



SUMMARY OF SELECTED GLOBAL COMMERCIALISATION METRICS: 2004 - 2019

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INTRODUCTION

The commercialisation of research has never been more important as humanity faces some of its greatest challenges. From vaccines that protect us against COVID-19 to technologies that offset and defer the consequences of climate change, the impacts and availability of these technologies are largely due to the commercialisation of research through a professional activity known as technology transfer, knowledge exchange or research commercialisation.



Globally the policies that underpin government support for the commercialisation of research are reviewed on a regular basis, with nations undertaking the challenging task of comparing the performance of international peers to help inform decisions and identify best practice. This exercise is challenging as there is no comprehensive normalised global benchmarking of research commercialisation metrics.

As the global peak body for the rapidly expanding technology transfer profession, ATTP has undertaken to maintain global standards for the activities and functions performed by our alliance members. We have compiled the following global benchmark report detailing the most common research commercialisation metrics. We hope that this report is used to inform quantitative assessment of research commercialisation performance and allow data and evidence-based decision making when considering research innovation policy.

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Chair, ATTP

WHAT IS TECHNOLOGY TRANSFER

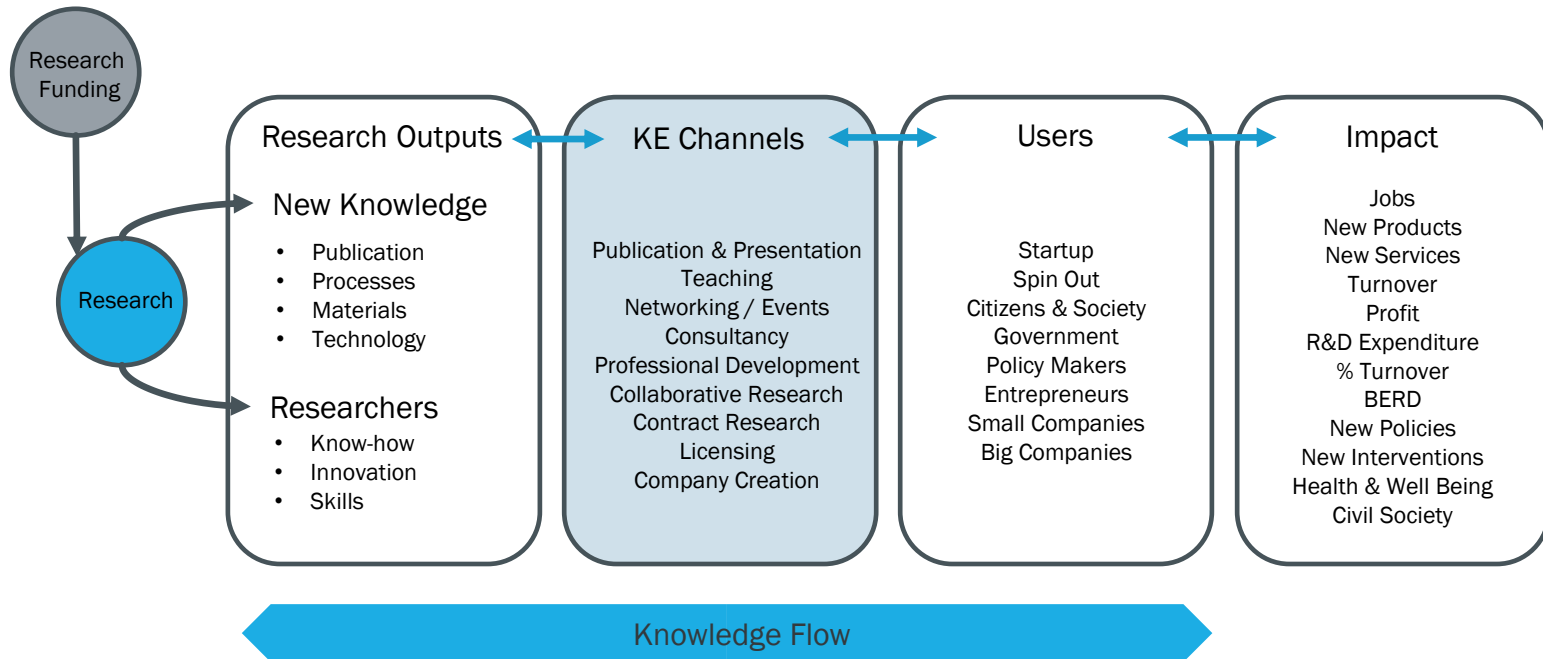
The ATTP alliance associations from around the world have adopted a single, agreed definition for Technology Transfer/Knowledge Exchange/Research Commercialisation. The agreed definition is:

Technology Transfer/Knowledge Exchange/ Research Commercialisation is a collaborative, creative endeavour that translates knowledge and research into impact in society and the economy.

This definition has been globally accepted and incorporated into best practice frameworks, including the Knowledge Exchange Concordat in the United Kingdom. The definition combines three elements which form the essential process for effective transfer, exchange, and commercialisation of knowledge or technology:

- A. Using skill and creativity to collaborate with partners
- B. Effectively translating and mobilising output from knowledge generators
- C. Leading to benefits and impact

THE KNOWLEDGE EXCHANGE SYSTEM



Technology Transfer, Knowledge Exchange and Research Commercialisation is best summarised by the model above developed by former ATTP Chair, Dr Kevin Cullen RTP.

The activities involved in the creation of products and services from the outcomes of research have evolved over the past twenty years. This has seen a shift from intellectual property licensing to include broader functions such as supporting innovation and entrepreneurship, developing industry research partnerships, and developing innovation ecosystems through the establishment of technology incubators and innovation precincts. The expectations have also evolved over time and now extend well beyond the monetisation of intellectual property to include the valorisation of research innovation for broader economic development for the benefit of society and the economy.

THE MEASURES

The measures selected in this global benchmarking exercise are in no way comprehensive, and are representative of the most commonly available metrics that can be compared on a normalised basis. The metrics considered include: research output performance as an input to research commercialisation, the quantum and efficiency of technology transfer and new venture creation through spinout companies.

Office Resourcing: Office staff involved in the Commercialisation of Research. This is the average staffing level per office involved in knowledge exchange, technology transfer or research commercialisation activity.

IP Disclosures: The intellectual property and research output disclosed to the technology transfer (or similar) office responsible for dissemination via the activities described in the “KE Channels”. IP Disclosures are an input to the knowledge exchange system.

Licensing Activity: The number or volume of transactions via licenses, options, and assignments (LOA) involving disclosed intellectual property. A higher rate means more transactions have occurred.

Revenue: The financial return from transactions returned from licenses, options, and assignments (LOA) involving disclosed intellectual property. A higher rate means more income from commercialisation.

Efficiency: The level of knowledge exchange occurring across the system. This is measured as the ratio of transactions to IP Disclosures that occur. A higher rate means more research outcomes are in the hands of partners who can build new products and services.

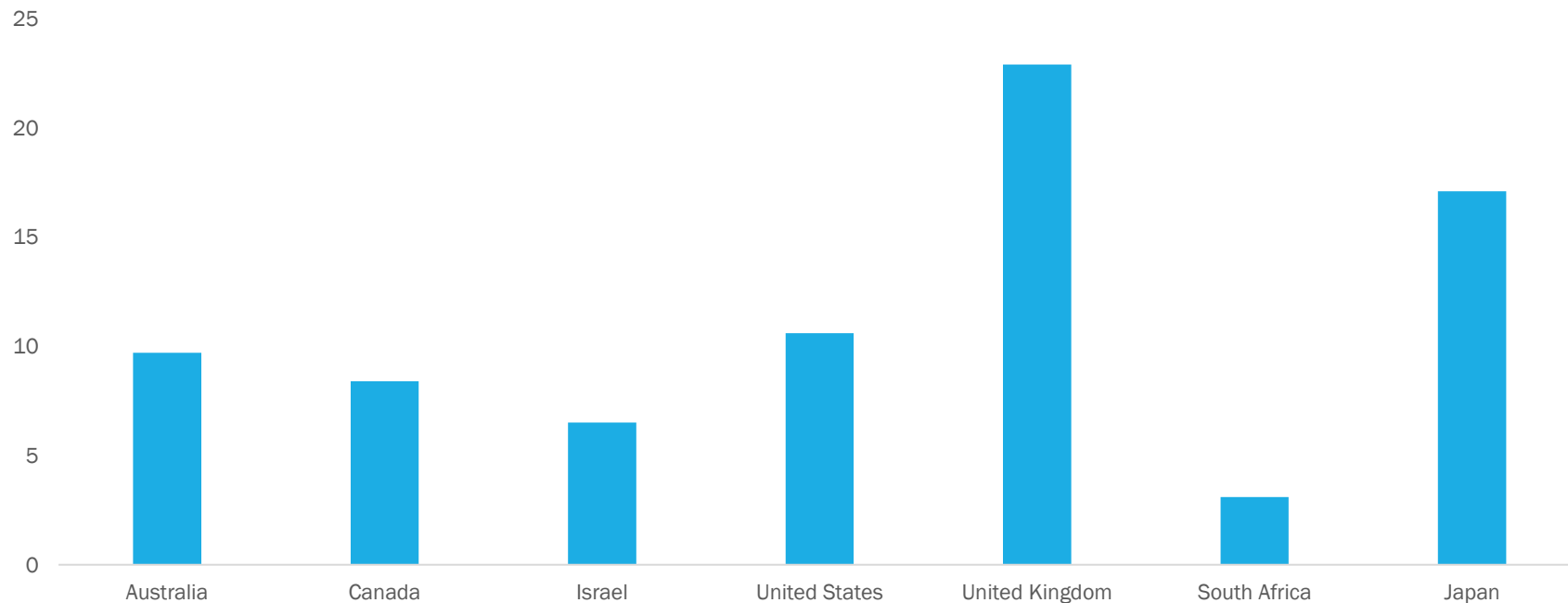
Spin-Out Activity: The number of new companies created from knowledge exchange, technology transfer or research commercialisation activity.

OFFICE RESOURCING

Resourcing for Commercialisation – Commercialisation FTE per institution (No.)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Australia	7.9	8	7.9	7.9	11.1	11.6	11.2	11	10.3	12	9.47	8.92	8.45			
Canada	8.3	7.8	7.9	9.1	9.9	9.5	8.9	9.1	9.5	8.8	8		4.7			
Israel						4.3		6.2	5.3	7.1	5.5	6.2	6.7		6.7	10.1
United States	8.3	6.9	9.6	9.9	11	11.6	11.8	11.7	11.8	11.6	12.3					6.6
United Kingdom	14.1	17.1	21.6	24	25	25.1	25.7	26.5	27.5							
South Africa															3.1	
Japan							19.2	16.2	17.9	18.4	16.3	15.3	15.1	16.4	18.0	18.5

Historical average per institution for FTE resource dedicated to commercialisation

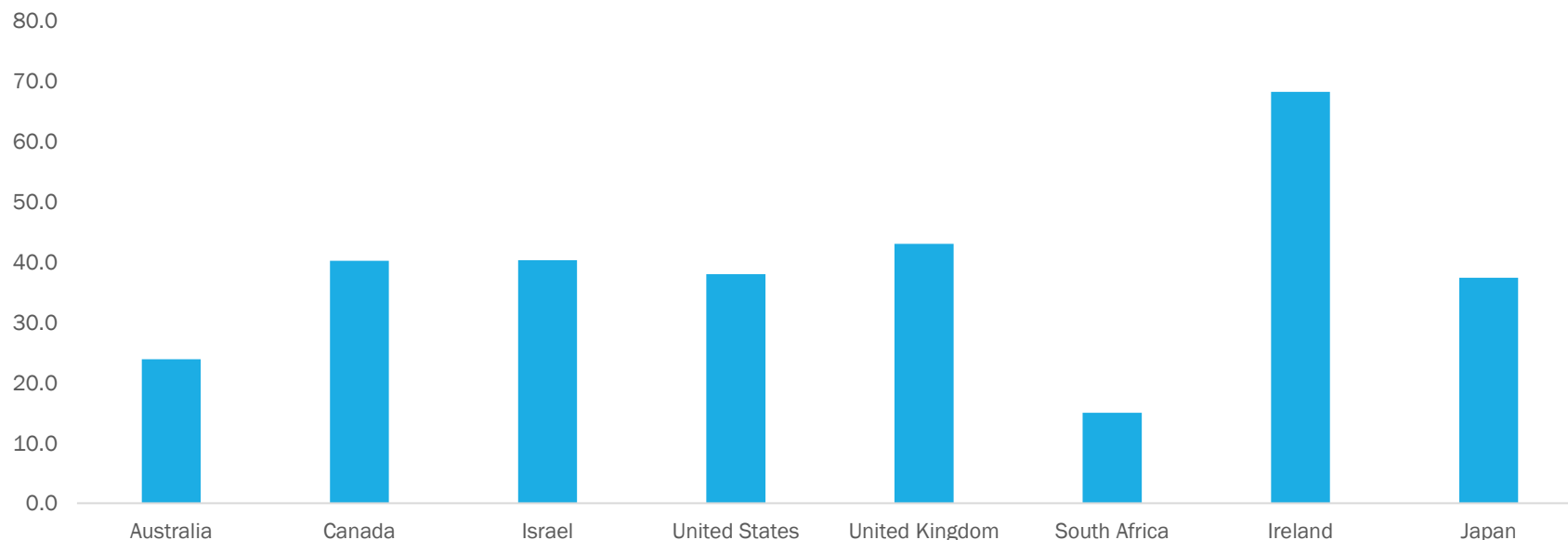


IP DISCLOSURE

Intellectual Property Activity - Invention Disclosures per USD100m Research Expenditure

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Australia	26.4	23.6	26.1	25.6	27.1	27.4	28.3	40.5	21.3	21.2	17.1	20.3	18.4	19.5	20.5	19.5
Canada	39.6	41.1	39.3	43.7	40.9	64.7	34.7	40.8	39.3	42.7	40.4	37.2	33.8	37.1	35.4	32.8
Israel									43.1	36.6	49.7	39.6	43.2	34.6	41.3	34.2
United States	40.9	41.1	41.6	40.6	39.1	37.6	34.9	35.6	37.2	36.9	38.3	38.0	38.6	36.7	36.6	33.8
United Kingdom	49.2	53.1	52	48	41.8	41	45.8	46.7	44.5	43.5			38.3	36.4	36.5	25.7
South Africa											15.7	16.5	12.9	13.0	17.1	
Ireland										77.4	67.5	70.3	68.4	71.2	64.3	58.0
Japan							45.3	39.6	38.3	34.8	35.5	35.4	37.5	35.8	35.2	36.2

Historical average number of Invention Disclosures per US\$100m Research Expenditure

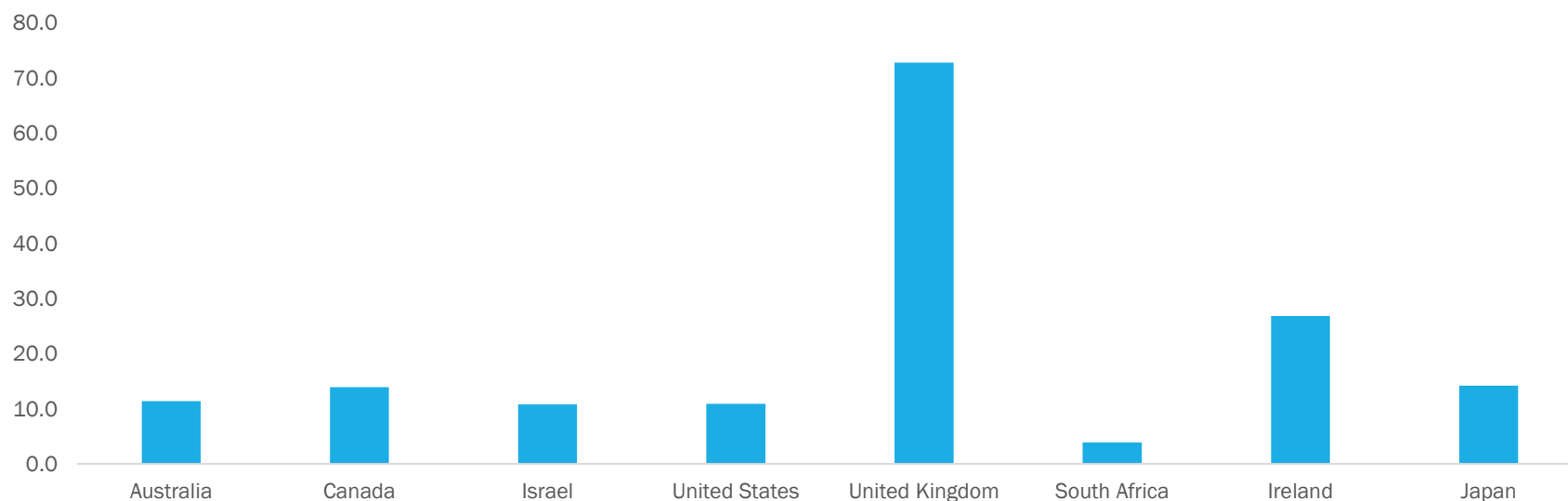


LICENSING ACTIVITY

Licensing activity – Licence, Options and Assignments (LOA) Executed per USD100m Research Expenditure (No.)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Australia	10.5	11.5	12.4	11.7	9.5	9.3	8.8	11.9	7.5	9.4	10.4	9.1	10.9	16.5	16.6	16.6
Canada	16.4	16.4	12.0	16.0	14.2	14.2	10.8	13.0	12.0	9.4	12.1	14.4	18.4	13.9	15.7	13.8
Israel										9.3	9.8	8.2	10.9	7.3	13.3	17.0
United States	11.6	11.7	10.9	10.5	10.0	9.9	9.1	9.9	10.0	10.1	11.0	11.9	11.6	11.5	13.0	12.6
United Kingdom	34.1	41.5	45.6	42.4	48.9	50.3	55.2	78	93.9	146.5			56.8	135.4	98.4	92.0
South Africa											2.9	4.2	3.6	4.9	3.9	
Ireland										23.3	26.8	31.1	27.6	23.1	28.8	26.5
Japan							8.6	7.2	10.4	10.3	12.1	12.4	13.4	15.1	21.2	31.9

Historical average number of LOA per US\$100m Research Expenditure

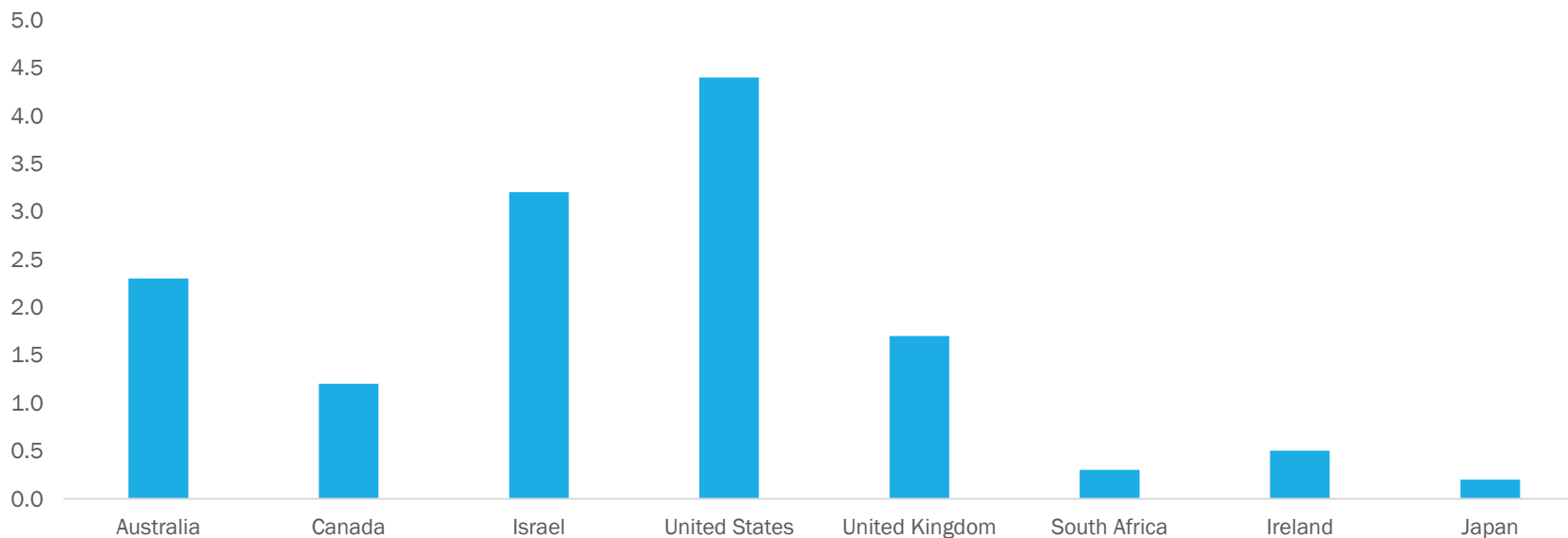


REVENUE

Ratio of LOA Income to Research Expenditure (%)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Australia	1.3	1.4	2.2	3.4	1.5	4.0	1.9	2.2	3.5	1.3	1.3	2.0	1.3	5.1	1.6	2.2
Canada	1.4	1.2	1.4	1.2	1.0	1.0	1.0	1.2	1.3	1.0	1.5	1.0	1.2	1.2	1.3	1.2
Israel									3.8	3.3	3.7	3.9	2.8	2.2	2.5	
United States	3.6	5.0	4.8	5.5	6.7	4.3	4.1	4.0	4.1	4.2	4.3	3.8	4.4	4.6	4.1	3.3
United Kingdom	1.5	1.4	1.3	1.4	2.1	1.3	1.1	1.2	1.3	1.9			2.2	1.9	2.5	2.6
South Africa											0.3	0.3	0.2	0.3	0.4	
Ireland										0.3	0.4	1.0	0.5	0.3	0.3	0.4
Japan							0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3

Historical average Percentage of LOA Income to Research Expenditure (%)

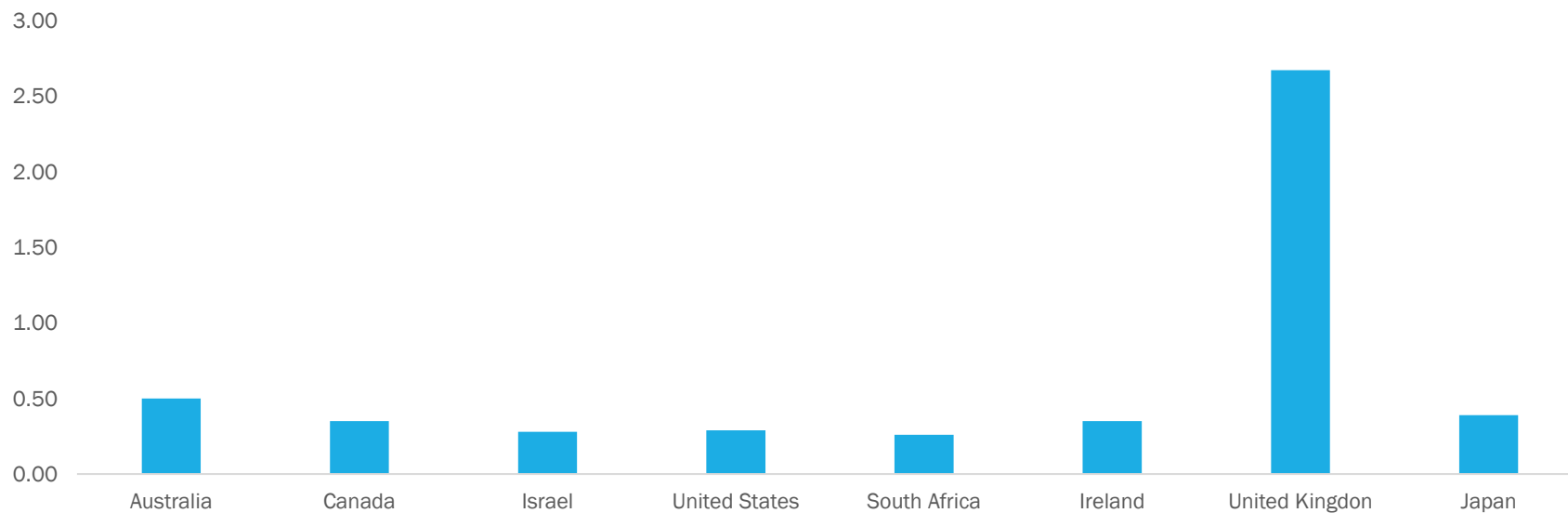


EFFICIENCY

Knowledge Transfer Efficiency Ratio – LOA to IP Disclosure

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Australia	0.40	0.49	0.47	0.46	0.35	0.34	0.31	0.29	0.35	0.44	0.61	0.45	0.59	0.85	0.81	0.85
Canada		0.40	0.30	0.37	0.35	0.22	0.31	0.32	0.31	0.22	0.30	0.39	0.55	0.38	0.44	0.42
Israel									0.00	0.25	0.20	0.21	0.25	0.21	0.32	0.50
United States		0.28	0.26	0.26	0.26	0.26	0.26	0.28	0.27	0.27	0.29	0.31	0.30	0.31	0.36	0.37
South Africa											0.18	0.25	0.28	0.38	0.23	
Ireland							0.22	0.28	0.23	0.30	0.40	0.44	0.40	0.32	0.45	0.46
United Kingdom												1.85	1.48	3.72	2.69	3.58
Japan							0.19	0.18	0.27	0.30	0.34	0.35	0.36	0.42	0.60	0.88

Historical yearly average of Knowledge Transfer efficiency measured as a ratio of LOA to IP Disclosures

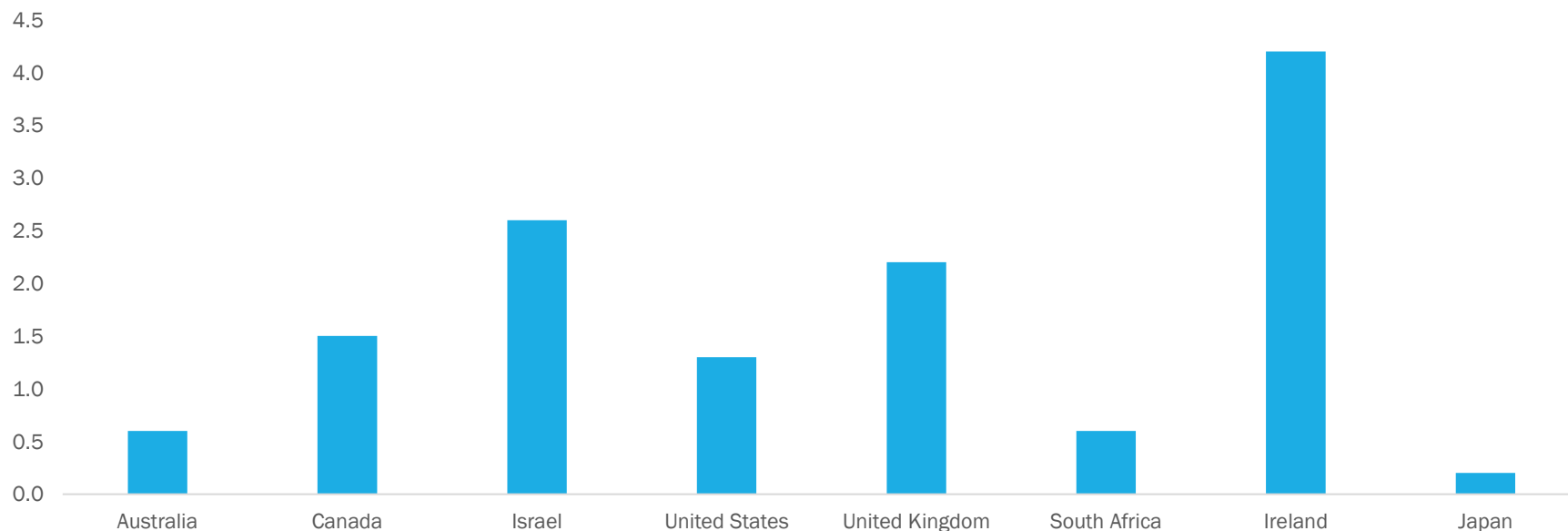


SPIN-OUT ACTIVITY

Startup Company Activity – TT IP related Startup Companies Formed per USD100m Research Expenditure (No.)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Australia	0.9	1.0	1.0	0.8	0.3	0.5	0.3	0.4	0.3	0.4	0.1	0.6	0.6	0.7	0.7	0.6
Canada	1.4	1.0	0.8	1.1	0.9	1.0	1.0	1.5	1.3	1.5	1.7	1.8	2.0	2.2	2.4	2.2
Israel									0.0	4.3	2.7	3.4	1.6	1.7	2.3	2.6
United States	1.1	1.1	1.2	1.1	1.2	1.1	1.1	1.1	1.1	1.3	1.4	1.5	1.5	1.6	1.5	1.3
United Kingdom	2.4	2.9	3.1	2.9	2.1	2.6	2.9	2.1	1.6	1.5			2.0	1.8	1.9	1.6
South Africa											0.5	0.5	0.6	0.7	1.0	
Ireland										6.2	4.3	4.7	4.2	3.0	4.0	3.3
Japan							0.4	0.3	0.3	0.2	0.3	0.2	0.1	0.1	0.1	0.1

Historical yearly average of research IP led spin-out formation per USD100m Research Expenditure (No.)



ABOUT ATPP

ATPP - (The Alliance of Technology Transfer Professionals) is the global professional body for Research Commercialisation, Knowledge Exchange and Technology Transfer. Representing over 20,000 individuals through an alliance of 14 international peak professional associations comprising of ASTP, AUTM, KCA, PraxisAuril, Redtransfer, SNITTS, SARIMA, STEM, TransferAllianz, UNITT, ÜSIMP, ITMA, ISTA, and Netval. ATPP is the custodian of the definition of the profession and confers the world-recognised Registered Technology Transfer Professional (RTTP) designation. The RTTP credential is the only global standard recognising Technology Transfer/Knowledge Exchange/Research Commercialisation practice. www.atpp.info



NOTES

Sources: Australia, National Survey of Research Commercialisation (NSRC) & Knowledge Commercialisation Australasia SCOPR; AUTM Statistics Access for Tech Transfer (STATT) Database; UK Higher Education Statistics Agency, the Israel Central Bureau Statistics, Knowledge Transfer Ireland – Annual Knowledge Transfer Survey, UNITT - Summary of University Technology Transfer in Japan and South African National Survey of Intellectual Property and Technology Transfer at Publicly Funded Research Institutions.

Data has been normalised to OECD Purchasing Power Parities rates found at:
<https://data.oecd.org/conversion/purchasing-power-parities-ppp.htm>

Some source datasets are complete national surveys collected by central government agencies, while others are compiled from voluntary submitted results. The UK licensing data does not include software licenses. Some data sets represent a full calendar year, while others report across a financial year ending prior to 31 December. In this case the data is reported against the year in which reporting closed i.e 2014/2015 data is reported against 2015. The outcome isn't perfect, however as data is normalised against reported RE and in each case the results are still indicative of overall outcomes and trends.