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IP Australia

The economic impact of innovation patents

IP Australia Economic Research Paper 05

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Executive Summary

This research paper examines the economic impact of the innovation patent system. The innovation patent is a second-tier patent with a lower inventive threshold, lower cost and shorter term than a standard patent. The policy objective of the innovation patent is to encourage innovation among Australian Small and Medium sized Enterprises (SMEs) by offering protection for lesser inventions.

The evidence shows that firms who file innovation patents are less likely to participate in the standard patent system afterwards. The great majority of Australian SMEs and private inventors appear to gain little benefit from the system. Three quarters of these applicants file one innovation patent and then never file another innovation or standard patent again.

Only 23 SMEs have become moderate users of the innovation patent system, filing at least 5 innovation patents, with at least one enforceable right, and entering the patent system via an application for an innovation patent. The average SME or private inventor files once and never again (74%) does not receive any enforceable right (83%), and lets their patent expire early because they see its value at less than the $110-$220 cost of renewal (78%).

The evidence shows that innovation patents have some positive effects, but in the one area of impact, firm survival, standard patents are found to have a bigger positive effect, and there is no effect from certifying innovation patents. Firms in the manufacturing sector, who file innovation patents, invested more in R&D than other manufacturing firms, but the same holds for standard patent applicants, both in manufacturing and across broader set of industries. The innovation patent by itself has no correlation with firm sales growth and no impact on market entry rates across industries.

Innovation patents impose a regulatory cost on Australian SMEs and private inventors of over $10 million per year, equating to nearly 95% of the regulatory cost of the system. The maximum private value of the innovation patent system as a whole was calculated to be in the low tens of millions per annum. This private value is expected to be offset by third party uncertainty costs to consumers and other producers, as the majority of innovation patents are not enforceable rights, but this offset could not be quantified. Large firms tend to obtain the majority of this value from their innovation patents, followed by SMEs and private inventors. This highlights that the costs and benefits are not accruing evenly across firms.

The low levels of repeated use by SMEs suggest that the innovation patent is not fulfilling its policy goal of providing an incentive for Australian SMEs to innovate, and the evidence shows a reduced likelihood of patenting after participating in the innovation patent system. Given the low private value of the system, it is likely that the system is a net cost to most of the SMEs that use it, and the system has imposed a regulatory burden of more than $100m since its introduction.

Contents

1. Introduction

In 2011 Australia's Advisory Council on Intellectual Property (ACIP) commenced a review of the innovation patent system to determine whether it was meeting its objectives. ACIP focused "on the effectiveness of the innovation patent system in stimulating innovation by Australian small to medium businesses" (ACIP 2013: 7, 2014: 5). In their concluding letter to the Minister ACIP summarized their initial findings as follows:

> ACIP tried to fairly assess the value of the innovation patent system to Australian innovators during the course of this review, but the evidence discovered was insufficient to make such an assessment. Consequently, ACIP is unable to make a recommendation supporting the retention or abolition of the current system.
>
> -Review of the Innovation Patent System (ACIP 2014: preamble)

ACIP did not provide a recommendation to retain or abolish the Innovation Patent system but did note that, if it were to be retained, a number of changes should be adopted to address concern around the innovation patent, including its scope, name and examination procedure (ACIP 2014: 6-15).

The intention of this research paper is to examine the economic impact of the innovation patent system in Australia.

1.1 The available evidence on second-tier patent systems

Second-tier patents, or utility models as they are often called, provide a lesser but more accessible form of patent protection for innovating firms or individuals. According to the World Intellectual Property Organization (WIPO), second-tier patents are currently used in 59 countries around the world (listed in Appendix 1.1). Australia's former version of second-tier patents was the petty patent, which was abandoned in 2001 to give way to the innovation patent as it exists today.

Part of the difficulty in assessing second-tier patent systems is that they are used very differently on a country by country basis. The length of a second-tier patent can vary considerably, for instance they can last up to 20 years in Malaysia, and up to 6 years in France. Differences across patentable subject matter, the name of the right, the patentability threshold and the requirement for examination differs country to country as well (see Appendix 5 in ACIP's 2014 report for details).

Determining the economic impact of the innovation patent system in Australia is not a trivial exercise. Conceptually we would like to measure the effects on inventors of innovation patents being available – the existence of the system - rather than the effect of obtaining an innovation patent. The former requires knowledge of firm behaviours in the counterfactual scenario where innovation patents do not exist, which is unobtainable. Therefore the latter approach, looking at the effect of taking out innovation patents, is taken in this report. Even this is difficult as the empirical evidence on second-tier patent systems is very scarce and generally does not focus on the Australian context, as evidenced by ACIP being unable to obtain such evidence during their two year review (ACIP 2014: 6). The paucity of evidence has also been noted by the European Commission (2014), which recently awarded a multi-year research contract to help it establish the economic evidence on second-tier patents.

We were confident that we could overcome this issue by using our recently published IP Government Open Data (IPGOD) which includes the complete IP registry with each applicant from 1990 to 2013 linked to Australian Business Numbers, allowing us to link innovation patent applicants with firm characteristics. In addition, IP Australia's Office of the Chief Economist worked with data from the Australian Bureau of Statistics, the Department of Industry and Science, the Australian Securities and Investment Commission and the Australian Business Register to build a comprehensive micro-dataset to allow detailed analysis of innovation patent applicants.

After developing this large dataset, which is detailed throughout the appendices, our strategy was to review the existing empirical literature on second-tier patent systems and replicate modelling done for other countries to estimate comparable effects in Australia.

In particular, we are interested in the relationship between the innovation patent system and Research & Development (R&D) expenditure, firm performance, market competition, regulatory cost, private value, firm survival and the usage by small and medium enterprises (SMEs) as well as individual inventors.

Looking at the literature, we found little empirical modelling: there is empirical evidence to suggest that in some developing countries a second-tier patent system can be useful in the technological catch-up phase (Suthersanen 2006), as in the case of Korea in the 1980s (Kim *et al* 2012) and Japan in the post-war period (Maskus & McDaniel 1999). When comparing countries, Kim *et al* (2012) finds a positive impact for some developing and developed countries, although Bielig's (2012) simple regression for the impact of second-tier patents in Germany shows a negative impact on Gross Domestic Product there.

There is a much larger body of literature comparing the legal framework in different countries, the most recent of which compared several European and the Chinese second-tier patent systems (Prud'Homme 2014). A body of literature also exists with the theoretical arguments for and against a second-tier patent system (see Boztosun 2010 or Cummings 2010 for the positive and Janis 1999 on the negative).

A few evaluations of second-tier patent systems have been undertaken, but their evidence gathering exercises have mainly focused on surveying attorneys (Kumar 2002, Kardam 2007) or patent holders (Verve Economics 2013) to ask if participants valued the system. A more detailed review of the Australian innovation patent was undertaken by Christie and Moritz (2004, 2007), but much like the ACIP Review, the data available for analysis was limited mainly to the number of filings, who filed innovation patents and who certified innovation patents.

The aim of this research paper is to incorporate these parts of the evidence base, and go beyond that to investigate what impact the innovation patent has on Australian firms and the economy. Specifically, we want to provide evidence to inform decision makers as to whether the system has fulfilled its main objective: Has it worked as an incentive for SMEs and private inventors to innovate.

Being an economic review, we are interested in whether the system provides a net benefit to the Australian economy, although the policy focus of the innovation patent – being aimed at small and medium enterprises – suggests that we should also pay attention to the distribution of costs and benefits.

1.2 Background and objectives of the Innovation Patent System

The Innovation Patent system was born out of the *Review of the Petty Patent System* that was completed in 1995. The 1995 review was conducted by ACIP and had to consider (ACIP 1995: 4):

- the role of petty patents in Australia's industrial property system and their contribution to economic and technological development in Australia; and
- the effectiveness and efficiency of a petty patent system in meeting its objectives with particular regard to small and medium business enterprises.

In its conclusion, the review found that there was a role for a second-tier patent in the Australian innovation system, and noted that:

> there is a clear need for a new and alternate form of industrial right protection for incremental innovations and recommend that such a system should be introduced. This new protection right, which we have called the Innovation Patent, will provide a net benefit to the Australian economy by encouraging Australian business to develop and market their incremental innovations in the domestic market.
>
> -Review of the Petty Patent System (ACIP 1995: preamble)

The transition from the Petty Patent system to the Innovation Patent system came with a number of changes, which aimed to achieve a range of objectives the review panel had identified (ACIP 1995: 27). These objectives included:

- the need to fill the 'gap' between designs and standard patents;
- quick to obtain;
- cheap to obtain and enforce;
- reasonably simple;
- helps small / medium business enterprises;
- has a measure of certainty; and

- lasts for a sufficient time to encourage investment in the developing and marketing of the innovation.

The report also noted that many of these objectives are in mutual conflict, so the recommendations aimed to design a system which is flexible enough to provide the opportunity for applicants to select those characteristics that best suit their needs.

To achieve these objectives, the system encapsulated the following features:

- a new name - Innovation Patent
- a lower inventive step requirement (the ‘innovative step’)
- the then current scope and breadth of the protection to remain
- a term of eight years (up from six years)
- a limit of five claims (up from three), with no restriction on type of claim
- same prior art base as a standard patent
- option to defer examination with substantive examination only on request
- to apply to the same subject matter permissible for a standard patent
- publication three months after filing and at grant
- no pre-grant opposition
- revocation by IP Australia
- priority deriving from provisional applications possible
- divisional practice to be retained
- convertibility - standard application to an innovation application, and vice versa
- concurrent protection for a standard and innovation patent

2. The innovation patent

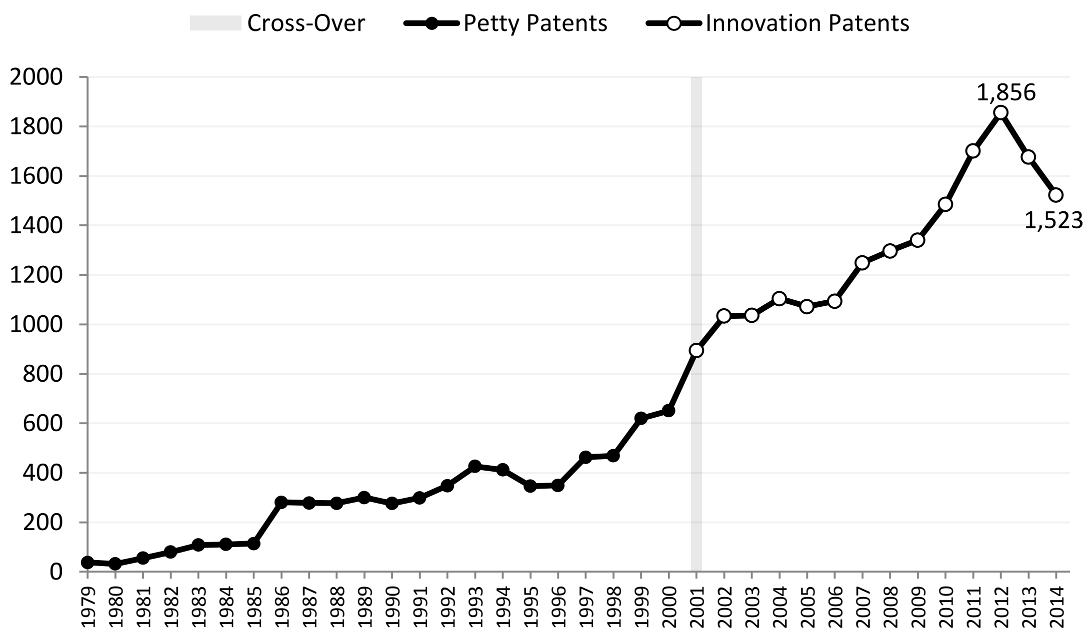
Innovation patents provide a second-tier patent protection system at a lower cost and with easier access than standard patents. The length of the monopoly provided by an innovation patent is less than a standard patent. Innovation patents that pass formality requirements are automatically ‘granted’, but are not legally enforceable until certified after an examination process.

There have been approximately three court oppositions per year over 12 years. Innovation patents have also met their objective of being convertible to and from standard patents, with approximately 700 conversions from standard patents to innovation patents and around 30 conversions from innovation patents to standard. This has provided a fall-back option for applicants who fall short of the inventive threshold required for a standard patent.

2.1 Second-tier patent applications rose after the introduction of the innovation patent

Christie and Moritz (2004, 2007) as well as ACIP (2014: 25) observe that second-tier patent applications increased after the petty patent was replaced by the innovation patent. This was a specific aim of the 2001 reform and we undertook regression analysis to test whether there had been a break in the series. The results confirm that the change in 2001 was statistically significant and more innovation patent applications were filed on average after the introduction of the innovation patent system (see appendix 2.0 for details). Figure 1 shows the growth in applications to 2012 with the drop off in applications since then.

Figure 1: Second-tier patent applications, 1979-2014



IP Australia has received 18,272 innovation patent applications as of 31 December 2014. Over the last two years, applications have been falling, mainly driven by a drop in filings by Australian entities. In relative terms, innovation patents account for nearly 5% of all (non-provisional) patent applications in Australia, making up a relatively small part of Australia's patent system.

The innovation patent is aimed at Australian firms and the majority of applicants for innovation patents (79%) have Australian addresses, compared to only 10% of standard patent applications (IP Australia 2014: 8). The proportion of Australian applicants has been on a downward trend since the system was introduced in 2001 when 88% of applicants were Australian entities, against 68% in 2013. So the system is mainly accessed by Australians.

2.2 Patent system attracts manufacturers undertaking R&D

A key purpose of the patent system is to incentivise R&D. Ideally we would have liked to replicate the work of Arora *et al* (2008) which modelled the incentive effect of R&D in the US economy and found a positive relationship between standard patents and R&D in the manufacturing industries. This would however require long R&D data series at the firm level, and estimates of propensities to undertake R&D and patent which is not available for Australia.

Our second best option is to investigate whether firms that filed innovation patents have undertaken more R&D than firms that did not file patents. To test this we first link the Department of Industry and Science database of firms claiming the R&D tax concession, or incentive, to IPGOD and look at all firms in the period 2001-2011 where matches between the two datasets exist. Where there is no match, we assign zero patents. The resulting dataset has 620 observations that have filed at least one innovation patent and 3,367 observations that have filed only standard patents and made use of the R&D tax concession since 2001. Moreover, 69,734 observations in the dataset are assigned zero patents, providing a large control group against which to compare our sample. See appendix 2.2 for details on the data.

We then compare the R&D expenditure and R&D staff levels of firms with newly generated standard or innovation patents against a comparable firm that filed no patent applications. To find the comparable firm, we conduct a Mahalanobis-type matching which finds a firm that has the minimum distance to our treated firm on characteristics that are likely to impact patenting (Rosenbaum & Rubin, 1985). The characteristics that we use are log of the number of employees, whether the firm is a foreign subsidiary, and geography in terms of longitude and latitude. We do the matching strictly within the top level Australian and New Zealand Standard Industry Classification (ANZSIC) to link major industry groups for more conformity between the firm and its match.

The matching provides us with a control group of similar or comparable firms to see if firms with patents have more R&D expenditure on average than firms without. Tests were also undertaken to determine if there is an average difference in R&D staff or R&D expenditure two years before filing patents, for similar firms that file no patents, those that file at least one innovation patent, and those that only file standard patents. The two-year lag that we implement here is standard in economic research to allow for the time delay from research to innovation.

The results suggest that firms that apply for patents spend more on R&D than firms that file no patent applications. These results are statistically significant at the 5% level for standard patent applicants in the mining, manufacturing, professional, scientific & technical services, education & training, healthcare & social assistance and arts & recreation services.

It was not possible to estimate the effect on firms that only file innovation patents as the sample size was too small for making proper conclusions, so we instead look at firms that have filed at least one innovation patent and may have standard patent applications as well. In this case only the manufacturing sector sees a statistically significant positive relationship at the 5% level between innovation patents and R&D expenditure. Table 1 reports all results that are statistically significant at the 10%, 5% and 1% level.

Table 1: Firms that patent tend to do more R&D

	ANZSIC Division	Innovation patents with or without standard patents		Standard patents only	
B	Mining			6.242	**
C	Manufacturing	2.584	***	1.269	***
E	Construction	-12.309	*		
I	Transport, post, warehousing	47.069	*		
M	Professional, Scientific & Technical Services			1.020	***
P	Education & Training			-0.089	**
Q	Health care & Social assistance			0.313	**
R	Arts & Recreation Services			1.759	***

Statistical significance indicated by asterisks at the 10% level * | 5% level ** | 1% level ***

These results show that firms that file patent applications undertook more R&D on average than similar firms – indicating that the patent system, and for the manufacturing industry, the innovation patent system, is used as a way to protect successful R&D expenditure.

The figures in the table can be interpreted as the average difference between treated and un-treated firms, so for example: firms filing innovation patents in the manufacturing industry claimed to spend an average of $2.584m more on R&D than firms that filed no innovation patents. The results for the innovation patent in ANZSIC division E (Construction) and I (Warehousing) are only significant at the 10% level, and are based on very few matched observations so should be treated with some caution.

Appendix 2.2 reports the full results, including a comparison between firms that take out at least one innovation patent against those with only standard patents, as well as the results for R&D staffing. We cannot, on the available evidence, say whether the innovation patent system incentivised R&D expenditure, but we can say that in only one industry do we see the expected use of the system. Those that do some R&D in manufacturing use the innovation system along with the standard patent system, while other industries tend to use the standard patent system alone.

2.3 Innovation patents aid firm survival

IP rights allow applicants the exclusive rights to commercially exploit an invention, and that should provide some monopoly power. This in turn should help firms remain in business for longer and, using survival regression techniques, we can investigate the extent to which firms that apply for innovation patents have a lower risk of failing at a given time, and whether applications that are successfully examined are any different in this regard than applications that have not undergone examination.

Survival analysis is a technique that has been widely used in the finance and actuarial literature to examine the factors that influence a firm's survival. In this instance we use it to determine the effect of holding a range of IP stock, including innovation patents, on the probability that a participant deregisters from the Australian Business Register or cancels its Goods and Services Tax (GST) status. Either of these events we take to mean the firm is no longer trading (Department of Industry and Science 2014: 76). Given that firm failure is generally considered an undesirable outcome, any market factors that can be linked to extending the life of a firm could be interpreted in a positive light.

We adapt the empirical model published by Jensen *et al* (2008) which found that IP rights did extend the life of firms in Australia, but the analysis did not include innovation patents explicitly. We adapt the model to look at whether innovation patents have a similar effect to other IP rights.

Following Jensen *et al* (2008), the probability of firm death is modelled as a function of firm, industry and macroeconomic variables. Firm-level variables included in the model are the current stock of applications and granted IP rights for innovation patents, standard patents, designs and plant breeder's rights. Dummy variables are included to account for firm size, subsidiary status and private or public companies. Industry specific effects are accommodated by a variable measuring the gross entry rates of firms into a particular ANZSIC division. Macroeconomic variables include an index of the Australian stock market and the change in gross domestic product.

Our dataset is an unbalanced panel of 14,033 companies observed from 2000 to 2013. The data on IP rights was drawn from the Intellectual Property Government Open Data (IPGOD). A key feature of the IPGOD is that it employs a unique set of identifiers which allows IP rights to be linked to individual firms, firm level characteristics and geospatial data. ABN and GST registration and de-registration dates were acquired from the Australian Business Register, where supplementary data was obtained from the ABS and the OECD databases (see appendix 2.3 for details).

Table 2 provides a summary of the survival regression results for the population of Australian firms with IP rights. The focus of our analysis is on the role that innovation patents may play in influencing firm survival. In this context the key variables of interest are the numbers of innovation patents that have not passed an examination (Applications) and the current stock of innovation patents that have passed examination (Certified). Of these two variables, only the number of innovation patent applications is statistically significant, and has a negative coefficient. This result means that firms with pending innovation patents are less likely to exit at a given time.

Table 2: Firm survival affected by patenting

Explanatory variables	Coef.		Std. Err.	z	P>|z|
Innovation Patent Applications	-0.2243	**	0.0909	-2.47	-0.014
Innovation Patents Certified	0.0599		0.1515	0.40	-0.693
Standard Patents Filed	-0.3631	***	0.0495	-7.33	0.000
Standard Patents Granted	-0.4589	***	0.0531	-8.63	0.000
… full list of explanatory variables in Appendix 2.3					

A negative coefficient implies a lower propensity to exit

Statistical significance indicated by asterisks at the 10% level * | 5% level ** | 1% level ***

A firm's stock of certified innovation patents does not appear to affect the survival of the firm compared to other forms of IP rights, and this is not the expected result. Other patent rights, innovation and standard, lower the probability of firm exit. On the basis of this it appears that firms that file innovation patents tend to survive longer than those that do not, but certification has an unclear effect. There could be a range of reasons why firms filing, but not certifying, innovation patents have a lower probability of exit, which are unconnected with the patent system. The results do indicate that the certified right itself does not provide the benefit, whereas standard patents, whether filed or granted, have a larger and positive impact on firm survival than innovation patents. This nuance is important as we look at the effect that innovation patents have on firm and market outcomes.

2.4 Innovation patents have no discernible macroeconomic effect

In aggregate terms we do not observe any correlation or association between innovation patents and macroeconomic variables such as firms' sales growth or market entry rates. No evidence exists to show a break in R&D expenditure across Australia, or in certain industry sectors, with the introduction of the innovation patent.

Kim *et al* (2012) find that filing innovation patents had a positive effect on firm sales growth in Korea. When we replicate the model in a fixed effect regression, we find that for Australian data there is no statistically significant relationship between innovation patent filings and firm performance as recorded by annual growth in sales (see appendix 2.4 for details). That said, our analysis relies on a more limited dataset than what is available for Korea and is weighted heavily toward large firms, so at most we can conclude that there appears to be no noticeable relationship between sales growth and innovation patents for large firms in Australia.

The lack of an impact on aggregate sales growth does not exclude the possibility that innovation patents have some industry impact. In particular we are interested in whether the system impacts competition or market entry. To this end, we have sought to explore the relationship between innovation patents and the rate of market entry of new firms. The classic reference on competition and innovation, as measured by patent applications, is the work by Aghion *et al* (2005) which found an inverted-U shape relationship between innovation and competition. In a follow-up paper Greenhalgh & Rogers (2010) test this relationship for patent and trade marks across UK industries with several measures of competition, and find that patents and trade marks are significant in a sub-set of industries.

The closest proxy to market contestability we can construct with Australian data is the rate of firm entry using the Australian Business Register. We use this to estimate what variables affect firm entry (as discussed by Cincero & Galgao 2005).

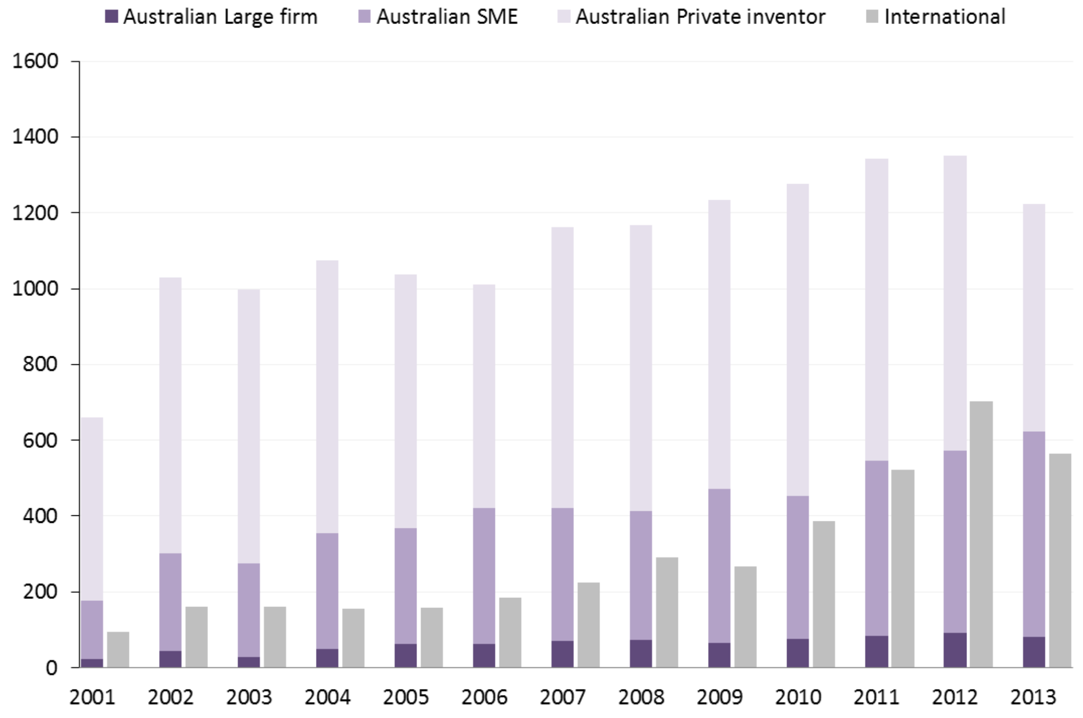
Following the literature (e.g. Dunne *et al* 1988, Herck 1984, Geroski 1995, Carree & Thurik 1996) we set up regression analysis with the quarterly rate of market entry as the dependent variable regressed on: the exit rate, population, gross value add, lags of gross value add, plant breeder's rights, design rights, standard patents and innovation patents held in industries as defined by the ANZSIC classification.

We find that population and exit rates have an impact on entry, which is consistent with the literature. The relationship between market entry and innovation patents across all Australian industries was explored via a variety of regression techniques; fixed effects, random effects and ordinary least squares. In none of the regressions were there any statistically significant (at 95% confidence) relationships between the rate of firm entry and the stock of pending innovation patents or certified innovation patents. Full results are available in appendix 2.4.

3. Volume of applications is low

These macro results, and limited associations between R&D and innovation patenting, are in large part explained by the low number of applications. There are not a lot of firms that file innovation patents, and they make up less than 5% of total patent applications filed at IP Australia. Figure 2 provides a breakdown of the number of innovation patent applications by domestic and international origin, with large, SME and private inventors highlighted in the domestic applications.

Figure 2: Innovation patent applications by applicant type



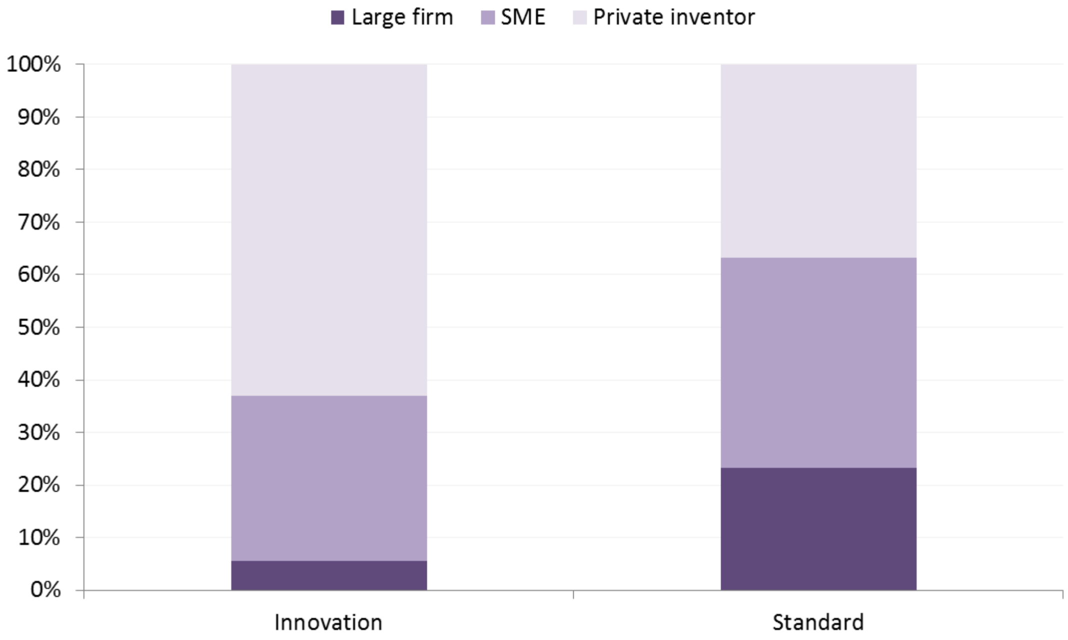
2014 data not included as firm matched data is not yet available

Since 2009 international applications have been on the rise, while Australian applications have fallen since 2012. The profile of the international applicants is also quite different from standard patents as the top foreign origins are China and Taiwan (see appendix 3.0 for details). In an economy worth more than $1.5 trillion with more than two million actively trading firms in 2013, only 623 Australian businesses filed for an innovation patent. This goes a long way to explaining why the innovation patent system does not appear in the macroeconomic effects. The question then is whether those few applications are filed by the SMEs and private inventors the system is intended for.

3.1 Australian SMEs and private inventors are the biggest filers

Innovation patent applications filed between 2001 and 2013 were mainly filed by Australians, and the majority of applicants were SMEs or private inventors – i.e. individual inventors who have no Australian Business Number (ABN). This observation conforms with Christie and Moritz's (2004, 2007) finding for the first few years of the innovation patent, and stands in some contrast to the standard patent system as illustrated in Figure 3.

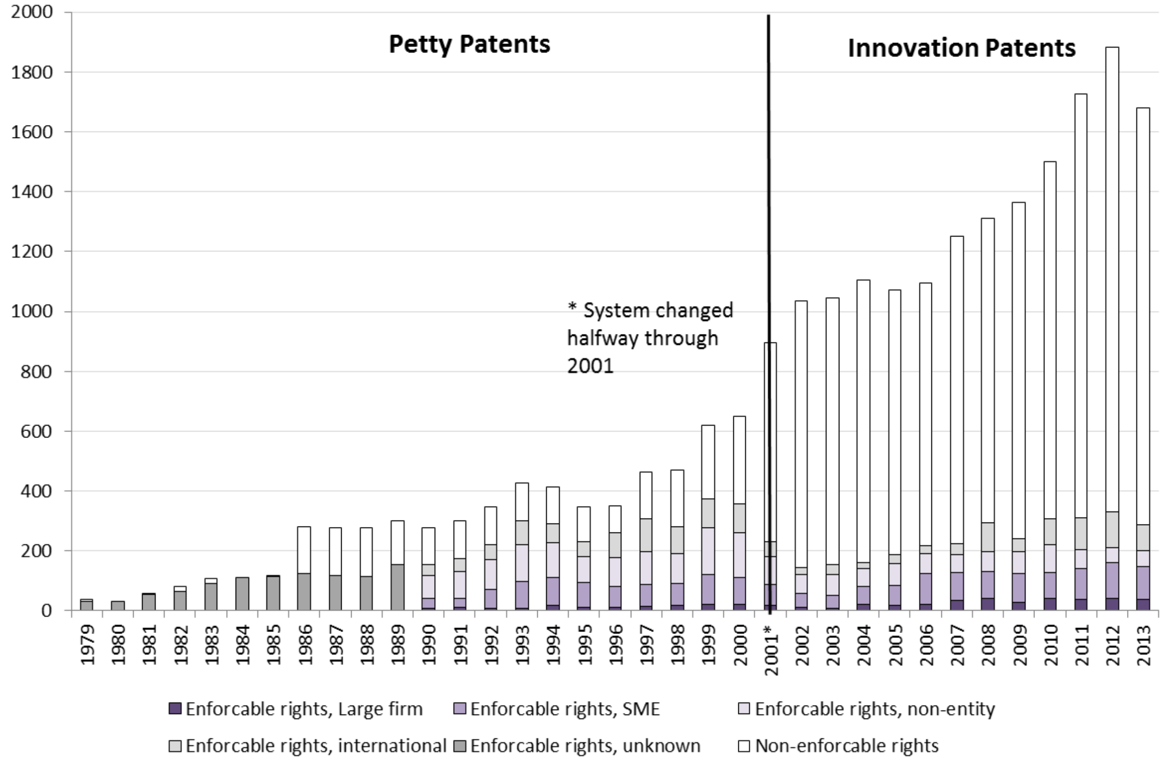
Figure 3: SMEs and Private inventors file most innovation patents, 2001-2013



As Figure 3 shows, private inventors proportionately use innovation patents more than standard patents. Both patent systems are used by SMEs to a similar degree (31% for innovation and 39% for standard), while large firms are responsible for proportionally more standard patent filings. Of the Australian innovation patent applications, 63% are filed by private inventors, followed by 31% from SMEs and 6% from large firms.

SMEs and private inventors file more innovation patents, and more second-tier patents applications were filed after the innovation patent was introduced, but any net-positive effect of the innovation patent system is most likely to revolve around the enforceable rights. Figure 4 illustrates the difference between applications and enforceable rights, showing total applications as a bar, with the shaded area indicating the enforceable rights under the petty patent system (1979-2001) and the innovation patent system (2001-2013).

Figure 4: Second-tier patents and enforceable rights, 1979-2013



While applications increased after the introduction of the innovation patent system, structural break tests confirm that the number of legally enforceable rights decreased after 2001 (see appendix 3.1). Of the 663 second-tier patent applications received in the year 2000, 357 were granted legally enforceable rights. The greatest number of legally enforceable innovation patents was 329 in 2012. In other words, after 13 years of application growth we have still not seen the same number of rights granted under the innovation patent system as we saw under the preceding system.

Non-enforceable rights still provide applicants with an option to obtain enforceable rights through patent examination. On average around 40% of petty patents filed over the years 1986 to 2000 did not pass examination and attain enforceable rights. The lack of legally enforceable rights could create uncertainty for other firms making commercial decisions where unclear rights may or may not be granted to their competitors.

In this sense most innovation patents could be considered placeholders for the applicant, providing an option to attempt to obtain a legally enforceable right. However, this option comes with an information asymmetry, where the applicant is better placed to know if the patent would pass examination than third parties at the point of application. Third parties can read patent applications that may impact their business to make their own determination of whether the patent would pass examination, but this comes at an additional cost to the third party. This creates additional costs in the marketplace, where uncertified applications may be filed to deter competitors. Prud'homme (2014: 11-12) notes that this type of uncertainty was a major factor in the decision of the Dutch and Belgian governments when they abolished their second-tier patent systems in 2008 and 2009.

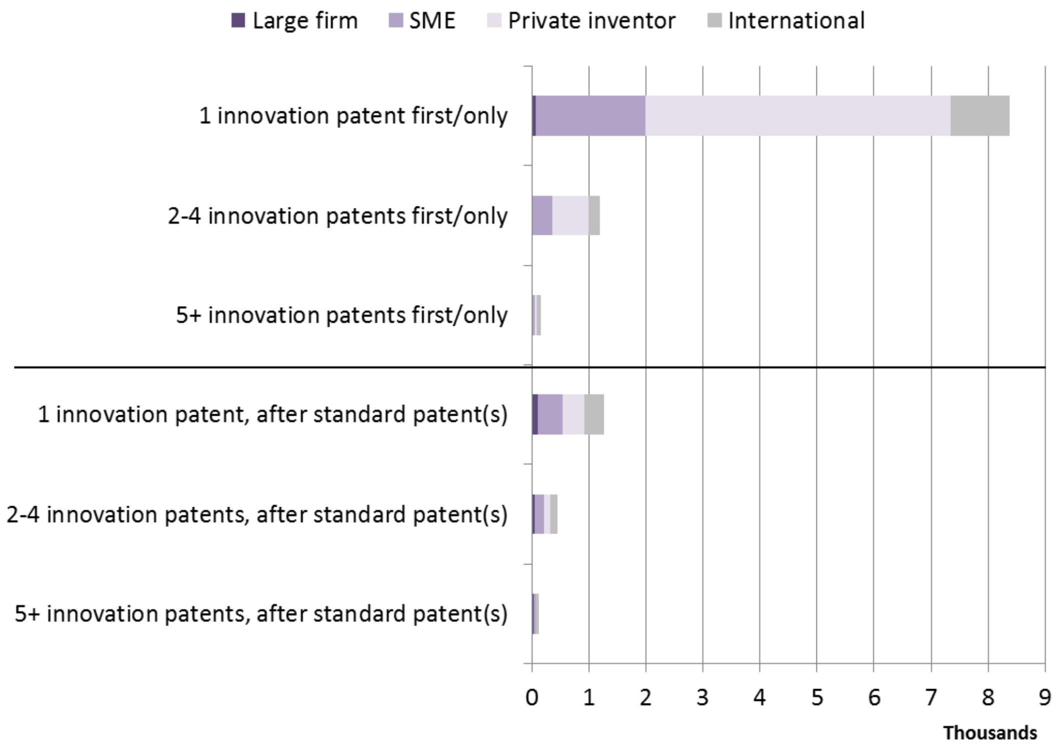
The private value derived from uncertified innovation patents in this instance comes through the application being a deterrent to competitors rather than a clear signal of a new invention. These private benefits are likely offset by costs to competitors and consumers.

3.2 SMEs are not repeat users of the system

If applicants felt the uncertainty value of patents were valuable to them, one might expect that firms that file uncertified innovation patents would be repeat users of the system. The data however suggests that the majority of uncertified applications belong to SMEs and private inventors that only file one innovation patent and do not file additional innovation or standard patents.

Figure 5 shows the number of applicants by firm size, categorised by the number of applications the applicant has filed in total and the order in which they filed them (standard or innovation patents first and those filing only innovation patents). Note that the vast majority of SME and private inventor filers did use the innovation patent system before the standard patent system (the top half of Figure 5) but mainly just filed one innovation patent.

Figure 5: Most SMEs get one innovation patent only



Large firms and international firms are mainly found at the bottom half of figure 5 and are responsible for 55% of applications in that space, indicating that they were already filing standard patents before they used the innovation patent system, and they tend to be repeat users. The issue here is that the innovation patent system was intended to be a way to encourage SMEs to innovate, and by proxy, participate in the IP system. Beyond this, one would expect that if innovation patents were found to be useful by the firms that file, they would file repeatedly. The majority of SMEs however file a single application and decide not to come back for a second time.

To test this, we adapt part of the model constructed by Kim *et al* (2012) to estimate the likelihood that an innovation patent filer pursues follow-on innovation in the form of additional patent filings. While patent filings are often used as a proxy for innovation in the literature (e.g. Aghion 2005) we are interested not just in 'innovation' as such, but in the specific instances where the innovation patent encourages firms to participate more actively in the IP system.

Using the complete set of IP applications between 2000 and 2013 for all Australian firms, with a firm size dummy to see if there are different effects by firm-size, we run a fixed effect regression to estimate the effects of standard patent filings. We find a statistically significant, but negative effect, on standard patent filing from the filing of innovation patents (see appendix 3.2 for details), indicating that firms that file innovation patents tend to file less standard patents. Table 3 sets out the results from the model, and while Kim *et al* (2012) found that second-tier patents encouraged future patent filings in Korea, we find the opposite in Australia.

Table 3: Filing an innovation patent does not encourage future standard patent applications

Explanatory Variables	**Coef.**		**Std. Err.**	**t**	**P>|*t*|**
(log of standard patent applications)$_{t-1}$	0.2905	***	0.0198	14.70	0.00
(log of standard patent applications)$_{t-2}$	-0.0760	***	0.0190	-4.01	0.00
(log of innovation patent applications)$_{t-5}$	-0.1305	***	0.0370	-3.53	0.00
(log of innovation patent applications)$_{t-6}$	-0.1790	***	0.0443	-4.04	0.00
(log of R&D expenditure)$_{t-1}$	-0.0029		0.0020	-1.46	0.14
(log of R&D expenditure)$_{t-2}$	0.0012		0.0018	0.64	0.52
Firm size dummy (51-300 employees)	0.0067		0.0108	0.62	0.53
Firm size dummy (301-1000 employees)	0.0048		0.0097	0.50	0.62
Firm size dummy (more than 1000 employees)	0.0107		0.0108	0.99	0.32
constant	0.0757	***	0.0062	12.27	0.00
sigma_u	0.3399				
sigma_e	0.1205				
rho	0.8883				

Dependent variable is the log of standard patent applications; lags replicate Kim *et al* (2012) exactly.
Statistical significance indicated by asterisks at the 10% level * | 5% level ** | 1% level ***

Some caution is warranted around these results as the Korean data used by Kim *et al* (2012) were much richer in both depth and breadth, but using the full set of data for the Australian second-tier system, the results do coincide with the behaviour observed from applicants. SMEs and private inventors, that make up the majority of applicants, file one innovation patent and do not return to file additional patents.

Looking deeper at the data we can see that of the 9,448 SMEs and private inventors that applied for an innovation patent, fully 74% (or 6,952) only ever filed one innovation patent. For those filing more than one innovation patent application, nearly half, even among SMEs and private inventors, are those that had already filed a standard patent and then filed an innovation application afterwards, as summarized in Table 4.

Table 4: Filing behaviour of SMEs and Private inventors

	SMEs	Private inventors	Total
Applicants filing one innovation patent only	1786	5166	6952
Applicants filing 2+ innovation patents only	304	620	924
Applicants filing innovation patents before a standard patent	221	240	461
Applicants filing standard patents before an innovation patent	633	478	1111
Total	2944	6504	9448*

*Note, this figure excludes 175 applicants that applied for their first standard and innovation patent at the same time. Due to the marginal impact these applications have on results, these applicants are not included in subsequent analysis and separate findings are available at appendix 3.2

This suggests that only 1,385 applicants, or 15% of the SMEs and private inventors that file, started with the innovation patent system before going on to file at least one more patent right.

There are very few Australian applicants among the heavier users of innovation patents that filed five or more innovation patents where the first was an innovation. 90 SME and private inventors fall into this category, or less than 1% of all SME and private inventor applicants. If we further narrow the group to only include applicants that have at least one of their applications pass examination, we are left with 36 SME and private inventor applicants over a 12 year period (0.4% of all SME and private inventor applicants). Finally if we look at those that have filed 10 or more innovation patents we are left with just 3 SMEs and 4 private inventor applicants (0.07%). In other terms, there are 7 Australian SMEs and individuals who:

- used innovation patents as an introduction to the patent system,
- used the system extensively (with 10 or more applications), and
- valued the net benefits of certainty of enforceability more than the cost of examination for at least one application.

For comparison, consider that only 0.4% of SMEs and private inventors are moderate users of the innovation patent system, but roughly seven times as many, or 2.9% of SMEs and private inventors, are moderate users of the standard patent system. By moderate users we mean that applicants filed five applications between 2001 and 2013, and had at least one successfully examined. Table 5 indicates the small number of SMEs and private inventors that are repeat users of the innovation patent system, which is multiples smaller than the SME use of the standard patent system.

Table 5: There are almost no serial SME users of the innovation patent system

	Innovation patents			Standard patents		
	SME	Private Inventor	% of total	SME	Private Inventor	% of total
Moderate users: Number of applicants filing 5 or more	23	14	0.4%	389	74	2.9%
Heavy users: Number of applicants filing 10 or more	3	4	0.1%	125	11	0.9%

Rounded to nearest decimal point, percentage of total applicants shown in table

This shows that the innovation patent system has attracted significantly less SME and private inventor applicants than the standard patent system and further supports the evidence that the system has not been successful in encouraging SMEs and private inventors to increase their participation in the patent system for follow-up innovation.

3.3 Large firms certify and renew innovation patents

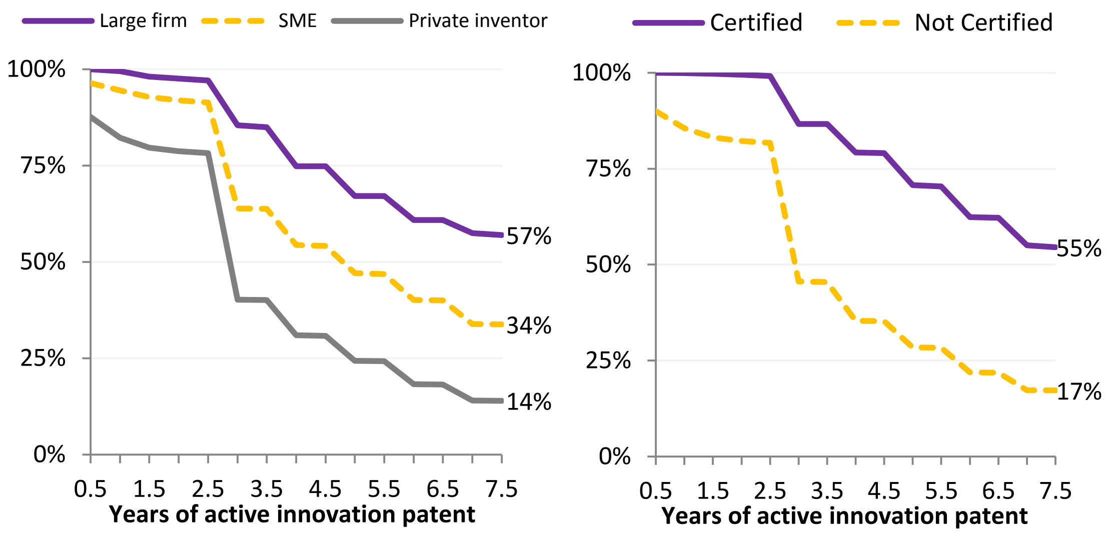
Very few SMEs and private inventors file multiple applications, and the follow-on issue is whether applicants see value in certifying and renewing their innovation patent. If applicants value the enforceable patent over the uncertainty provided by an uncertified patent, then applicants would be expected to certify their applications.

Looking at the data, we see that larger firms have a far greater propensity to certify their patents than SMEs and private inventors. Large firms, SMEs and private inventors certify their patents for 44%, 24% and 11% of applications (see appendix 3.3 for details). SMEs and private inventors together certify 17% of their applications (or inversely, 83% of their applications are never certified). From this we could deduce that either large firms place greater value on the knowledge that their patent is enforceable, or smaller firms and private inventors place greater value on creating uncertainty costs for their competitors, or some combination of the two. The first is considered most likely, as larger firms tend to place greater value on risk mitigation strategies.

A decision is made annually by applicants to renew or lapse their patent. From an economic viewpoint, the decision to renew is rational if the value of the patent to the applicant is greater than the cost of renewal, with the cost of renewal ranging between $110 and $220 in 97% of cases (detail on renewal cost structure available at appendix 4.3). The decision to let the patent lapse is rational if the value of the patent is less than the cost of renewal at the time of decision. Effectively, when applicants do not renew they demonstrate that the patent protection itself holds little additional value to them.

When we compare who renews their innovation patents we find that large firms have a much greater propensity to take innovation patents to their full 8 year term. Moreover, large firms are also more likely to certify their innovation patent, which in turn is linked to patent longevity as demonstrated in Figure 6. Figure 6 shows the rate at which innovation patents are allowed to lapse depending on the firm size of the applicant and the choice to certify.

Figure 6: Innovation patent renewal by firm size and certification



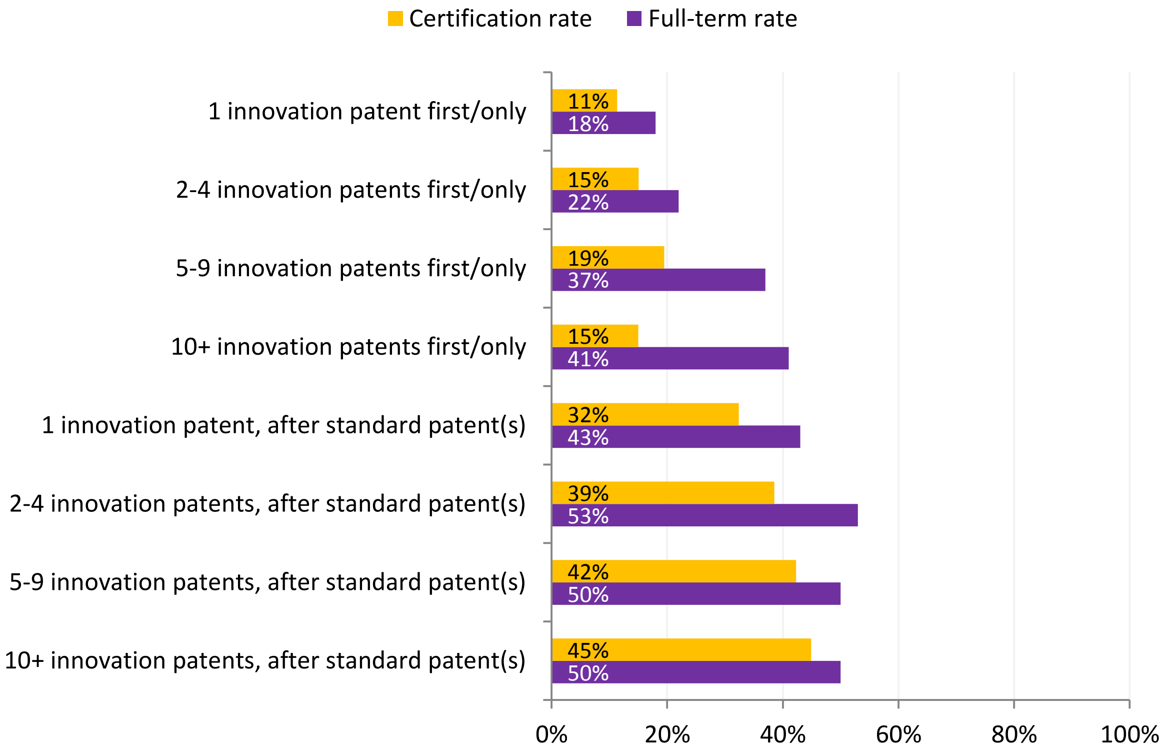
Details on how active patent life is calculated is available in appendix 3.3

This shows that fully 57% of innovation patents filed between 2001 and 2006 by large firms went to term, noting that we can only look at this cohort as later applications have not yet had the chance to reach their 8 year term. The drop in the third year indicates that SMEs and private inventors in particular choose not to pay the first renewal fee (of $110), and simply lapse their application. Being aware that small firms have a higher risk of closing down, we looked to see if the decision to lapse innovation patents were affected by the de-registration of an SME from either the Australian Business Register or from paying GST. We found less than 100 instances where the choice to lapse occurred within a year of de-registration, and conclude that SMEs are actively choosing to lapse their innovation patent.

The implication is that large firms have a revealed preference for maintaining innovation patents, implying that they value the patents more than small firms, which in turn value them more than private inventors.

Looking at patents that go to full term, Figure 7 shows the percentage of applications that are certified and taken to their full term. The top half of Figure 7 shows that the applicants that use the innovation patent system as their first point of entry, or only file innovation patents are less likely to certify and less likely to take the patent to its full term. This category is dominated by SME and private inventor applicants.

Figure 7: Repeat patent users certify more and hold rights longer



The full-term renewal rates are highest among those firms that already use standard patents, indicating that those that were already innovating (and unlikely to have been incentivised by the innovation patent system) are receiving the most value from the system.

Even in the case where applicants file 10 or more innovation patents, and used the innovation patent first or exclusively, the certification rate is only 15%. This is because applications in this category are dominated by international applicants that filed 323 of the 633 patents – only 16 of which have been certified (see appendix 2.0 for more information on international applicant filing behaviour)

3.4 Most SMEs and private inventors get little value from innovation patents

Following the logic that the decision to certify, and the decision to pay the renewal fee to maintain patents is a proxy for the value of the patent to the applicant (Schankerman 1998), the factors associated with renewals are important. A number of things impact on the expected lifespan of an innovation patent, the most notable of which include:

- Firm size of applicant (larger firms' applications live longer)
- Certification status of the patent (certified applications live longer)
- Whether the applicant used an agent or represented themselves (those that use agents live longer)
- Whether the application was a divisional child of a standard patent (far more likely to live longer), and

- The prior patenting experience of the applicant (applications by more experienced applicants, particularly those who use standard patents, live longer).

Innovation patents that were filed by large firms that used agents, have used standard patents before, were the divisional child of a standard patent and were certified have an early mortality rate of just 12%, meaning 88% go to term (off an extremely low base of 26 patents). On the other hand, innovation patents that are filed by self-represented private inventors, that are non-divisional, not certified and where applicants have never filed a standard patent have an early mortality rate of 94%, leaving only 6% to go to term (off a significant base of 1,521 applications).

These variables are multicollinear in that they are highly correlated with each other. For instance, innovation patents filed by large firms have better survival rates than private inventors. The implication being that SMEs and private inventors on average hold lower value innovation patents than large firms.

4. Private value accrues to a small minority

In considering the value of the innovation patents system, what we really want to know is the value that innovation patents add to inventions. As outlined by Mark Schankerman (1998: 77) in his work on patent valuation “the private value of patent rights represents the *incremental* returns generated by holding a patent on the inventions, above and beyond the returns that could be earned by using the second best means”.

The value of a patent comes from having a legally enforceable monopoly over an invention for the term of the patent. Regardless of whether a patent is taken out, the inventor can still use their invention; the added value of a patent is that the applicant can enforce the right provided by the patent to stop others from using the patented invention. This enforcement is not automatic, and requires the patent holder to have sufficient resources to oppose those in breach of the patent. Nonetheless, the disincentive to competitors and the patent holders’ option to enforce has an added value that provides additional financial incentive to inventors.

For policy makers trying to figure out the value added by patent rights, seeking the total value of an existing invention will over-state the value added by patent rights for two reasons. Firstly, it will include the value of the invention itself, which would still be valuable even if it was never patented, and secondly, legally enforceable monopoly rights over the invention may become more valuable once public disclosure of the invention is made under the patent system. To assess the private value generated by the innovation patents system, we’re interested in the prospective value-add of patents (see appendix 4.0 for details).

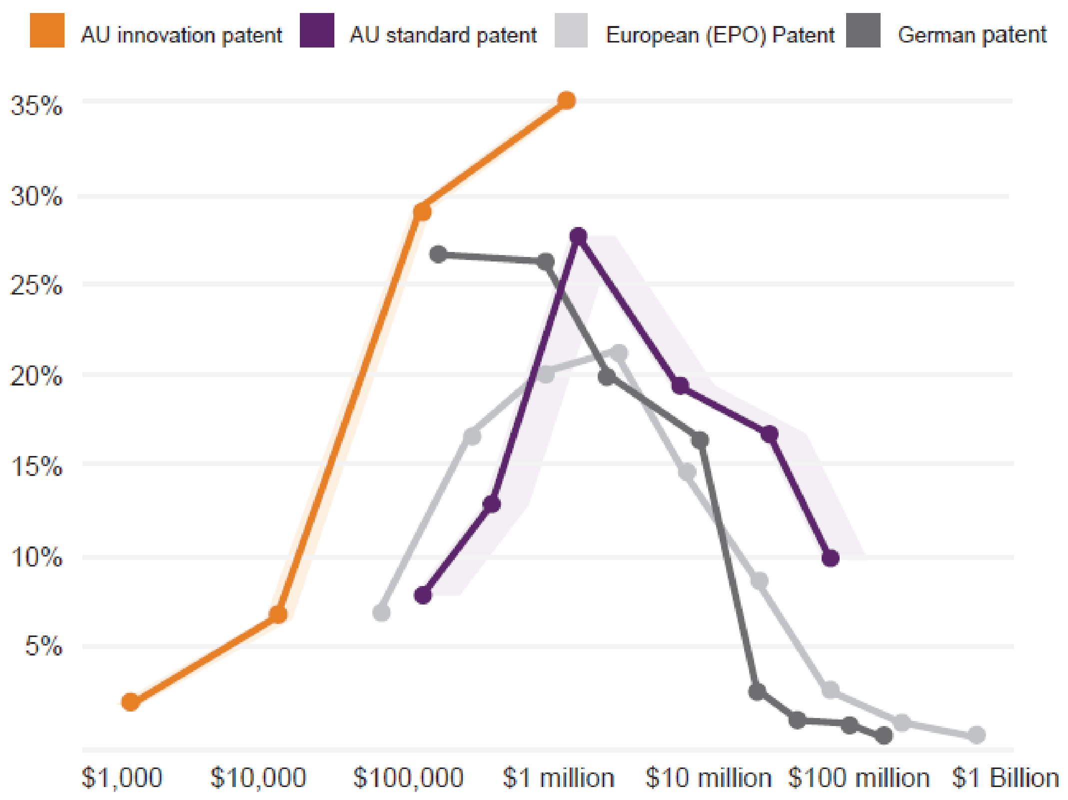
There are three main methods of valuing patents in the literature, including: 1. patent renewal methods (e.g. Schankerman & Pakes 1986) 2. stock market value through Tobin's Q (e.g. Hall *et al* 2007), and 3. inventor surveys.

For this report we did not pursue estimates through the renewal method, as it requires us to assume perfect information and perfect foresight on behalf of the patent owner, and is very sensitive to the assumed form of distribution of patent values (see appendix 4.0 for details). Method 2, using Tobin's Q to see the impact that innovation patents have on stock market prices was not deemed appropriate for the policy intent, as this would mainly show the implied value to large firms, and not SMEs that tend not to be listed on the Stock Exchange. Below we have used method 3, inventor surveys, as we expect this to give the highest average valuations, and we are interested in the upper boundary of value. Usefully, a survey exists for the innovation patent system in Australia and we can compare this to surveys from other countries.

4.1 International and domestic comparison of patent value

We have found four surveys of patent value in the literature, of which one looks at the innovation patent system. Figure 8 shows the value distributions for standard and innovation patents granted in Australia, Germany and by the European Patent Office. These values represent the value that inventors judged their patents to be worth at the time of the survey. The x-axis is a log scale of 2014 Australian dollars and the y-axis indicates the proportion of patents that fall within a certain value estimate range.

Figure 8: Patent value distributions in 2014 Dollars



Source: Verve Economics (2013), Harhoff *et al* (2003), European Commission (2005), Jensen *et al* (2009), IP Australia data transformation (see appendix 4.1). These value distributions are the percentage of patents to fall within a value range plotted against the mid-point of that value range.

Best estimates of normalised data are shown in solid lines. Because the surveys were run across different periods in different countries and currencies there is some variability around the estimated 2014 dollar values, as indicated by a shaded area around the best estimate. This occurs as we have converted the currency to Australian dollars and applied an inflator as detailed in appendix 4.1. Briefly, the variation in value estimates for European Patent Office data is + 10%, Australian innovation patents data - 15% to + 15%, and Australian standard patents data - 13.5% to +78%.

Since Figure 8 is on a logarithmic scale the visual difference of shifting any of the value distributions to the upper or lower bound does not significantly alter the overall impression of the distributions in relation to one another. No upper or lower bound line is shown for German standard patents, as the data was consistently denoted in 1980 German marks.

The valuations presented in Figure 8 are a mixture of the value-add of the patent and the invention, since the figure shows inventor valuations of standard and innovation patents subsequent to a patent being taken out. The results, therefore, reflect the value of the invention plus the premium gained from having patent protection.

For all surveys, data was sourced as interval data, that is, the number of patents that fell within given valuation intervals. Note that in all four surveys the upper most valuation interval is unbounded, and a mid-point has not been calculated.

For the Australian innovation patent data (Verve Economics 2003) this causes a problem as 25% of data lies in its unbounded upper interval and therefore 25% of data are not explicitly reflected in Figure 8. While for the other surveys the quantity of observations in the unbounded area was much lower, at 0.3%, 0.77% and 1.23% for German, European and Australian standard patents, respectively. Hence, the appearance that the innovation patents value distribution stops well before the others is at least in part an artefact of the interval boundaries chosen in the surveys.

4.2 An estimate of the private value-add of innovation patents

The fundamental question here becomes one of how much of an innovation patent's value is attributable to patenting, rather than to the value of the invention itself. An invention itself holds an implicit value to inventors which could then be added to by a patent through restricting competitors from using that invention. There is no direct way to calculate this for Australian innovation patents with the available empirical evidence, but the innovation patent value distribution combined with patent premium estimates for the US allow us to get an estimate of the magnitude of their value-add.

Given the greater inventive step required and the higher maximum patenting period for standard patents relative to innovation patents, it seems plausible that there is a difference in the value distributions of the inventions. This follows from the combination of two observations: 1. the idea that monopoly over the use of an invention is likely to be positively related to the value of the invention itself, since the more valuable an invention, the more valuable it may be to exclude others, and 2. where a monopoly over an invention is more valuable and the inventive step requirement is met, a prospective patent owner has an incentive to seek out the longer maximum patenting period. These observations lead to the conjecture that the standard patent system attracts more valuable inventions.

It seems reasonable to assume that the more valuable an invention is, the greater the value of excluding others from it. But there is no reason to believe that the value of the patent premium is different between innovation patents and standard patents. i.e. it could be the case that both types of patent add a 10% premium to the invention. Because the innovation patent attracts lower value inventions the total value-add of the patent and invention is on average lower than inventions protected with standard patents. The data is not inconsistent with this proposition although we have no way of verifying that this is the case. On the other hand, it could be the case that inventions filed in both systems have the same value, and the innovation patent provides a lower premium – and this would be consistent with the observed values as well.

We can try to get at the magnitude of the value of the patent premium by applying findings from the related literature. Arora *et al* (2008) estimate the patent premium for standard patents in the US, using data on patenting from the early 1990s. A number of simplifying assumptions have to be made, as detailed in appendix 4.2, which include the assumption that innovation patents have patent premia comparable to standard US patents. We take the highest and the lowest patent premium estimates and apply them to the innovation patents survey data gathered by Verve Economics (2013), treating the $1m+ patents as being worth just $1m. To get an upper value bound we assume that Verve Economics survey respondents are representative of the active population of innovation patents at the time of the survey, plus those that had expired at full term. This leads to an expected upper bound value-add of the innovation patent being $40m per annum, while the expected lower bound, where we treat the survey respondents as un-representative, gives a value of $10m in private value-add per annum. These estimates are the expected bounds of the average annual present value of innovation patents' value-add.

Using the patent valuation method of surveying inventors, which we expect would provide the highest patent value estimates, and a set of assumptions to get the upper and lower bounds of the expected average annual present value, we conclude that the private value-add of the innovation patent system is in the low tens of millions.

Our assumption would be that applicants who hold innovation patents that have a very high patent value-add would renew the innovation patent for longer to preserve this value. We know that the majority of firms that behave in this manner are large firms and international firms, which consequently presumably gain the largest private benefit from innovation patents.

4.3 The regulatory burden falls on SMEs and private inventors

While the private monetary benefits are quite uncertain, the private regulatory cost is relatively easy to estimate. We know that applicants fulfil a number of administrative requirements to participate in the innovation patent system and these requirements carry regulatory compliance costs. We calculate the regulatory costs according to the Office of Best Practice Regulation guidelines (with a detailed breakdown in appendix 4.3) and include:

- cost of time spent filing patents,
- cost of time spent renewing patents,
- cost of time spent requesting examination and subsequent amendments for examination,
- cost of time spent in disputes, both for applicants and defendants of the dispute.

Without the innovation patent system these regulatory costs would not be incurred. The costs amount to approximately $11.6m per annum, based on consultations conducted by KPMG on behalf of IP Australia in preparing IP Australia's 2014 regulatory audit. The lower and upper bound of these annual costs are a minimum of $5.8m and a maximum of $17.3m.

The regulatory costs include the time spent by both Australian applicants and their representatives. Consistent with OBPR guidelines, time spent by Australian agents working for international applicants is also included, but the time spent by international applicants themselves is not.

These costs accrue evenly across domestic applications, as the administrative requirements do not change depending on the applicant and it is only the time of international applicants that is not counted. This means that since large firms file 5.55% of all domestic innovation patent applications they absorb 5.55% of all administrative costs tied to domestic applicants. The midpoint estimate of all domestic costs (rounded to nearest thousand) across firm sizes is set out in Table 6 indicating that the regulatory burden falls mainly on SMEs and private inventors:

Table 6: Annual Regulatory cost of the innovation patent system

	Large firm	SME	Private inventor
Filing costs	$561,000	$3,180,000	$6,359,000
Renewal costs	$14,000	$78,000	$156,000
Examination costs	$24,000	$135,000	$271,000
Opposition costs	$20,000	$114,000	$228,000
Total regulatory costs	$618,000	$3,508,000	$7,013,000

SMEs and private inventors therefore incur approximately 95% of the regulatory burden imposed by the innovation patent system on domestic applicants. In addition to these costs, Australian agents incur a regulatory burden of around $445,000 (mid-point estimate) for international applicants using Australian representatives.

IP Australia's fees were not counted in the regulatory costs, as they are not considered a regulatory burden by OBPR guidelines. For the purpose of understanding the total private costs incurred by applicants, fees paid by Australian applicants have been calculated in Table 7.

Table 7: Annual private cost from fees

	Large firm	SME	Private inventor
Fees	$71,000	$296,000	$381,000

The fees included in the calculation were the application fee (ranging from $180 to $280 depending on application method), the renewal fees (ranging from $110 to $270 depending on both the renewal method and the number of years the patent is renewed for), and examination fees of $500. Additional fees that were not calculated due to data limitations include the request for re-examination ($1,200) and late payments of renewal fees ($100). These additional fees are not expected to significantly alter the fee calculations, but mean that the totals are slightly below the actual annual cost.

Overall, the majority of both the regulatory burden ($5.8m to $17.3m) and the fees ($0.7m) fall on Australian SMEs and private inventors.

4.4 Third party costs off-set private value

The literature discusses third party costs imposed by intellectual property rights as the additional costs to consumers and opportunity costs of other firms that are unable to act, given the short-term exclusivity of the patenting firm. Where IP rights are effective in establishing exclusive rights, there can even be a decrease in innovation activities due to increasing transaction costs of subsequent innovators, limited imitation causing a natural inhibition to technological change, or delays to the commercial exploitation of future innovation (see for example Kanwar & Evenson 2003 or Hall & Harhoff 2012).

While there are a range of third party costs that undoubtedly exist to some degree, it is unclear how they can be measured for the innovation patent. The theoretical costs can be shown to exist under certain circumstances, such as when innovation is sequential and complementary, or when innovations are small, but knowledge of the proliferation of these circumstances across the economy, and assigning an actual monetary cost to them is not a simple task. The literature traditionally shows that the positive incentive effects of the IP right system will off-set these third party costs, but in the case of the innovation patent we have not seen any evidence of such off-setting effects or additional incentives to innovate. Given that foreign applications are unlikely to disclose any 'new to world' inventions to the Australian market, it is likely that third party costs have a net negative impact. Quantifying these costs has not however been possible.

Where applicants value their own certainty to be able to enforce less than the uncertainty cost to competitors – as appears to be the case for innovation patents that are not certified – it is likely that third party costs would directly off-set the private value.

5. The economic impact

We investigated whether having innovation patents would encourage R&D and traditional patent applications that would not otherwise have occurred, particularly by SMEs. The evidence suggests that this does not happen;

Private inventors and SMEs do participate in the innovation patent system, but the vast majority, 74% of all applicants between 2001 and 2013, only ever file one innovation patent, and tended to allow their innovation patents to lapse early, rather than pay the renewal fee. This suggests that the vast majority of SMEs found little value in the system, or at least not enough value to use either the innovation or standard patent system again, or indeed pay the renewal fee of $110 to $220. We found evidence that the system discouraged follow-on patenting or innovation if we consider additional patenting a proxy for innovation. If we broaden that group of SMEs and private inventors out, to define a set of light users of the innovation patent system, we find that 86% of SMEs and private inventors only ever file 1-4 innovation patents and never file any standard patents.

Only 1% of the SME and private inventors in the innovation patent system are moderate to heavy users of the system: They entered the patent system by first filing an innovation patent and filed at least 5 applications over the 12 year period, having at least one examined. This is the type of repeat use which would indicate a perception of additional value from each innovation patent. Of the 9,644 SMEs and private inventors that filed innovation patents, only 37 entities fall into this category. With that in mind, it is not surprising that we see no macroeconomic effect from the innovation patent system.

The innovation patent system may or may not have a net benefit in aggregate terms. The private value generated by innovation patents appears to be in low tens of millions of dollars, and this should theoretically accrue mainly to firms that maintain and certify their patents, of which large firms hold the greatest proportion. The regulatory and private cost of the system is equally in the low tens of millions of dollars, but fall mainly on private inventors and SMEs. It is not possible to quantify the third-party costs, but even if they were relatively low costs, the system would not be expected to yield an aggregate net benefit. The distribution of costs and benefits are however skewed against SMEs. We estimate the range of regulatory burden to be between $5.8m and $17.3m per annum. The majority of domestic costs, around 95%, falls on SMEs and private inventors, suggesting that since its introduction, the innovation patent system has imposed a regulatory cost on SMEs and private inventors exceeding $100m.

Contrary to evidence in developing countries, the innovation patent system does not appear to have resulted in higher sales growth or more innovation as proxied by patenting in Australia. The innovation patent system does attract R&D spenders, but only in the manufacturing industries, while the standard patent system also attracts firms in the manufacturing industry and it is also is used by a broader range of industries.

We find evidence that innovation patents have some positive effects, but in the one area of impact, firm survival, standard patents are found to have a bigger positive effect, and there is no effect from certifying innovation patents.

ACIP (2014: 38-39) noted that while large international companies may obtain private value from the system, it is unlikely that the innovation they are protecting would not have occurred if not for the innovation patent system - i.e. that the innovation patent system did not incentivise the innovation as such, and is therefore imposing a deadweight cost on third parties. The majority of innovation patents are not certified, and so the value of these patents are likely to exist in the uncertainty they create in the marketplace, a key factor in abolishing the system in the Netherlands and Belgium.

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