Impact and Outcome of Regulation on the Economy

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There have been more serious studies made of government regulation of industry in the last fifteen years or so, particularly in the United States, than in the whole preceding period. These studies have been both quantitative and nonquantitative. The main lesson to be drawn from these studies is clear; they all tend to suggest that the regulation is either ineffective or that when it has a noticeable impact, on balance the effect is bad, so that consumers obtain a worse product or a higher-priced product or both as a result of regulation. Indeed, this result is found so uniformly as to create a puzzle: one would expect to find, in all these studies, at least some government programs that do more good than harm. Ronald Coase, "Economists and Public Policy," in J. F. Weston, editor, Large Corporations in a Changing Society New York Univ. Press, 1975.

There is an understandable tendency for people to dismiss 'regulation' as a boring topic for economists. But the effects, for good and ill, of regulation pervade everyday life. Regulation profoundly affects what you can and cannot buy, how much you pay, the price of your house, the quality of your child's education and whether they can get a job. It is a basic, quality of life, question.

Regulation: Market Friendly or Market Hostile?

Competitive Markets Bring Prosperity

There is no longer a strong theoretical or practical support for the political paradigm where markets and competition play no role. No respected authority nowadays maintains that state planning delivers more efficient outcomes than the interplay of producers and suppliers within competitive market conditions. Nor is there any practical example of a society that has achieved sustained success whilst eschewing the market economy.

Competition allied with property rights is the source of economic efficiency. Competition forces suppliers to constantly look to market tastes and needs and to constantly review their costs out of fear that a newcomer will usurp their market position.

Well-functioning markets need good laws. The rule of law is basic to achieving a decent society. Effective laws against murder, fraud, theft and so on are of obvious and enormous social benefit. They greatly widen the ambit of social action by greatly lowering the risks of social interaction. Effective property rights regimes are of the same nature. To make social life more secure and social interactions simpler is the great benefit of effective rule of law.

In the language of modern economics, good law lowers transaction costs, and creates social benefit by doing so. It does so by helping people to do what they want without infringing on the rights of others. It sets clear boundaries for people to act.

One way to judge regulation is whether it makes life simpler or more complex. Does it raise the cost of interactions and exchanges, or does it lower them? If it increases cost, if it makes life more difficult, then it is very unlikely to be of social benefit. Such regulation stops people spending their money, offering their services, building, playing and so on in the way they might otherwise choose. It therefore must be presumed to bring reduced welfare since it diverts activities from those people would
otherwise prefer. It means some individuals have to accept less favoured goods, services and activities than those they would have opted for thereby obtaining less pleasure per ounce of effort.

The question of what government *should* do is limited by the question of what government *can* do well with any degree of reliability, and taking into consideration all the risks.

An obvious risk is diminution of accountability. The mechanisms of government accountability are not infinitely flexible. The more government does, the more strain on the instruments of accountability to the general public. Even though we cannot say simplistically that de-regulation is the immediate and universal answer, there are clear costs to complexity and benefits from simplicity. That laws and regulations may raise costs, make transactions more risky, stop mutually beneficial exchanges with minimal negative third party effects taking place will create a tendency for people to seek to evade them. And a legislative response such as longer Acts risks breeching ‘tipping points’ where complexity alone pushes a law or regulation over into net social harm.

**Government Intervention in Market Operations**

Market exchanges have the great advantage that people freely choose them and they have good information and incentive process "built-in". Regulations which get in the way of such exchanges undermine the benefit maximising process analysed so brilliantly over two centuries ago by Adam Smith and present a challenge to the liberty of the individual. They entail both moral and efficiency costs. To minimise such costs requires a highly restrained role for government, the only means by which regulation can be enforced.

Yet the application of the free market approach is heavily qualified in practice. Markets are popularly seen as being necessary to be overridden because of three sorts of reasons:

- Monopoly which discourages the supplier from making as robust economies as he might otherwise need to and which will allow him to profit by restricting supply below the levels that would prevail under competitive conditions
  - Yet in fact, cases of monopoly where products are concerned e.g. IBM, Microsoft, Standard Oil, are never likely to prevail; the monopolist must always operate as though it is in a competitive market because a new technology or upstart is always waiting in the wings. More problematic is the case of the “natural monopoly” like power lines, or ports or roads.
  - Moreover, government forcing the monopolist to operate as a business ringed with rival suppliers rarely yields the benefits sought after.
- Product or work complexities which are seen as too difficult for people to make rational decisions about; the trade-offs between risk and cost are seen as too complex and, moreover, the risk itself will mean some intolerable psychic and perhaps monetary costs imposed on the rest of the community if poor choices are made.
  - This has led to minimum safety standards on products, pre-reviews of safety by governments and workplace safety regulations.
Externalities are the spillover costs that are imposed on third parties. This has spawned the great array of environmental regulations.

**Types of Regulation**

From the above it is useful to distinguish two types of regulation: economic and social.

- Economic regulation has received more attention because it most blatantly flouts the rules of sound economic policy. Regulation of prices or access to markets is always likely to bring increased costs by distorting product offerings, denying the lowest cost competitors an ability to offer their services and reduce the competitive pressure on the existing suppliers.

- Social regulation is normally targeted at externalities; it requires suppliers to incorporate a more comprehensive set of features in their goods and services than they might have chosen to offer (e.g. impact resistant car panels) or it may require them to build to a higher specification (e.g. low energy using refrigerators) or it may forbid certain activities (like mining in natural parks, or logging or other activities where there are thought to be endangered species present) or it may require buyers to avoid the cheapest products in pursuit of sustainable ecological development (most countries require a proportion of high cost exotic renewable electricity rather than lower cost coal or gas based generation).

There are two means by which regulation is done. One comprises laws that simply require things be done and the other is the expenditures of governments – the subsidies that shift activities from where they would otherwise be. Subsidies are no less regulations than compulsive measures, since they rely on government for the funds they employ. Both these forms of regulations differ from two other types of regulations: those that protect and define the property of individuals and those that specify conventions. Laws that protect and define individuals’ property are at the heart of the reasons for government. The common law represents centuries of experience in such: statute law has to be very well designed indeed to match the embodied experience of common law.

In addition to these regulations are other laws, which are more akin to enacted conventions, like driving on the left hand side of the road or agreed units of measurement. These are best thought of as common sense measures that disadvantage nobody while facilitating interaction. They are not normally considered as coercive and therefore not included within the costs of regulation.

**Developments in Regulatory Reviews**

**Longer Term Trends**

Regulation policy like many political processes moves in waves.

Nurturing the growth of modern living standards was regulation reform founded on a critical analysis and eradication of regulations, most notably in England from the Middle Ages onwards. The 200 years to the 1870's marked a systematic culling of laws and regulations. Of the 18,110 Acts passed since the Thirteenth Century, over four-fifths were repealed. The great majority of the repealed acts were constraints on competition.
Naturally, with the observed economic success of England and its Colonies, other countries followed suit.

There followed a period, which lasted up to the last thirty years or so, when socialism and statism triumphed in public policy circles. From the middle of the nineteenth century until quite recently, economists have tended to regard property rights as secondary and have often been enamoured by planning, largely because economics as a discipline developed in a context where property rights were taken for granted. More recently, economic historians in particular have developed a much more sophisticated awareness of the importance of well-defined property rights, and varying pressures on governments to provide public goods including good law, particularly in explaining the widely differing paths of human societies.

The aforementioned over-confidence in central direction led to increasing regulations of markets, including its ultimate form nationalisation of many industries in countries (other than the US). In Australia we had rail, buses, gas and electricity, telecommunications, shipping, insurance, banking, ports, gambling, brought under state ownership – in some cases even excluding any rival private sector suppliers. Other countries saw the nationalised industries extended to steel, automobiles, coal mining.

Gradually, observed productivity levels demonstrated the greater efficiency of private ownership and of industries with competitive entry.

The contemporary push for deregulation was initiated in the US. Its greatest early focus was on the economic regulations rather than the social regulations that were even then increasing rapidly.

Wiedenbaum in the early 1980s started trying to assemble data about the pervasiveness of US regulatory restraints and conjured up numbers about what they were costing. Other prominent economists-turned-bureaucrats like Herman Kahn were developing ideas based on their own experiences – in his case with the regulations of airlines – about how a better approach may be to let the anarchy of unfettered competition prevail. Early outcomes of these types of reforms had their impact in Australia.

In Australia, the enthronement of deregulation remarkably came from a left-of-centre Labor Government, most of the members of which had railed against the inefficiencies and inequities of capitalism for a great deal of their public lives. But the burgeoning cost of rising welfare states forced such attention. The policy premium on economic efficiency rises as the cost of welfare grows. As New Zealand Labour politician (and future WTO Secretary-General) Mike Moore said "I can't tax losses". If social welfare was to be sustained, corporate welfare had to be cut and economic efficiency increased.

Prime Minister Hawke, addressing the Business Council of Australia in September 1984, said:

I am convinced that after eighty-four years of federation, we have accumulated an excessive and often irrelevant and obstructive body of laws and regulations. We will examine critically the whole range of business regulation, most importantly with a view to assessing its contribution to long term growth performance. We will maintain regulation which upon careful analysis, clearly promotes economic efficiency, or which is clearly an effective means of achieving more equitable income distribution. And we will abandon regulation which fails these tests.
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This offered a clear signal favouring deregulation—perhaps the clearest such signal previously given by an incumbent Government in Australia.

Recent Regulation Review Arrangements

These developments led to further reviews of “competition policy”, particularly with the 1993 Hilmer Report. The report formed the basis for the three inter-governmental agreements signed in 1995 which underpin current National Competition Policy:

- the Conduct Code Agreement along with the Competition Policy Reform Act and various State and Territory legislation extended coverage of part IV of the Trade Practices Act to all businesses irrespective of their legal form or ownership;
- the Competition Principles Agreement sets standards on structural reform of public monopolies, reviews of anti-competitive legislation and regulation, prices oversight, access to essential infrastructure, competitive neutrality, and local government;
- the Agreement to Implement the National Competition Policy and Related Reforms set out conditions for financial transfers to the States and local government in return for implementing competition reforms.

The key measures contained in National Competition Policy are:

- small businesses and government-owned businesses have been brought within the remit of the Trade Practices Act
- government owned businesses which compete with the private sector now enjoy no special advantages and suffer no disadvantages as a result of public ownership (‘competitive neutrality’)
- public monopolies were reformed, with their commercial and regulatory functions separated and their pricing policies subject to oversight
- all regulations which restrict competition were to be reviewed in order to determine whether regulation delivers a net benefit to the community.

Outcomes have been a substantial freeing up of regulatory restraints on competition in airlines, ports, electricity and gas, rail, and telecommunications. This has been accompanied by a deal of re-regulation in what has been over-ambitiously defined as the “essential service” components. This regulation is headed by a national regulator, the Australian Competition and Consumer Commission and by several state bodies that set prices for pipelines and electricity lines and the like. Though having some market awareness, like regulators the world over, these bodies tend to see their role as vitally necessary long after it has become counter-productive.

Fortunately, Australia has a long-standing regulatory review body, the Productivity Commission, which has a strong concern for economic efficiency built into it. Over a great many years, this institution has conducted reviews at the behest of the government into trade regulations and invariably recommended lower tariffs. Gradually governments have come to accept their analyses until the level of protection today has fallen to the
average 3 per cent or so seen in most other mature economies. Twenty-five years ago, tariff protection in Australia was the highest in the OECD area.

The Productivity Commission has been a useful counterweight to the ambitions of the regulators to maintain control. It recommended, against their advice, the deregulation of airports which the government accepted (the monopoly features of airports comprising landing charges account for only 10-15 per cent of their revenues and can be left to negotiation given the powerful players involved. Similarly, and in association with the analysis undertaken by the IPA and by the appeal body to the ACCC, the Trade Practices Tribunal, the regulatory controls on gas pipelines have been pinned back somewhat.

Victoria has brought in some ostensibly strong regulatory oversight arrangements in the form of the Competition and Efficiency Commission. This has strong powers to assess new regulations and is being given commissions by the government to review wide areas of existing regulation. Currently a major review of the building industry is under way. Although the new Commission failed its initial test – the government allowed new regulations favouring renewable energy – it may yet breathe more power into regulatory downsizing. In this respect, with the reduction of economic regulation, State governments are more significant since their role tends to be greater in social regulations.

Outcomes of Deregulation

Australia’s deregulatory flourish, with all its shortcomings, has been accompanied by a vast increase in economic growth. From being one of the laggards in the Western world from 1913 to 1985, the Australian economy has been transformed to be the second-highest growth rate of the mature economies.

In the case of the deregulated industries, massive gains have been seen.

For electricity and gas, this is readily estimated.

Electricity generation for example has seen labour productivity more than double. In some states the increase has been even greater five and three and a half fold respectively in the privatised Victorian and South Australian systems.
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At the same time, notwithstanding the fewer people they now employ, the power stations have improved their availability to generate, as can be seen below.

![Power Stations' Availability to Run](chart)

Prices have remained low by world standards. On average in Australia they are prices to household consumers are only one third of those seen in the more expensive countries like Japan and Germany and are similar to those of Canada (US prices on average are about 30 per cent higher).

We have also had adequate incentives so that new capacity, both government owned (in Queensland) and private (in Victoria and South Australia) has been brought on stream as it has been needed.

Some matters of concern are however:

- claims by private generation businesses that Queensland government investments are being undertaken at below real cost; those claims if true would distort markets and discourage efficient investment

- a mandatory insurance system in place in NSW which makes it difficult for private retailers to enter the residential/small business half of that market in competition with the government owned retailers; this will mean the new investment incentives are less meaningful than they might be

- discussion and regulatory action regarding greenhouse gas emissions has already forced the abandonment of a major new NSW coal based investment and is threatening one in Victoria. This is already adding a layer of regulatory costs and could lead to shortages of power in the future

- On-going discussion on how to handle the interface between the regulated sectors and the entrepreneurial sectors – especially the issue of transmission; if transmission is regulated with an assured rate of return it can substitute for new
generation that, though more expensive, once transport costs are factored in is more efficient. These issues have yet to be fully resolved anywhere in the world.

The sorts of productivity increases seen in electricity as a result of deregulation, including labour market reforms are seen in other industries. One notoriously inefficient Australian industry has historically been the wharves. Chocke-block with Johnny Friendly union types and having the romantic image of the tough-working guy, together with a great deal of monopoly power most evidenced by the fact that wharfie jobs became to be largely inherited, reform of the ports was particularly difficult in Australia and was only achieved in the teeth of a bitter and lengthy strike during the course of which union power was fought to a standstill.

Port movement rates are well documented throughout the world in terms of TEUs based on 20 foot container equivalents. Notwithstanding considerable government blandishments and employment buy-outs, this level was under 20 per hour in 1992, whereas rates of 30 per hour were seen in the most efficient ports in our region. The TEU rate actually fell over the course of the next few years.

According to left-wing think tanks, “(Federal Minister) Reith's dream of a 25 container per hour average across Australian ports is probably technically impossible.” ¹ In fact the average rate exceeded 28 in the June quarter 2004.

The productivity rates are illustrated.

![Container Terminal Productivity](image)

In terms of costs, this has brought a real reduction of over 25 per cent.

**New Areas of Regulation**

The deregulatory reforms have been confined to “economic” regulation. That is regulation that specifies prices or restricts competition in some way. We have also seen the tearing down of barriers constructed to protect government owned businesses,

though some of these businesses remain, especially in electricity and there are *de facto* regulatory restraints in effect where this is so.

What remains is the regulated rump of price controls over “essential facilities” and the growing array of social regulations to protect the environment, workplace safety, and consumers, added to which we have an active judiciary that overturned 200 years of property rights and created a concept of native rights which is leading to reduced certainty and activity in the mining and farming sectors.

**Essential facilities**

The most entrenched monopolies—perhaps the only ones with durability—are those supported by government. The central purpose of the Australian competition reforms was to smash these. In part, this meant hiving off the clearly contestable areas (e.g. generation of electricity). What is left is a set of residual apparent monopolies covering wires, pipes, ports and roads. Most of the recent policy debate has focused on the price and access conditions.

With perfect knowledge, the wise and incorruptible bureaucrat could devise a transmission system that would prevent monopolistic waste and could also bring about a great many of the dynamic gains achieved with commercial rivalry. However, these conditions are not present. Producers and carriers will be reluctant to reveal to competitors and customers alike the extent of their costs; and they too have imperfect knowledge of these. Buyers will seek to keep options open to the maximum degree, and will not reveal the full extent of their demand, their alternative means of having it supplied and their preferred means of supply.

Requiring private firms to provide access to competitors or others will diminish their incentive to build a facility or will distort the nature of that facility if built. Well-established property rights are, however, consistent with open access at a commercial price. For example, it is generally agreed that patents which assign ownership to ideas and products encourage innovation for the benefit of all. Access of such ideas and products can then be arranged under mutually accepted licensing agreements.

Control over essential facilities has brought considerably more regulatory intrusion than had been envisaged. At the time of the competition reforms the term “light handed” was in universal use. This has not been the outcome.

In electricity lines, telecoms and elsewhere, the regulatory authorities have been preoccupied with preventing monopolistic gouging. This has led to extraordinary complex submissions being required, highly legalistic appeals of decisions and so on.

The price squeezes that have been imposed on the essential facilities bring risks. These include the excessive resources allocated to pleasing regulators rather than customers and distortions of investment if the incentive and cash is squeezed too heavily. Both NSW and Queensland have shown some fragilities in their electricity supply infrastructures that might be attributed to over-tough regulatory restraints. Similarly, although the ACCC argues to the contrary, the Productivity Commission found that the regulatory conditions were preventing investment. Any new gas pipelines constructed under the present regime where open access is required and prices are determined by a regulator have incorporated costly inefficiencies to avoid regulatory control. The SEAGAS pipeline delivering Bass Strait gas to Adelaide for example as deliberately sized to avoid any spare capacity which non-participants in the ownership could use to recruit the ACCC to
require access be given at a price not acceptable to the participants. This is a clear economic waste as designing in spare capacity can be achieved at a low cost.

Similar adverse outcomes can be seen as stemming from the regulatory control over the Dampier to Bunbury natural Gas Pipeline. The regulator’s insistence of a price that the owner, Epic Energy, considered too low led to its bankruptcy. In addition, the low price made it uneconomic for Epic to expand capacity, an outcome of which was shortage of gas to allow increased electricity capacity with resulting black-outs.

Issues have arisen with other controls over essential facilities. One which became highly topical at the start of 2005 was Queensland's Dalrymple Bay Coal Terminal. This is regulated by the Queensland Competition Authority which set a charge of $1.53 per tonne in a draft decision compared to the current rate of $2.08 per tonne. The facility’s owner, Prime, decided that it would be unprofitable to expand capacity with the result that the port is unable to cope with increased demand. Rather than regulating the facility and having a regulator set the price, a far superior solution is to allow businesses to establish their own contractual arrangements as they do with office space and a great many other production inputs.

Similar restraints on the dominant telecommunications carrier, Telstra, threaten to constrain investment in that sector as well. Telstra, the major telecommunications carrier faces difficulties because of its part government ownership and because of its regulatory environment. The latter issue has detrimental effects over the entire sector.

Any changes in price, or in offerings, or in infrastructure development are greeted with a barrage of lawsuits and media campaigns from regulators and collectivists alike. When Telstra tried to offer sporting content to its internet and mobile phone subscribers, it was created with charges that it was acting monopolistically. When it drops the price of broadband to consumers, it is threatened with a more than $10 million dollar competition notice, despite protestations by Telstra that its actions had more than doubled the Australian broadband market.

These troubles stem from decisions made more than ten years ago when Telstra was first privatised. In an effort to encourage growth in the industry, the government forced the then monopoly carrier to open up its infrastructure to competitors, failing to separate the network from Telstra's other business activities. While this may have seemed sensible at the time, the effect has been to encourage the growth of resale industries, whose business model is parasitic - based around lobbying the ACCC to force Telstra into more concessions. These are companies which own little to no infrastructure, and engage in little innovation. Rather than gaining a competitive advantage by innovating and development of developing new products and services, they use the government regulators and lawsuits. This “forced access sharing” is nothing more than government acquisition of private property rights.

As with any undermining of property rights, it has negative consequences. After having trampled all over this central tenet of economic freedom, companies – particularly Telstra – are reluctant to build new infrastructure, lest they also get their property rights undermined. The development of the fibre-optic cable network in Australia is being held back until the ACCC can unequivocally assure the carriers that once it has been built, it won’t be redistributed by the government. Telstra’s Head of Regulatory Affairs, Bill Scales, in his’ recent appearance in a Senate committee, made it clear that the Telstra was fearful that the ACCC would force the carrier to share its new infrastructure, destroying the economics of the initial rollout.
Any company that spends money laying out the vast infrastructure that these new technologies require must be allowed to profit from their investment. As David Kopel of the American Heartland Institute says, “whoever takes the risk of failure should reap the reward of success. If a company must bear all the risks, but must share much of the rewards with its competitors, the company will stop taking risks.”

Moreover, the specification of a facility as a regulated “essential facility” means its price is inevitably set by a regulator at a level that is below real (risk-adjusted) costs. Hence there is less incentive for other suppliers to build new capacity rather than piggy-backing on the dominant incumbent’s network. This is one reason why Australian internet speeds are less than those in some other countries. Thus Telstra’s ADSL network, running off the access-controlled copper wire, operates at 1.5 megabytes per second, whereas in some areas of the world, ADSL networks achieve rates of 5-10 times this. More importantly, fibreoptic networks, which can easily run much faster, are still not being built in Australia because no firm will undertake such a vast investment in a regulatory environment likely to require provision of one firm’s facilities to a rival.

Applied to the telecommunications sector, such a disincentive to innovation is disastrous for Australian businesses and consumers, both of whom rely on a steady and increasing innovation cycle to stay competitive on a world scale. Not only this, but the uncertainty about how forced-access policies will be applied in an era of unparalleled network proliferation puts industry on a back foot before any infrastructure is even developed. Regulators would be wise to avoid adopting access policies in the telecommunications sector, as they unavoidably stifle infrastructure development.2

**Estimating the Overall Costs of Regulation**

In many ways regulation in Australia is less intrusive than in many other successful economies. Indeed, a recent World Bank analysis placed Australia as having the world’s least intensive regulatory environment for starting a new business3. Such measures, while useful, are only partial and cannot incorporate all the facets of regulation that confront businesses.

Nobody seems able to come to grips with the total national expenditure on regulation in Australia. It is especially difficult to estimate the impacts of local rules and ordinances that impose massive indirect costs on farmers, miners and individual householders who want to build an extension or carport.

We do have regulatory review bodies, especially in Victoria and the Commonwealth that are trying to assemble compilations of the total number of regulations. From this the

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2 A classic discussion of the dire consequences of a history of insecure and poorly-defined property rights is contained in Tom Bethel's discussion of the causes of Irish poverty and the Irish potato famine in *The Noblest Triumph: Property and Prosperity* through the Ages, Palgrave Macmillan, 1999

3 [http://rru.worldbank.org/DoingBusiness/ExploreTopics/StartingBusiness/CompareAll.aspx?direction=asc&sort=1](http://rru.worldbank.org/DoingBusiness/ExploreTopics/StartingBusiness/CompareAll.aspx?direction=asc&sort=1). It was however cheaper to start a new business in nine other economies including the UK, New Zealand, the US, Singapore and France. Australia also rated relatively highly in terms of its flexibility of employment conditions – our unusual wage determination process through a court of law (the Conciliation and Arbitration Commission) was perhaps too unfamiliar for the assessors to evaluate. It was however found that Australia is a relatively expensive place in which to enforce contracts, barely beating Ghana and falling below most western economies, the former Soviet bloc and some improbable economies like Iran and Turkey.
agencies will be able to move over time to estimating the change in regulatory intrusion and perhaps put some reasonable costs on the imposts. At present however, we have to rely on less direct measures.

Some estimates of the costs of US federal regulation have been made over a great many years by the Office of Management and Budget. For the latest year the gross cost was estimated at around 8 per cent of GDP4.

According to the Gary Banks, the Chairman of the Productivity Commission, “At the Federal level, government agencies with explicit regulatory functions alone employed around 30 000 staff and spent some $4.5 billion in 2001-02. This ignores other government departments that have regulatory functions, not to mention ministerial councils and inter-governmental bodies (such as the National Transport Commission).” Interestingly, the US regulatory enforcement budgets account for less than 5 per cent of US estimated regulatory costs (US $31 billion), significantly less in relation to the size of the two economies than Australia.

Banks continues, “Regulations not only create paperwork, they can distort decisions about inputs, stifle entrepreneurship and innovation, divert managers from their core business, prolong decision-making and reduce flexibility. To put this in perspective, one American analyst (Hopkins 1996) has suggested that paperwork-related compliance burdens amounted to around one-third of the aggregate regulatory burden in the USA. However, included within his definition of “paperburden” is health care regulations as well as tax form filling and other traditional inclusions. Hopkins’ categorisation of regulatory costs is illustrated below.

**Composition of Regulatory Costs**

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental and Risk Reduction</td>
<td>37.1%</td>
</tr>
<tr>
<td>Price and Entry Controls</td>
<td>30.2%</td>
</tr>
<tr>
<td>Paperwork</td>
<td>32.7%</td>
</tr>
</tbody>
</table>

Yet, we can be confident that the increasing volume of legislation is imposing significant costs, costs which mean fewer jobs, higher prices and less choice. These costs are not imposed evenly. Small companies, with fewer employees to divide tasks amongst, find regulations more burdensome than large companies.

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While tax and environmental management make up the majority of direct labour compliance costs, the sheer range of regulatory matters (including for occupational health and safety and employment) is considerable. AIG, on the basis of a survey of 257 manufacturing firms employing almost 15,000 people with a combined turnover of more than $2.5bn, estimated that direct labour compliance costs for manufacturers in Australia totals $680m a year. There is certainly no automatic mechanism which factors in such costs into the regulatory process.

Analyses of the cost of regulation in Canada and Mexico have shown comparable (though slightly lower) levels of costs as a share of GDP to those estimated for the US⁵.

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⁵ W. Mark Crain and Thomas D. Hopkins, “The Impact of Regulatory Costs on Small Firms,” Report
Hence measures of the total cost of regulations in an economy like Australia’s is likely to amount to around the 8-9 per cent of GDP seen in similar economies.

**Documenting the Growth of Regulation in Australia**

**Overall Trends in Regulatory Growth**

The volume of legislation is increasing dramatically. In the four years 2000 to 2003, the Commonwealth Parliament passed as many pages of legislation as were passed from 1901 to 1969, inclusive. It seems remarkable that four years marked by no great crises apparently required the same volume of legislation as the creation of Commonwealth, both World Wars, the Depression, post-war reconstruction and the changes of the 1960s, combined.

**Pages of Legislation passed by Commonwealth Parliament**

<table>
<thead>
<tr>
<th>Decade</th>
<th>Total Pages</th>
<th>Average per Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900s</td>
<td>1,072</td>
<td>6</td>
</tr>
<tr>
<td>1910s</td>
<td>1,195</td>
<td>3</td>
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<td>1920s</td>
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<tr>
<td>1940s</td>
<td>2,795</td>
<td>4</td>
</tr>
<tr>
<td>1950s</td>
<td>5,274</td>
<td>6</td>
</tr>
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</tr>
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<tr>
<td>2000-03</td>
<td>22,339</td>
<td>34</td>
</tr>
</tbody>
</table>

*Source: Acts of the Parliament*

Looking at the incentives and feedbacks applying to the legislative engine creates further scepticism that this burgeoning legislative activity is a net social benefit. It is a particularly extreme example of what economists call ‘agency problems’. The benefit to legislators of passing a law may well be entirely unconnected to the level of actual social benefit. Similarly, it is generally relatively costless to legislators for a new law to be passed with very little connection to, or even basic information about, what the actual cost to the general society is. The invention of photocopiers and word-processing no doubt make it easier to produce longer Acts, but this is unlikely to match to any need for such wordiness. There are little in the way of direct incentives for legislators to inquire seriously into the actual effects of the laws they pass. Rather the opposite would tend to apply. There are certainly grounds to suspect that, in such circumstances, law will and is being over-produced.

One such grounds is that one group who obviously benefit from increased regulatory complexity are public servants, the permanent advisers to legislators. More law, means more enforcement, thus more career opportunities. It also creates specialised intellectual capital that legal simplification may reduce or destroy. For example, a complicated tax system tends to increase the future income possibilities of tax officials.

prepared for Small Business Administration, Office of Advocacy, RFP no. SBAHQ-00-R-0027, October 2001,
Compounding this effect, regulatory authorities and some governments have also been keen to “empower” so-called representative consumer bodies by either subsidising them or requiring that a regulatory levy be exacted on the businesses they control. Such empowerment has been instrumental in injecting issues like greenhouse gas restraints being into local planning decisions, and complaints on behalf of particular consumer segments that have not benefited from the price reductions generally experienced.

Nor is it merely a matter of normal legislation. Commonwealth subordinate legislation is also dramatically increasing in volume.
The Commonwealth's increasing legislative addiction is quite remarkable. The Victorian Parliament, for example, is relatively restrained, though some tendency to increase is there, both in pages of legislation and in subordinate legislation.

The numbers of pages in Acts and subordinate regulations in NSW have also shown progressive increases.
Particular Areas of Regulatory Growth

The House Building Industry

The open nature of the Australian housing market and its network of extensive subcontractors has served the consumer well over the years and clearly contributed to low prices, especially compared with the heavily unionised commercial building sector.

A study of the housing markets of more than 300 American cities since 1950 pieced together evidence of regulation-induced inflation in many places. In the two decades after 1950, American house-price rises were almost entirely caused by increases in construction costs. Between 1970 and 2000, however, building costs were stable in real terms, due to greater efficiencies. Yet real house prices kept on rising and by large amounts in some areas. In 1960, properties in the highest-priced decile were 50% more expensive than those in the lowest-priced decile; by 1990, the margin was 200%. One of the benefits of economic liberalisation is that, by lowering costs and widening opportunities, it undermines social stratification. Higher costs and greater restrictions almost invariably fall hardest on those with least resources.

The study demonstrates that the change was due to the growth in planning laws which require permission to build and which limit the land that is made available for home building. In the case of Manhattan, they estimate that the regulatory tax of planning laws has risen to more than 50% of the average price of an apartment.

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6 Why Have Housing Prices Gone Up? Edward Glaeser and Raven Saks, and Joseph Gyourko Forthcoming in the American Economic Review

7 Social stratification should not be simplistically tied to economic inequality. It is much more a matter of level of social mobility. Thus the US has higher levels of income inequality than most developed countries, but it also has higher levels of income mobility. One of the key differences in politics between the US and Europe is precisely that social stratification tends to be higher in Europe: see Cowboy Capitalism: European myths, American Reality, by Olaf Gerseman, Cato Institute, 2004, pp156ff.
This is particularly striking because a ranking of 88 urban areas in the US, Canada, Australian and New Zealand found that, on the measure of the ratio of median house prices to median income, Melbourne's housing market was almost as unaffordable of New York's (both taking 7 years of median income to purchase the median house) while Sydney's was notably worse (it took almost 9 years of median income to purchase the median house). In the study, 7 of the top 21 most unaffordable housing markets were in Australia (Sydney 4th, Melbourne 9th, Adelaide 12th, Hobart 13th, Brisbane 15th, Canberra 20th, Perth 21st).\(^8\) A remarkable result for a country with such low population density. (The most unaffordable Canadian housing market, Vancouver, rated only 23rd, taking 5.3 years of median income to purchase the median house while in Houston, Dallas and Atlanta -- three of the fastest growing cities in the high income world -- it took from 2.6 to 2.7 years of median income to purchase the median house.)

In Australia, the cost of building has increased slightly ahead of general inflation over the past two years, but the main culprit in escalating new home prices has been the price of land.

That a sufficient and flexible supply of land can alleviate demand pressures is evidenced by the experience of South East Queensland during the mid-1990s. A Rapid increase in the demand for housing due to inter-state migration was accompanied by a supply response possible due to the availability of land. The net result was a major jump in new housing activity with little pressure on prices either in the new or established housing markets, especially on the urban fringe.

One builder provided evidence that the increased documentation rewired for new house building in NSW cost an additional $9,958 per dwelling over the past few years. The HIA estimated that the regulatory “tax” on new subdivisions in western Sydney was $60,000. Though some of this is arguably for infrastructure directly contributing to the value of the subdivision, much of it is for social infrastructure like “affordable housing contributions”, local community facilities, public transport contributions and the employment of community liaison officers.

There are however disturbing increases in regulation and evidence of regulatory barriers being erected to new competition.

In New South Wales, builders are now required to ensure that all power tools used on a building site are checked for safety by a qualified electrician every three months. It is hardly necessary to have expensive checks on 50 or more tools, some of which are used only once a year. It is even more doubtful that “tools” like portable radios and the kettle for morning tea should be as regularly and rigorously tested as heavy equipment. The home buyer pays for this nonsense.

Builders are supposed to meet every visiting contractor on site and discuss their work practices with them, no matter how experienced the tradesperson or how simple the job to be done. Builders and site managers are even expected to be responsible for ensuring their workers protect themselves against the sun.

\(^8\) [http://www.demographia.com/dhi-rank200502.htm](http://www.demographia.com/dhi-rank200502.htm). By comparing median house prices to median income, the study adjusts for relative income levels. Thus, that Hobart rates above Brisbane does not mean its house prices are higher, merely higher compared to the income of its residents.
Other measures have been taken that will adversely impact on house prices. In the main these have been the result of regulatory “capture” and a symbiosis between regulators and the occupations they control.

In the past, the house builder was normally a tradesman who gained sufficiently wide experience to take on a management role in the project. The system of sub-contracting greatly facilitated this.

More recently there has been a rise in credentialism. Unlike in the past, builders now have to take written tests and demonstrate to the authorities a knowledge of the system that have not proved to be necessary in the past. One outcome has been an increase in people purporting to be “owner-builders” to escape the regulatory restraint.

This is turn has led to a vast expansion in the so-called owner builder applications which accounted for 37 per cent of building permit applications in Victoria last year. One facet of this has been the considerable limitations on the ability of an owner-builder to construct new houses and major extensions. As a result, provisions have been introduced in Queensland, NSW and recently in Victoria that are targeted against the owner-builder. In some cases they require the would-be owner-builder to attend a completely useless building course to force up the regulatory costs of opting for this method of building. These provisions have no effect in terms of the safety or functionality of the work (mandatory insurance is necessary in any case and there is no evidence that owner builder work is any less satisfactory than that built by registered builders). In fact, owner-builders are based on the same sub-contracting principles that prevail throughout the industry – nobody actually lays the bricks or installs the roof trusses.

Governments have introduced increased cost impositions on new house. NSW has an array of measures that must be incorporated into new houses and which involve the unfortunate new home buyer with unwanted costs. In Victoria, similar such measures were introduced with the Plumbing (Water and Energy Savings) Regulations 2004. Under these regulations, people buying new houses must install low pressure water valves. In addition, they have a choice of installing a 2000 litre rainwater tank or a solar heating system.

That new set of regulations was introduced after a Regulation Impact Statement (RIS) had been prepared, an RIS that was woefully inadequate. This cited but failed to quantify savings from reduced greenhouse gas emissions. It made no attempt to quantify the reductions in consumer satisfaction that the RIS admits will result from the implementation of the proposals, or to acknowledge them via a sophisticated integration of quantitative and qualitative elements. In addition it relied on Keynesian multiplier effects (e.g. increases in employment, gross state product etc) to reach its conclusions, when these “benefits” are not accepted as a legitimate element of economic and/or cost/benefit analysis by a great many experts. The increased activity from regulatory forcings was considered as a benefit, whereas in fact such measures merely involve a transfer of expenditure into areas that would not be preferred absent the regulatory coercion.

The net benefit for the water to the individual household storage alternative is based on cost savings estimated at $11 per annum. These savings offset capital costs of $1895 added to which would be costs of loss of useable space and maintenance costs that will be incurred. Even without these other costs, it is doubtful that the effect of these outcomes on individual households could be positive at any feasible discount rate. This
reinforces the case for ensuring that the government quantify the social and environmental benefits that are expected.

The new home buyers’ alternative regulatory choice, solar heating, involves an up-front outlay of $2000. This is for an unreliable energy supply that costs three times as much as conventionally generated electricity.

The Victorian Competition and Efficiency Commission is conducting an inquiry into building rules and hopefully this will be the prelude to a much needed bonfire of these regulatory measures, and will flow on to other states.

**Regulation of Access to Buildings**

An example of regulations that are motivated by the best of intentions concerns those under consideration to improve access into commercial buildings for people with handicaps. The proposals involve hundreds of additional requirements covering matters ranging from access ramps to hotel swimming pools passing space and installation of wheelchair friendly lifts.

These measures are mainly aimed at the mobility impaired who comprise about 10 per cent of the population. However, those who have a permanent mobility impairment largely comprise wheelchair users who comprise around 80,000 people between 15 and 65 years of age.

The estimated building cost increases due to the implementation of the proposed standard of around $1.5 billion annually. The annual value of all new non-residential building approved is around $15 billion with a further $8 billion in alterations and extensions. It was estimated that the regulatory costs would add nearly 5 per cent to the cost of new buildings and over 10 per cent to the costs of upgrades for existing buildings which would need retro-fitment and see some loss of usable space.

In addition there would be costs stemming from the change in the nature of buildings constructed. For example, the cost impact is greatest on smaller offices and shops since the adaptations required of the regulations are more easily spread across larger building structures. This would mean a work and shopping environment less well suited to business and consumer needs. It is also likely to lead to premature scrapping of existing building which is more expensive to convert than building from scratch. And the higher costs that need to be passed on to customers would bring an overall reduction in building activity.

Nor is it clear that the outcome will bring an increase in employment of those with disabilities. Frisch\(^\text{10}\) points out that the 80,000 wheelchair users in the community between 15 and 65 years old have a workforce participation rate of only 38 per cent compared with a rate of 76.9 per cent for those without disabilities.

He shows that if the number of wheelchair users participating in the workforce were to rise by 12,000 to 53 per cent (i.e. still considerably below the non-wheelchair user levels), then even on highly conservative assumptions about remuneration levels, this would

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\(^9\) ABS Cat 8731.0 Building Approvals.

\(^{10}\) *The Benefits of Accessible Buildings and Transport: An Economist’s Approach*, Dr Jack Frisch.
Impact and Outcome of Regulation on the Economy

mean an increase of $300 million per annum in income levels\textsuperscript{11}. The effects of such a shift can be considered from a number of viewpoints, as follows:

- From the viewpoint of society as a whole, the benefit is equal to $300 million, which is the amount by which national GDP would be increased annually.
- From the viewpoint of the individual wheelchair user, the income gain would be equal to the difference between their net wage income (plus any benefits that remained payable) and their current benefit income.
- From the government’s perspective, the budget would reap expenditure savings equal to the reduced allowances payable to the 12,000 newly employed persons, while there would also be revenue gains equal to the tax payable on the wage incomes of this group.

There are clearly sound theoretical reasons for predicting that improved building accessibility would enhance the employment participation of people with a disability. However, analyses undertaken of previous legislative attempts to improve access to employment do not provide strong empirical backing for this proposition. A number of analyses have been undertaken of the Americans with Disabilities Act (ADA), which was passed in 1990 and was fundamentally geared to redressing the discrimination that people with a disability experience with regard to their employment opportunities.

The most authoritative estimate, that of the National Organization on Disability/Harris\textsuperscript{12}, indicated that 29 per cent of individuals with disabilities were employed in the survey of 1998 compared with 31 per cent in 1994 and 34 per cent in 1986. This is a disappointing outcome, even though disaggregation of the data showed substantial variability within sub-groups, with some age groups – especially older women – with increased employment levels relative to their able-bodied counterparts.

Improving the access of disabled persons is a regulatory proposal with seemingly innocuous costs and targeted at relieving the discomfort and improving the work prospects of a highly meritorious group of people within society. Yet a careful analysis of the costs shows them to be far in excess of what most would regard as being reasonable, while an empirical analysis of the outcomes of similar regulation elsewhere indicates that the positive impacts envisaged are not easy to achieve.

Agriculture and Farm Regulations

Regulatory framework for innovative food crop technology

The use of modern genetic technology to develop better crop varieties is recognised globally as a dynamic current area of technological innovation. The total land area sown to new genetically modified (GM) crops developed from biotechnology continues to expand globally.

Agriculture remains as a significant contributor to Australian economic activity.

\textsuperscript{11} The Benefits of Accessible Buildings and Transport: An Economist’s Approach, Dr Jack Frisch, p2. The $300 million figure assumes average productivity for the additional wheelchair using workers of $25,000 per annum, approximately $10,000 per annum below that of the workforce as a whole.

\textsuperscript{12} Chartbook on Work and Disability, National Institute on Disability and Rehabilitation, http://www.infouse.com/disabilitydata/workdisability_2_9.html
Promotion of an investment climate that fosters innovation in this growing field should be a major component of both the state’s economic strategy, and indeed also major component of the state’s research and innovation strategy.

Nevertheless, State Governments have recently introduced Legislation that has banned the commercialisation of two new GM varieties. These GM varieties had previously passed stringent Federal government regulatory requirements to assure they pose no risks to the environment or to human health. The technology allows a marked reduction in the use of fertilizers and weed control chemicals as well as reduced labour use in the application of these chemicals.

These prohibitions and the long time lags in plant variety improvement mean that genetic technology used already for ten years by Australia’s international trade competitors including in Canada and Argentina are denied Australian farmers. The competitiveness of the industries themselves and of those that use the products in food and other agricultural processing is impeded by the measures. In addition, Australian consumers will fail to gain the benefits of the lower prices that will emerge from the lower costs.

Moreover, as a result of this legislation and of the political risks posed towards plant biotechnology, some innovative plant breeding research groups have now been disbanded. This poses a longer term threat to the industry remaining ate the technological cutting edge where it needs to be to fulfil government and industry aspirations for agriculture and agricultural processing.

Regulatory “Takings” in water
Much of agriculture in Australia is generally on irrigation, especially in the Murray Darling Basin which contributes some 40 per cent to Australian.

Regulatory takings of water in pursuit of ill-founded but oft-repeated claims that water is needed to remedy environmental degradation are likely to have significantly impact economically on rural Australia while delivering little if any environmental benefit. Nonetheless, prompted by militant green NGOs, governments are attempting to take water allocations back from farmers.

Farmers need to have confidence about fair play with future decisions. Irrespective of the merits of the water allocation decisions and water rights acquisitions that have taken place over the past century or more, the status quo of de facto rights needs to be the starting point of any reformed system.

Native vegetation
Legislation on flora and fauna is similar in most Australian States, and prevents clearance of native vegetation.

There are some clear problems.

First, the regulations do not embody well-defined objectives. For this reason their proponents and administrators are not obliged to weigh the costs and benefits of the regulations or the decisions made under them. This situation arises because the regulations have generally been devised without those who bear the costs being consulted and, as a result, not adequately considered. This is not just a problem for those in the rural economy but it tends to have more widespread effects there.
Second, there is inconsistency in the application of the regulations. The reason is that they are devised at a high policy level and administered by local authorities, case by case, often by unqualified staff with no means of cross checking. Moreover, officials often have little experience in or knowledge of the pressures and requirements of practical farming. This is not helped when the Government changes the rules to reverse particular cases such as novel restrictions which have been on vermin control activity. Third, the provisions for compensation are either non-existent or inadequate where decisions are made that affect the income-earning capacity or capital value of assets.

Fourth, because the rules are more stick than carrot, there are powerful incentives for landowners to undermine the purpose of the regulations. This is reinforced by the increasingly popular but farcical requirement for Net Gain of native vegetation cover whenever an application to clear is made. This principle inappropriately values native vegetation as an absolute good. The results are predictable:

- Many sound, beneficial clearing proposals are not put forward as the costs of regulation exceed the benefits to the farmer.
- Farmers tend to favour exotic species in tree planting to avoid future reservation for environmental purposes.
- New native forestry activities are discouraged for the same reason.
- Rare and endangered species of vegetation are concealed to avoid quarantining of productive land.
- Poor management practices (overgrazing of native vegetation) are encouraged in an effort to circumvent the restrictions.

**Bushfire hazard reduction**

In the 2003 bushfires, twenty thousand hectares of Victorian Alpine Ash were burned. These caused an estimated economic loss of $150 million. The Alpine parks were severely damaged. The 3 million hectares burned across Australia would classify as “clearing” under native vegetation rules. This compares with average annual logging over all Australia of 60,000 hectares.

There is a propensity to regard such fires as natural events and therefore beyond the reach of human control. This is not the case. With our increased knowledge of wildfire behaviour we should be responding more effectively in advance of such events rather than engaging in frantic emergency reaction when the fires are out of control.

Many factors have played a part in the tragedy. One is the indiscriminate, massive enlargement of under resourced National Parks. But regulation plays a part as many of the official inquiries have since found. Given the enormous cost of the fires it would be worth examining whether there is potential for improvement in the various regimes as a special case to allow them to mitigate the losses.

Several possibilities occur:

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13 Such a case was identified by the Productivity Commission
• A relaxation of the rules to allow more extensive hazard reduction burning. This would be combined with more precise and proactive guiding principles for bushfires control. This links to the preceding section in that the processes for approval of burning native vegetation are detailed, delayed and expensive.

• Rewrite National Parks regulations to require a style of management which favours hazard reduction, maintains better access and concentrates on protection of fire sensitive areas rather than whole tracts of bush.

• Dismantle regulation-mandated committees that give excessive influence to groups with no interest in the land and allows them to apply inertia to prevent decisions on mitigation.

This area of regulation is an amalgam of different State departmental responsibilities but the issue is sufficiently important and integrated to merit a unique regulatory response. The fuel build began again immediately. Fires will inevitably occur but we can reduce their toll.

The mushrooming of these regulations is a feature of many economies. Notwithstanding the deregulation we have experienced, the aggregate level of regulations has increased markedly as a result of these.

The Victorian Farmers Federation has drawn attention to a vast number of other regulations that have detrimental effects on the agricultural sector. These include:

• Child employment laws that ban kids under 13 from doing farm chores.

• Tough noise and odour regulation that impinge on farm productivity

• Pest control regulations that put businesses at risk – that require permits to control kangaroos and emus

• Multiple licensing requirements for fertilizer use and transport

Financial Services Regulation

In its Annual report the Business Council draws attention to the unique position Australia holds in taxing superannuation at three stages: contributions, investment income and benefits. The adverse effects of this taxation regime are exacerbated by a plethora of costly and duplicative controls on the industry which involve a massive paperburden. This is particularly serious as the industry is one of the prime vehicles through which domestic savings are gathered and directed to investment activity.

Since the passage of the Financial Services Reform Act (FSRA) the superannuation industry has become regulated by APRA, ASIS, the RBA as well as a raft of industry regulatory bodies like the ACCC on pricing, franchising conduct, we have industry body regulators in banking, insurance and wealth management. Lawyers Weekly quotes David Murray, chief executive of the Commonwealth Bank of Australia, as saying, “the FSR Act
means that a simple overdraft for a business that once required 20 pages of documentation now requires 227 pages.\textsuperscript{14}

According to an ANU Discussion Paper by David Ingles, “While Chile has been regarded as very expensive system, administratively (there are front-load costs of roughly 15-20%, equivalent to an annual cost of around 1% of assets), as has the UK system, Australian costs appear to be as high or possibly higher than these. Our costs are also higher than in countries like Switzerland and Sweden, which also have elements of mandatory savings in their national retirement income systems.\textsuperscript{15}”

Costs are estimated to be in the range of about 1.34% of funds. If the real return is 4 per cent over the long term, this comes to over 30 per cent. Put another way, Ingles estimates a fund would accumulate $185,000 from someone earning $20,000 per annum over a 40 year working life at a net return of 5 per cent but only $145,000 if the net return is 4 per cent.

The Securities Institute has made strong complaints about over-regulation in the industry. It has referred to “compliance fatigue” due to constant change and an escalating compliance burden. It has even suggested that the burden is so great that it imperils the conduct of the businesses concerned. It raises particular issues with the requirement for “fit and proper” tests that vary across financial regulatory arenas. The matters that are regulated include difficult to define and undefined issues like “high level decision making”, the very notion of “commercial or professional activities”, what constitutes “criticism”, a “dispute resolution body” and so on.

**Concluding Comments**

There are disciplines that should be in place to ensure regulation is carefully considered and that a regulation once in place is neither the foothill for a new regulatory empire, nor even something that remains indefinitely.

The Commonwealth Office of Regulation Review has specified the sort of disciplines that should be followed. Not only is rigour necessary to ensure a regulation is necessary but the best regulatory route should also be selected and there should be regular reviews. Moreover, it is insufficient to relate the regulatory measure to the actual targeted behaviour but an assessment should also examine the consequential behaviour. If regulations on ladder design result in ladders becoming very expensive, fewer will be bought and ad hoc means will be used or faulty ladders retained with the possible effect of increasing the number of climbing injuries.

Australia has enjoyed increased prosperity over recent years at least in part because of the deregulatory reforms that were set in train in the mid-1980s. The simultaneous rise of new forms of regulations, particularly social regulations covering the environment, consumer protection and occupational health and safety threaten to undermine these gains. This requires more intensive regulatory surveillance at all levels of government.

\textsuperscript{14}http://www.lawyersweekly.com.au/articles/0D/0C026F0D.asp?Type=55&Category=8
\textsuperscript{15}http://www.anu.edu.au/pubpol/Discussion\%20Papers/dp_77.htm