



**Economic analysis of the .au
domain range**

.au Domain Administration Ltd

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Glossary

ABS	Australian Bureau of Statistics
ADNA	Australian Domain Name Administration
AGD	Attorney General's Department
auDA	.au Domain Administration
CIC	Critical Infrastructure Centre
CSIRO	Commonwealth Science and Industry Research Organisation
DAE	Deloitte Access Economics
DNC	(.nz) Domain Name Commission
DNS	Domain Name System
DoCA	Department of Communications and the Arts
FTE	Full Time Equivalent
GOS	Gross Operating Surplus
ICANN	Internet Corporation for Assigned Names and Numbers
IO	Input-Output
IT	Information Technology
NZ	New Zealand
PRE	Preferential Registration Eligibility
TISN	Trusted Information Sharing Network
UK	United Kingdom
URL	Uniform Resource Locator

Executive summary

.au is Australia's country code top-level domain (ccTLD). The .au Domain Administration (auDA) is the policy authority and industry self-regulatory body for the .au domain system. auDA is recognised manager of the .au domain by both the Australian Government and the international body responsible for keeping the Internet secure, stable and interoperable, ICANN (Internet Corporation for Assigned Names and Numbers).

auDA has commissioned Deloitte Access Economics to examine three areas of the .au domain space. This report provides an analysis of the proposal to introduce direct registration of domain names at the second level in Australia. The report then examines the extent to which the .au domain range is considered to be critical infrastructure to Australia. Finally the report presents estimates of the economic contribution of .au and discusses its social contribution.

Direct Registration
Analysis

Critical
Infrastructure
Analysis

Economic and
social
contribution of .au

The analysis in this report is informed by desktop research along with consultations with domestic and international stakeholders:

- Nominet (UK)
- InternetNZ (NZ)
- Domain Name Commission (NZ)
- NZRS Ltd (NZ)
- Canadian Internet Registration Authority (Canada)
- Council of European National Top-Level Domain Registries (Europe)
- Country Code Names Supporting Organisation - ICANN (Europe)
- Department of Communications and the Arts (Australian Government)
- AusRegistry (Australia)
- Australian registrants (demand side)

Direct registration analysis

The proposed direct registration policy, also known as direct second level domain registration, suggests that Australians should be able to register domain names directly under .au (such as example.au), without the use of second level domains (2LD) such as .com.au or .gov.au.

The cited benefits of direct registration include supporting innovation, providing shorter and sharper domain names (with the potential for time and space saving, particularly where characters are limited e.g. Twitter), greater range of choice, more representative domain names with reduced need for classification (for example, for registrants who have .com.au but are not businesses) and consistency with current practice in other countries. Costs of direct registration would be relatively small technical costs, the costs to businesses of registering these domain names and the potential for

some negative behaviours such as cybersquatting or defensive registrations¹ to occur.

Direct registration as a concept has received general support domestically and overseas, with direct second level domain registration possible in most of Europe and several other countries. Direct registration has also recently been introduced in the United Kingdom and New Zealand. The proposed introduction of direct registration in Australia would benefit from international experience, however it should be recognised that each country's situation is different, and lessons may not be directly applicable to the Australian context. In particular, in some jurisdictions the historical set up of domain registrations meant that direct registrations were a natural extension to domain registrations rather than a new policy.

While direct registration as a policy is broadly accepted, consultations suggest that the specifics of its implementation are causes of contention. International experience has identified that significant public consultation will be required to identify an implementation policy that will be appropriate for the Australian context, noting that with any policy change there will be stakeholders who are adversely affected. The consultation process should ensure that the consulted population sample is representative of the total population of registrants and registrars to ensure that the best outcome is reached for the Australian economy.

A more quantitative analysis of the costs and benefits should also be undertaken. Any modelling of costs and benefits should give proper consideration to their distribution. If the benefit of the proposal is concentrated to a handful of individuals or businesses, or the cost is disproportionately borne a small subset of the industry, the proposal may be inappropriate even if the total benefits exceed the total cost because of equity considerations.

Critical infrastructure analysis

The .au domain range plays an important role in facilitating Australia's websites. If the domain range were to be compromised, there would be widespread implications for Australian websites and hence online activity. As such, it is valid to consider whether the .au domain range should be considered as critical infrastructure.

Consultations with the Department of Communications and the Arts (DoCA) confirm that the .au domain range is implicitly considered to be critical infrastructure but to date has not been formally recognised as such. However, the Department noted that the .au domain range is actively being reviewed by government for consideration as critical infrastructure in Australia.

A key part of the government's review will be determining which components of the .au domain range should be considered critical infrastructure. For example, it may be the registry component (or specific elements of the registry) as opposed to auDA's policy role which is considered critical infrastructure.

¹ Cybersquatting is the practice of registering common or brand-related domain names with the aim of reselling them at a profit. Companies may engage in defensive registrations of these domain names to prevent others engaging in cybersquatting. If direct registration of .au domain names were to occur, the increased supply of these previously-unavailable domains could potentially provide new opportunities for cybersquatting or defensive registration activity.

The main benefit of recognition as critical infrastructure for auDA would be the potential to officially take part in regular cyber security discussions between the government and private sector. This would provide auDA with greater insight into government policy issues and their implications for the .au domain range. To participate in these discussions, auDA could apply to become a member of the Communications Sector Group of TISN, which is managed by the DoCA, which helps sets the Group's policy agenda. Membership to this group would provide auDA with a more structured forum to discuss security issues with the government and the wider communications industry.

Current economic contribution

Economic contribution studies provide an estimate of the footprint of an industry on the economy at a particular point in time, both directly through the industry's own operations, and indirectly as its activities filter through the economy.

For the purposes of this analysis, the .au domain range industry has been defined as 'web hosting services', within the ABS industry category of information media and telecommunications.

These businesses provide specialised hosting activities including web hosting, streaming services or application hosting, provide application service provisioning, or provide general timesharing mainframe facilities to customers.

In 2015-16 the sector generated \$282 million in direct value added. The majority of the value added is accrued to employees as wages, reflecting the sector's relatively labour-intensive production (more so than the wider ISP, Internet Publishing and Broadcasting, Websearch Portals and Data Processing IO industry). Furthermore, the industry directly supports 2,313 Full Time Equivalent (FTE) workers.

The sector's purchase of intermediate inputs in 2015-16 contributed to \$395 million in value added: \$192 million in wages and \$203 million in gross operating surplus (GOS). The largest input industries for the sector were:

- Telecommunication Services;
- Internet Service Providers, Internet Publishing and Broadcasting, Websearch Portals and Data Processing;
- Professional, Scientific and Technical Services;
- Rental and Hiring Services (except Real Estate); and
- Computer Systems Design and Related Services.

Combined, these sectors accounted for 67% of intermediate expenditure. This expenditure indirectly supported a further 2,258 FTE jobs in the Australian economy.

The total economic contribution is the sum of the direct and indirect contributions, summarised below.

Table i: Total economic contribution of .au Domain industry, 2015-16 (\$ million)

Wages	383
Gross Operating Surplus	294
Total Value Added	677
FTE employment	4,571

Forecast economic contribution

Along with considering the current economic contribution, estimates of the economic contribution of the businesses in the .au domain space in 2020-21 were developed. Two scenarios were forecast.

- **Scenario One** assumes the future growth of the .au industry over the next five years matches the growth rate of the preceding five years (that is, there is no introduction of direct second level registration). This extrapolates the growth estimated between 2011 and 2016 for another five years.

The total economic contribution for Scenario One is presented below. Compared to the 2016 contribution, wages make up a slightly larger proportion of total value added, and the indirect contribution is, proportionally, marginally bigger than the direct.

Table ii: Total economic contribution of .au Domain industry, 2020-21, Scenario One (\$ million)

Wages	443
Gross Operating Surplus	368
Total Value Added	811
FTE employment	5,159

- **Scenario Two** examines the case where there is an increase in domain registrations due to the introduction of direct registration, resulting in increased economic activity. This second scenario is informed by AusRegistry modelling of the expected increase in registrations from the policy.

The total economic contribution for Scenario Two is presented in the table below, as the sum of the direct and indirect contributions.

Table iii: Total economic contribution of .au Domain industry, 2020-21, Scenario Two (\$ million)

Wages	528
Gross Operating Surplus	405
Total Value Added	933
FTE employment	5,650

Scenario Two assumes a higher growth in industry revenue than Scenario One, resulting in a larger direct and indirect effect. The difference in economic contribution between the scenarios should not be taken to be the difference in net benefits. The differences reflect differences in the size of the industry and their subsequent purchases of inputs from other industries – a larger industry will have a greater economic contribution, but this does not show the net benefits of introducing direct registration in Australia. Cost benefit modelling would be required to compare the welfare effects of the two scenarios.

Social contribution

The .au domain space also generates benefits for downstream firms which use .au websites.

A strong online presence can support the growth of Australian businesses. Websites act as an important marketing tool; they are a relatively inexpensive method of showcasing a business' goods or services. Websites can broaden a business's potential market, facilitating sales beyond a business's trading hours or physical proximity.

.au domains may also help Australian businesses generate additional sales relative to using a generic top level domain. As .com.au and .net.au domains can only be registered by businesses or organisations with an Australian Business Number or Australian Company Number, .au domains are a clear signal of being a 'local' business. The .au domain can also increase trust, which can in turn facilitate trade. 22% of surveyed businesses with an .au domain, report choosing the domain due to it being a trusted namespace (AusRegistry, 2016).

Deloitte Access Economics

1 Background

1.1 .au Domain range

.au is Australia's country code top-level domain (ccTLD). The .au domain range was introduced 31 years ago, when the University of Melbourne network administrator, Kevin Robert Elz, was given authority over the .au domain registration by the University of Southern California's Information Sciences Institute (AusRegistry, 2016a).

Elz voluntarily administered the range, setting its original policies and establishing the range's second-level domain name structure. In 1996, Elz granted a five-year license to the University of Melbourne's commercial IT arm, Melbourne IT, to administrate the growing number of requests for .com.au domains.

In 1997 the internet community created a self-regulatory body called the Australian Domain Name Administration, or ADNA. In 1999, ADNA was reformed, relaunching as the .au Domain Administration (auDA), which took over operating the .au ccTLD in 2001.

Today auDA administers the .au domain range ranges, and licenses technical management of the registry system and Domain Name System (DNS) to AusRegistry.

1.1.1 Key industry participants

auDA

The .au Domain Administration (auDA) is the policy authority and industry self-regulatory body for the .au domain system. auDA is recognised manager of the .au domain by both the Australian Government and the international body responsible for keeping the Internet secure, stable and interoperable, ICANN (Internet Corporation for Assigned Names and Numbers).

auDA has a number of key function (auDA, 2017):

- developing and implementing domain name policies;
- licensing registry operators;
- accrediting and licensing registrars;
- implementing consumer safeguards;
- running the .au Dispute Resolution Policy;
- technical management of the .au zone file; and
- maintaining a secure and stable Domain Name System.

AusRegistry

AusRegistry is the licensed registry operator for .au. It is the wholesale provider of all open second level domains and.gov.au and .edu.au. AusRegistry maintains the registry database of .au domain names and operates the IT infrastructure for the Australian WHOIS service.

Registrars

Customers (registrants) looking to purchase an .au domain must do so through an accredited registrar or reseller². Registrars have direct access to

² Resellers sell domain names on behalf of registrars.

the registry database, so they can register domains with AusRegistry on behalf of the registrants. There are 45 registrars accredited by auDA, most provide additional services such as web hosting and design.

Currently domains are registered at the third level (e.g. a registrant may register *mydomain.com.au*, where *mydomain* is the third level, *.com* is the second and *.au* is the first). There are a variety of different second level domains. There are five 'open' commercial domains:

- *.asn.au* – for incorporated associations and clubs,
- *.com.au* – for commercial entities,
- *.net.au* – for commercial entities,
- *.id.au* – for Australian citizens or residents, and
- *.org.au* – for charities and non-profit organisations.

In addition, there are closed domains, including:

- *.edu.au* – for educational institutions,
- *.gov.au* – for federal, state and local government bodies,
- *.csiro.au* – for the Commonwealth Science and Industry Research Organisation (CSIRO), and
- *.conf.au* – designed for conferences and exhibitions requiring short duration internet connectivity, but which is no longer accepting new registrations.

There are also a number of community geographic domain names, for use by community groups in the relevant area, such as *.act.au* or *.nsw.au*.

In a report to the auDA board, the 2015 Names Policy Panel has recommended that Australians should be able to register domain names directly at the second level (e.g. registering *example.au*, rather than *example.com.au*). This is explored further in Chapter 2 of this report.

1.1.2 The significance of .au

.au is an important part of Australia's internet landscape. There are over 3 million registered *.au* domain names. Just under half of all Australian businesses have a web presence (ABS, 2016). In contrast to some other international ccTLDs which have different eligibility rules, *.au* provides a strong signal that a business is local, as only Australian businesses can register *.com.au* or *.net.au* domains. This fosters a strong sense of trust in *.au* websites by Australians (AusRegistry, 2015).

In 2011 auDA and AusRegistry commissioned Deloitte Access Economics to undertake a statistical, economic and market analysis of the *.au* domain range in Australia. auDA have once again commissioned Deloitte Access Economic in light of the growth in *.au* domain market and a change policy environment.

1.2 This report

This report examines three areas of the *.au* domain space. The report provides an analysis of the proposal to introduce direct registration of domain names at the second level in Australia. The report then examines the extent to which the *.au* domain range is considered to be critical infrastructure to Australia. Finally the report presents estimates of the economic contribution of *.au* and discusses its social contribution.

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- Department of Communications and the Arts (Australian Government)
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Chapter 2 of this report analyses the proposed decision of introducing direct registration at the second level in Australia, based on the international experience of New Zealand and the UK.

Chapter 3 explores the extent to which the .au domain range is considered to be critical infrastructure.

Chapter 4 estimates the current economic contribution firms and organisations involved in maintaining the .au domain space. Chapter 5 provides a forecast of this contribution to 2020-21.

Chapter 6 provides a qualitative analysis of the social contribution .au, examining how Australian domains facilitate productivity and the growth of the digital economy.

2 Direct registration analysis

2.1 Direct registration

The proposed direct registration policy, also known as direct second level domain registration, suggests that Australians should be able to register domain names directly under .au (such as example.au), without the use of second level domains (2LD) such as .com.au or .gov.au.

The proposed policy would expand the available set of domains with no direct impact on existing 2LDs. Under this policy it is assumed that eligibility rules for registrants, rules on the names that can be registered (related to the registrant's name or trade mark), and policies prohibiting misspellings would remain unchanged.

The cited benefits of direct registration include supporting innovation, providing shorter and sharper domain names (with the potential for time and space saving, particularly where characters are limited e.g. Twitter), greater range of choice, more representative domain names with reduced need for classification (for example, for registrants who have .com.au but are not businesses) and consistency with current practice in other countries. Costs of direct registration would be relatively small technical costs, the costs to businesses of registering these domain names and the potential for some negative behaviours such as cybersquatting or defensive registrations³ to occur.

Direct registration as a concept has received general support domestically and overseas, with direct second level domain registration possible in most of Europe and several other countries. Direct registration has also recently been introduced in the United Kingdom and New Zealand. The proposed introduction of direct registration in Australia would benefit from international experience, however it should be recognised that each country's situation is different, and lessons may not be directly applicable to the Australian context. In particular, in some jurisdictions the historical set up of domain registrations meant that direct registrations were a natural extension to domain registrations rather than a new policy.

While direct registration as a policy is broadly accepted, consultations suggest that the specifics of its implementation are causes of contention. International experience has identified that significant public consultation will be required to identify an implementation policy that will be appropriate for the Australian context, noting that with any policy change there will be stakeholders who are adversely affected.

There are a number of factors to be considered as part of the implementation policy, including the:

³ Cybersquatting is the practice of registering common or brand-related domain names with the aim of reselling them at a profit. Companies may engage in defensive registrations of these domain names to prevent others engaging in cybersquatting. If direct registration of .au domain names were to occur, the increased supply of these previously-unavailable domains could potentially provide new opportunities for cybersquatting or defensive registration activity.

- maintenance of current rules for domain names and registrants;
- grandfathering process - which existing registrant will get priority over .au, as well as the allocation process and associated costs;
- reservation process – the period for which .au will be held for existing registrant, and associated costs;
- dispute resolution process; and
- costs of registration.

2.2 Benefits of direct registration

There are a number of potential benefits of direct registration. This section discusses the identified benefits.

Shorter, more appealing and/or innovative domain names

Direct registration allows for shorter, more visually appealing name. Smaller names are in general easier to remember and quicker to type into URL bars. They are advantages in situations where space may be limited such as twitter or billboards. Direct registration opens up the possibility of more interesting, memorable names, such as *nouve.au* (an example of a 'domain hack').

However, the degree to which shorter domain names encourage more online activity is limited by the extensive use of search engines. The length of a domain is fairly inconsequential when clicking a link from a search results. A 2015 survey of Australian web users by AusRegistry (2015) found that 74% of surfers used search engines to find websites, with 37% of respondents using search exclusively. In contrast, 22% of surveyed respondents used domain names to navigate to websites and only 2% used domain names exclusively.

Consistency with international practice

Many major ccTLDs (particularly in Europe) allow direct registration at the second level, including .de, .cn, .uk, .nl, .ru, .ca and .fr. Moving to direct regulation would put .au in line with the general international practice.

Recently .uk and .nz have moved from exclusively registering at the third level to allowing direct registrations at the second level.

Other markets which chose to introduce direct registration may not always be directly comparable, as each market have unique features. For instance, the UK and NZ both allow non-residents to purchase .uk and .nz domains respectively⁴. Moreover, the UK has a long history of direct second level registration – before the general introduction of direct registration a small number of websites had been registered at the second level during the early days of .uk, including prominent sites such as *parliament.uk*. UK web users, then, were familiar with direct registration before its larger release.

More choice for consumers

Another cited benefit of direct registration is that it would open up more choice of domain names for registrants.

However, the number of new domains will be limited by defensive registrations. Businesses may feel pressure to obtain the direct domain that matches their third level domain to avoid confusion. Such defensive registration will increase the costs of businesses, but may be limited value

⁴ While .uk does not strictly require UK residency, registrants must provide a UK address (PO boxes are not accepted).

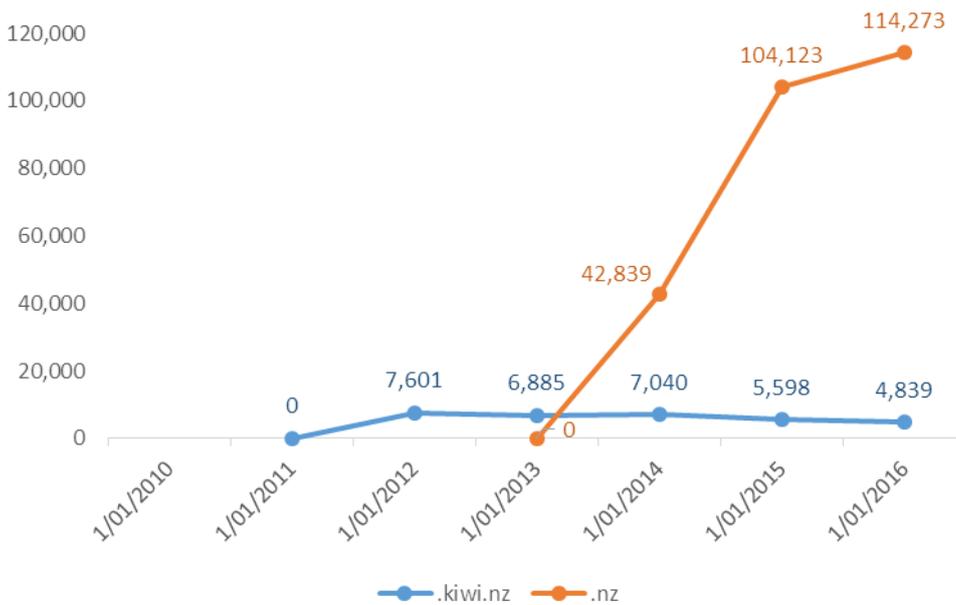
to businesses if the domain is simply used to redirect to their .com.au domain.

In 2012 InternetNZ approved the introduction of .kiwi.nz, which was implemented by the Domain Name Commission. An application for the domain was received DNC in April 2012, which was followed by a 25-day public consultation, after which the DNC recommended the new domain. A threshold of 500 .kiwi.nz pre-registrations was required, a target met within 15 minutes (DNC 2013). The domain is unmoderated, meaning registration is open to any individual. Domains were sold on a first-come first-served basis: there was no Preferential Registration Eligibility for any existing registrants or trademark holders and no auction process for selling the domains.

There has been no analysis performed on the reasons for registration of .kiwi.nz domains. As such, it is not possible to ascertain whether an individual purchasing the .kiwi.nz equivalent domain name is acting defensively, attempting to increase the scope of their (business or personal) brand or purchasing it for some other reason. At the time of introducing .kiwi.nz a Dispute Resolution Service (DRS) was in place; however, since its inception very few complaints to the DRS have involved a .kiwi.nz name⁵.

By the end of 2012, .kiwi.nz had around 7,600 registered domains. This made the domain the fourth most popular domain after .co.nz, .org.nz and .net.nz, surpassing domains such as .gen.nz and .geek.nz. However, .kiwi.nz still only represents a small proportion of total domain names (under 1.5%). Moreover, since then .kiwi.nz registrations have fallen to around 4,800 domains. This may be due in part to competition from .nz, introduced in 2014 (as of the end of 2016, .kiwi.nz made up 0.7% of .nz domains).

Chart 2.1: .kiwi.nz domains registered vs .nz domains registered



⁵ A search of all DRS complaints reveals that only two complaints directly or indirectly involve .kiwi.nz names:
<https://dnc.org.nz/decisions?body=.kiwi.nz&outcome=All&keyword=All>

From the perspective of individuals as opposed to businesses, .kiwi.nz provided a new choice for individuals looking to register a domain, who might have felt that the existing domains (such as .co.nz, .org.nz or .gen.nz) were not relevant. However, since registering a .co.nz does not require the registrant to prove that they represent a commercial entity, .co.nz can be used for personal names. Surveys of New Zealanders registering a personal domain undertaken by NZRS show that .co.nz is the most popular domain name for individuals. .kiwi.nz has, therefore, never assumed a prominent position as the domain for New Zealand individuals.

.au may provide a good space for individuals to register a domain as, unlike NZ, .com.au registration requires a business number. While .id.au currently exists as a second level domain targeted to individuals, the domain has never achieved significant take up. In 2015 there were around 13,000 .id.au registered domains – a tiny fraction of the three million .au domains (AusRegistry, 2015). Direct registration may encourage a bigger uptake of individuals, rather than commercial entities or organisation, creating a domain as part of their Australian online identity.

2.3 Costs of direct registration

This section discusses some of the identified costs of introducing direct registration in Australia.

Resource impacts of implementation

Direct registration will result in one-off launch costs. Introducing direct registration will require technical changes by the registry and registrars. Furthermore, there will be cost associated with promoting and informing internet users about the direct registration. Additionally there may be costs to running an ongoing conflicted names process.

Nominet experienced a spike in operating costs in the year it introduced second level registrations, reflecting in part one-off launch costs. Operating expenditure for Nominet increased from £19.8m in 2013 to £24m in 2014 during the launch of second level registration, falling to £21.3m in 2015⁶ (Nominet, 2015, 2016).

The introduction of direct second level domains will likely result in a notable increase in the number of registrations. This will likely result in some costs to registrars and web-hosting businesses to increase their scale.

Cost to businesses of additional registrations

As noted in 2.2, above, businesses which register the direct domain that matches their third level domain will bear the cost of registering an additional domain. These businesses might choose to do so only out of a desire to protect their brand-identity or avoid confusion with their third level domain.

Consultations from New Zealand suggest many small businesses were not particularly concerned with the need to defensively register their equivalent second level domain. The bulk of domain names are sufficiently specific and not well-known enough and that it unlikely that another registrant would attempt to register the equivalent second level name.

On the other hand, the costs to businesses of registering the direct domain equates to revenue for the industry.

⁶ Year dates are in year ending 30 September.

Confusion by users

If a .com.au domain and the corresponding .au domain are owned and used by separate parties there is a risk of users confusing the two domains. This could be especially problematic in the cases of emails being misdirected, which could be a privacy concern. For instance, a user intending to mybusiness.com.au might instead email mybusiness.au.

This risk already exists, however, in cases where the same third level domain is used by different second levels, e.g. example.org.au and example.com.au, may be held by different registrants.

2.4 UK experience

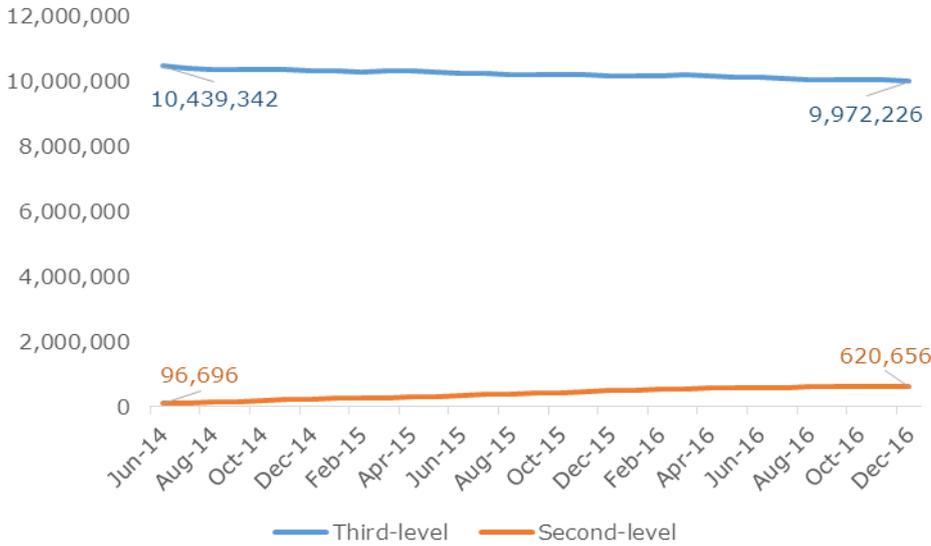
The opening up of direct second level domain registration in the UK started in 2014. Nominet, the official registry for .uk domain names, was a key player in the lead up to this launch. Prior to start of Nominet in 1996, there were approximately thirty direct second level domains registered, mostly for academic institutions including for the British Library (bl.uk) and Parliament (parliament.uk). There was some pressure for direct registration in the UK as virtually all countries operate this way.

There are no country-specific rules for registering .uk domains; registrants do not have to be located in the UK. During the consultation phase, it was suggested that Nominet could offer direct registration under .uk as a premium domain, with higher costs and additional security elements for the .uk domain. Feedback in the consultations suggest registrants preferred that additional security elements be optional, or not offered at all, to avoid premium pricing and to avoid the appearance that .co.uk domains were inferior or insecure.

Several rounds of public consultation were conducted in relation to the implementation policy, before the final policy was decided. For cases where registrants existing third level domains were unique, the registrant was automatically reserved the equivalent shorter domain for five years. If there were conflicts (e.g. one person owns example.co.uk and another example.org.uk) the .co.uk domain-owner was given the reserve rights. Reserving the domain does not entitle registrants to use the domain, the registrant would have to register the shorter name at cost. If name is not registered after the five years, it will be opened to the wider public.

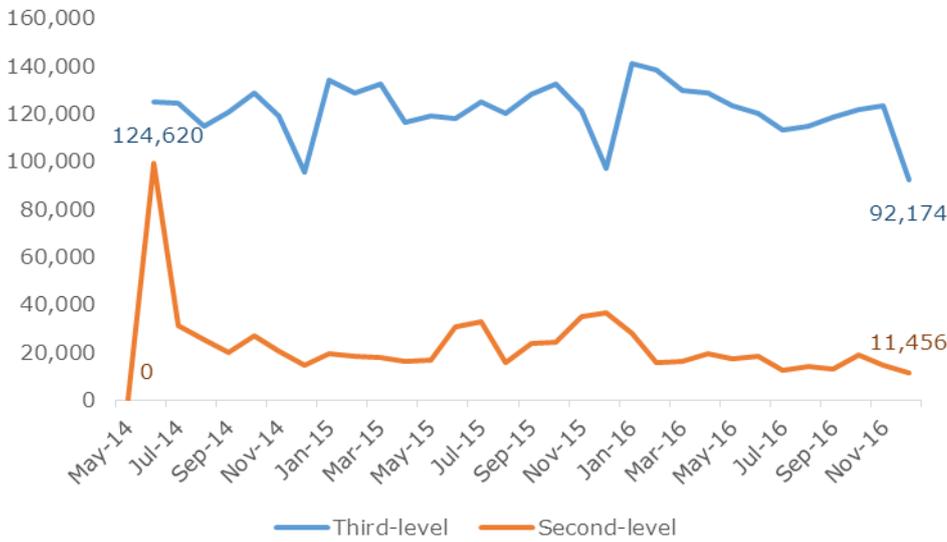
Second level registration was introduced in June 2014. There was strong take-up of .uk domains in the first 6 months they were available, with about 220,000 second level domains registered. There are currently around 650,000 second level domains registered. Consultations suggest that there will likely be a rapid increase in registrations in 2019 when the automatic reservation period nears its end.

Chart 2.2: Total .uk domains since the introduction of second level domains in June 2014



Source: Nominet Reports and Statistics

Chart 2.3: Monthly new registrations since the introduction of second level domains in June 2014

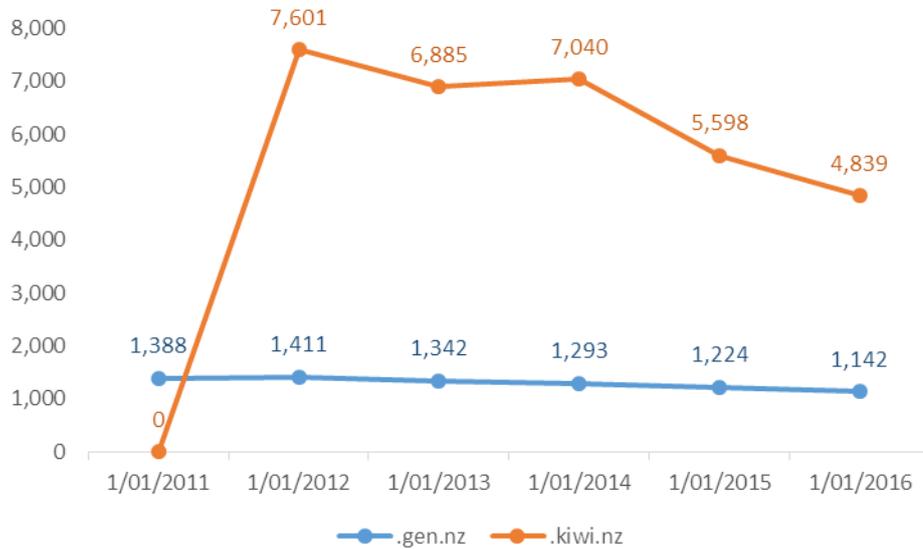


Source: Nominet Reports and Statistics

2.5 NZ experience

Direct registration was introduced in New Zealand in 2014 following regular reviews of the local policy framework. There was a strong appetite for domain names that are relevant to New Zealand, with a reasonably high take-up of .kiwi.nz when it was introduced. Consultations suggested individuals registering .kiwi.nz domains felt that they did not fit well with the existing domain structure (the general .nz domain, .gen.nz, has only ever had modest uptake).

Chart 2.4: Registrations of .kiwi.nz domains (compared to gen.nz)



Source: DNC Statistics

Under the New Zealand policy, a Preferential Registration Eligibility (PRE) period allowed some registrants to register or reserve the shorter version of their domain name before it became available to anyone else. Preferential eligibility was based on the date of registration and the status of registration.⁷ This allowed the registrant the right to a 6 month period to decide whether to register or reserve the .nz version of the domain, followed by an 18-month period to reserve the domain name for free if desired.

Where there are conflicted domain names, that is, a name has been registered in at least two second levels, no existing second level domain is given preference over the .nz domain name. For instance, registrants of example.co.nz and example.org.nz would have to lodge their preference for example.nz online as part of the Conflicted Names Process organised by the Domain Name Commission.

The four options for businesses are (DNC 2016b):

- You want to try and get the shorter version of your domain name
- You don't think anyone should get it
- You don't want it and don't care who gets it
- You don't think anyone should get it and think it should become its own second level like .co.nz, .org.nz or .school.nz

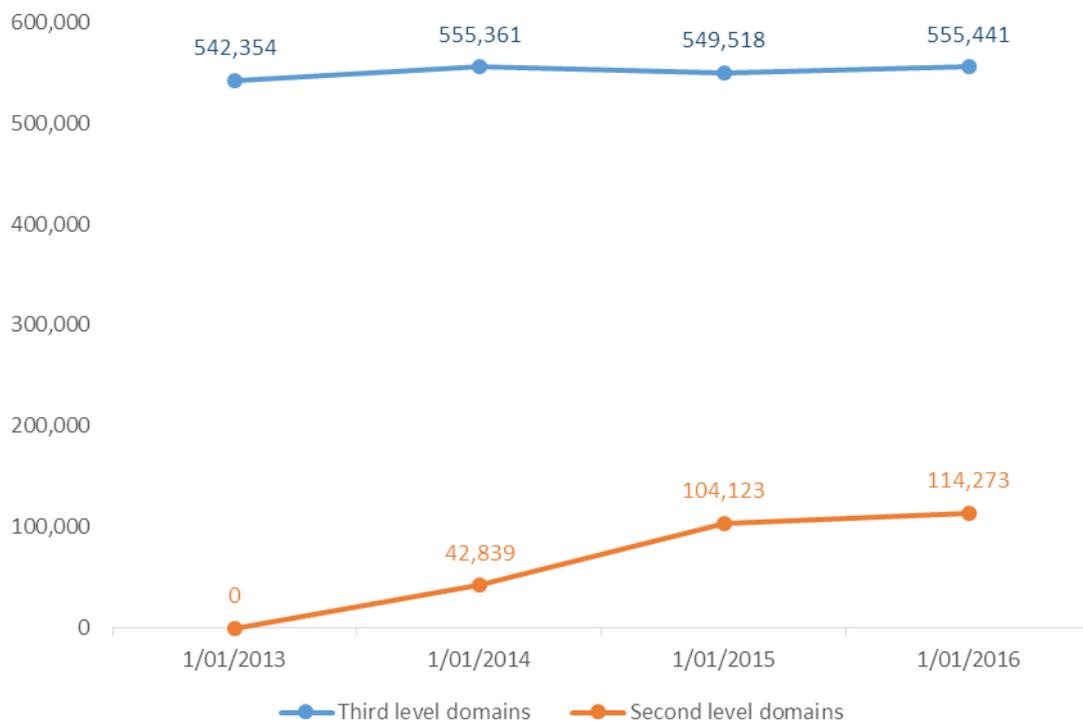
If lodged preferences do not result in agreement (or if not all preferences are lodged), the conflicted name becomes unavailable for registration. The

⁷ Two groups of Registrants were eligible for PRE. The two groups were: Group 1 – Registrants who registered a .nz domain name prior to 9am on 30 May, 2012, and who have kept it current. Group 2 – Anyone who had a unique .nz domain name that was registered between 9am on 30 May 2012 and 3pm on 11 February 2014 (and who has kept it current). An example of this would be of someone registering anyone.net.nz during this period with no other examples registered before or during this time frame (e.g. there is no anyone.co.nz, anyone.school.nz, anyone.org.nz or any other version). (DNC, 2016b)

current conflicted names process does not require any timeframe for registrants of a conflicted name to lodge a preference. In effect this means that, under these rules, many conflicted names will likely never be resolved. In late 2016, the NZ DNC proposed that all registrants of conflicted names would have to launch a preference within 12 months and that they remove the option for a conflicted name to become a new second level.

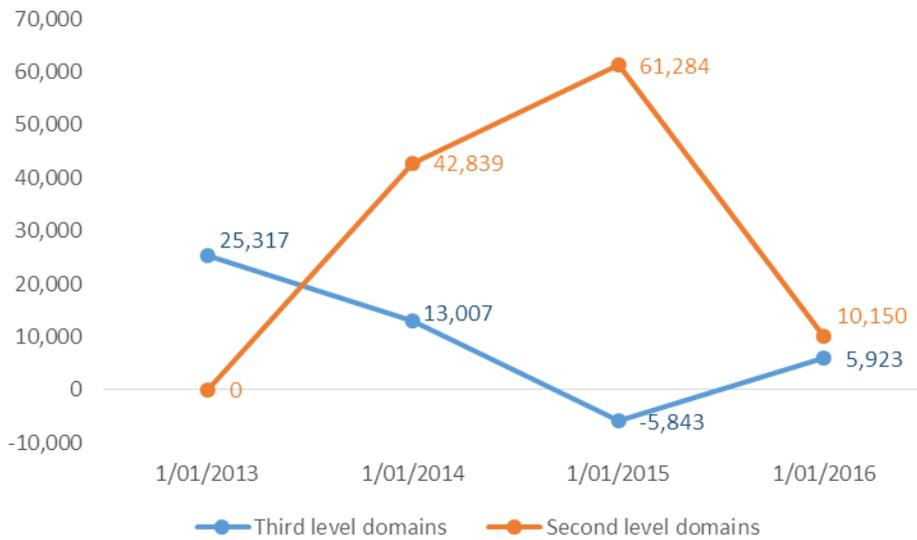
Costs for registering a second level domain are the same as for registering at the third level, with the same terms and conditions and same registrars. Domain names using .nz are not limited to New Zealand-based registrants.

Chart 2.5: Total second and third level .nz registrations



Source: DNC Statistics

Chart 2.6: Annual change in second and third level .nz registrations



Source: DNC Statistics

2.6 Implications for introduction in Australia

Australia has a different starting point for the direct registration discussion, relative to the UK and NZ. There is less historical pressure to adopt direct registration and there may be a lower level of demand for a 'local, relevant' domain as the .au domains are already restricted to Australian-based registrants.

If direct registration is to proceed in Australia, the implementation policy for transition needs to be confirmed. International experience suggests that several rounds of public consultation may be required, and that the process will benefit from being transparent.

International experience also provides valuable insights for an Australian implementation policy. The initial proposed UK approach to offering a higher cost, higher security .uk domain has met with some criticism, and a more simplified approach along the lines of the final UK or NZ model (same price, security and registrars) may be more appropriate.

A reservation policy similar to that used in NZ may also be appropriate in Australia. Consultations suggest that a shorter time period (2 years, rather than 5) is adequate for the transition, and there are benefits from having a preferential eligibility policy as opposed to automatic reservation of domains for specified registrants as domains are less likely to be tied up with registrants who do not want the shorter version of the domain name.

The selected grandfathering policy will be of critical importance to the implementation success of direct registration. Whether an existing second level domain (likely .com.au) will receive preference, or whether none will receive preference, there will be stakeholders who are made worse off. It is possible that the first approach will be less problematic for Australia relative to UK experience as there are fewer historical organisations which have held domain names and seek priority over newer businesses with the same third level domain name. On the other hand, if the latter approach is

selected, the implementation policy will also need to include a process for conflicted domain names. Consultations suggest that, while the NZ approach to conflict resolution has generally been successful, there have been instances where the Conflicted Names Process has remained unresolved. The introduction of an expiry date (for example 6 months) on conflicts would encourage action from businesses and conflict resolution.

In selecting whether to proceed with direct registration and identifying an appropriate path for implementation, the consultation process should ensure that the consulted population sample is representative of the total population of registrants and registrars to ensure that the best outcome is reached for the Australian economy.

2.7 Next steps for direct registration

If direct second level registration is to be implemented, it will require more extensive consultation.

Consultations should ultimately focus on the end users of domains: businesses and individuals who register the domains and Australians browsing the web. Consultations can easily focus on auDA members, such as registrants, re-sellers and those who actively participate in the second-hand domain market. These individuals and businesses, however, make up only a very small percentage of domain owners.

A more quantitative analysis of the costs and benefits should also be undertaken. Any modelling of costs and benefits should give proper consideration to their distribution. If the benefit of the proposal is concentrated to a handful of individuals or businesses, or the cost is disproportionately borne by a small subset of the industry, the proposal may be inappropriate even if the total benefits exceed the total cost.

3 Critical infrastructure analysis

3.1 Australia's critical infrastructure framework

This chapter examines the extent to which the .au domain space should be considered critical infrastructure. "Critical infrastructure provides services that are essential for everyday life in Australia, including energy, food, water, transport, communications, health and banking and finance" (Australian Government, 2016). Infrastructure that is formally recognised by the Australian Government as critical may be subject to greater government oversight due to its importance for all Australians.

Critical infrastructure is managed by both public and private organisations. The Attorney-General's Department is the primary government agency for critical infrastructure. It manages the Critical Infrastructure Centre (CIC) and the Trusted Information Sharing Network (TISN).

The CIC was established in January 2017 to better co-ordinate the management of critical infrastructure, which has often been handled by a range of different government departments. Its key functions include identifying critical infrastructure, co-ordinating whole-of-government risk assessments, developing risk management strategies and supporting compliance (Australian Government, 2016).

The TISN was established in 2003 to facilitate information sharing between business and government. It provides a secure network through which government and businesses can regularly share information about critical infrastructure within and across eight sector groups: banking and finance, communications, energy, food and grocery, health, transport, water services and Commonwealth Government.

The Australian Government is currently undertaking the Telecommunications Sector Security Reforms (TSSR). These reforms amend the Telecommunications Act 1997 to strengthen and formalise the security obligations of telecommunications carriers and carriage service providers.

3.2 The .au domain range as critical infrastructure

The .au domain range plays an important role in facilitating Australia's websites. If the domain range were to be compromised, there would be widespread implications for Australian websites and hence online activity. As such, it is valid to consider whether the .au domain range should be considered as critical infrastructure.

Consultations with the Department of Communications and the Arts (DoCA) confirm that the .au domain range is implicitly considered to be critical infrastructure but to date has not been formally recognised as such. However, the Department noted that the .au domain range is actively being reviewed by government for consideration as critical infrastructure in Australia.

A key part of the government's review will be determining which components of the .au domain range should be considered critical infrastructure. For example, it may be the registry component (or specific elements of the registry) as opposed to auDA's policy role which is considered critical infrastructure.

One approach to assessing critical elements is considering which elements must be available and functional at all times. This approach was adopted following the 2007 cyber attacks on Estonia, which required systems to be turned off to protect against attack. This led to consideration of which websites were critical, and hence consideration of what infrastructure is required to facilitate these websites. For example, websites associated with Parliament could be considered critical, while those associated with businesses could be temporarily suspended. Building up a list of what is critical in Australia and understanding the infrastructure required to facilitate this will assist in the identification of critical elements of the .au domain range.

There would be costs and benefits of the .au domain name being formally recognised as critical infrastructure. According to the DoCA, costs may include much more heavy handed regulation or application of greater bureaucratic or reporting processes. This assertion would need to be directly tested with the Attorney General's Department. Consultations also suggest that some of these processes will apply regardless of formal or implicit critical infrastructure status. For example, it is likely that Foreign Investment Review Board's scrutiny of potential foreign ownership of any parts of the .au domain infrastructure would occur regardless of the domain range's formal status.

The main benefit of recognition as critical infrastructure for auDA would be the potential to officially take part in regular cyber security discussions between the government and private sector. This would provide auDA with greater insight into government policy issues and their implications for the .au domain range. To participate in these discussions, auDA could apply to become a member of the Communications Sector Group of TISN, which is managed by the DoCA, which helps sets the Group's policy agenda. Membership to this group would provide auDA with a more structured forum to discuss security issues with the government and the wider communications industry.

Given the uncertainty around the definition and implications of the .au domain name being formally included as part of critical infrastructure, it is not possible at this point to quantify the relative costs and the benefits to auDA and the domain industry of pursuing recognition as critical infrastructure. It is possible that the .au domain's 'implicit' status may be the ideal state for auDA, particularly if the key benefits can be achieved without the need for formal recognition. DoCA would be an important stakeholder in further discussions with the AGD.

In both the UK and New Zealand, the domain range is not officially designated as critical infrastructure. In the UK, the domain registry is a small private company and has never received public funding. There are current moves towards official designation as critical infrastructure but there remain outstanding questions regarding the process. These questions include issues regarding the government's understanding of the technical details, the reporting obligations of critical infrastructure and the need to preserve independence of the registry's operations.

4 Current economic contribution

Economic contribution studies provide an estimate of the footprint of an industry on the economy at a particular point in time, both directly through the industry's own operations, and indirectly as its activities filter through the economy.

This chapter estimates the economic contribution of the organisations and businesses involved in maintaining .au domains, using Input-Output analysis. For the purposes of this analysis, the .au domain range industry has been defined as 'web hosting services', within the ABS industry category of information media and telecommunications.

These businesses provide specialised hosting activities including web hosting, streaming services or application hosting, provide application service provisioning, or provide general timesharing mainframe facilities to customers.

Deloitte Access Economics were not able to identify any comparable overseas economic contribution studies; consequently, international comparisons are not available.

Appendix A presents a summary of the approach to the economic contribution analysis.

4.1 Methodology update

In the 'Economic and statistical analysis of the .au domain range', Deloitte Access Economics (2011) estimated the economic contribution of the .au domain range. This analysis has been updated with a revised methodology in this report, reflecting a number of changes since the previous analysis:

- the Australian Bureau of Statistics (ABS) industry categories have changed;
- the ABS has released updated input-output (IO) tables; and
- a new data source (IBISWorld) provides a more detailed picture of the industry.

Given these changes, an updated economic contribution would not be comparable to the analysis in the 2011 report. To facilitate a comparison between the 2011 and 2016 contributions, the 2011 results were replicated using an updated methodology and the most contemporary (for the year 2011) 2009-10 tables, which were not available at the time of the original analysis.

4.2 Economic Contribution

4.2.1 Direct contribution

Table 4.1: outlines the direct economic contribution of the .au domain range industry. In 2015-16 the sector generated \$282 million in value added. The majority of the value added is accrued to employees as wages, reflecting the sector's relatively labour-intensive production (more so than the wider ISP, Internet Publishing and Broadcasting, Websearch Portals and Data

Processing IO industry). Furthermore, the industry directly supports 2,313 Full Time Equivalent (FTE) workers.

Table 4.1: Direct economic contribution of .au Domain industry, 2015-16 (\$ million)

Wages	191
Gross Operating Surplus	91
Total Value Added	282
FTE employment	2,313

4.2.2 Indirect contribution

Table 4.2: outlines the indirect contribution of the .au sector. The sector's purchase of intermediate inputs in 2015-16 contributed to \$395 million in value added: \$192 million in wages and \$203 million in gross operating surplus (GOS). The largest input industries for the sector were:

- Telecommunication Services;
- Internet Service Providers, Internet Publishing and Broadcasting, Websearch Portals and Data Processing;
- Professional, Scientific and Technical Services;
- Rental and Hiring Services (except Real Estate); and
- Computer Systems Design and Related Services.

Combined, these sectors accounted for 67% of intermediate expenditure. This expenditure indirectly supported a further 2,258 FTE jobs in the Australian economy.

Table 4.2: Indirect economic contribution of .au Domain industry, 2015-16 (\$ million)

Wages	192
Gross Operating Surplus	203
Total Value Added	395
FTE employment	2,258

4.2.3 Total contribution

The total economic contribution is the sum of the direct and indirect contributions.

Table 4.3: Total economic contribution of .au Domain industry, 2015-16 (\$ million)

Wages	383
Gross Operating Surplus	294
Total Value Added	677
FTE employment	4,571

4.3 2011 result update

To facilitate a comparison between the 2011 and 2017 reports, the 2011 results were updated using the new methodology and more contemporary 2009-10 input-output tables. The updated methodology results in a slightly lower direct contribution, but a larger indirect contribution relative to the original analysis.

In 2011, the largest input industries for the sector were:

- Internet Service Providers, Internet Publishing and Broadcasting, Websearch Portals and Data Processing;
- Professional, Scientific and Technical Services;
- Telecommunication Services;
- Rental and Hiring Services (except Real Estate); and
- Non-Residential Property Operators and Real Estate Services.

Table 4.4: Economic contribution of .au Domain industry, 2010-11 (\$ million)

	Direct	Indirect	Total
Wages	175	140	316
Gross Operating Surplus	69	199	269
Total Value Added	245	340	584
FTE	2,228	1,727	3,955

4.4 Industry growth over time

The following table shows the growth in the industry's economic contribution from 2011 to 2016. Total value added and FTE jobs increased by 16% over the period. Expenditure in 2016 comprised more labour-intensive industries in 2016, resulting in higher growth in wages as part of the indirect contribution relative to in the direct contribution. This also results in direct GOS growing at a faster rate than indirect GOS. The higher rate of growth in indirect FTE relative to direct FTE also reflects the movement towards expenditure on relatively labour-intensive industries in 2016.

Table 4.5: Growth in the economic contribution of .au Domain industry, 2010-11 to 2015-16 (%)

	Direct	Indirect	Total
Wages	9%	37%	21%
Gross Operating Surplus	32%	2%	9%
Total Value Added	15%	16%	16%
FTE	4%	31%	16%

5 Forecast economic contribution

This chapter presents an estimate of the economic contribution of the businesses in the .au domain space in 2020-21. Two scenarios are forecast.

- **Scenario One** assumes the future growth of the .au industry over the next five years matches the growth rate of the preceding five years.
- **Scenario Two** examines the case where there is an increase in domain registrations due to the introduction of direct registration, resulting in increased economic activity. This second scenario is informed by AusRegistry modelling of the expected increase in registrations from the policy.

Two limitations to the analysis need to be noted:

- An economic contribution analysis estimates the size of a sector and its links to other sectors of the economy. It does not provide an estimation of the net benefits of an industry, as they do not consider opportunity costs of production. Consequently, the difference in value-added between the scenarios should not be interpreted as a 'benefit' attributable to the second scenario.
- Forecasting is inherently difficult and relies on assumptions about the future that may not necessarily eventuate. The analysis in this chapter uses the same IO tables as were used for the current (2016) contribution modelling, since these tables are the latest available. Consequently, the forecasts presented below assume that the industry's production structure and technology remain unchanged into the future. If the industry experience economies of scale or future efficiency gains, the economic contribution will be different.

5.1 Scenario One – current policy settings

Scenario One estimates the economic contribution where the current policy settings prevail (that is, there is no introduction of direct second level registration). It assumes that the growth in real terms of revenue, wages, profit and employment over the past five years (2010-11 to 2015-16) continues at the same rate over the next five years (2015-16 to 2020-21).

5.1.1 Direct contribution

Under Scenario One, the forecast direct economic contribution of the .au domain range industry is \$328 million. Of this value added, \$208 million is accrued to workers as wages and \$120 million is accrued to owners of capital as GOS. The industry will employ an expected 2,401 FTE employees.

Table 5.1: Forecast direct economic contribution of .au Domain industry, 2020-21, Scenario One (\$ million)

Wages	208
Gross Operating Surplus	120
Total Value Added	328
FTE employment	2,401

5.1.2 Indirect contribution

Table 5.2 below outlines the forecast indirect contribution of the .au sector in 2020-21 under Scenario One. The sector's purchase of intermediate inputs contributes to \$483 million in value added. Of this, \$235 million is wages and \$248 million is gross operating surplus. As the modelling assumes the production structure of the industry remains unchanged, the largest input industries remain the same as those discussed in Section 4.2.2. This expenditure indirectly supports 2,758 FTE workers in the Australian economy.

Table 5.2: Indirect economic contribution of .au Domain industry, 2020-21, Scenario One (\$ million)

Wages	235
Gross Operating Surplus	248
Total Value Added	483
FTE employment	2,758

5.1.3 Total contribution

The total economic contribution for Scenario One is the sum of the direct and indirect contributions. It is presented in Table 5.3 below. Compared to the 2016 contribution, wages make up a slightly larger proportion of total value added, and the indirect contribution is, proportionally, marginally bigger than the direct.

Table 5.3: Total economic contribution of .au Domain industry, 2020-21, Scenario One (\$ million)

Wages	443
Gross Operating Surplus	368
Total Value Added	811
FTE employment	5,159

5.2 Scenario Two – increase under direct registration scenario

Scenario Two models the expected economic contribution in the case where direct registration is introduced. AusRegistry modelling suggests that this

will result in an increase the number of registrations over time and, therefore, the revenue of the .au domain industry.

The AusRegistry modelling provided the expected increase in registrations following the introduction of direct registration. Over the 6 years to 2021-22 domains under managements are expected to increase 4.5% per annum. This was used to estimate the expected increase in revenue for auDA, the AusRegistry and the wider .au domain industry (assuming their revenue increase is in line with auDA and AusRegistry). The growth rate in wages, profit and employment was then calculated by assuming the ratio of wages, profit and employment to revenue in 2020-21 is unchanged from 2015-16.

As noted above, the forecasts presented below assume that the industry’s production structure and technology remain unchanged into the future. However, it is possible that under this scenario in particular, where there is a rapid increase in registrations (and, correspondingly, revenue), the industry could experience economies of scale. That is, revenue will increase at a greater rate than input expenditure. This would mean a smaller indirect effect than estimated below.

5.2.1 Direct contribution

Table 5.4 outlines the forecast direct economic contribution of the .au domain range under Scenario Two. The total value added is expected to be \$389 million: \$263 million is accrued to workers as wages while \$126 million is gross operating surplus. The industry will employ an expected 2,541 FTE employees.

Table 5.4: Forecast direct economic contribution of .au Domain industry, 2020-21, Scenario Two (\$ million)

Wages	263
Gross Operating Surplus	126
Total Value Added	389
FTE employment	2,541

5.2.2 Indirect contribution

Table 5.5 outlines the forecast indirect contribution of the .au sector in 2020-21 under Scenario Two. The sector’s purchase of intermediate inputs contributes to \$544 million in value added: \$265 million is wages and \$279 million is gross operating surplus. As the modelling assumes the production structure of the industry remains unchanged, the largest input industries remain the same as those discussed in Section 4.2.2. This expenditure indirectly supports a further 3,109 FTE workers.

Table 5.5: Indirect economic contribution of .au Domain industry, 2020-21, Scenario Two (\$ million)

Wages	265
Gross Operating Surplus	279
Total Value Added	544
FTE employment	3,109

5.2.3 Total contribution

The total economic contribution for Scenario Two is presented in Table 5.6 below, as the sum of the direct and indirect contributions.

Table 5.6: Total economic contribution of .au Domain industry, 2020-21, Scenario Two (\$ million)

Wages	528
Gross Operating Surplus	405
Total Value Added	933
FTE employment	5,650

5.3 Comparison of scenarios

Scenario Two assumes a higher growth in industry revenue than Scenario One, resulting in a larger direct and indirect effect. As noted earlier the difference in economic contribution between the scenarios should not be taken to be the difference in net benefits. The differences reflect differences in the size of the industry and their subsequent purchases of inputs from other industries – a larger industry will have a greater economic contribution, but this does not show the net benefits of introducing direct registration in Australia. Cost benefit modelling would be required to compare the welfare effects of the two scenarios.

6 Social contribution

Chapters 4 and 5 estimate the economic contribution of the .au domain space in terms of the direct economic activity generated by the organisations and businesses that maintain the .au domain range and the indirect economic activity of the firms which supply to these businesses. However, the .au domain space also generates benefits for downstream firms which use .au websites. This chapter qualitatively discusses these benefits.

6.1 Facilitating growth in digital economy and online transactions

A strong online presence can support the growth of Australian businesses. Websites act as an important marketing tool; they are a relatively inexpensive method of showcasing a business' goods or services. Websites can broaden a business's potential market, facilitating sales beyond a business's trading hours or physical proximity.

Further, domains are not just for websites – they also provide businesses with a company-specific email domain. A 2014 survey of New Zealand internet users (NZRS, 2014) found that free email domains, such as @gmail.com, are overwhelmingly perceived to be less professional and trustworthy than a company-specific domain (only 6% described such emails as 'professional').

Australian businesses with a strong digital focus are likely to grow faster. Australian small to medium sized businesses (SMBs) with an advanced level of digital engagement, compared to businesses with basic engagement, are significantly more likely to experience revenue growth, export products and innovate by offering new products or services (DAE, 2016).

DAE undertook a survey of over 600 SMBs, dividing them into one of four levels of digital engagement: basic, intermediate, high and advanced. Businesses with basic engagement used traditional marketing methods such as newspapers and lacked a website or social media presence. Their only online tool was a business email. In contrast, businesses with a high or advanced level of digital engagement utilised search engine optimisation (SEO) and marketing (SEM). Compared to businesses with basic digital engagement, high and advanced businesses had 27% and 58% greater revenue growth respectively; furthermore, they increased their employment over the past year by 3 and 12 more workers respectively than basic businesses.

These results are in line with Lee and Kozar (2006), who also found that high quality websites produce higher business performance.

Given the benefits of digital engagement, it is not surprising that businesses are more readily adopting the digital tools at their disposal. In DAE's 2013 Connected Small Businesses survey, DAE found that 16% of business utilised SEM and SEO. In 2016, the survey found that this proportion had increased to 31%.

6.2 Benefits of .au for Australian businesses

.au domains may help Australian businesses generate additional sales relative to using a generic top level domain.

As .com.au and .net.au domains can only be registered by businesses or organisations with an Australian Business Number or Australian Company Number, .au domains are a clear signal of being a 'local' business. An .au domain indicates that a business has an Australian presence, which means they may have tailored their operations to Australian needs (e.g. pricing goods in Australian dollars). This may attract customers who value Australian-based businesses. Roughly 50% of surveyed businesses in 2016 who chose a .au name did so as it "best represents Australian organisations" (AusRegistry, 2016b).

The .au domain can also increase trust, which can in turn facilitate trade. Due to its more restricted registration requirements, .au is more highly trusted by Australians than other ccTLD or gTLD. 22% of surveyed businesses with an .au domain, report choosing the domain due to it being a trusted namespace (AusRegistry, 2016).

ccTLD such as .au are used by search engines as a signal that the website is designed for locals. This information is used in the algorithms to create more accurate and relevant results (Google, n.d.).

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Appendix A: Economic contribution approach

This economic contribution examines the direct and indirect economic activity generated by the organisations responsible for the maintenance of .au websites using Input-Output analysis. The direct component is based on the value added measure – the returns to labour (wages) and the returns to capital (profit – estimated as Gross Operating Surplus or GOS). The indirect contribution calculates the value added created by the businesses that produce inputs for the industry. It estimates the profit and wages that are generated an industry's expenditure on inputs. The indirect contribution was estimated using the latest ABS Input-Output tables (2013-14).

The analysis uses two primary data sources: *Information and Communication Technology, Australia, 2006-07* (ABS 2008) and *IBISWorld Industry Report J5921* (2016), which provide revenue, wage, employment, and profit statistics on the "Data processing and web hosting services" industry in Australia. The IBISWorld and ABS reports use different methodologies for calculating the data processing and web hosting services industry resulting in a slight difference in their estimated size.

The businesses necessary for the maintenance of the .au domain range are a subset of the data processing and web hosting services industry. Therefore, the estimated the size of the .au domain industry was calculated based on the number of auDA and web hosting-related businesses as a proportion of ABS' (2008) estimation of the number of data processing and web hosting services businesses.

The growth in revenue, profit, employment and wages of the .au domain businesses from 2006-07 to 2015-16 was based on IBISWorld's estimated growth in the data processing and web hosting services industry during these years. This results in the estimated economic contribution of the .au domain sector in 2016.

To calculate the indirect contribution of the .au domain industry, it is necessary to estimate the intermediate expenditure of the sector. The input expenditure was based the intermediate spending of the "Internet Service Providers, Internet Publishing and Broadcasting, Websearch Portals and Data Processing" industry (Input-Output Industry Group 5701) from the 2013-14 IO tables.

Using the supply and use tables, derived from the ABS, Deloitte Access Economics calculated how much the Internet Service Providers, Internet Publishing and Broadcasting, Websearch Portals and Data Processing industry group spends on each input-output industry group as a percentage of intermediate expenditure. These ratios were then multiplied by the total intermediate spending amount of the .au domain subsector. This provided a breakdown of estimated expenditure of the subsector which was used to determine the indirect effect using the Deloitte Access Economics IO model.

In contrast, the 2011 analysis based:

- estimates of the growth revenue and profit in the .au domain industry between 2006-07 and 2010-11 on ABS consumer price index (CPI) data;
- the growth in wages on estimated wage growth of the Internet Service ICT industry; and
- the indirect contribution on the gross output multipliers for labour income and value added of the Internet Service Providers, Internet Publishing and Broadcasting, Websearch Portals and Data Processing IO industry.

For the updated methodology, the wage and revenue growth in the .au sector since 2006-07 is based on the IBISWorld's wage and revenue data for the data processing and web hosting services industry. This provides a more precise estimation of the change in the .au. For the indirect contribution, an estimated expenditure bundle (in terms of input-output industry groups) was calculated and run through the Deloitte Access Economics IO model. This provides a more accurate estimate of the indirect effect in the case where there is a notable divergence between the labour-intensity of the .au industry the broader industry group it is part of.

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