

# Australia's Future in Research & Innovation

A Submission by CSL – February 2016



**Joint Select Committee on Trade and Investment Growth  
Inquiry Into Australia's Future in Research and Innovation**

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# CSL Background

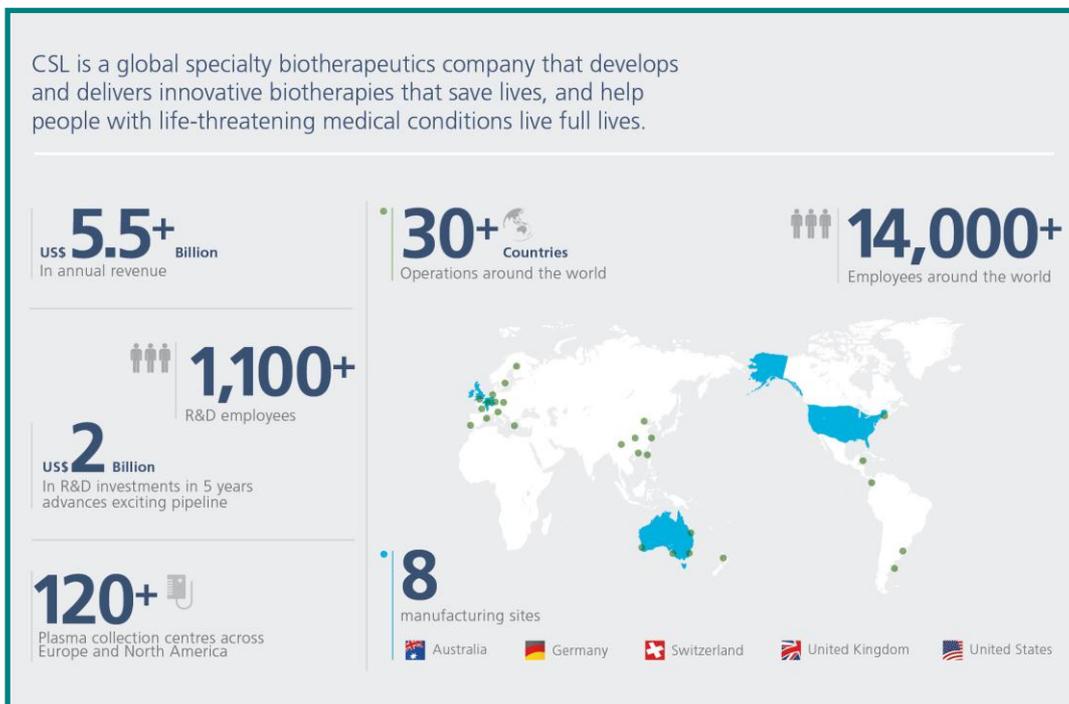
CSL is a \$45 billion global biotherapeutics company and the only advanced manufacturer in the ASX top twenty.

The company employs more than 14,000 staff in over 30 countries (including around 2000 in Australia) and has substantial manufacturing operations in Victoria plus the US, Germany, and Switzerland.

CSL Limited is based in Melbourne, Victoria. Established in 1916, it is Australia's largest biotechnology company and develops, manufactures, and markets pharmaceutical products globally to treat and prevent serious human medical conditions.

Research and development (R&D) is central to CSL's business and it is one of the largest private investors in R&D in Australia. Each year CSL invests around 9% of global revenue on R&D (in 2014-15 this was \$USD463m). CSL's global research and development function is headquartered in Melbourne.

CSL has a successful track record in the development of innovative medicines for global markets, and maintains and develops a pipeline of prospective products in various stages of development that may in turn become life-saving medicines for sale into global markets. Considerably in excess of half of CSL's R&D expenditure is on high risk potential new products.



## Executive Summary

In order to realise the Australian government's emerging vision for the future of science and innovation, CSL believes it is critical to consider the global perspective, track the value-chain and international movement of Australian innovation and initiate reform designed to position Australia as a global competitor and keep our intellectual property onshore for as long as possible.

As a globally integrated but historically Australian company CSL has a long-term and abiding commitment to support world-class medical research and development in Australia.

In 2015, there were two very significant Federal Government initiatives in the medical research sector. These were the establishment of the Medical Research Future Fund and the announcement of the National Science and Innovation Agenda, specifically the creation of the Biomedical Translation Fund.

The strong focus and significant funding to be allocated to these initiatives clearly indicates that the Government has recognised the potential social and economic value of the sector and is serious about nurturing medical research and development.

CSL strongly commends both initiatives and looks forward to working with Government to help them become realities and to ensure the Government's vision is realised in practical and measureable outcomes.

Presently, Australia has world class early research and biotechnology hubs which are emerging as globally significant.

However, the R&D tax incentive is under threat, the success rate for NHMRC funding is at all time lows, and much of Australia's research goes offshore at a very early stage due to the lack of capacity for translational science in Australia. Even where research is translated onshore, various factors, including particularly high corporate tax rates compared to peer jurisdictions, mean Australia is uncompetitive as a destination for the late-stage development, commercialisation and manufacture of biotech products.

The impact of losing intellectual property too early is that Australia does not reap full value from its world class research base.

CSL believes that in order to realise the government's admirable vision for the future of science and innovation in Australia, particularly in the field of biotechnology, it is critical to consider the global perspective, track the value-chain and international movement of Australian innovation and initiate some innovative reforms designed to position Australia as a global competitor and keep Australian intellectual property onshore for as long as possible.

# Recommendations

In this submission CSL outlines a number of suggested actions and reforms including some practical examples from CSL's business experience. The main messages and recommendations are summarised below.

1. Australians will reap the maximum social and economic benefits from Australian research if policy makers aspire to the creation of a supportive business environment where firms can take a product the entire way from early stage research to manufacture in and export from Australia.
2. Research clusters attract researchers, research funding and act as an incubator for innovative start-up companies and a valuable source of 'knowledge spillovers'. Government should continue to support the Parkville Precinct as a biotechnology and medical research cluster and actively consider supporting any future hub/cluster initiatives of this type which build on existing infrastructure.
3. The existing R&D tax concession is an important incentive for the conduct of R&D in Australia. Reducing or restricting this incentive would likely reduce Australia's attractiveness as a destination and may result in a reduction of onshore R&D.
4. Targetted support for translational research (through the new Biomedical Translation Fund and, in the longer-term, the Medical Research Future Fund) should help recruit substantial, complementary research funding from the commercial sector, increase the value of intellectual property before it goes offshore, and increase the pool of sound research projects that firms like CSL can take forward to the later stages of development (thus increasing revenue and royalty flows).
5. Once the Medical Research Future Fund is fully funded and established, at least 20% of its annual \$1 billion disbursements should be allocated to translational research.
6. CSL considers that the most effective policy for commercialising Australia's research is to make Australia, through the tax system, an attractive location for businesses doing late-stage development and commercial manufacture of high value added products for global markets. Differential tax rates for new advanced manufacturing are critical to securing these lucrative investments for Australia.
7. In order to capture more of the benefits which come from the late stage commercialisation of its own medical research and intellectual property more generally, Government should implement some highly targeted macro-economic reforms that will make it a competitive/attractive option for globally mobile manufacturing.
8. Tax reform or at least differential tax rates for certain investments must be central to Australia's innovation agenda and this reform must be cognisant that the international disparities are so large that broadly cutting the headline tax rate is unlikely to be effective.

# Biotechnology Value-Chain

Australia produces world-class medical research yet very often Australia's intellectual property is either not translated from an idea into a product or goes offshore for development at a very early stage.

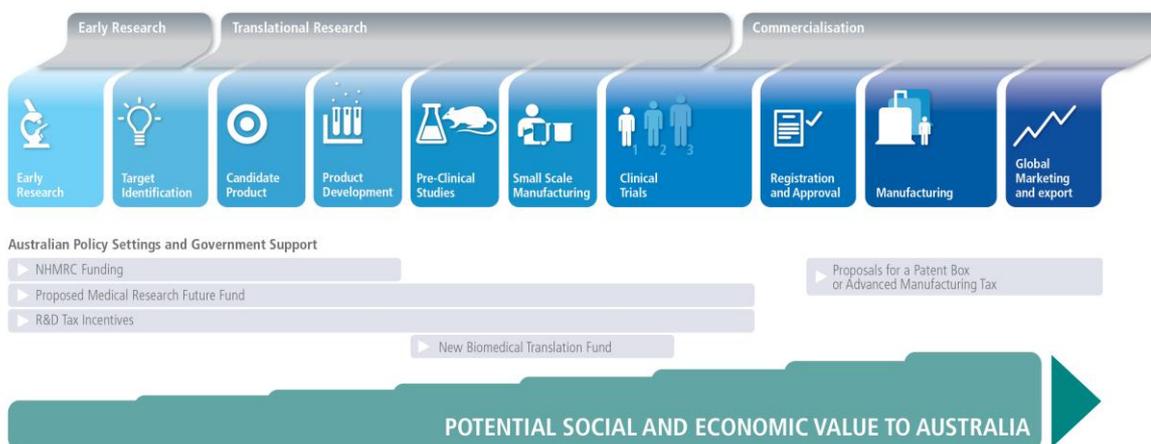
The value chain for intellectual property (IP) begins with early research and ends with commercialisation. The further along the value chain the IP progresses the greater the social and economic value.

Australia finds it very difficult to capture the economic and productivity benefits which come from the late stage commercialisation of intellectual property. Few candidate discoveries are able to leap the biotech 'valley of death' onshore - having the confidence and financial capacity to fund clinical trials before a single dollar is earned from the IP.

However, when this happens - when Australia essentially underwrites R&D for the rest of the world to commercialise - it does not capture the real prize and payback, the economic multipliers afforded by large scale manufacturing for supply to global markets.

From an economic perspective, *invented here* is good, *translated here* is better, *made here* is best. When Australia earns royalties on 'invented here' but does not get the returns on 'made here' we do not secure the full range of benefits from our innovation system.

## Biopharmaceutical Value Chain



### Recommendation:

1. Australians will reap the maximum social and economic benefits from Australian research if policy makers aspire to the creation of a supportive business environment where firms can take a product the entire way from early stage research to manufacture in and export from Australia. Invented here is good. Translated here is better. Made here is best.

## Basic / Early Research

Australia is an excellent location to undertake research and development (R&D). Basic research from universities and research institutes provide an essential input to the medical and biopharmaceutical sector in which CSL operates.

Basic research is the first R&D step. It is not typically immediately directed towards a commercial product, but rather towards an understanding of the basic science that might in due course form the basis for translation into clinical practice and/or a commercial product.

Basic research is typically characterised by large knowledge spillovers. In fact, one of the defining characteristics of basic research is that it is deliberately published so that others can build upon it.

Because there are large spillovers that cannot and, arguably, *should* not be captured, private firms are typically unwilling to invest in basic research; they cannot capture a sufficient share of the value of the research to make it commercially worthwhile. Government therefore plays an important role in funding a sufficient level of basic research which then form the essential cornerstones of innovation, knowledge spillovers and IP that can be developed into commercial (life-changing and life-saving) products.

Australia's basic research sector — primarily universities, research institutes and the CSIRO, all of which are predominantly government funded — is highly productive, internationally connected, and recognised globally for its high quality research.

In the biopharmaceutical sector, basic research often involves identifying targets such as cell surface receptors or metabolic pathways that could be possible sites for drug action, and then identifying compounds that are active against the target, of which there may be many, and which may lack specificity.

CSL considers that Australia is at the world forefront in a number of areas of basic research and Victoria is certainly a world leader in biotechnology and medical research. In particular, the Parkville biotechnology precinct, is a world class hub.

CSL maintains its global centre of excellence in R&D in Victoria largely because of this cluster of Universities, medical research institutes, and hospitals and the high quality of intellectual property this ecosystem generates.

Specifically, CSL's Centre for Early Research and Translational Science is located within Melbourne University's BIO21 Molecular Science and Biotechnology Institute.

CSL has been a partner in BIO21 since 2006 and this industry-university partnership has been very successful. We currently have 70 research scientists based at BIO21 and we are intending to double our occupancy in the next year or so, including transferring several more researchers from Parkville into an expanded BIO21 facility.

CSL has found that our researchers enjoy being located in a wholly research environment and appreciate access to peers and colleagues plus the associated opportunities for professional development and continuing education at the University, adjacent medical research institutes and hospitals. CSL's co-location also increases opportunities for collaboration with University researchers and others in the Parkville precinct.

This is inline with the international experience, that hubs and clusters work well to foster innovation and encourage investment (in the IT sector the most prominent example is of course Silicon Valley).

Innovation depends on the exchange of ideas among individuals and in the biotechnology and pharmaceutical space, the ecosystems created by the co-location or geographic closeness of pharmaceutical companies, research institutes, hospitals and world-class universities attract researchers, research funding and can act as an incubator for innovative start-up companies and a valuable source of 'knowledge spillovers' (when a given company's innovation stimulates related inventions and technical improvements by other companies).

CSL recommends that the Government continue to support the Parkville Precinct as a biotechnology and medical research cluster and actively consider supporting any future hub/cluster initiatives of this type which are similarly jointly anchored by academia and industry.

More broadly, the level and availability of Australian Government support for universities and research institutes has been and remains important in making Australia a high quality centre for R&D. These institutions also help train and develop a pool of highly skilled scientists and researchers entering the work force; further funding therefore helps increase the size of the skills base on which the innovation economy relies.

It is of significant concern to CSL and the Australian medical research sector that the success rates for NHMRC grants in 2015 have fallen to an alltime low of 13.7%. CSL cautions that this funding is at the epicentre of Australia's biotech ecosystems and when the basic research institutions are starved of funds it has a knock-on effect and not only risks good ideas and good people going elsewhere, but the very reason for a hubs existence is threatened.

Further, the existing R&D tax concession is a very significant incentive for commercial operations like CSL to conduct R&D onshore and maximise this investment. Annually CSL's qualifying R&D expenditure is nearly \$100m.

Any reduction or removal of this incentive, in addition to the cap which has already been introduced, would be of significant concern to us and would be a factor in Australia's competitiveness when determining CSL's future investment in R&D in Australia.

## Recommendations:

2. Research clusters attract researchers, funding, act as an incubator for innovative start-up companies and a valuable source of knowledge spillovers. Government should continue to support the Parkville Precinct as a biotechnology and medical research cluster and actively consider supporting any future hub/cluster initiatives of this type which build on existing infrastructure.
3. Current levels of NHMRC funding are at all-time lows but are critical inputs to Australia's emerging biotech sector. Funding levels should be increased as a matter of priority.
4. The existing R&D tax concession is an important incentive for the conduct of R&D in Australia. Reducing or restricting this incentive would likely reduce Australia's attractiveness as a destination and may result in a reduction of onshore R&D.

# Translational Research

Translational research is the development of a concept from academia to commercial, from fundamental science to its practical application.

There is still significant scientific risk at this stage and intellectual property at the *pre-translational* stage is far less valuable (economically and socially) than that same intellectual property at the *post-translational* stage.

Whilst Australia's basic research is world class, the nation does not rate well internationally in terms of our ability to commercialise our intellectual property. Too often it is either not translated from an idea into a product or goes offshore for development at a very early stage and Australians miss out on the potential social and economic payback from the early research investment.

As the name suggests, translational research lies between basic research and the R&D activities undertaken by businesses. It is characterised by substantial knowledge spillovers, being relatively early in the development pathway, but is typically more complex and costly than the basic research upon which it relies.

In Australia, the combination of knowledge spillovers and complexity means that many potentially valuable projects fail to attract the level of resource required to progress further. For example, at CSL we look at over 100 new product opportunities each year, of these, we choose 5-10% for full evaluation and then fewer still for licensing.

Some of those that CSL decides not to pursue could, no doubt, result in significant economic benefits to Australia if they were further developed, but are not sound candidates for commercial development by CSL, or are not yet sufficiently advanced to transition to commercial development.

Thus, an appropriate way for government to maximise the value of Australian IP is to specifically support funding for translational research, the beginning of the commercialisation process.

CSL has been an outspoken advocate for greater support for translational research in Australia. We strongly believe this critical nexus between academia and commercialisation is underfunded and this impedes the overall productivity of the Australian medical research sector.

Targetting this stage of the value chain will increase the likelihood that the large investment that governments make in tertiary education and basic research would actually translate into projects that can be taken through to market (or at least closer to market) by Australian firms.

Whether or not Australia manages to attract additional *manufacturing* there is significant value-adding to IP the whole way through the development process. Support for translational science itself would very likely increase revenue and royalty flows into Australia.

CSL welcomed the Federal Government's December 2015 announcement that it would be establishing a \$250 million Biomedical Translation Fund to provide matching capital for translational research as part of the new National Science and Innovation Agenda.

In addition to this, we recommend that once the Medical Research Future Fund is fully established and funded with capital of \$20 billion, at least 20% of its annual \$1 billion disbursements should be allocated to translational research. This could be directed to academic researchers on their own or, partnered with a credible industry partner like CSL or other start-up and small biotech companies.

Together, these new initiatives will certainly help recruit substantial, complementary research funding from the commercial sector as well as increasing the pool of sound research projects that firms like CSL can take forward to the later stages of development.

#### Recommendation:

5. Targetted support for translational research (through the new Biomedical Translation Fund and, in the longer-term, the Medical Research Future Fund) should help recruit substantial, complementary research funding from the commercial sector, increase the value of intellectual property before it goes offshore, and increase the pool of sound research projects that firms like CSL can take forward to the later stages of development (thus increasing revenue and royalty flows).
6. Once the Medical Research Future Fund is fully funded and established, at least 20% of its annual \$1 billion disbursements should be allocated to translational research.

# Advanced Manufacturing

The manufacture of biotherapies requires technically skilled staff and has a high reliance on technology and intellectual property. This form of advanced manufacturing, producing low volume, high value products, results in high value directly and delivers significant economic multipliers in its host community.

Australia is highly suited to advanced manufacturing because of its well-educated and highly skilled workforce, good universities, effective research sector, low sovereign risk and high living standards.

Further, because advanced manufacturing tends to produce low volume, high cost products (like pharmaceuticals), the challenge of Australia's geographical isolation and distance from global markets is somewhat mitigated as compared to traditional manufacturing.

However, global competition for advanced manufacturing is fierce and Australia is currently an uncompetitive location for investment.

High corporate tax rates can be a significant impediment to new investments in late-stage development and commercial manufacture. Australia's corporate tax rate is high by OECD standards, and it is one of the few countries that has not reduced its corporate tax rate since 2005.

While the Australian government may argue that revenue requirements preclude a substantial reduction in corporate tax rates this problem is not unique to Australia.

Many other developed economies with strong research sectors are revising their system of corporate tax to capture the full benefits of their public research, particularly through incentives for innovation. They are using manipulation of the tax system as a macro-economic lever to create a favourable and competitive environment for the location of capital investment (homegrown or otherwise).

The UK is progressively reducing its corporate tax rate to 20%, Ireland has a flat tax rate of 12.5% and Singapore a 17% rate, and each of these offer an additional range of further concessions related to R&D. Further, at least seven European Countries have introduced 'patent box' schemes which offer low rates for revenues from intellectual property.

These rates are often fully three times lower than Australia's 30% corporate tax rate. The difference in net present value over the lifetime of a major project, between locating advanced manufacturing in these locations and Australia, can be in excess of \$1bn for large-scale projects.

This is a serious challenge for Australia.

If the Federal Government wants to capture more of the benefits which come from the late stage commercialisation of its own medical research and intellectual property more generally, it needs to afford some highly targeted macro-economic reforms that will make it a competitive/attractive option for globally mobile manufacturing.

CSL believes tax reform or at least differential tax rates for certain investments must be central to Australia's innovation agenda and this reform must be cognisant that the international disparities are so large that broadly cutting the headline tax rate is unlikely to be effective. Reducing the

Australian headline corporate tax rate from 30% to 25% will not significantly close the gap for these particular investments and is likely to be of limited effectiveness.

Strategically targetted differential tax rates and being offered internationally and Australia needs similar incentives.

### Recommendation:

7. In order to capture more of the benefits which come from the late stage commercialisation of it's own medical research and intellectual property more generally, Government should implement some highly targeted macro-economic reforms that will make it a competitive/attractive option for globally mobile manufacturing.
8. Tax reform or at least differential tax rates for certain investments must be central to Australia's innovation agenda and this reform must be cognisant that the international disparities are so large that broadly cutting the headline tax rate is unlikely to be effective.

## Why Australia Needs Advanced Manufacturing

CSL's advocacy in relation to Australian tax reform is informed by it's own investment experience and its status as a globally integrated but historically Australian company.

In 2014, CSL needed to decide on a location for a new \$US500m manufacturing facility to produce a family of innovative haemophilia products (recombinant coagulation) through biotechnology manufacturing methods. This is a platform technology for CSL, and other products will be developed using this technology in the future.

A significant proportion of the R&D and scientific proof of concept work was done by CSL in Australia.

After a very thorough evaluation of all the international possibilities, including Australia, in a process that took almost a year, CSL decided to build the plant in Lengnau, Switzerland.

One of the most significant impediments to Australia's competitiveness was the corporate tax rate.

By choosing to place this manufacturing facility in Australia CSL would have been putting itself at a disadvantage against multinational manufacturers of similar products and making a poor decision from our shareholders perspective.

However, if CSL *had* chosen to build this plant in Australia it would most likely have been adjacent to existing facilities in Broadmeadows, Victoria. Economic modelling suggests that the value of this facility to the Australian community would have roughly doubled CSL's existing annual economic contribution, from \$2-3bn to \$5bn pa.

In fact, modelling indicated that by 2022, the direct output related economic activity generated annually in Australia by an advanced manufacturing facility of this type would be approximately \$720m. Additionally, the facility would likely employ around 360 skilled fulltime-equivalent

employees (FTEs) contributing around \$55m in household income per annum from wages, salaries and benefits (not including the construction phase).

When multiplier effects are calculated the total annual economic contribution over the period 2020-2024, would comprise:

- an output based contribution to the economy of approximately \$2bn;
- a household income based contribution to the economy through expenditure on wages and salaries of around \$160m; and
- approximately 1,500 jobs in the economy which, given the nature of advanced manufacturing would be of high wage and high value.
- an annual contribution to GDP of up to \$450m.
- knowledge spillovers worth, perhaps, \$20m-\$40m
- plus tax revenues (which should be calculated at a reduced corporate rate).<sup>1</sup>

The international community, which is actively competing for these investments, recognises the broader economic benefits and job creation effects of these facilities and, demonstrably, is 'sacrificing' tax revenue for jobs and investment.

That said, there is actually no foresaking of revenues because realistically without a low and competitive corporate rate the facility would not have been placed there in the first place.

## *Proposal for an Advanced Manufacturing Tax*

**To improve Australia's competitiveness in attracting new advanced manufacturing investment, CSL is proposing a highly-targetted preferential corporate tax rate for new advanced manufacturing undertaken in Australia, subject to certain conditions.**

The aim of a lower tax rate would be to foster investment in Australia that would not otherwise take place here and the purpose of the conditions is to confine the lower tax rate to such footloose investment.

Unlike a 'patent box', CSL's Advanced Manufacturing Tax (AMT) proposal would not diminish existing tax revenues, would only apply to investment that would not otherwise take place in Australia, and requires IP to be tied to advanced manufacturing.

The new advanced manufacturing investment that would result would also generate new skilled employment, help offset the decline in conventional manufacturing, capitalise on valuable government investment in R&D and education, and contribute to the broader Australian economy.

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<sup>1</sup> Economic modelling commissioned by CSL and undertaken by Synergies Economic Consulting.

In broad terms CSL is proposing a preferential corporate tax rate of not more than 10%, on new advanced manufacturing undertaken in Australia.

In order to qualify as advanced manufacturing for the purposes of the AMT rate, CSL would suggest:

1. There must be new investment in a manufacturing facility.
2. The manufacturing facility should generate substantial entrepreneurial value such that the value of its products should be much greater than the costs (including capital costs).
3. The value-add must derive from identifiable and valuable IP. (IP will be defined so as to include rights registered in Australia, and would include patents, including certified innovation patents, data exclusivity periods and corresponding licences to those patents).
4. The relevant IP should be either developed in Australia or acquired and then significantly enhanced through further development while under Australian ownership.
5. The Australian owner must have taken risks in the development of the IP.
6. The preferential tax rate would not apply to profits earned on royalties, license fees or sales of Australian-owned IP, as these do not arise from advanced manufacturing in Australia.

With these pre-requisites, CSL suggests there are a number of safeguards for the Australian government.

1. The AMT would not require government funding or cannibalise existing tax revenues. Rather, it aims to attract investments that would not otherwise take place in Australia.
2. The requirement to manufacture in Australia will ensure that the preferential tax rate does not apply to revenues from IP development alone such as royalties and license fees (which, if this were not the case, might encourage firms to locate IP or develop IP in Australia without using that IP in Australia).
3. The criteria would exclude most investments in other industries reducing the likelihood that investments that would take place in Australia even without the AMT (such as most investments to extract Australia's natural resources) will benefit at the expense of government revenues.
4. The requirement for substantial value-add in Australia has a number of safeguards and benefits. It will:
  - a) prevent low value-add projects that would probably be undertaken otherwise in Australia from benefitting, thereby minimising the risk that the AMT will result in reduced government revenues;
  - b) largely confine the AMT to investment projects that are genuinely footloose and likely to be swayed by a differential tax rate; and
  - c) result in net increases in government revenue by attracting investment to Australia that would not otherwise take place in Australia, without providing a preferential rate to investment that has already taken place.

5. The requirement for revenues to be derived from advanced manufacturing that is reliant on identifiable and valuable IP developed in Australia, or acquired and then significantly enhanced in Australia, should:
  - a) increase the likelihood that Australia will reap the full economic benefits of its large R&D efforts and holdings; and
  - b) ensure that the AMT will be confined to advanced manufacturing rather than to conventional manufacturing that generates lower value-add, whose investment choices are less affected by Australia's high corporate tax rate.
6. It would not distort business behaviour. Some types of Patent Box have been criticised for encouraging firms to transfer the ownership of IP from one jurisdiction to the next without creating new economic activity in the destination country. The AMT is designed to minimise this risk by tying the concession to real economic activity.
7. It is designed to be limited to business enterprises that meet certain requirements in respect of valuable IP and investment in manufacturing. This should not require any steps that are not already undertaken by the Australian Tax Office in its routine assessment of the R&D tax credit and investment-related tax concessions such as accelerated depreciation for the mining and small business sectors.

An AMT would encourage investment in Australia capitalising on the large investments that government has already made in R&D.

Properly designed, it would attract new manufacturing investment that would not otherwise take place in Australia without requiring subsidies from government, and with a low risk that existing government tax revenues would be eroded.

## Contact Information

CSL would be happy to provide further information or participate in public and/or private consultation as appropriate.

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