

# tax and innovation

## Taxation

Tax has a pervasive effect on economic behaviour of all kinds, including innovation. It is difficult to show any clear link between the rate of economic growth and either the total tax take as a share of GDP or the highest personal tax rate.<sup>1</sup> On the other hand, the link between the rate of company tax and economic growth is strong and well established. Lee and Gordon<sup>2</sup> find a statistically significant and strongly negative relationship between individual countries' growth rates and their company tax rates.

One important means by which lower company tax raises economic growth is by increasing investment, particularly foreign investment.<sup>3</sup> Several recent studies suggests that reductions in corporate tax rates increase entrepreneurialism. Although the evidence is mixed, a number of recent studies have found that reductions in corporate tax rates increase entrepreneurialism. The most recent study by Djankov et al reported that 'the effects of [corporate]taxes on entrepreneurship are large and statistically significant'.<sup>4</sup>

Lee and Gordon's study suggested a 10 percent cut in the company tax rate produces an increase in annual per capita growth of between 0.57 and 1.82 percent. The case for lowering company

1 Hassett, K.A. and Mathur, A. Taxes and Wages, American Enterprise Institute, AEI Working Paper No. 128, June, 2006 available at [http://www.aei.org/publications/filter.all.pubID.24629/pub\\_detail.asp](http://www.aei.org/publications/filter.all.pubID.24629/pub_detail.asp). Lee, Y., and Gordon, R.H. Tax Structure and Economic Growth. *Journal of Public Economics*, 89, pp1027-1043. 2005.

2 Lee, Young & Gordon, R. H., Tax structure and economic growth. *Journal of Public Economics*. Elsevier, 89(5-6), pp 1027-1043, June 2005.

3 Gordon, R.H., and Hines Jr, J.R. International Taxation, in AJ Auerbach and M Feldstein (Eds.), *Handbook of Public Economics*, 4. Amsterdam: Elsevier, pp 1935-1996 at 1969. 2002.

4 Djankov, S., Ganser, T., McLiesh, C., Ramalho, R., and Shleifer, A., The Effect of Corporate Taxes on Investment and Entrepreneurship, National Bureau Economic Research Working Paper No. 13756, p. 18. January 2008. See Mooij, R. A. de and Nicodème, C., Corporate Tax Policy, Entrepreneurship and Incorporation in the EU, March 2007, for a more complex view. Note also the driver of entrepreneurialism in Cullen, J. B., and Roger G., Taxes and Entrepreneurial Risk-Taking: Theory and Evidence in the U.S. *Journal of Public Economics* 91(7-8): 1479-1505. 2007. This paper sets out a theory – for which it finds empirical evidence in the US – that reductions in personal tax harm entrepreneurialism by reducing the rate of tax subsidy of personal losses whilst reductions in company tax rates stimulate entrepreneurialism.

tax rates in Australia is strengthened by the fact that over the last 15 years OECD countries have cut their own company tax rates so aggressively that Australia, which has also cut its corporate tax rates, has nevertheless moved from having a corporate tax rate somewhat below the OECD average to one that is now clearly above the average, which continues to fall steadily.<sup>1</sup>

Of course cutting company taxes will forego revenue. In this context the Panel notes recent proposals for a revenue neutral reduction in the company tax rate funded by the abolition of dividend imputation. Dividend imputation was introduced to reduce 'double taxation' on equity finance which is a sensible objective. In practice, however, there is strong evidence that imputation credits are not fully valued by the market.<sup>2</sup>

Further, because foreign buyers of Australian shares are the marginal investor and so dominate the price setting process, as Cannavan, Finn, and Gray suggest, 'in a small open economy such as Australia, the company's cost of capital is not affected by the introduction of a dividend imputation system'<sup>3</sup>. In another study Hathaway and Officer calculate that dividend imputation delivers an effective rate of company tax 'closer to 19 percent than the statutory rate',<sup>4</sup> suggesting that the abolition of dividend imputation could fund a reduction in company tax from 30 percent to as low as 19 percent.<sup>5</sup>

Such a switch looks extremely promising from the perspective of promoting entrepreneurialism, productivity, investment and economic growth. The equity issues it poses are surprisingly mild for such a large change. Although returning to a classical tax system, albeit at a lower rate, the effective rate of tax on dividends from Australian based companies to Australian shareholders would rise, foreign demand for those shares would rise, substantially increasing their price. Those Australian shareholders who wished to re-weight their portfolios in response to changes after tax returns could do so at a healthy profit.

1 KPMG, Corporate and Indirect Tax Rate Survey 2007. Since this survey New Zealand, Luxembourg and Germany have cut their corporate tax rates further.

2 Around eighty percent of firms do not value such credits in the hands of shareholders when appraising projects for commercial viability; see Truong, G., Partington, G., and Peat, M., Cost of Capital Estimation and Capital Budgeting Practice in Australia, The Accounting & Finance Association of Australia and New Zealand Ltd AFAANZ 2005. Available at [www.afaanz.org/web2005/papers/partington-FIN.pdf](http://www.afaanz.org/web2005/papers/partington-FIN.pdf). Further, imputation credits are valued by the sharemarket at considerably less than 100 cents in the dollar with the remaining value they create for Australian shareholders circulating in the market as windfall. Some of the most credible econometric estimates of the extent to which franking credits increase the share prices of the companies that pay are unable to reject the hypothesis that they do not attract any share price premium. Lateral Economics, Tax Cuts to Compete: the influence of corporate taxation on Australia's economic growth. 2006. Cannavan, D., Finn, F., Gray, S. The value of dividend imputation tax credits in Australia, *Journal of Financial Economics*, 73. 2004, p167-197; Bond, S.R., Devereux, M.P., and Klemm, A. The effects of dividend taxes on equity prices: A re-examination of the 1997 UK tax reform, November 2005, mimeo/

3 Cannavan, D., Finn, F., Gray, S. The value of dividend imputation tax credits in Australia, *Journal of Financial Economics*, 73. p 193. 2004. Ickiewicz, finds that the introduction of dividend imputation did not appreciably increase Australia's share prices. Ickiewicz, J., Valuing Dividend Imputation Credits in Australia: an Alternate Approach, University of Queensland Business School. Honours Thesis, 31st October 2006.

4 Hathaway, N., and Officer, R. The value of imputation tax credits, unpublished working paper, University of Melbourne, Victoria. 1992.

5 Although Officer and Hathaway give a range of 10-21 percent as the effective corporate tax rate.

At present our relatively high company tax rate is collecting resource rents from the very high commodity prices being paid to our miners. Accordingly company tax might be cut further, or at less fiscal cost, if it were accompanied by action to recoup any lost resource rents. Measures to prevent the use of companies for avoiding personal tax could also be considered.

We believe, therefore, there would be a substantial economic growth and innovation dividend from reducing Australia's rate of company tax. A promising means of doing so in a revenue neutral fashion would be to return to the classical tax system typical of many countries with low company tax rates. The appropriate forum to consider these issues further is the Australia's Future Tax System Review being chaired by Dr Ken Henry.

### **The R&D Tax Concession**

The R&D Tax Concession is an iconic program in Australia.<sup>1</sup> It is also the largest single government innovation outlay, currently amounting to over \$500 million annually. Such tax instruments are deployed in many countries with the models used varying substantially.

In reviewing the R&D Tax Concession the Panel's working group considered submissions, held special consultations with industry and professional advisors, and interviewed a number of firms. It also had the benefit of the numerous previous reviews, including the findings of the recent Productivity Commission Inquiry into Public Support for Science and Innovation. A further issue considered was the changing nature of business investment in R&D. In the 1980s and earlier, when these tax instruments were introduced, the prevailing model of business research centred around in-house corporate laboratories. Today the prevailing model is one of open innovation markets, where corporations exchange, collectively develop, or trade in technology or intellectual property. In addition the mix of product and process innovation is changing – and the line between them is blurring.

The inherent characteristics of a statutory tax instrument create challenges with respect to the availability of data and the transparency of the operation of the scheme. The evidence base around a scheme which has operated for nearly 25 years is astonishingly poor. This paucity of data is largely caused by the legal and probity barriers to open disclosure of taxation data and the lack of progress in producing longitudinal data around matched data sets. A further problem in the Working Group's assessment was the inherent difficulty of accurately forecasting the effects of changes to a tax instrument. This difficulty has been acknowledged

<sup>1</sup> The remainder of this chapter focuses on the R&D Tax Concession. Some other innovation schemes focus on tax measures, for instance the Innovation Investment Fund, however this has been discussed in the following chapter on market facing mechanisms to foster innovation

previously in Senate hearings and introduces the need for some caution in framing recommendations.

The second reading speech introducing the Tax Concession noted that the objectives of the Concession were:

- to provide an incentive for greater levels of R&D in Australia;
- to concentrate new R&D efforts in industry by greater business investment in, and responsibility for, R&D;
- to provide positive support for R&D activities in industry, on the basis that significant benefits accrue both to industry and to the wider community through enhanced competitiveness of industry;
- to provide mechanisms for encouraging effective use of Australia's existing R&D expertise; and
- to encourage a capacity in industry to be aware of, and exploit, technological developments occurring in other countries.

These objectives are part of a broader set of objectives which seek to encourage, through the Government's industry and technology policies, the development in Australia of internationally competitive, export oriented, innovative industries<sup>1</sup>.

This reminds us that the Tax Concession needs to be considered and evaluated within the overall suite of innovation and technology policies.

The Australian R&D Tax Concession provides an increased deduction (150 percent in the period 1985–96, 125 percent thereafter) to be claimed on the volume of R&D expenditure, and this then reduces tax payable with tax loss firms entitled to carry the additional deduction forward. Between 1985 and 2008 there have been numerous changes to the Concession, most notably to the definition of R&D and, in 2001, the introduction of two new elements: the Tax Offset<sup>2</sup> and the 175 percent Premium Concession<sup>3</sup>. The 175 percent International Premium<sup>4</sup> concession was introduced in 2007. The result has been fragmentation and complexity.

In 1989 the 150 percent tax concession scheme was expanded to allow Syndication. This permitted projects that were carried out by a group of companies. Concerns about possible abuses of syndication through some of the financing schemes deployed lead to the

<sup>1</sup> House of Representatives, Income Tax Assessment Amendment (Research and Development) Act 1986, Second Reading Speech.

<sup>2</sup> The Tax Offset gives small firms in tax loss the option of receiving an early cash payment based on their eligible R&D expenditure, rather than a future entitlement to a deduction.

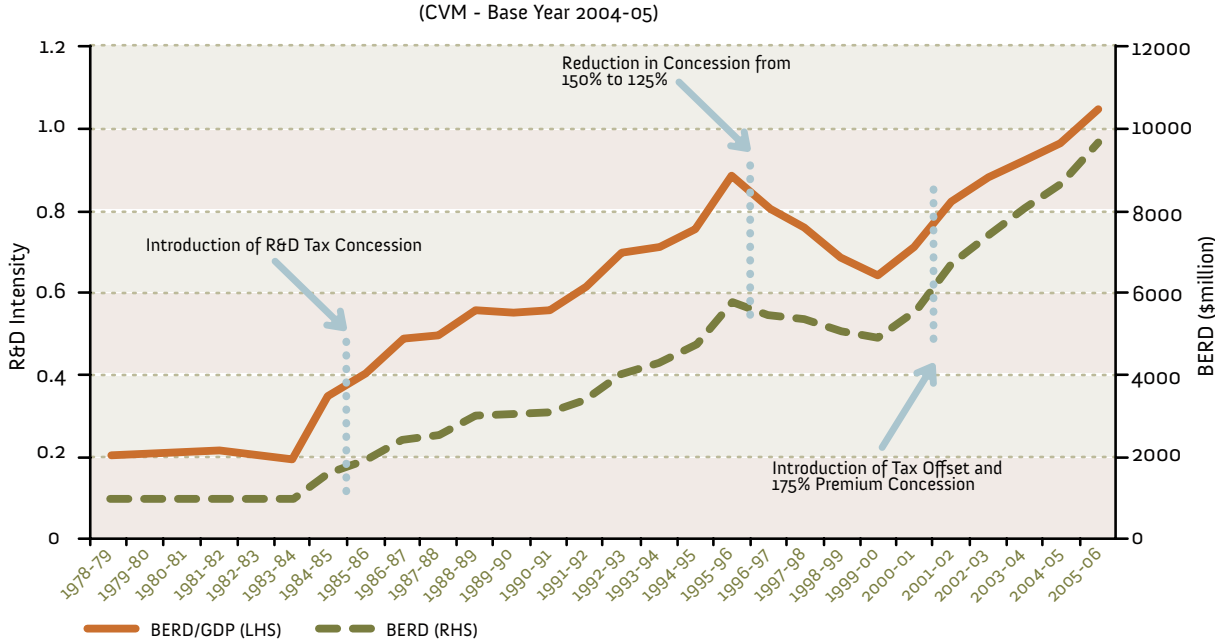
<sup>3</sup> The 175 percent Premium R&D Tax Concession is for labour-related R&D expenditure (expenditures eligible under the 175 percent are called 'incremental expenditures') above the average of a firm's previous three-year expenditure.

<sup>4</sup> The 175 percent International Premium Tax Concession is for those companies belonging to a multinational enterprise group for additional R&D expenditure on behalf of a grouped foreign company above a rolling three-year average of expenditure.

scheme being dropped in 1996. To some extent the issue of how to support big collaborative projects has been partially addressed through other programs, like the Cooperative Research Centres Program and large ARC Linkage Grants.

Figure 14 shows the long run trends in business expenditure on research, with the Tax Concession milestones flagged.

**Figure 14: Long run trends in business research expenditure**



Source: ABS, Australian System of National Accounts - 2005-06. Cat No. 5204.0

Whilst this trend analysis suggests a strong correlation between the availability of the Concession and the steady increase in BERD, some caution is needed in imputing causation. One question is how much of the growth was driven by the internationalisation of the Australian economy in the 1980s and the resulting need for trade exposed companies to innovate to be competitive, as opposed to the effects of the Tax Concession. Certainly, the decline from 1996 to 2000 following changes to the Tax Concession was sharp. It is, however, difficult to untangle the reduction of the concessional rate from the ending of tax syndication. It is estimated that syndication represented at least 30 percent of the Concession outlays by 1995<sup>1</sup> and had been a major driver of firm uptake of the Concession in the early 1990s. In the period after 2000 it remains inherently difficult to unbundle any additional effects across inter-related innovation and assistance programs, including the expanding CRC program.

<sup>1</sup> Productivity Commission, Public support for science and innovation, p. 398. 2007.

The Concession has also changed in value over time. Falls in the rate of corporate tax over the period since 1985 have reduced the effective value of the Tax Concession by a factor of three. As Table 3 shows, the Concession would need to be raised to well over 175 percent to regain its original direct incentive value.

**Table 3: Impact of the corporate tax rate on the value of the incentive**

Financial Year(s)	Tax rate (%)	Incentive Rate (%)	After Tax Benefit
87-88	49	150	24.5
88-89 to 92-93	39	150	19.5
93-94 to 94-95	33	150	16.5
95-96 to Aug 96	36	150	18.0
96-97 to July 2001	36	125	9.0
Current	30	125	7.5

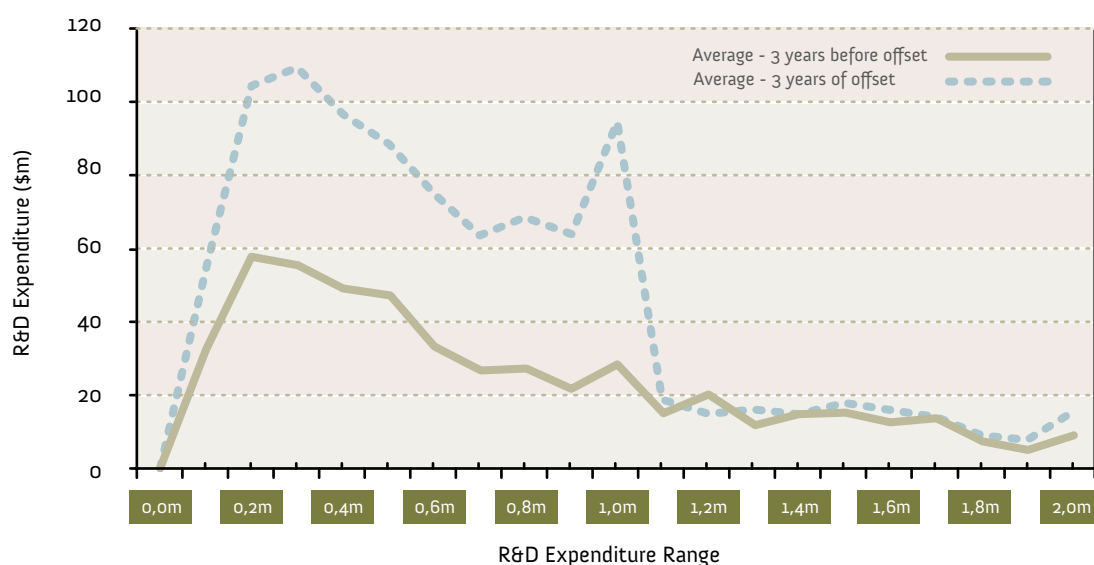
Source: Victorian Innovation Economy Advisory Board, 2006

The inducement effects of a concession are likely to differ as between small technology based firms, and larger more mature firms. At one consultation with larger companies, 82 percent of those present indicated, when polled, that the incentive value was marginal or none, and no one said the 175 percent incremental premium scheme influenced their R&D activity. This is consistent with the findings of the 2005 Business Council survey of the commercial imperatives driving research and innovation<sup>1</sup>. The Tax Working Group concluded (like many in the stakeholder meetings) that firms were frequently unable to use the 175 percent Premium strategically because the grouping rules mean that acquisition, merger or demerger activity prevents firms from planning their use of the scheme in advance.

At the other end of the spectrum, the introduction of the Tax Offset element of the Concession for small tax loss firms has been highly successful, despite its limited coverage and the perverse effects of the rules around the \$1 million cap on eligible expenditure on behaviour. This is shown dramatically in Figure 15.

<sup>1</sup> Business Council of Australia, Research and Development Investment by Australia's Leading Businesses – A Survey of BCA Member Companies. 2004

**Figure 15: Illustrating the perverse effects from program design**



Source: Department of Industry, Tourism and Resources (2007)

Eligibility rules limit the number of firms that can benefit from the Tax Offset. Yet firms in tax loss are often the most innovative. Further, many start-up firms too large to qualify for the Tax Offset endure tax losses for the best part of a decade, particularly in sectors like biotechnology. Waiting this long to access the Concession hugely degrades its commercial value, particularly for firms engaging in high risk research. And of course many start ups are unsuccessful and so never access the Concession.

There is a compounding problem. While a tax loss is something that is potentially valuable on a firm's books – because it enables a future stream of operating profits equal to those losses to be enjoyed before any tax must be incurred – the real value of these losses is threatened by a range of anti-tax avoidance provisions which will often make it difficult for a firm that acquires the start up firm from enjoying the tax loss. The Panel appreciates the necessity for the anti-avoidance provisions. Nevertheless it is also the case that in this context they badly distort the capital market for start up firms and as a result suppress investment in them.

Further, tax loss firms not eligible within the current limited Offset scheme are robbed of one avenue for funding additional R&D that tax profit firms are not – namely the option of reinvesting the benefit from the Concession. Thus the structure of the current scheme discriminates against firms that are particularly important within the innovation system. There is also a difference in the value of the Tax Concession to shareholders given the operation of

dividend imputation.<sup>1</sup> This means that the Concession is of greater value to the foreign owners of firms operating in Australia than it is to Australian owners. Whether or not one should discriminate between foreign and domestically owned firms it seems perverse to discriminate against domestically owned R&D.

There is another drawback of the existing structure. The Concession is typically accounted for 'below the line' which means that it is essentially invisible in a range of business decision-making circumstances. This obviously dilutes its effectiveness in inducing additional R&D expenditure.

### **A tax credit**

The Panel proposes that a non-refundable tax credit of 40 percent be introduced to support all R&D activity undertaken in Australia to replace the 125 percent R&D Tax Concession, the Tax Offset, the 175 percent Premium, and the International Premium. It proposes further that smaller firms get access to a refundable credit at a rate of 50 percent. Further the Panel proposes that the Australian Government dramatically lift the threshold beyond which firms are classified as large firms ineligible for the refundable credit.

The refundable tax credit will put the government assistance to business R&D activity 'above the line' in firm budgets, will induce higher levels of expenditure by small firms, and will induce more R&D expenditure to be undertaken in Australia. The simpler rules and consistency of approach will remove much of the complexity of the current schemes making it easier to evaluate its impact, and to fine tune the concessional parameters of the scheme over time.

In arriving at these recommendations the Panel emphasises the significant and direct benefit these measures will provide to smaller technology firms still in tax loss, including firms in key industries like biotechnology. The incentive should apply to any research activity carried out in Australia, regardless of firm ownership.

It is important to note that a tax based entitlement scheme is poorly suited to supporting large joint or collaborative projects (as demonstrated by concerns around R&D syndication). The Panel reiterates the desirability for direct support mechanisms to be maintained in this area such as the current CRC and ARC Linkage programmes.

<sup>1</sup> In the hands of a domestic shareholder, in principle the concessional tax treatment principle takes the form of a loan: The tax the concession saves the firm also prevents it from passing the benefits of that tax payment onto its shareholders as franking credits. By contrast, franking credits are of limited use in the hands of foreign shareholders who do not pay Australian tax, though they may have some value in reducing withholding tax obligations.

*Recommendation 8.1: The set of taxation measures outlined below be considered as a package and the recommendations that may lead to cost-saving not be adopted in isolation from recommendations to restore the value of incentives to firms.*

*Recommendation 8.2: The R&D Tax Concession be changed from a tax deduction to a tax credit.*

*Recommendation 8.3: The existing R&D Tax Concession (the 125 percent R&D Tax Concession, the 175 percent Premium, the R&D Tax Offset and the International Premium) should be replaced with a Tax Credit in order to raise the level of business expenditure on research and development by providing a less complex and more predictable support mechanism. A 40 percent Tax Credit should be available to large firms with a refundable Tax Credit of 50 percent available to smaller firms with turnover under \$50 million.*

The 50 percent tax credit would provide support equivalent to a 166 percent R&D Tax Concession and the 40 percent tax credit would provide support equivalent to a 133 percent R&D Tax Concession. Details are provided in the Annex 8. Treasury has provided indicative costings for this proposal on a confidential basis which has given the Panel confidence that the proposals are affordable.

The Panel has adopted the principle that all R&D expenditure undertaken in Australia should be supported by the non-refundable tax credit. This is a movement from the previous policy position which restricted access to R&D activity where IP ownership was in Australia. The Panel does not consider the focus on IP ownership is appropriate given the global nature of R&D and the movement of global enterprises across continents dependent on where the best environment exists, and in particular to gain access to capability, skills, and markets. Firms undertaking foreign-owned R&D expenditure in Australia would be able to access the non-refundable tax credit.

*Recommendation 8.4: All R&D undertaken in Australia which meets relevant definitions be eligible for the tax credit.*

Any delay in provision of support – currently the Offset is provided in the year post-expenditure – has a negative impact on firms ability to undertake R&D. Indeed, other sources of capital are often contingent upon firms being able to provide assurance of existence of matching capital. For this reason, and providing issues of tax integrity and practicality are adequately addressed, we should get firms the benefits of assistance as soon as possible. Currently the benefit is paid yearly in arrears. With sensible risk management strategies, and perhaps for firms with a track record, it should be possible to make assistance available to them earlier than this.

*Recommendation 8.5: Risk management models be developed to maximise the extent to which the refundable tax credit can be paid more regularly – at least quarterly in arrears. Regard should be had to the likely benefit relative to administrative and compliance costs and the need to manage risk.*

The Panel considers there is no specific policy purpose to be served, and there may be a risk to the integrity of the R&D tax credit system, if overseas firms were given access to the refundable tax credit for firms in tax-loss.

*Recommendation 8.6: R&D expenditure undertaken in Australia by foreign-owned firms be eligible for the 40 percent Tax Credit but excluded from the refundable Tax Credit.*

#### **The breadth of R&D activities covered**

Since the scheme's inception there have been persistent tensions around the definition of eligible activity. In principle one would like a relatively generous definition because even marginal, incremental innovations are an important driver of growth and in many ways more easily copied than more fundamental innovations. Unfortunately, however, the abuses to which such a course would lead make it impracticable.

The Panel would like to see the Concession made more widely available to innovators in services but acknowledges the practical difficulties. We propose some further work in this area, but expect that it will be difficult to take the Concession far beyond the

technical risk taking on which the current Concession is based. This means that where government is seeking to encourage innovation, particularly in services that do not rely on R&D with substantial technical risk, it is likely that more specific programs will need to be developed.

One area in which the Panel considers progress is possible is software development. Providing it is technically risky software development is eligible for the R&D Tax Concession. In addition it must be made available for multiple sale or lease. The Panel accepts that this is not an ideal situation because some such projects would both be worthy of assistance and might not go ahead without it. However we accept that the rule is there to prevent what would be large claims from large firms – for instance in retail and banking – on projects that would proceed without government support.

On the other hand, there is one area in which it is clear that there will be substantial spillovers from software development. Where firms develop *open source* software and donate the code from their development back to the open source project, this will generate clear spillovers for the rest of the community which will be able to access their developments. It is hard to think of a more straightforward case for government support. The Panel accordingly recommends that R&D on open source programs should qualify for the multiple sale test. Given the pervasiveness of positive spillovers, it may also be cost beneficial to relax somewhat the degree of technical risk required in relation to open source software.

In recent years several firms have been successful in the aggressive use of the R&D Tax Concession to make claims for a very large share of expenditure in large one-off projects like mines and civil engineering. These claims have demonstrated that some aspect of the project is new and technically risky. This having been done it has been possible, despite the efforts of the Australian Taxation Office, to claim as much as 80 percent or more of all investment expenditures in the project.

The Panel appreciates that such ventures are both risky and innovative. At the same time it is clear that such 'whole of mine' claims are gaining for themselves a degree of assistance disproportionate to the benefits available to many other innovative projects. While they are also being undertaken by firms with very good access to capital, it is also true that capital markets are averse to risks in long term technology projects. This is an issue which needs to be addressed in its own right, and not by default through a general tax concession.

For this reason the Review considers that, to protect the revenue and the continued viability of the R&D Tax Concession, measures should be taken to limit the degree to which such projects can qualify for the Tax Concession. These could include amending legislation in relation to the definition of R&D for the Tax Credit and the development of more comprehensive guidelines by Innovation Australia to improve the targeting of the Tax Credit on worthwhile innovation.

In the time available for the Review the Panel was unable to satisfy itself as to how best to deal with this problem. If the matter cannot be satisfactorily dealt with by refining the definition of R&D, the best that can be done may well be the imposition of some ceiling on the extent to which any project of a particular scale should be able to qualify for the Concession, and to limit the nature and extent of 'directly related costs' which may be able to be claimed against eligible R&D activities.

*Recommendation 8.7: Refinements should be made to clarify the activities that should be supported by the Tax Concession or new Tax Credit. Further exploration may be warranted to see if there are practicable ways of expanding the definition of eligible activities to include some of the less technically risky activities involved in innovation in services. In the immediate term:*

- *R&D on open source programs should qualify for the multiple sale test;*
- *guidelines should be reviewed to clearly identify what is eligible activity; and*
- *appropriate measures be taken to heavily constrain 'whole of mine' and similar claims against the existing R&D Tax Concession program or proposed Tax Credit program.*