus of intervention is at the applications and content level, with infrastructure and connectivity providers playing a secondary role in enforcement.

Implications of convergence "givens" and convergence trends for cultural outcomes

Traditional policies for the electronic media are based on a number of assumptions. These traditional assumptions include:

- the special status of free-to-air services and the dominance of the advertising-supported business model;
- limited viewer choice and broadcaster control over how its service is used; and
- the clear distinction between broadcasting services and other kinds of content-based and transactional services.

Some of these assumptions are based on the traditional industry structure, and some are the consequences of the particular regulatory model adopted in Australia after WWII.

The convergence "givens" challenge the traditional cultural policy assumptions in a number of ways. The contrast between the traditional assumptions and the impact of the convergence "givens" is set out in the following table:

Traditional assumptions	Impact of convergence "givens"
<p>Broadcasting is free, advertiser-supported, and targeted to a mass audience.</p> <p>Subscription and narrowcast services are marginal to commercial and policy considerations.</p>	<p>Content applications providers make commercial decisions about the mix of advertising, subscription or pay-per-view revenue sources, depending on the service provided and the target audience.</p> <p>The viewer market is more fragmented. Mass and niche services co-exist, and viewers allocate viewing time in accordance with personal preferences.</p>
<p>The content of broadcasting services can easily be observed and regulated because the service is defined centrally by the broadcaster.</p>	<p>The content of an applications service cannot be uniquely measured because user choice and interaction contributes to the service provided.</p>
<p>Broadcasting is a stand-alone content-based service, clearly distinguishable from text-based and content-free transactional services, and confined to established channels.</p>	<p>The provision of content is part of a services suite, and the boundary between text services, video services and transactional services is blurred. Re-purposed versions of the same content-based service appear on different delivery platforms.</p>

All of these impacts will have significant consequences for media and cultural policy once convergence begins in earnest in the media industries:

- Fragmentation of the viewer market will make it harder to identify the significant industry participants that should be subject to intervention in support of local content, diversity, plurality, or community standards objectives. The determination of "cultural and social significance" becomes highly subjective;

- Cross-ownership restrictions will become harder to implement as the boundaries between text-based services, video-based services, and other services become blurred;.
- As content is "re-purposed" across a range of media, it will be harder to determine what is a new service and what is just the same service in a different form. This also makes it much harder to implement regulatory barriers to entry such as cross-media rules;.
- The predominance of free-to-air broadcasting will no longer be taken for granted. Other types of subscription and niche services will grow in cultural importance, and this will need to be addressed in policy. In addition, the growing demand for content will increase commercial pressure to allow increasing amounts of foreign content for broadcast;.
- The impact of Australian content rules will become harder to measure because growing user choice will make it harder to determine what is being watched or downloaded (as opposed to simply being made available).;
- New types of content and services will appear, placing pressure on existing support mechanisms for content production.

In addition to these issues, the key convergence trends of vertical disintegration and market internationalisation will have a range of other effects.

The broad implications of a vertically disintegrated industry structure for cultural outcomes are summarised in the following table:.

Traditional assumptions	Vertical disintegration assumptions
Specialised analog technologies make it easy to identify broadcasting infrastructure for separate industry-specific regulation.	Digital technologies integrate broadcasting infrastructure into wider digital infrastructure and connectivity markets.
Spectrum is a scarce natural resource that must be carefully allocated to service providers.	Bandwidth is a commodity which can be purchased on the connectivity access market.

Vertical disintegration has the following general consequences for media and cultural policy:

- Technological barriers to entry into broadcasting service markets will fall, but other barriers will still be significant, such as access to content and to the strategic alliances which entrench market position;.
- Control of access to spectrum can no longer be used solely as a means of enforcing local content or community standards rules. Such requirements may also have to be imposed on licensed service providers directly.

The implications of market internationalisation can be summarised as:

Traditional assumptions	International market assumptions
Broadcasting is geographically restricted, and confined to the relevant licence area. The grant of a geographical licence is the basis of the business case.	Content applications can be delivered over international digital networks to many locations. Ownership of customer relationships is the basis of the business case.
Broadcasting services are provided by domestic operators from domestic locations.	Broadcasting services may be provided by either domestic or international operators, and may be provided from domestic or international locations.

- Geographical licence areas for copyright and broadcasting become less relevant as the market for content-based services becomes more international and crosses licensing boundaries.
- ;Barriers to foreign entry are much lower. Both deliberate and fortuitous entry into the Australian television and radio market are possible because services are visible to Australian audiences through international networks, irrespective of whether this is intended or not.

Chapter 4 found that vertical disintegration would have significant impact on the cultural and media industries, but that market internationalisation has a stronger impact overall. This will be evident as the policy implications of different structural scenarios are discussed below.

In the issues paper, the basic structural question for the media industry was whether the traditional industry structure or the "Internet" Internet structure would prevail, or whether they would ultimately co-exist. Submissions leaned to the co-existence option. If this is true, it means that a comprehensive cultural policy will need to incorporate industry development, choosing the most appropriate priorities and interventions in each industry segment.

Cultural policy options in different structural scenarios

The convergence "givens" are relevant in all of the structural scenarios considered in this report. In contrast, the convergence trends of vertical disintegration and market internationalisation are not. The implications of vertical disintegration and market internationalisation are different in different scenarios because these trends manifest themselves to differing extents in those scenarios.

The ***Déjà Vu*** scenario is the closest to the traditional service sector structure, and the policy priorities in that scenario are generally traditional ones. The impact of the convergence "givens" is significant enough for new policy issues to arise, and for new intervention strategies to be considered.

Traditional interventions will generally still be available because the traditional industry structure is largely preserved, but the convergence "givens" mean that it will be harder to determine how to apply these interventions. In particular, it will be harder to identify a content-based service, because the content that distinguishes it will probably be available through a range of delivery technologies. Is a web version of a newspaper the same service as the newspaper, or is it a different service? What if the content is identical? What if it differs in a few words? A few paragraphs, or a few stories?

It will also be harder to determine which services are significant enough to warrant intervention in support of cultural objectives. The fragmentation of the viewer market will create a continuum of services ranging from culturally significant to culturally insignificant, and it will become impossible to draw a line between the two in a non-arbitrary way. For example, which interests and which services should be subject to intervention in support of plurality or local content objectives? As the boundaries between different types of service are blurred, it will also be necessary to consider whether common interventions will be needed to ensure that competitive neutrality between different service providers is maintained.

These issues will be significant in all of the structural scenarios. What they suggest is that the current ownership and content restrictions will become harder to implement once convergence begins in earnest in the media industries, because market and service boundaries will be harder to draw.

These developments have not yet occurred, and are not likely to occur until significant digitalisation of transmission and structural change has occurred in the media and cultural industries. When that occurs, a range of responses will be possible. As the effectiveness of these “viewer market” interventions is eroded by the growing complexity of the media and cultural industries, it may be necessary to rely more heavily on other interventions which are focussed on input markets and government participation.

In input markets, it has been necessary to provide support for production in Australia in order to ensure sustainability in global content markets. The inherent difficulty of operating a small production industry in a global marketplace has already been pointed out, and these difficulties will probably increase rather than decrease over time. The result may be greater reliance on government support in order to maintain the industry at current levels. Another likely development is a sharper focus on structural issues in the local production industry, such as the availability of management, marketing and technical skills, practitioner access to up-to-date production and post-production equipment, access to capital, and access to distribution and marketing channels.

The policy options that can be deployed in support of cultural outcomes in *Déjà Vu* can be summarised as:

- structural interventions such as:
 - creation of property rights such as copyrights, patents and trademarks;
 - foreign and cross-media ownership restrictions on capital markets;
 - international trading rules in content input markets;
 - control of service market entry through licensing of infrastructure and spectrum;
- conduct interventions such as:
 - Local content rules;
 - community standards rules;
- government participation such as:
 - national broadcasting;
 - government support for community broadcasting;
 - tax concessions for content production activity;
 - direct subsidisation of input production activity (i.e. film, multimedia and music funding); and
 - government support for production skills formation and industry infrastructure.

The comments on the Déjà Vu scenario apply to **Home Alone** with equal force, but the vertical disintegration of the electronic media industry would add some new issues and make others more pressing. The separation of broadcasting infrastructure from broadcasting services would have two major consequences.

It would become harder, though not impossible to restrict media market entry, and barriers to entry would generally be lower. This is generally good for plurality and diversity, but it erodes the capacity to enforce Australian content and community standards requirements in output markets through controlling access to spectrum. Direct imposition of these requirements onto service providers through the service licensing will be necessary. International service provision is possible because wired distribution (not terrestrial spectrum-based distribution) can be performed from an overseas location even if the service market is domestic. Traditional local content requirements may then need to be supplemented by more flexible approaches such as cultural industry development planning in conjunction with major broadcasters and other cultural service providers.

In contrast, the providers of broadcast infrastructure would probably be drawn into a wider digital infrastructure market, finding themselves in competition with the telecommunications industry. This competition can then be facilitated by the extension of access and interconnection requirements to cover broadcasting networks, but this would be subject to the solution of technical interconnection problems between telecommunications and broadcasting networks.

Market internationalisation has little impact on the capacity to impose economic regulation on domestic infrastructures, but it has significant impact on the capacity to license and enforce in service markets.

The policy options that can be deployed in support of cultural outcomes in *Home Alone* can be summarised as:

- structural interventions such as:
 - creation of property rights such as copyrights, patents and trademarks;
 - foreign and cross-media ownership restrictions on capital markets;
 - facilitation of economic access to digital delivery networks;
 - international trading rules in content input markets;
 - control of service market entry through licensing of domestic service providers;
- conduct interventions such as:
 - Local content rules;
 - community standards rules;
- government participation such as:
 - national broadcasting;
 - government support for community broadcasting;
 - tax concessions for content production activity;
 - direct subsidisation of input production activity (i.e. film, multimedia and music funding); and
 - government support for production skills formation and industry infrastructure.

The internationalisation of markets in the **Virtual Countries** scenario, coupled with vertical integration of services and infrastructure, leads to an industry structure with mixed benefits from a cultural and media policy perspective. The lack of access to digital

networks means that structural issues move up the cultural policy agenda because content distribution becomes a major bottleneck and constraint on cultural industry development. Government support of both production and distribution emerge as key elements of cultural intervention strategies. Opportunities to promote plurality and diversity are limited because the lack of access to infrastructure prevents new entry and suppresses innovation.

Conversely, concurrent licensing of services and infrastructure is still viable. This provides opportunities to impose service requirements such as Australian content and community standards rules through licensing of infrastructure and access to spectrum. The new challenge that arises is the coordination of competing national agendas for service regulation across infrastructures that span national boundaries. International rules determined in international forums are one element of the solution. It is likely that some level of “re-domestication” of services would be the result, in order to meet different cultural concerns in different countries. National broadcasters become more focussed on Australian content and offset the impact of foreign programming.

Geographical licensing of intellectual property becomes problematic in this scenario because digital content can be readily transported across geographical boundaries. The result is a shift to global licensing, triggering a globalisation of the content distribution and exhibition industries.

The policy options that can be deployed in support of cultural outcomes in *Virtual Countries* can be summarised as:

- structural interventions such as:
 - creation of property rights such as copyrights, patents and trademarks;
 - foreign and cross-media ownership restrictions on capital markets;
 - international trading rules in content input and consumer markets;
 - control of service market entry through licensing of infrastructure and spectrum;
- conduct interventions (in cooperation with leading regulators overseas) such as:
 - Local content rules;
 - community standards rules;
- government participation such as:
 - national broadcasting;
 - government support for community broadcasting;
 - tax concessions for content production activity;
 - direct subsidisation of input production activity (i.e. film, multimedia and music funding); and
 - government support for production skills formation and industry infrastructure.

The combination of both of the major convergence trends in the ***Cut and Thrust*** makes this scenario the most problematic from the perspective of cultural and media policy. It combines high policy priorities with the most limited set of points of intervention.

Support for cultural industry development is pivotal for the achievement of cultural and media outcomes in this scenario, because few other kinds of intervention are available which can affect cultural outcomes.

The policy options that can be deployed in support of cultural outcomes in *Cut and Thrust* can be summarised as:

- structural interventions such as:
 - creation of property rights such as copyrights, patents and trademarks;
 - facilitation of economic access to digital delivery networks;
 - international trading rules in content input markets;
 - control of service market entry through licensing of domestic service providers;
- conduct interventions (for Australian service providers only) such as:
 - local content rules;
 - community standards rules;
- government participation such as:
 - national broadcasting;
 - government support for community broadcasting;
 - tax concessions for content production activity;
 - direct subsidisation of input production activity (i.e. film, multimedia and music funding); and
 - government support for production skills formation and industry infrastructure.

In summary, the media and cultural environment will become more complex in all plausible scenarios. This will make the implementation of traditional media and cultural interventions more difficult, but this process is expected to happen gradually.

Scenarios where service provision is structurally separate from infrastructure provision are problematic for the imposition of content requirements such as Australian content and community standards. If service markets are domestic then it is still possible to impose these requirements on domestic service providers.

In international scenarios these issues become acute, and direct support for cultural industry development becomes the primary intervention. These interventions need to integrate cultural and industry development perspectives in order to ensure sustainable cultural outcomes. In all scenarios where structural change undermines cultural interventions in viewer markets, interventions which promote both production and distribution of cultural services are key to local representation and global participation.

7.4 Achieving industry and regional development

The desired national outcomes for industry and regional development have been summed up in this report as:

- International attractiveness as investment site for digital infrastructure & services
- Global recognition as reliable, affordable service provider
- Strong capabilities in innovative applications and content development
- Broad geographical spread of domestic economic activity

The structural profile of the service sector has been addressed in previous sections. In this section, the focus is on the policy implications of convergence for industry and regional development.

The earlier discussion of employment issues touched on a number of issues directly related to industry development and the distribution of jobs both nationally and internationally. The issues paper also identified the global division of labour as a key issue for industry development policies in a convergence environment.

The broad centralising trend that is linked to the convergence “givens” is most evident when considering industry and regional policies. There are significant economies of scale and scope in the traffic switching and data processing that underpin this trend to centralisation of activity. This so-called hubbing of services has obvious implications for the distribution of economic activity and employment. These were discussed in previous sections.

From the perspective of industry and regional development, the basic challenge of the digital economy is twofold:

- to ensure that Australia captures the benefits of digital service activities, and does not find service activities exported to overseas service hubs; and
- to ensure that regional Australia captures the benefits of digital service activities, and does not find service activities exported to urban hubs within Australia.

These two issues are almost identical, differing only in the scale at which they are relevant. The same pressures that encourage centralisation of service activity in cities also encourage global centralisation in major overseas markets. The policy responses are in principle the same, namely to ensure that the complementary human, intellectual and social capital required to capture service activity is in place nationally and regionally.

Regional development issues are not the same as rural access issues. Access is all about demand-side participation in the digital economy. Industry and regional development is about supply-side participation, including investment and employment. Although these issues are separate, they are strongly linked. The basic objective of development policies for electronic services must be to trigger a virtuous cycle of expanding service activity, deepening investment, and growing demand-side participation in the regional and national economies.

Failure to address all of these elements simultaneously could be counterproductive. Access without activity will result in the export of investment and jobs from regions and the nation. Activity without access will fail to achieve the critical mass of users needed to sustain investment. Consumer and access-oriented policies are becoming linked to industry and regional development outcomes. There is strong synergy between the achievement of social and industry outcomes.

Traditional interventions associated with industry and regional development are dominated by government participation. They include:

- structural interventions such as:
 - creation of property rights such as copyrights, patents and trademarks;

- conduct interventions such as:
 - industry development planning with major market participants;
- Government participation such as:
 - subsidisation or supply of inputs such as equipment, infrastructure, skills, R&D and content production;
 - tax concessions for equipment, infrastructure, skills, R&D and content production; and
 - Government purchasing from national or regional suppliers.

Implications of convergence "givens" and convergence trends for industry and regional outcomes

The convergence "givens" and trends set out in the previous chapters have significant impact on the implicit assumptions underpinning industry and regional development policies.

The impact of the convergence "givens" on traditional industry and regional development assumptions is summarised in the following table:

Traditional assumptions	Impact of convergence "givens"
Physical infrastructure is the focus of investment because infrastructure is the key to service definition and delivery.	Human, intellectual and social capital are the focus of investment because value-added is primarily in service and applications activities.
Service activities are dispersed because service delivery is face-to-face or tied to local infrastructures.	Returns to scale and new economies of scope increase the tendency for service activities to centralise both nationally and internationally.
Local service provision reduces the importance of recognition and associated intellectual property such as trademarks and branding.	International service provision increases the importance of global branding and trademarks which attract consumer confidence.
Innovation and development policies focus on equipment and infrastructure.	Innovation and development also focus on the formation of human and intellectual capital.
Regional development depends primarily on the availability of cheap labour, resources and infrastructure.	Regional development depends primarily on the availability of human, intellectual and social capital.

The implications of these changes are:

- The importance of intangible property raises the importance of copyright, trademark and patent protection;.
- Australia needs to position itself to capture the benefits of activities based on intangible capital such as advanced manufacturing, applications development and international service deployment. First mover advantage in the development of skills, intellectual property and social capital will be important to international success;.

- Priorities for investment are shifting from physical infrastructure to human, intellectual and social capital. These intangible assets are at the core of national competitiveness. Policies designed to promote capital formation will need to address this shift;
- Regional development policies for digital services must address both digital infrastructure and human, intellectual and social capital requirements in order to be effective. Human, intellectual and social capital are essential for regions to capture the benefits of digital economic activity. Policies based solely on infrastructure investment will be counterproductive because they will encourage the export of economic activity and jobs from regional areas into major urban service centres.

The convergence trends also have important implications for the implementation of industry and regional policies. Vertical disintegration will affect the assumptions of traditional policies

Traditional assumptions	Vertical disintegration assumptions
Quality of physical and analog infrastructure is essential to the attractiveness of service investment.	Quality of human, intellectual and social capital is also essential to the attractiveness of service investment.
Global recognition for equipment and infrastructure automatically translates into global recognition of service quality because service quality is primarily determined by infrastructure quality.	Global recognition for commodity equipment and infrastructure, and recognition for advanced services and products, are achieved independently because service quality depends on human, intellectual and social capital as well as digital infrastructure.
Service innovation is controlled primarily by infrastructure providers.	Service innovation is controlled primarily by third-party applications developers and user communities.
The location of service activities is tied to the location of the required infrastructure.	Digital service activities are highly mobile and are attracted to centres of human, intellectual and social capital, and to low-cost communications and data processing centres.

- The formation of intangible capital must have equal importance as physical capital in any industry or regional development policy;
- As access to digital networks develops, service sector innovation will intensify and will place both increased and novel demands on innovation policies that were originally developed for tangible products; .
- As noted above, infrastructure investment will only aid national and regional development if the complementary human, intellectual and social capital is also available to capture the benefits of digitalisation. This is particularly true in vertically disintegrated scenarios because service activity is more mobile.

The impact of market internationalisation is also substantial:

Traditional assumptions	International market assumptions
Global capital for service investment is allocated on a multi-domestic basis because service markets are domestic.	Global capital for service investment is allocated to major service centres that possess large economies of scale and scope, or unique human, intellectual and social capital.
Global recognition in international markets is primarily about business to business trade.	Global recognition in international markets is primarily about consumer participation in international service markets.
Priorities for investment in service sector capabilities are primarily driven by domestic demand.	Priorities for investment in service sector capabilities are primarily driven by international demand.
Regional development is primarily about capturing a share of national economic activity.	Regional development is primarily about capturing a share of global economic activity.

- The centralisation of service activity in major centres means that there will be winners and losers in any international restructuring of economic activity. This could have either positive or negative balance of trade implications. Intervention should be aimed at capturing these centres of activity;.
- Growing participation of consumers in international markets generates new opportunities for the “importation” of customers from other countries, and blurs the distinction between domestic and international markets. Measures designed to build consumer confidence, discussed in earlier sections, will facilitate the development of these new global service markets by Australian service providers;.
- National industry development policies must simultaneously combine investment in infrastructure with developments that attract services centre activity. Policies based solely on infrastructure investments may prove counterproductive if they inadvertently facilitate the export of economic activity to other major service centres.
- Regional development policies must benchmark regional performance against global norms, not national norms.

Industry and regional development policy options in different structural scenarios

The range of interventions does not vary a great deal between scenarios because most industry and regional development interventions involve government participation, which is relatively unaffected by structural change. What changes is the scale of intervention required to offset the urban centralisation and export of service activities.

The convergence “givens” imply a range of new priorities for industry and regional development policies that are valid in all structural scenarios. The implications can be seen in the ***Déjà Vu*** scenario, which differs from the traditional industry environment only in the impact of these “givens”.

The interventions associated with industry development outcomes have been traditionally associated with the agricultural, mining and manufacturing industries, not the service industries. The policy options in this scenario do not differ substantially from the

traditional ones, but will increasingly be used to address issues arising from the formation of intangible capital as well as physical capital.

In the regions, this means that measures designed to attract capital for digital infrastructure must be complemented by measures to build human, intellectual and social capital which underpins advanced service development and delivery. This can be accomplished through skills investment, measures to promote local networking of businesses and consumers which mobilise demand, and measures to promote research and development of locally and globally-oriented applications and services. Intellectual property law allows investors in these assets to capture part of the value that they create.

National industry development policies must incorporate a similarly complementary approach that simultaneously favours infrastructure investment and the development of applications services. The combined approach will have the effect of attracting applications activities and raising the level of international connectivity. Particular industries targeted for exporting digital services to international markets, especially Asia, already include financial and education services industries.

The policy options that can be employed in support of industry and regional development outcomes include:

- structural interventions such as:
 - creation of property rights such as copyrights, patents and trademarks;
- conduct interventions such as:
 - industry development planning with major market participants;
- government participation such as:
 - subsidisation or supply of inputs such as equipment, infrastructure, skills, R&D and content production;
 - tax concessions for equipment, infrastructure, skills, R&D and content production; and
 - government purchasing from national or regional suppliers.

The **Home Alone** scenario differs from *Déjà Vu* because service and infrastructure activities are structurally separated. The implications of this difference are lower barriers to entry in service markets which will promote innovation, but may also place growing demands on innovation support measures.

The higher mobility of service activity makes the centralisation of service activity more likely, requiring more vigorous efforts to assist regional and national communities to capture service-related activity.

The international scope of service markets in the **Virtual Countries** scenario means that the global as well as the national distribution of activity are significant. The tighter integration of infrastructure and service activities means that global service centres, once entrenched, will be difficult to shift. In this scenario, efforts to capture service activities can only be achieved by meet meeting or exceeding global benchmarks for quality and cost of infrastructure, ensuring global recognition of the quality of regulatory regimes and legal frameworks, and investing in skills, service research and development and community networking which mobilises demand.

Regional development has much the same agenda. The difference in this scenario is that the benchmarks which regionally-based service activity must meet are no longer those of metropolitan Australia, but of rival service provision industries globally.

The impact of globalisation is exacerbated in ***Cut and Thrust***. The vertical disintegration of service activities and infrastructure activities increases the mobility of service activity, making it easier for global service investment to chase scarce human, intellectual and social capital. This raises the scale of intervention required to ensure these resources are available both nationally and regionally.

In summary, industry and regional outcomes are becoming more dependent on successful formation of human, intellectual and social capital, as well as digital infrastructures designed to support electronic services. Integrated development of both tangible and intangible capital is essential to avoid national and global centralisation of service activity which can result in the export of economic activity from the regions and the nation.

The range of interventions in support of industry and regional outcomes does not vary a great deal between scenarios because most industry and regional development interventions involve direct or indirect government participation in market activities, and are relatively unaffected by structural change. The primary difference between scenarios is that the scale of intervention required to ensure the capture of service activity nationally and regionally is greater in scenarios where service markets are international in scope.

7.5 Policy strategies and measuring progress

The contrast between generic and industry-specific approaches is obvious when considering how to measure progress towards the desired national outcomes. Measures of progress can be either generic or industry-specific, depending on the level at which progress is measured. In either case, the globalisation of the services sector means that competitive benchmarking of both industry and regulatory performance is an essential aspect of the development of measures of progress. Australia is not competing with itself, but with other countries.

The generic measures of progress are mostly familiar ones: macroeconomic measures of economic performance, and gross levels of industry and cultural investment and output. Some are quantitative and others are qualitative, but they are basically the same measures which have been used for decades in one form or another. This is to be expected; just as the desired national outcomes do not change with changing industry and market structures, neither do these high-level measures change much.

Ultimately, progress can only be measured against the desired national outcomes, but measures of industry performance are necessary to complement generic measures. This is because different industries make different contributions to those outcomes. The measures of progress must be built into the policy strategies that are assembled from the insights provided by the convergence perspective and the other factors that may also be decisive when determining policy responses to changing industry conditions.

The development of these policy strategies is beyond the scope of this report. It will fall to responsible authorities in both Federal and State Governments to address the sectoral

responses to convergence and the associated restructuring. As stated in the Introduction, it will probably take two to five years to address these issues because the structural uncertainties are still large, and because the effort required to develop and implement new approaches to the achievement of national outcomes is considerable.

8.0 LEGISLATIVE AND REGULATORY RESPONSE TO CONVERGENCE

The previous chapter set out policy options to achieve desired national outcomes for different scenarios of convergence industry structure. The effective implementation of these policies will require a diverse range of government approaches including not only legislation, but also direct provision of services, direct funding and subsidies, participation in international forums and other interventions.

This chapter explores the institutional policy responses to convergence with particular attention to the communications legislation and the established communications regulatory institutions. The most important pieces of legislation are the *Broadcasting Services Act 1992*, the *Telecommunications Act 1997*, and the telecommunications-specific parts of the *Trade Practices Act 1974*. These Acts are administered by the Australian Broadcasting Authority (ABA) and the Australian Communications Authority (ACA) and the Australian Competition and Consumer Commission (ACCC) respectively.

The commentary of this chapter is based on four observations:

- The structure of legislation should reflect the current industry structure, rather than past or future structures. This is because the structure of legislation is closely related to the structure of the industry being regulated. In particular, the basic service definitions define the scope of legislation, and ideally reflect the boundaries of the markets and industries that the legislation addresses;.
- The timing of legislative and regulatory change should be driven by industry events, not the other way around. This is because structural change is unpredictable, and pre-emptive changes to the structure of legislation carry high regulatory risk. Changes to legislation as a result of convergence need only be considered if the convergence test is passed for a particular industry;.
- The structure of regulators should reflect the nature of the task they perform, particularly whether they serve economic, technical, social, or cultural objectives. This is because the skills sets and approaches required in each area are different;.
- Transition management needs to incorporate realistic timeframes for legislative change. This is in order to avoid excessive disruption of either consumers or industry, and minimise the costs of transition.

These four observations allow broad conclusions to be drawn about the nature and timing of legislative and regulatory change. This chapter addresses these issues at a high level, because any detailed proposals will probably be overtaken by events over the next two to five years. The benefit of a high-level analysis is that the statements will be more enduring.

8.1 Convergence and legislative structure

All legislation is based on service definitions that define the scope of intervention. These definitions ideally reflect the boundaries of the markets and industries that the legislation addresses. This means that the basic legislative definitions are the starting point for a high level analysis of the communications legislation.

Telecommunications legislation

As noted in earlier chapters, the telecommunications industry is highly digitalised compared to other service industries. Many elements of telecommunications such as overseas links, inter-exchange infrastructure routes and switching equipment are digital. In contrast, the local loop remains largely analog, limiting full digital end-to-end connectivity. This obstacle to full digitalisation will probably be removed within the next two to five years, allowing the full impact of convergence to be felt in consumer service markets.

Digital technology has been an integral part of telecommunications networks for decades, and the convergence test has been met. It is reasonable to expect that significant structural change would have occurred over that period. Over the least twenty years, the telecommunications industry has shifted from vertically-integrated monopoly to vertically-disintegrated competition. Separate infrastructure, connectivity and service providers now operate in a web of intermediate access and interconnection markets.

Most telecommunications consumer markets are still domestic in scope, so the telecommunications industry has some parallels with the *Home Alone* scenario. The principal exception is the Internet business, where service markets have been “born global”, and is closer to the *Cut and Thrust* scenario. A range of independent content, applications, connectivity and infrastructure providers operate in the Internet industry in a highly disintegrated structure.

Competition is not fully established in many telecommunications markets, especially in infrastructure industry where barriers to entry are relatively high, but there has been substantial progress towards a convergence industry structure.

This industry structure is reflected fairly faithfully in the definitions that underpin the telecommunications legislation. The current telecommunications legislation is based on several definitions, but the principal one is *carriage service*, defined as “a service for carrying communications by means of guided and/or unguided electromagnetic energy”. Carriage services closely correspond to the idea of *connectivity* in the convergence industry structure.

Similarly, the legislation defines a *facility* as “any part of the infrastructure of a telecommunications network, or any line, equipment, apparatus, tower, mast, antenna, tunnel, duct, hole, pit, pole or other structure or thing used, or for use, in or in connection with a telecommunications network”. In essence, a facility corresponds to the idea of *infrastructure* in the convergence industry structure.

Finally, a *content service* is defined as either a broadcasting or online information or entertainment service. There is also scope for the definition to be broadened by regulation, although no submitters argued for the definition to be extended to all of the *applications* identified in the issues paper. This suggests that the competitiveness of the connectivity industry has eroded the economic power of connectivity providers, and that application providers have adequate access to the connectivity they need to deliver services.

Broadly, the structure of the telecommunications legislation reflects the current realities of the industry, both in terms of the key activity definitions and the level of competition. Telecommunications is still in a transitional phase, and some industry-specific and

asymmetric elements are still present and appropriate. These arrangements will be the subject of a review in 2000, and the need for industry-specific and asymmetric regulation will be examined. However, the analysis of this review suggests that the telecommunications legislation is generally congruent with the structural trends in the telecommunications industry, and will not require fundamental change in the next few years.

Broadcasting legislation

In contrast to the telecommunications industry, the broadcasting industry has barely begun the convergence process. The absence of digital technology for broadcasting service delivery, apart from a few satellite services, means that the convergence test has not been met. As a result, there is little evidence of significant structural change. The broadcasting industries still have a traditional structure. Service markets are domestic, while service activities are still highly integrated with analog infrastructure activities. In recognition of its specialised nature, broadcasting infrastructure is exempted from the telecommunications legislation.

There are actually several broadcasting industries, each with specific structural features. This industry structure is reflected in the licensing structure for broadcasting, where different service types are effectively defined. Television and radio, subscription and free, and broadcast and narrowcast classes of service are all recognised, giving eight service types in total.

Free-to-air broadcasting services and the associated infrastructure and spectrum have a common licence, reflecting the traditional vertical integration of the industry. Terrestrial spectrum remains the dominant form of free-to-air delivery largely for reasons of consumer preference. Analog television and radio are mature and inexpensive technologies which viewers are accustomed to. As a result, spectrum-based technology is one of the characteristic features of free-to-air broadcasting. The technology and industry-specific approaches of the current legislation simply reflect this fact.

In contrast, subscription broadcasting and the associated infrastructures are licensed separately. The relatively high bandwidth demands of multi-channel television, and the absence of sufficient spectrum to deliver such services, has pushed subscription services into a wider range of technologies such as satellite, microwave distribution and cable.

These structures are likely to remain stable until digital technology substantially penetrates the broadcasting industries. When affordable, reliable digital alternatives to the existing analog infrastructures are available, then structural change may commence. Based in on reasonable assessments of the likely penetration of digital television and radio, this is several years off. The recent digital television amendments, for example, allow for a simulcast period of eight years with an option to extend. This might seem a long time but it is quite rapid in comparison with the telecommunications industry, which has taken at least two decades to reach its current stage of convergence.

Like the telecommunications legislation, broadcasting legislation largely reflects the current structure of the broadcasting industry, and these structures are likely to persist for several years. As a result, it is likely that the corresponding structure of the broadcasting legislation will remain sound for some time.

8.2 Convergence and regulatory structure

The regulatory structure for communications is roughly divided into three responsibilities: economic regulation (administered by the ACCC), technical regulation (administered by the ACA), and broadcasting regulation (administered by the ABA).

These regulators fall into two classes. The ACCC and the ACA largely deal with economic and related issues, including technical regulation. In contrast, the ABA has primary responsibility for cultural issues in the electronic media, including cross-media and local content rules, but also spectrum allocation in the broadcasting services bands.

The issue is whether convergence has any implications for this regulatory structure. The two most commonly raised issues are whether the ABA should retain responsibility for spectrum licensing in the broadcasting services bands, and whether communications regulation should be brought into an FCC-style communications regulator.

The current vertical integration of free-to-air services and spectrum licences suggests that there would be little to gain from separate licensing in the short term. If new industry structures emerged then this arrangement would need to be re-examined, but the relatively slow progress of digitalisation in broadcasting transmission suggests that this will not happen for some time.

The division of labour between regulators is the result of specialisation, because different skills sets are required for different types of regulation and for different industries. Convergence may mean that regulators need to be given a new focus or responsibilities. This may in turn require new skills and new regulatory structures.

The ideal regulatory institutional structure would exploit organisational synergies and facilitate the transparent management of different types of policy objectives. This suggests that the current division of labour between the ACCC (economic objectives), the ACA (technical objectives) and the ABA (primarily cultural and social objectives) is broadly correct.

Carving communications competition responsibilities out of the ACCC and putting them into a new regulator would reverse the trend towards generic economic regulation. This would be difficult to sustain because electronic and physical infrastructures become more substitutable means of service delivery. Shifts in market boundaries suggest that a whole-of-economy approach to economic regulation remains the best approach to economic regulation, and that competition responsibilities should remain with the ACCC.

The principal area of ambiguity is the split of spectrum management responsibility between the ABA and the ACA. This arrangement has been based on a clear division between broadcasting and non-broadcasting spectrum. The appropriate future division of responsibility will depend on a number of factors, including the pace and direction of broadcasting industry change and the growing use for broadcasting of spectrum outside the broadcasting services bands. If these factors become important or are recognised as likely developments, then a rethink of the division of responsibility for spectrum management may be needed.

8.3 Note on transition management

In an ideal world, it would be possible to link policy development directly to industry change, avoiding all trade-offs and tensions. In the real world, with different paces of change in different industries and different countries, and with trade-offs between different objectives, this linkage is strained.

Practical policy judgments often need to balance different objectives, particularly in periods of structural transition. Judicious management of these transitions is required, but there is no predetermined formula for transition management. The relative priority placed on economic, socio-cultural and industry development outcomes may vary during the transition period.

In the case of digital television, the government has placed an initial priority on the stability of consumer markets and cultural protection, in order to maintain a pace of change which is manageable for consumers, industry and the wider society. Judgements of this kind will be common during transitional periods where the potential for significant impact on industry or consumer interests is high. Policy responses need to address a less-than-ideal industry environment where it is not always possible to advance towards all desired national outcomes simultaneously.

It is common to contrast “revolutionary” with “evolutionary” approaches to policy development in overseas debates on legislative responses to convergence. This distinction misses the point. Legislation does not evolve; it is amended in discrete steps. This means that no policy framework for transition can ever completely mirror industry developments. Policy responses to convergence will always be imperfect.

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TERMS OF REFERENCE

The convergence review is intended to provide an authoritative and comprehensive analysis of the issues related to the convergence of technologies and markets in the telecommunications, information technology, broadcasting and media industries, and the wider economy, over the next five to ten years.

The review will address clause 59 of Schedule 4 of the Broadcasting Service Act 1992, which states that:

- (1) Before 1 January 2000, the Minister must cause to be conducted a review of the following matters:

- (a) whether any amendments of laws of the Commonwealth should be made in order to deal with convergence between broadcasting services and other services;

Under the Act, the Minister must also cause a report of the review to be prepared.

The report of the review will provide useful input for government policy development over the medium term, particularly in the regulation of the communications and related industries which are a key enabler of technological change across the economy.

The review will provide:

- *an analysis of the impact of convergence on international industry and policy developments, placing the Australian economy in a wider international context;*
- *an analysis of the issues raised by convergence for existing Australian regulatory and policy approaches; and*
- *options for alternative approaches to address convergence.*

Scope of the review

The review is to report on:

- *The the scope and significance of convergence in the Australia economy, including:*

- *trends in the international industry environment and in associated demand markets, and their implications for Australia;*
- *the enablers and drivers of convergence;*
- *the timeframes for convergence and associated structural changes; and*
- *possible industry and consumer scenarios in Australia over a five to ten year timeframe.*

- *international policies and developments designed to address convergence, including:*

- *legislative, institutional and regulatory changes;*
- *direct interventions such as funded programs; and*
- *other policies designed to respond to convergence;*

- *the implications of convergence for the achievement of government policy objectives, including:*
 - *an analysis of options for the achievement of long-term policy objectives in a convergence environment; and*
 - *transitional strategies for policy and preferred timeframes for any proposed changes, including regulatory policy and institutional responses.*

INTERNATIONAL POLICY DEVELOPMENTS

One of the main major structural trends identified in this report was the progressive internationalisation of service markets. International markets for content, information and transactional services are emerging as connectivity costs decrease and the customer base broadens outside national boundaries.

The underlying digital technology that enables convergence is available to businesses in all countries. Therefore, the impact of convergence will affect regulatory authorities, governments and international bodies globally. The relative importance of specific issues will vary depending upon the current domestic regulatory framework and the extent of the emergence of new industry structures in the domestic economy.

Many national governments and international organisations have conducted investigations and reviews of convergence. This section of the report explores some of these international reviews, and investigates the major industry and policy developments in those markets.

Nearly all of the reviews by national governments or international bodies have occurred over the past three years. The level of recent interest in convergence can be attributed to a combination of factors. Over this time period, prices for digital connectivity have decreased to the stage where service industries have been able to take advantage of them. In addition, the exponential growth in consumer and business use of the Internet has permitted alternatives to traditional means of service provision.

The United Kingdom and the European Commission have both conducted quite detailed reviews into the issue of convergence. The process that they used was quite similar to this convergence review with the release of an issues or green paper, a period of public consultation and the production of a final report. The International Telecommunications Union has also conducted some reviews. While the USA, Canada, New Zealand and Japan have not conducted separate reviews of the impact of convergence on their economies and regulations, each of their economies is facing structural change and their regulatory structure is under stress due to the impact of digitalisation. Each country is investigating new regulations and regulatory structures for their convergence industries.

Most national governments or international bodies confine their reviews of convergence to impacts upon the telecommunications and broadcasting industries rather than the wider scope of other service industries. Some insight into the analysis of the potential impact of digitalisation on other service industries internationally can be found in strategic planning and foresight documents. For example, New Zealand and the United Kingdom have established Foresight projects to encourage a process of strategic thinking to that guides the development of new government policies. Both use scenario planning to explore the future in order to determine possible policy responses.

The following summarises the major points of interest in various countries and international organisations. Major findings from their investigations are detailed as well as the impact on existing regulations and the structure of regulatory authorities.

European Commission

The European Commission has produced a large number of detailed documents on convergence. In December 1997, they released a Green Paper on the Convergence of the Telecommunications, Media and Information Technology Sectors, and the Implications for Regulation. Two rounds of public consultation were conducted through 1998. The second round of consultation focused on three areas; : access to networks and gateway facilities, ; investment, innovation and content production, and balancing regulation between public interest and competition considerations. The final paper on the results of the public consultation was released in March 1999. Proposals for action drawing from the results of the consultation will occur in two areas:

- reforms in the regulation of infrastructure and associated services will be proposed as part of the 1999 Communications Review entitled *Towards a New Framework for Electronic Communications Infrastructure and Associated Services.*; and
- reforms in the regulation of content services will be covered by adjustments to existing legislation or by the introduction of new measures.

The 1997 Green Paper stated that convergence is most commonly expressed as:

- the ability of different network platforms to carry essentially similar kinds of services; or
- the coming together of consumer devices such as the telephone, television and personal computer.

The EU focussed their report on the first definition of convergence even though the latter definition is the one most cited in the popular press. They particularly addressed the new business and market phenomena enabled by network convergence through digital technology.

One of the main market trends identified was a shift in the value chain where content production, packaging and service provision increase in value while carrying services over a network become comparatively low value activities. The significant increase in merger, alliances and acquisitions activity is a result of companies seeking to move up the value chain to higher margin activities through vertical integration.

The Green Paper put forward five principles for future regulatory policy in the sectors affected by convergence. These were that:

- regulation should be limited to what is strictly necessary to achieve clearly identified objectives,;
- future regulatory approaches should respond to the needs of users,;
- regulatory decisions should be guided by a need for a clear and predictable framework,;
- public authorities should seek to ensure full participation in a converged environment, ; and
- independent and effective regulators will be central to a converging environment.

The key messages from the public consultations from the Green Paper were:

- affirmation of the continuing need for regulation to meet a range of public interest objectives whilst recognising the need to promote investment in new services;
- the need for transparency, clarity and proportionality with regard to rules and to distinguish between:
 - regulation imposing positive and negative obligations in the public interest, ;
 - sector-specific regulation complementing case-by-case application of competition rules, ; and
 - promotional measures ensuring outcomes according to specific policy objectives.
- separation of transport and content regulation, with recognition of the links between them for possible competition problems. This implies a more horizontal approach to regulation with:
 - homogenous treatment of all transport network infrastructure and associated services, irrespective of the types of services carried;
 - a need to ensure that content regulation is in accordance with the specific characteristics of content services, and with the public policy objectives associated with those services ;
 - a need to ensure that content regulation addresses the specificity of the audiovisual sector, in particular through a vertical approach where necessary, building on current structures; and,
 - application of an appropriate regulatory regime to new services, recognising the uncertainties of the marketplace and the need for the large initial investments involved in their launch while at the same time maintaining adequate consumer safeguard.
- a balanced solution as to how public broadcasting can be best integrated into the new environment, which should:
 - respect Member State competence by defining the remit of public service broadcasting;
 - encourage those organisations vested with public broadcasting obligations to exploit new technologies and new ways of reaching their audiences; and,
 - require such broadcasters to distinguish clearly between defined public broadcasting activities and activities lying in the competitive domain.
- effective application of the competition rules; an increased reliance on those rules, accompanied by gradual phasing-out of sector-specific regulation, as the market becomes more competitive; and,
- actions aimed at promoting premium European content.

The second round of public consultation focussed on three areas identified as crucial to the convergence debate. These were access issues, a framework for investment and innovation, and ensuring a balanced approach to regulation.

Access issues, including access to the local loop and to gateway facilities, were generally agreed to be a key factor for the development of competition. Respondents claimed that network access was of strategic importance and hence provided the most pressing case for regulatory attention. New entrants and established broadcasters favoured service based competition that involves opening access to the infrastructure so that the reach of potential users is maximised. This would give operators access to a critical mass of customers earlier and lead to greater innovation and competition in the rapid introduction of services. Incumbent telecommunications operators generally disagreed as such competition would act as a disincentive to investment in new infrastructure.

Varying views were also expressed between those who expressed a continuing role for sector specific economic regulation, those preferring an approach based solely on competition rules, and those seeking a gradual phasing-out of sector specific regulation as a competitive market develops. Arguments for continuing sector specific regulation included to ensure that public interest objectives were defined in a precise legal framework, and that economically, legal certainty was required for investment and the timely solution of anti-competitive practices. Proponents for a competition-law approach recognised that sector specific regulation could only be phased out after a period of transition towards a mature competitive market. Their view was that during this transition, the relaxing of regulations could be tied to certain trigger points associated with criteria based on the development of competition.

In general, a balance between avoiding over-regulation, meeting legitimate public interest requirements and encouraging sustainable competition needs to be achieved. In addition, gateways, bottlenecks and essential facilities need to be clearly defined and decisions made as to the application of sector specific regulation in addition to standard competition law.

There was widespread recognition from the consultations that current investment programs to promote European audiovisual production would need to be adapted to the digital environment. There was a strong view that channel proliferation would further fragment the market, making it more difficult for productions aimed at smaller national and regional markets to recoup their costs. While the production of local content was a matter for the industry first and foremost, continued financial support mechanisms were seen to play an important role. Many contributions argued that content requirements based on broadcast time were rapidly becoming obsolete and that consideration should be given to mechanisms based on investment requirements.

In taking account of investment needs, the consensus view was to establish a consistent, predictable and technology-neutral regulatory framework. There were difficulties in predicting the future and dangers in regulatory "second-guessing" promoting certain standards or platforms. While the regulatory framework needs to encourage competition and market entry, it must be flexible enough to take account of rapid economic and technological development, yet stable enough to encourage early investment.

Many submissions saw that there was no necessary contradiction between facilitating the development of open competitive markets and securing public interest objectives. In general, it was considered that open and competitive markets could make a necessary, but not always sufficient, contribution to securing public interest objectives such as universal access, affordable prices, pluralism and diversity. There was a clear consensus that the regulation of infrastructure and the regulation of content required separate and differing approaches. Self-regulation was also viewed as able to contribute to the achievement of the balance between competition and public interest, particularly in markets where competition was assured but also with regard to certain public interest objectives in the content sectors.

The results from the Review into Convergence in the Telecommunications, Media and Information Technology Sectors, and the Implications for Regulation will be used in the recently launched 1999 Communications Review, *Towards a New Framework for Electronic Communications Infrastructure and Associated Services*. The Commission aims to use this later review to propose by mid-2000 for a new regulatory framework to

provide for more competition, simplification of existing legislation and the removal of market access barriers.

The new policy framework to be developed will need to cater for new, dynamic and largely unpredictable markets with many more market players than today. Moreover, in line with convergence between services, networks and technologies, the rules will need to be adapted from a traditional telecommunications oriented framework to cover all electronic communications infrastructure and associated services in a consistent manner.

In explaining the reasons for launching the Communications Review, the Commission stated that the communications sector is undergoing technological and market development at an unprecedented speed. The following factors are causing these developments:

- convergence of the telecommunications, broadcasting and IT sectors is making the traditional separation of regulatory functions increasingly obsolescent;
- globalisation of technologies and markets is accelerating in scope and intensity;
- mergers and acquisitions, including new alliances, are bringing about profound changes in the nature of the industry;
- the growth of the Internet is overturning traditional market structures by providing a common service delivery platform;
- improvements in processing, access and basic transmission technologies (such as WDM and xDSL) are reducing costs and increasing the capacity of communications infrastructure;
- wireless applications are increasingly entering all segments of the market;
- software re-configurable technologies are enabling operators and service providers to tailor their services to meet specific local market requirements; and
- the development of datacasting and transactional services is promoting innovation in the media sector (digital TV).

The review proposes to amend the regulatory framework for communications infrastructure and associated services into three key elements; : binding sector-specific legislation, complementary non-binding sector-specific measures and competition law. The current legislation would be simplified and consolidated from twenty existing legal measures to six. Competition law will have increased importance as full competition develops in the communications marketplace.

The proposed communications legislation will cover the communications infrastructure and associated services such as telecommunications services and conditional access services. Services provided over networks such as broadcasting services or electronic banking will be outside the scope of the proposed legislation. These will be regulated by other measures at EU or national level. In line with the principle of technological neutrality, two separate authorisations will be required for future broadcasters, one relating to the operation of network infrastructure and the broadcasting of network signals and the other concerned with the content of the broadcast. The latter will not be subject to communications regulations.

Current legislation does not explicitly require local loop unbundling but covers at least some forms of shared access arrangements. Some Member States have mandated

local loop unbundling. The Commission is encouraging these measures to increase competition in the local access network as it sees this area as critical to reducing communication costs and encouraging the take-up of high speed access services.

The key policy proposals from the 1999 Communications Review are:

- to produce a single regulatory framework for communications infrastructure and associated services so that equivalent rules apply to different networks and that these rules are without prejudice to other regulations which will apply to the content of broadcasting services or other information society services;
- to treat Internet transmission services the same as other transmission services;
- to require licensing under general authorisations rather than explicit licensing by a regulator before services could be provided (except for numbering resources and radio spectrum);
- to establish common principles for regulation of access and interconnection across all communications infrastructure;
- to ensure that affordable access for all to communications services remains a key priority;
- to use its powers under competition rules to encourage local loop unbundling; and,
- to improve cooperation between the EC and national regulators.

United Kingdom

Over the past two years, the United Kingdom has released a number of papers on convergence and the building of a knowledge driven economy. The Department of Trade and Industry have conducted much of this work.

Two reports in 1998 targeted directly the issue of convergence. The first report, the Green Paper *Regulating Communications: approaching convergence in the Information Age*, specifically focussed on the implications for the legal and regulatory frameworks covering broadcasting and telecommunications. The second report, *Converging Technologies: Consequences for the New Knowledge-Driven Economy* highlighted the potential impact that the convergence of information systems, telecommunications and broadcasting will have on companies and markets over the next 10 years.

Further reports from the UK Government that consider the impact of structural convergence on the national economy include the White Paper *Our Competitive Future; Building the Knowledge Driven Economy* and analyses conducted by the UK Foresight program such as *2010: W(h)ither financial services*.

The 1998 Green paper, *Regulating Communications: approaching convergence in the Information Age* observed that convergence blurs the traditional distinctions between content creation, content distribution and consumer access to, and interaction with, content. Convergence is likely to create many more distribution opportunities, greatly increasing the potential for creators and owners of high quality content to exert greater bargaining power and realise greater returns. Convergence also makes it easier for companies to leverage their market power vertically (such as from content into distribution or vice versa) or horizontally (such as from wire based delivery to satellite delivery). The tendency towards integration and concentration through convergence will make supply-

side regulation increasingly important to protect the consumer interest through the appropriate exercise of competition law.

The Green Paper further points out that the pace of change is not uniform across different sectors of the economy. This is challenging for regulators to choose between adopting a radically new regulatory structure to avoid barriers to competitiveness or to keep the status quo until mass markets for converged services have developed to a significant extent. The UK Government has determined to adopt an evolutionary approach for regulators to cooperatively manage overlaps and anomalies. They will involve building on the Competition Bill powers and progressively withdrawing regulation to the minimum level required to address issues such as bottleneck control, interoperability and universal access and to amend cultural regulation so that it is based on categories of service which reflect differing consumer expectations. In general, the responses to the Green Paper supported the adoption of this evolutionary approach and accepted that competition law should gradually replace some sector specific regulation.

A further challenge for regulators is to strike a balance between providing investors with certainty and stability while retaining flexibility to ensure that developers of new services are not hindered by outmoded regulations. Regulators will need to cooperate to be able to deal with these issues. In addition, the paper put forward a number of possible models for the eventual structure of regulation such as:

- separate regulators for infrastructure and for content providing industry;
- separate regulators for economic and competition issues on the one hand and for cultural and content issues on the other;
- either of these models with a coordinating body spanning both areas to ensure coherence; or
- a single fully integrated regulator whose internal organisation might be split along the above lines.

The most widely supported model was a single content and a single economic regulator, variously in one organisation or under an umbrella organisation.

An analysis of the impact of convergence on other sectors of the economy apart from communications was conducted in the report *Converging technologies: Consequences for the New Knowledge Driven Economy* produced by the Department of Industry and Trade's Future Unit. This report used a ten-year timeframe to assess the implications for various markets, including manufacturing, retail, financial, intermediaries, health, and the broadcasting sector.

Over this timeframe, the report considered that the impact of convergence would disrupt business process and structures in the following ways:

- further drive industry structures away from conventional vertical integration to more complex structures incorporating contracting out;
- greatly enhance the value of brands and lowering market entry costs through exploiting the implicit trust of brands;
- sharply polarise retail between physical shopping for those with free time and who value the social experience and electronic shopping for those whom time is at a premium; and

- require many existing intermediaries to adapt or face being taken over by technology, and create many new intermediaries.

Clusters of related activity will continue to be required to foster innovation and address the social context. The report states that whilst convergence makes access to formal information easy and distance independent, social interaction is necessary to manage tacit knowledge in a creative manner. Opportunities are available for local or regional shared work centres and this could have a positive effect in shifting work from urban centres to lower cost rural communities. The report also notes that work that does not require tacit knowledge such as call centres is at real risk of loss to lower cost economies.

The report also explored the implications of convergence on government policy. It proposed that policy should:

- encourage the early adoption of successful innovations, ;
- elicit further debate on the use of regulation of customer information and its use by varying sectors of the economy, ;
- promote social inclusion through universal access provision;
- update existing intellectual property laws to protect content creators;
- promote content filters that could be applied to all electronic media;
- move power and responsibility progressively from regulators to the individual;
- encourage flexibility and mobility in the labour market as convergence will displace many information jobs;
- promote proactive competition regulation with the challenge of mapping new markets with an amorphous structure;
- make small business aware of the opportunities from electronic commerce;
- have the government as an exemplar of best practice; and
- encourage the development of new institutions to support the evolving labour market.

The White Paper *Our Competitive Future; Building the Knowledge Driven Economy* was presented to Parliament in December 1998. This paper put forwards a number of proposals to raise the sustainable rate of economic growth by improving productivity and producing innovative products and high-value services. The report states that government's key role is to act as a catalyst, investor and regulator to strengthen the supply-side of the economy. It will guide three forces that drive growth: *capabilities* by promoting commercialisation of research and encouraging entrepreneurs, promoting creative *collaboration* between businesses and within regions, and making markets more *competitive* through strengthening the Office of Fair Trading and adopting further action to liberalise telecommunication laws.

The UK Government sees digital technologies as a key enabler of a modern, knowledge-driven economy. Opportunities for new business and threats to existing business are enabled through digital technologies across the value chain in activities such as supplier relations, operations, distribution, marketing and sales, and after-sales care. In addition, support activities like organisational structure and human resource management are also affected. It sees the demand drivers of the digital economy as culture, competitive pricing and packaging, access to skills, access to advanced infrastructure and the positive macro economic environment. Supply side drivers include industry

competitiveness, willingness and ability to invest and access to skills. An effective regulatory and legislative environment to underpin these drivers is viewed as critical.

These papers will be used to develop a White Paper during 2000 that will put forward proposals for reforming telecommunications and broadcasting regulation to take account of the convergence of the communications industries. It will take account of the European Commission's proposals for reforming the European Union's regulatory framework for communications. The White Paper will be broad in scope, covering areas such as future regulation of broadcast content, media ownership rules, and the role of public service broadcasting as well as fostering effective competition in communications.

The UK regulator, OFTEL, announced its new strategy for regulation in January 2000. The strategy retains OFTEL's goal of obtaining the best deal for the consumer in terms of quality choice and value for money. Four new underlying objectives will be pursued; : effective competition that benefits consumers, well-informed consumers, adequately protected consumers, and prevention of significant anti-competitive practices. The old strategy focussed on opening up previously monopoly markets. The new strategy rolls back formal regulation where competition is effective with greater emphasis on industry self-regulation and co-regulation where some control is needed. There will also be a stronger emphasis on preventing anti-competitive practices.

The new strategy will result in reduced amounts of telecommunications-specific regulation. New regulations will only be introduced where absolutely necessary to promote competition and protect consumers. Regulation will be as light touch as possible. A rolling two-year cycle will be introduced to review individual telecoms market sectors. International benchmarking comparisons will be used to test for effective competition. Strategy implementation will result in greater predictability of regulatory actions and the ability to respond quickly and effectively as markets rapidly change.

OFTEL also produced a report in July 1999 on *Access to Bandwidth*. They proposed that British Telecom (BT) should be required to make access available to its local loop. This is primarily to allow the introduction of DSL technology to deliver higher bandwidth services for the unmet demand of SMEs and domestic consumers. OFTEL believed that it is in the national interest that other companies should have the opportunity to specify the type of higher bandwidth services to be run over the BT local loop and to make the necessary investments. These companies should not have to be simply the followers of BT. OFTEL made this recommendation to encourage competition in this emerging market even though BT is under a regulatory obligation to allow others to supply services over its network on the same basis as it allows its own businesses to supply such services.

BT has been given until July 2001 to liberalise its networks but the government has placed recent pressure on the regulator to bring this date forward. The UK has timed local calls which adds to the cost of Internet charges, reducing the relative competitiveness of industry and impeding demand growth.

OECD

The Organisation for Economic Co-operation and Development (OECD) has produced a number of recent reports of relevance to this convergence review. They include a 1998 paper from their Working Party on Telecommunications and Information Services policies entitled *Cross-Ownership and Convergence: Policy Issues*. This report investigates cross-ownership and joint provision regulations that have been used as regulatory safeguards to limit the market power of former monopoly firms in emerging communications markets. Another report from the Committee on Competition Law and Policy is entitled *Regulation and Competition Issues in Broadcasting in the Light of Convergence*. It was produced in early 1999 and it comments on the changing role of broadcasting regulation as broadcasting trends towards digital, interactive, and higher bandwidth communications.

The Cross-Ownership report investigated a number of forms of regulations in OECD countries including:

- regulations between fixed and mobile communications;
- regulations between the telecommunication and cable television sector;
- regulations between the telecommunications and broadcasting sector;
- regulations between cable television and broadcasting sector; and,
- regulations within television services.

Many of the cross-ownership or joint provision restrictions were implemented to facilitate entry to telecommunications and broadcasting sector markets of most countries and to address issues of bottleneck power. In many countries, markets are now competitive and these regulations are progressively being removed. However, other countries are finding that their incumbent public telecommunication operator (PTO) or broadcaster still possesses market dominance and other forms of regulation are being used to prevent market distortion.

Some countries are implementing asymmetric regulation to allow mobile cellular service operators without fixed link operations to invest in fixed networks while preventing dominant carriers from doing so. Another form of asymmetric regulation is to prevent incumbent PTOs from investing in cable television networks or to divest their holdings in cable networks in order to promote competition in the local loop. Some OECD countries also prevent incumbents from providing cable television services. However, many countries are now implementing policies which set a time limit on restrictions in order to develop broadband infrastructure competition in the local loop. The report strongly recommends the removal of restrictions against cable television operators from providing full PSTN services over their networks in order to increase competition in the local loop.

Regulations have also been implemented in restricting cross-ownership or joint provision between the cable television and broadcasting television sectors. In recognising the structural and technological changes in this industry sector, some countries have begun to modify their regulatory treatment. New measures based on total audience share limits (such as 15% per cent in the UK) are replacing previous cross-ownership regulations. These share limits are attributed to each television service, not the distributor of the service. Other regulatory safeguards such as must-carry obligations or ex-post competition law may also be used.

Traditional regulatory measures for television services in the OECD are either aimed to limit market power and concentration or to promote diversity in service provision and ensure pluralism of control. Due to convergence, there is a need for a strong financial basis for market players to keep up with competition. For industry to achieve these economies of scale, some countries are relaxing their regulations in order to promote economic efficiency. New regulations are also allowing television services to compete at the same level regardless of their distribution platform.

The *Regulation and Competition Issues in Broadcasting in the Light of Convergence* report noted that many of the traditional rationales for broadcasting regulation no longer apply in a world of essentially unlimited bandwidth. The traditional distinction between the telecommunications and broadcasting sectors requires a regulatory reappraisal due to:

- individual delivery platforms are now capable of carrying all manner of messages;
- definitional boundaries based on the distinction between private (telecoms) and public (broadcasting) can no longer be sustained;
- distinctions based on the essential character of the messages transmitted are also becoming obsolete, ; and;
- the increasingly multi-purpose nature of terminal equipment makes distinguishing services on the basis of physical equipment or technology no longer relevant.

The report defines broadcasting as the production of interactive information content and distributing it via telecommunications services. The key competitive advantage of broadcasting is the timeliness of the content. The overall picture of the broadcasting market that emerges is one of a large number of markets for related, but differentiated, products and services. The report defines convergence as the process, due to underlying technological changes, under which economies of scope increase to the point where two or more products or services that were previously produced by separate firms are produced within the same firm. The implications are that convergence changes market structure, changes the level of competition in the converging sectors, places pressure on existing regulatory regimes, and typically leads to new products and services.

The traditional sectors of telecommunications and broadcasting are both tending to offer high bandwidth two-way communication services, a convergence in market structure. The broadcasting industry is thus facing the traditional competition and regulatory concerns in distribution that surround the issue of access to the consumer. In addition, previously separate markets for content for newspapers, film, TV, and Internet publishing are converging into a single market for interactive content. The report also identifies concerns that convergence may define new bottlenecks that decrease competition by reducing access to infrastructure.

The OECD produced another report in late 1999 entitled *Interconnection and the Internet: Competition and Regulation Issues at Local Access and Backbone Levels*. This paper examined how regulatory interventions influence the strategy and structure of Internet Service Providers (ISPs). It considers that there will be a greater variety of charging structures in the future with extreme variants of Free ISPs where the only charge is a per minute telecommunications charge and Flat Rate charges of a specified amount per month regardless of access time. Consumers will sort themselves into groups, choosing a tariff that minimises their costs. Regulation should be directed to encourage a range of

ISP pricing strategies that promote Internet access. The current UK model of high local call charges favours the Free ISP model which limits overall price competition.

The paper also examined whether there would be market failure in Internet access markets arising from a hierarchical network structure. It notes that Internet interconnection arrangements have moved away from third party administrator models or cooperative agreements towards peering between similar-sized networks and hierarchical relationships with transit payments from smaller to larger ISPs. The Internet Backbone market is becoming dominated by a few large companies (such as UUNet, MCI, BPN, Sprint) who have the potential to deny peering for smaller ISPs to distort competition and abuse their market powers. This could result in higher transit costs for smaller ISPs through collusion between top level backbone and service providers. Regulators need to guard against such potential abuse through arrangements including setting transit prices, imposing peering obligations, prohibiting vertical integration or exclusive dealing and disclosure of transit peering arrangements.

International Telecommunications Union

The International Telecommunications Union (ITU) has produced three papers during 1999 which are relevant to the convergence review. They are *The Changing Role of Government in an Era of Telecommunications Regulation*, *Challenges to the Network: Internet for Development* and *Trends in Telecommunication Reform 1999: Convergence and Regulation*. The first document specifically investigates the changing role of telecommunications regulation in developing countries; the second explores the current and future impact of the Internet on national economies and PTOs in developing countries. The final document takes a more global view of the recent and future impact of convergence on regulatory authorities.

The reports agree that the introduction of digital networks is having a profound impact on world economies. Digital technology allows the convergence of media with telecommunications and computing to create a holistic 'something' which is greater than the sum of its parts and poses many challenges for regulatory authorities, PTOs and commercial organisations. During the 1990s, the telecommunications world underwent significant reform with many national carriers privatised, new competitors licensed and new innovative services allowed to enter the market.

The aim of enabling competition is to improve access to facilities and services in order to increase their uptake. Many developing nations are adopting pro-competition policies as they view the introduction of digital technology as a way of levelling the playing field and rendering their traditional disadvantages of distance from markets, under-invested basic infrastructure, and under-utilised capacity less onerous. The challenge is for developing economies to overcome other impediments including state monopolies, trade barriers, poor telecommunication infrastructure, poor workforce education and higher risk of fraud and corruption.

The introduction of digital telecommunications networks is supplanting traditional voice networks. Basic voice services are becoming less important than the new data services that support future economic development activities. The trend towards data services impacts upon the universal service obligations of incumbent PTOs. Innovative technologies are expanding the options for basic connectivity including to low income and rural communities. Many regulators are shifting their focus on paying PTOs to meet a

Universal Service Obligation to encouraging innovation by entrepreneurs to commercially provide digital telecommunications services.

Private markets are being viewed as a primary source of technology and business innovation and hence, a driving force for access to telecommunications. Therefore, regulators are changing their role to one of facilitating entrepreneurial activity with offering market incentives for new operators. Private sector participation has been particularly encouraged in cellular and other value added services.

Many companies have merged, acquired or formed alliances with other companies to avoid losing market share or to increase it in new markets. The new partnerships achieve efficiencies through economies of scale and scope and the reduction of transaction costs. However, the consolidation of markets from digital convergence and the alliances from major market players could lead to anti-competitive practices. Governments are becoming increasingly proactive in this area. Interconnection charging is one specific area that is highly important for governments to regulate to ensure that wholesale prices are set at a level to promote new entrants in value added service markets. Some governments are taking the extra step of preventing their PTO from providing value-added services (like ISP) or becoming content providers to prevent the emergence of such anti-competitive conduct.

Jurisdictional boundaries are blurring with the advances in information and communications technologies. Courts and legislators are having difficulty enacting and enforcing laws over an Internet party that is located in another jurisdiction. Geography is not the only challenge; pressures are occurring on regulators with the increasing overlap of telecommunications regulation with content or broadcasting regulation. Malaysia's 1998 Communications and Multimedia Act is for the time being a unique piece of legislation that groups telecommunications, broadcasting and the computing industries with the one regulator.

United States Federal Communications Commission

The Federal Communications Commission (FCC) is an independent United States government agency charged with regulating interstate and international communications by radio, television, wire, satellite and cable. The FCC is currently drafting a five-year strategic plan to build a new regulatory and competition communications agency. Along with its draft strategic plan, it has released other papers over the past year including an October 1999 staff report *Broadband Today* which examined the issue of whether cable companies should be required to provide access to their plant by unaffiliated Internet and online service providers.

The main issue of this report is whether there was a threat of a monopoly market developing in broadband over cable which could result in anti-competitive behaviour. There is potential for unaffiliated service providers to be prevented from entering the market leading to high prices to consumers which would restrict the take-up of the technology. It would also result in potentially undermining the open nature of the Internet.

The report identified that the broadband services market was expanding with alternative platforms to cable entering the market offering high-speed access to data, telephony and video services. These services include DSL, satellite and wireless technologies. Prices for these alternative broadband providers are falling which is mitigating the risk that cable

will become the gatekeeper to the Internet and prevent the cable providers from establishing a bottleneck monopoly in broadband services. The FCC believes that customer demand for choice ultimately will compel cable operators to open their systems to unaffiliated service providers.

The FCC's charter is to avoid direct intervention in competitive and well functioning markets and to find ways to encourage market-based solutions. The report adds that mandating open access could reduce the financial incentives for cable companies to invest in upgrading their systems. The FCC believes that there is a credible risk that rapid deployment of broadband services over cable would be greatly compromised if regulations were enforced on the nascent industry. They are resisting moves to regulate open access that forces interconnection and are placing faith in competitors building a network of networks that creates a fertile environment for growth and a diversity of user options. However, the Commission will continue to monitor developments in the industry and consider regulation only if competitive harm actually arises.

The five-year Strategic Plan for the FCC was launched in March 1999. It builds on the 1996 Telecommunications Act which recognised that competition should be the organising principle of communications policy and replace micro-management and monopoly regulation. The strategic plan has six goals to facilitate the transition to fully competitive markets. They are to:

- promote competition;
- deregulate as competition develops;
- protect consumers;
- bring communications services and technology to every American;
- foster innovation; and
- advance global competition in communications markets.

The FCC will move away from its current structure based on the technology lines of wire, wireless, satellite, broadcast and cable communications and reorganise along functional lines that take into consideration technological convergence. Dispersed enforcement functions will be consolidated into a new Enforcement Bureau and a Public Information Bureau will be created to encourage more public participation in the work of the FCC.

There are three priority areas for the FCC, which the chairman has labelled ABC: Access, Broadband and Competition. Access is for network access for the disadvantaged or underserved community members, and the international links to less developed countries. Broadband is to enable every home to have high-speed access to high quality programming. Competition is about opening local exchange markets and reviewing major merger proposals.

Canada

The Canadian Radio and Television Commission (CRTC) is an independent public authority vested with the authority to regulate and supervise all aspects of the Canadian broadcasting system and to regulate telecommunications common carriers that fall under federal jurisdiction. Like the FCC in the United States, the CRTC is establishing and implementing new frameworks to facilitate competition and to place less reliance on detailed regulation.

In May 1997, new rules to facilitate the entry of new service providers into the local telephone market were announced. These decisions opened the door for telephone companies to apply for licences to operate broadcasting distribution services, thus creating another milestone leading to convergence in the communications industries. A new regulatory regime for broadcasting distribution came into effect in early 1998 and applies to all distribution services providers in Canada, including cable, wireless or satellite. These new rules are designed to foster fair competition between distributors and new distribution technologies in the broadcast distribution market.

To address complaints of anti-competitive behaviour, distributors are prohibited from giving undue preference to any person, including itself, or conferring an undue disadvantage on any person. An example of such market intervention is a CRTC decision made in September 1999. The Commission ordered that each incumbent cable carrier make their cable modem Internet access services available for resale by ISPs at a discount of 25% per cent from the lowest retail Internet rates. These terms must be maintained until the cable carrier provides competing ISPs with access through interconnection according to a tariff approved by the Commission. Cable television operators were declared to be common carriers in January 1996, yet it has taken three years for resale services to be mandated. Until June 2000, ISPs can advertise that their services will be available at a discount to cable carriers. However, some industry commentators (Ménard and Denton) are wary as to whether ISPs will then be able to effectively compete with the bundling of Internet access and IP based telephony services by cable carriers. They believe that a new approach to telecommunications policy is required for Canada that favours horizontal specialisation of services (the ISP business model) rather than the vertical integration of services (the cable television carrier business model).

New Zealand

New Zealand commenced deregulating its telecommunications industry on in 1989 by opening the market to competition. The New Zealand Government opted for an unusual system of so-called light-handed regulation to promote competition rather than have a dedicated telecommunications industry regulator to counteract the monopoly power of the incumbent national company.

The lack of a regulator resulted in a long court battle between Telecom New Zealand and Clear Communications in relation to the terms of interconnection. It was appealed all the way to the Privy Council who stated that it was "not surprising" that the parties could not agree on the terms of interconnection given the unique lack of regulatory or legislative guidance on such terms during the introduction of competition into the telephone services market.

Likewise, the New Zealand television broadcasting industry was opened to competition. NZ On Air was established to collect and administer the Public Broadcasting Fee which is used to fund programs with local content for cultural and public service objectives. However, commercial free to air broadcasters, including the State owned Television New Zealand are under no obligation to purchase these programs. About 24% per cent of on screen programming is local content (as at 1998). A debate is currently taking place in New Zealand about the need for new high-tech NZ industries to have a competitive edge and a point of difference, and that the key to this is a unique cultural identity. A recent symposium identified that a coordinated and comprehensive strategy needs to be developed that takes account of the important role that broadcasting plays in reflecting the nation's social and cultural landscape. Options to improve the current situation of

apparent market failure in broadcasting sufficient local content include additional funding, introduction of a quota model, using a public service broadcaster or a mix of the above.

Telecom New Zealand announced recently a new pricing structure for ISPs. Its aim is to switch all Internet users to an alternative network and it will do so by time-charging Internet calls not on the new network. Industry concerns have been expressed that the monopoly on Internet traffic by Telecom New Zealand is anti-competitive and represents a threat to innovation and growth. Interestingly, Telecom New Zealand's own ISP is not required to shift customers over to the new network. This would appear to conflict with the principle of ensuring that monopoly network providers provide similar services at similar costs to their downstream allied companies and competitors.

Strategically, New Zealand is formulating priorities and strategies to embrace the knowledge economy. Their IT Advisory Group prepared a submission in August 1999 to the government outlining six key issues that need to be addressed. These include education, Maori success, immigration, Research and Development, innovation and changing the export mix. The overall thrust of the report echoes the changes that are occurring to other national economies from a reliance on manufacturing or agricultural activities to activities that are knowledge based in order to maximise economic growth.

Japan

In May 1998, the Japanese Ministry of Posts and Telecommunications (MPT) published an outline of a report by the group to consider convergence of, and developments in, telecommunications and broadcasting. Their report described four different types of convergence which were:

- convergence of services that permit new forms of broadcasting using telecommunications infrastructure;
- convergence of lines that enables the same line to be used for telecommunications and broadcasting;
- convergence of business that enables for example, cable television broadcasters to offer telecommunications services; and,
- convergence of terminals that enables for example, a TV to act as an Internet terminal.

During 1999, the MPT held the Executive Meeting on the Next-Generation Info-Communications Infrastructure Initiative. This group compiled a report concerning the implementation of high-speed Internet infrastructure at reasonable rates and the development of policies for new services. Specifically, the MPT is looking to define policies to promote interconnection of networks including the opening of the subscriber local loop to realise freedom and fairness of the competitive environment.